Reindeer breeding in the Chukchi Autonomous District and the basic directions of its stabilization

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Abstract. The characteristic of the condition of northern reindeer breeding in the eastern sector of the Arctic, the number of deers on farms, around administrative and geographical areas of the territory is given. The factors which affect the economic efficiency of the industry, production, the main reasons for the unproductive waste of deers are noted. In modern conditions, reindeer husbandry performs a number of important economic and social functions. There are three different points of view on the development of reindeer husbandry. In the first economic aspect, reindeer husbandry is considered as a commodity business in the northern economy. In the second aspect, reindeer husbandry is considered as an ethno-saving industry, the way of life associated with the traditional economic activities of the native population of the North, which provides its employment. The third approach means the ethnocultural development of reindeer husbandry, which creates opportunities for the tourism business development - ethnocultural tourism. The main directions of improving the productive and social infrastructure of the industry, ways of innovative development, and solving the personnel problem are proposed.

Reindeer husbandry maintains its economic and social significance in the Far North districts, being the main area of employment and the way of life of indigenous peoples. It allows to involve in the economic impact the Arctic and subarctic tundra poor in plant resources, which are not suitable for using by other branches of animal husbandry.

It is a key sector of agricultural production in the Chukchi Autonomous District. 14 municipal agricultural enterprises, peasant farms and private farms are involved in deer breeding. At the beginning of 2020, there were 132,454 deer, including 360 heads in peasant farms, 3,165 in private farms, the rest of the livestock is owned by municipal agricultural enterprises. The number of hinds is 63,505 goals.

The area of deer pastures in the Chukchi Autonomous District exceeds 42,597 thousand ha. with a project reindeer capacity of 410 thousand heads, which is a significant potential for the development of the main agricultural sector of this most remote territory of Russia [1]. The majority of deer is concentrated in three districts - Iultinsky, Anadyrsky and Chaunsky -102,850 goals. The largest number of deer is in Iultinsky district, in the agricultural enterprises of which – “Pioneer”, “Amguema” and “Vozrozhdeniye”, 43,565 heads are grazed (table 1). The second largest district is Anadyrsky district – 34,892 heads.
Five municipal enterprises are engaged in deer breeding here – «Kanchalansky», «Named after the First Revolutionary Committee of Chukotka», «Khatyrsky», «Markovsky», «Vayezhsky», and two peasant farms. In Chaunsky district there is an agricultural enterprise with the same name, where there are 24,393 deer. Today it is the largest reindeer husbandry in Chukotka. In the Bilibino district, where there are 17110 heads in the main herd, deer are bred in three municipal enterprises - Ozernoye, Oloy, Ostrovnoye and in one peasant farm. There are 6,982 deer in the Chukchi District, in the agricultural enterprise “Zapolyarye”. The Providensky district has the least quantity of deer, 2347 animals are grazed in the «Korat» agricultural enterprise (table 1).

Table 1. Deer husbandry indicators for 2019.

| Agricultural enterprise name | Deer livestock by 01.01.2020 | Hinds including | Sold for meat in live weight | ADLS, CQC for 100 hinds |
|-----------------------------|-------------------------------|-----------------|-----------------------------|------------------------|
|                             | Heads | % | Heads | c |                      |                      |
| Kanchalansky                | 14969 | 7934 | 53.0 | 1152 | 817.24 | 84.2 | 63.3 |
| Im. I Revkoma               | 10022 | 4931 | 49.2 | 856  | 554.66 | 81.1 | 60.6 |
| Khatyrsky                   | 5017  | 2612 | 52.1 | 1062 | 624.62 | 75.0 | 59.1 |
| Markovsky                   | 2754  | 1506 | 54.7 | 161  | 122.83 | 81.9 | 43.4 |
| Vayezhsky                   | 1890  | 1174 | 62.1 | 176  | 128.08 | 32.6 | 15.0 |
| Ozernoye                    | 6270  | 3060 | 48.8 | 359  | 284.85 | 93.2 | 66.6 |
| Oloy                        | 5406  | 2891 | 53.0 | 604  | 489.00 | 84.0 | 58.0 |
| Ostrovnoye                  | 5314  | 2518 | 47.4 | 964  | 591.15 | 67.7 | 49.7 |
| Pioneer                     | 18081 | 8388 | 47.8 | 1185 | 1170.60 | 79.7 | 59.6 |
| Amguema                     | 16608 | 7976 | 48.0 | 2099 | 1839.74 | 80.8 | 54.7 |
| Vozrozhdeniye               | 8876  | 4864 | 54.8 | 853  | 851.34 | 67.5 | 34.4 |
| Chaunsky                    | 24393 | 10731| 44.0 | 1756 | 1271.37 | 74.5 | 49.3 |
| the Arctic                  | 6982  | 3370 | 48.3 | 943  | 805.01 | 80.6 | 57.8 |
| Korat                       | 2347  | 1098 | 46.8 | 190  | 218.27 | 77.9 | 49.0 |

