Natural pastures as the most important feed resources

E G Imeskenova, S Ch Sodboeva and T D Namdakova

Buryat State Agricultural Academy named after V.R. Pilippov, 8, Puchkin Street, Ulan-Ude, 670024, Russia

E-mail: imesc@mail.ru

Abstract. Distant pastures are an important reserve of livestock feed. The object of research is the territory of distant natural pastures of the Tunkinsky district of the Republic of Buryatia. The studies are carried out in accordance with the Guidelines for conducting scientific research on hayfields and pastures. In order to obtain a long-term economic effect in the Republic of Buryatia, it is necessary to observe the basic elements of rational grazing (grazing load, dates of beginning and end of grazing, compliance with optimal coefficients of phytomass disposal, etc.). The rich natural grasslands and sources of water supply significantly improve the taste of livestock products, and thus increase its competitiveness, while reducing feed costs.

1. Introduction

Historically, the Republic of Buryatia (RB) is a cattle-breeding region. It is reasoned by the huge reserves of feed resources, and above all grasslands. Areas suitable for distant free grazing serve as great fodder base reserves. The vegetative cover of such grasslands is undoubtedly characterized by the rich and diverse floristic herbage, which is largely determined by soil and climatic conditions. The quality and volume of the harvest obtained from pastures is determined by the species composition of the grasses growing there. The main types of farm animals that are most adapted to the free grazing are horses, young animals and sheep [1, 2].

Free-range animal husbandry is now developed in the UK, the Balkans, the Scandinavia, the Caucasus, Central Africa and the Middle East. In Europe, free-range livestock breeding, became widespread in the pre-Roman period [3-5]. Due to historical, cultural and geographical reasons, distant cattle breeding with three types of pastures is practiced: pastures close to settlements (winter, located near villages in the valleys), intensive (spring-autumn, those at the foot of the mountains), and distant (summer, in the highlands) [6].

The development of free-range animal husbandry requires the solution of a set of problematic issues, since in the Buryatia Republic the overall situation with grasslands is unfavorable. The areas of such pastures make up 33.1% (360000 hectares) of the total area of natural pastures of the Republic of Buryatia. To date, there has been an uneven distribution of grasslands, as well as significant recent growth in the number of individual livestock which has created an imbalance in the needs and availability of natural forage lands. Distant pastures in the republic are located in sparsely populated areas, in forests of the Federal ownership and in the highlands. With the proper use of the distant pastures capacity, Buryatia can become a region producing environmentally friendly livestock products. The sustainable development of animal husbandry in the republic largely depends on the availability of grazing feed to animals. Therefore, free-range animal husbandry should be one of the priorities in the development of the agro-industrial complex of the Republic of Buryatia [7].
The available areas of natural pastures as a whole must be properly and effectively used, maintaining and increasing their productivity from year to year [8, 9]. Under this study distant pastures are considered as an important reserve of the feed base of animal husbandry.

2. Research object and methods
The object of the study is the territory of the distant pastures of the Republic of Buryatia. Tunkinsky district is located in the southwestern part of the Republic of Buryatia, 40 km west of Lake Baikal, bordering Mongolia in the southwest. The region is located in the area of the mountains of Southern Siberia: the Khamar-Daban range, the Munko-Saridak massif, and the Tunkinsky Goltsy (Bald peaks). Of the total area of the region, 67.1% is forest land, 8.7% is agricultural land (of which 2.5% is arable land) [10].

The studies were conducted in the Urgadei location of the High Mountain area of the Tunkinsky District. The total area of these pastures is 7000 ha. Nowadays, these territories are not used in a sustainable way (no more than 20%), while in this unique area over 20 thousand farm animals can graze. Highland ridge district is characterized by very harsh climatic conditions. According to long-term meteorological data, the average annual air temperature is minus 5.6°, the vegetation period is 109 days, and the frost-free period is 36 days; the average annual rainfall is 276 mm. The soils of the study area are alluvial, alluvial-meadow, thin, light loamy and loamy [2, 3].

The studies were carried out in accordance with the Guidelines for conducting scientific research on hayfields and pastures [11, 12].

3. Research results
Semi-nomadic animal husbandry practiced by herders of the Tunkinsky district supporting the preservation of nomadic ways established for centuries ensured a high level of livestock production (1928). From the moment of collectivization (1934 is the of the first livestock census after collectivization) until the adoption of the resolution on the use of distant pastures (1942), with the strictest measures aimed at preserving the livestock, a slight increase in livestock has been observed. The use of distant-pasture livestock breeding has led to a considerable increase in the number of all types of livestock.

From archival data it is known that in 1976 there were 34041 cattle in the region, 27,730 sheep, 3939 horses. In 1985 there were 36621 cattle, 21059 sheep, 5013 horses. In 1995: 24828 cattle, 3309 sheep, 5140 horses. Since the mid-1990s, there has been an excessive decrease in the livestock of farm animals, especially sheep, which is associated with the elimination of collective and state farms. As of January 1, 2016 (tab. 2), the number of farm animals in the area i.e. the number of horses remains at the level of the 90s, and is higher in the number of cattle and sheep [13].

| Type of farm animals | Businesses | | | | | |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|
|                      | 2016      | 2016 in % to 2015 | 2016      | 2016 in % to 2015 | 2016      | 2016 in % to 2015 | 2016      | 2016 in % to 2015 |
| Cattle including cows | 28069 | 93.9 | 458 | 104.6 | 25043 | 91.8 | 2586 | 118