a ADLS – Adult deer livestock safety.
b CQC – Clear quantity of calves for 100 hinds.

The pedigree livestock is concentrated in the Vozrozhdeniye gene pool sector, the Khatyrsky pedigree reproducer and in 6 breeding branches in agricultural enterprises (table 2). Since 2002, they have raised and sold over 35 thousand animals of the highest bonitet.

Table 2. The number and the location of the deer pedigree livestock in Chukhch Autonomous District.

| Household                  | Livestock | Location and pasture-geography zone                                      |
|----------------------------|-----------|-------------------------------------------------------------------------|
| Branch «Vayezhsky»          | 3331      | Anadyrsky district. Forest-tundra pastures of the southwestern part of Chukotka Autonomous Region |
| UE^+ AE b «Vayezhsky»       |           |                                                                         |
| Branch «Aion»               | 9089      | Chaunsky district. Arctic tundra of the East Siberian Sea coast, Aion Island. |
| UE AE «Chaunsky»            |           |                                                                         |
| Gene pool sector            | 10935     | Iultinsky district. Arctic tundra of the southwestern part of the Chukotka Peninsula and the eastern coast of the Gulf of Cross. |
| UE AE «Vozrozhdeniye»       |           |                                                                         |
| Pedigree reproducer         | 5706      | Anadyrsky district. Tundra pastures of the southwestern part of Chukotka Autonomous Region on the coast of the Bering Sea. |
| UE AE «Khatyrsky»           |           |                                                                         |
| Branch «Zarya»              | 8376      | Iultinsky district. The Arctic Ocean coast Arctic tundra, adjacent to the Chukchi Sea. |
| UE AE «Peoneer»             |           |                                                                         |
Reindeer husbandry creates 1,000 jobs, mainly for native people, which has great social importance in remote areas of the Far North. The average monthly salary of agricultural workers in 2019 was 56,683 rubles. 12,386 deer with live weight of 9,788.31 centners are sold for meat by the households of the district.

The best rate for the preservation of the adult livestock and clear number of calves were achieved in the «Ozernoye» reindeer herding farm - 93.2% and 66.6 animals with the region's average rate of 76.4 and 52.8, respectively (table 1).

Despite the measures which are taken, the number of deers is declining. So, if in 2010 there were 195.4 thousand goals in the district, in 2018 - 154.9; 2019 - 141.9 thousand, at the beginning of 2020 - 132.454. Mainly, this decrease in the number of deers happens because of the large unproductive losses of animals.

The extreme environmental conditions of the Arctic, migratory wild reindeers, predatory animals and birds - wolf, bear, wolverine, fox, arctic fox, raven, all of this in combination cause enormous damage to domestic reindeer husbandry. A near complete cessation of measures to control the number of predators in the 1990s led to a rapid increase in their populations on the territory of deer pastures, which turned into a real disaster for the industry. The factor of extreme concern and reindeer herds dispersal by wolves had become the main cause of so-called “missing” losses [2].

Total number of excess deer losses round the region exceeded 18 thousand heads in 2019, meanwhile the amount of the lost profit was 198 million rubles.

In modern conditions, reindeer husbandry performs a number of important economic and social functions: maintaining food security, strengthening social stability in rural areas, reducing poverty and the survival of the indigenous population in extreme climatic and economic conditions of the Far North. The industry helps with the traditional food provision, job creation, and it serves as a source of wealth for indigenous peoples. In the countryside, each person in some way gets income from reindeer husbandry. The industry has to be developed for employment and stabilization of the socio-economic situation of the indigenous peoples of the Far North (IPFN) [3,4].

Now there are three different points of view on the development of reindeer husbandry. The first is economic: reindeer husbandry is considered as a commodity branch of the northern economy. From this point of view reindeer herding should be a cost-effective industry, which using the IPFN labor resources, supplies the market with meat, fur, medicinal-raw materials and other products. In the economic approach the optimization criteria are the amount of produced and sold products and the amount of profit received by the farm. When planning investments, the priority is given to strong enterprises that can ensure cost recovery and loan repayments [5].

From another point of view, reindeer husbandry is considered as an ethno-saving industry, the way of life which is connected with the traditional economic activities of the indigenous population of the North, which provides its employment. At the same time, the social effectiveness of reindeer husbandry is assessed by its role in the self-sufficiency and self-employment of the population, the amount of financial and natural income received by reindeer herders and members of their families, the number of jobs, the number of owners of their own reindeer herds, etc. Because of it the ethnosocial aspect of saving the northern Reindeer husbandry seems to be more significant than the still prevailing utilitarian-economic [3,4].

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| Branch «Tourvaurgin» | 6363 | Bilibino district. Forest-tundra pastures of the northwestern part of Chukotka Autonomous Region. |
|----------------------|------|--------------------------------------------------------------------------------------------------|
| UE AE «Ostrovnoye»   | 6335 | Anadyrsky district. Arctic tundra adjacent to the Anadyr Gulf and the west coast of the Gulf of Cross. |
| «Kanchalansky»       | 11360 | Iultinsky district. Arctic tundra in the northwest of the Chukchi Peninsula.                      |

* Unitary enterprise – UE.  
* Agricultural enterprise – AE.
Reindeer husbandry today is the main way to preserve northern ethnic groups, the "ecological niche" their unique culture, which requires a conceptually new approach. It has been identified that in regions where the number of domestic deers per native inhabitant exceeds 12 goals, a stable positive demographic dynamic of the indigenous peoples remains. The families of reindeer herders unlike the township people have high stability of marriage, have high number of children, children are brought up in the atmosphere of respect for elders, and children also early start the labor process. Indigenous people who are engaged in reindeer husbandry, as a rule, consume several times less alcohol than those living in villages. Reindeer herding collectives continue to remain specific enclaves of ethnic culture, as the economy and life are inseparable in them.

Reindeer teams (camps) today still have those indigenous cultural components that they have practically forgotten as a result of assimilation under conditions of their living in large settlements, and in cities. National clothes, native language environment, ways of nature management, organization of living space, traditional food and cuisine, homes and a nomadic way of life, ethnic rituals play an important role in maintaining their inherent lifestyle [2].

The third approach involves the ethnocultural development of reindeer husbandry, which creates opportunities for the tourism business development - ethnocultural tourism. On the basis of such reindeer husbandry centers, cultural-economic and educational-cultural centers are being created that preserve the uniqueness and originality of northern ethnic groups. The traditional industry in the North of the Far East should develop using simultaneously all three directions.

Reindeer husbandry is also interesting in the aspect of organic agriculture, as a source of environmentally friendly products. Throughout the year reindeers graze on natural pastures, eat only wild vegetation, consume natural minerals and water from clean sources. Growth stimulants - hormones, antibiotics, biologically active additives are not used in reindeer husbandry. Very seldom deers are fed with compound feedstuff and very fewer veterinary drugs are used. So, it is obvious that the products obtained from reindeers are ecologically pure and are beyond competition among other branches of animal husbandry [6].

In modern economic conditions, the production of reindeer herding products is unprofitable. The efficiency of the industry is adversely affected by extreme natural and climatic conditions of its habitats and a long production cycle. The great remoteness from the main markets entails huge logistics costs and it turns the industry into an unattractive area for investors. Under market conditions, traditional indigenous industries that sell products with a low degree of processing, have become ineffective. To bring northern farms to a subsidy-free level, diversification of production is necessary.

There is organizational-economic, technological and technical backlog of reindeer husbandry. The staff problem is extremely acute, dating back to the 1950s and 1960s, when children of reindeer herders were forcibly taken from their families. Brought up in boarding schools in isolation from their native environment, they become unable to live and work in traditional industries. In addition, the long stay of reindeer husbandry in the framework of archaic forms of work and life made it unattractive for young people, which ultimately led the industry to stagnate due to staff shortage [7].

Further stable development of reindeer husbandry is possible only with the innovative way. The modernization of the industry should be carried out in two directions - technological and social. The first is directed on the fundamental technical and technological re-equipment of the traditional industry and bringing it to the modern level [8].

Technological modernization includes providing reindeer husbandry with modern off-road vehicles for all seasons of the year. These are cars and rovers for transporting goods and moving people across the territory of deer pastures; snowmobiles for grazing deers in the winter period and wandering duty shifts with the shift method of work; 1-2-seat helicopters, gyroplanes, drones for monitoring and controlling the deer population, especially during the spring slush, the killing of predatory animals on the territory of grazing land, the searching and collecting of stray animals, exploring and surveying of grazing lands (figure 1). Equipment for bonitation, tagging (chipping), animal identification, fixing and veterinary treatment of deer, scaring away predatory animals and birds. Personal protective equipment for workers from extreme environmental conditions of the Far North, safety measures.
Figure 1. Monitoring a herd of deer using a 1-seater helicopter in Alaska.

Zootechnical and economic measures include: monitoring of the biochemical composition of blood to control the physiological state and full nutrition of animals; protein-mineral feeding of deers in the winter-spring period. Improvement of breeding on genetic monitoring, molecular diagnostics, exchange of allele fund between herds and farms according to the rotation plan of producers; organization of a genetic fund for the breeding and saving of an Even breed of deers; optimization of herd structure, increase in the number of hinds to 53–55%. Controlling of the number of predatory animals and birds on the territory of deer pastures, insurance compensation for damage according to market prices. Resection of velvet antlers to increase the fatness and meat productivity of deer, gives an increase in live weight of 10–15% without extra costs of food and stimulants. The collection of horns and velvet antlers, manufacturing and selling of souvenirs (decorative horn, etc.), the production of sewing and leather goods from fur raw materials.

An optimized of the prevention and control system of mosquitoes, gadfly and necrobacteriosis using modern veterinary prophylactic and therapeutic facilities allows avoiding animal losses during the summer season, which is especially dangerous for reindeer husbandry. It includes insecticidal-repellent treatments against blood-sucking insects and gadflies, early chemotherapy of edemagenosis and cefenomyosis, prevention and therapy of necrobacteriosis [9].

Northern reindeer herding has always been considered not only as a branch of agriculture, but also as a socio-economic system that is closely related to the life-support of northern indigenous peoples [3,10]. Due to the improvement of social conditions in reindeer husbandry, the prestige of the profession will increase, it will become real to attract and retain young men and women in the industry, the formation of young families, and the solution of the northern indigenous peoples' demographic problem.

For the purpose of career guidance, it is necessary to provide the living of the children of preschool age with their parents in reindeer herding camps on the basis of housing complexes. It is necessary to teach primary school pupils remotely (remote education). It is also necessary to teach the basics of traditional industries in rural schools. To do this, it is necessary to develop appropriate education
programs. In specialized classes for children of reindeer herders to teach reindeer husbandry professions with employment after the 9th grade. The implementation of these measures will allow the systematic training of workers and the adaptation of indigenous youth for employment in the traditional industry [7].

Attracting professionally trained young people, primarily from among the northern indigenous peoples, will make it possible to master modern technologies in the field of reindeer herding production and processing. Innovative development should lead to an increase in quality indicators to a level that ensures the effective development of the industry [9].

The northern reindeer herding modernization is vital for maintaining the industry, increasing the number of jobs and increasing labor efficiency by creating and updating productive, technological and social infrastructure.

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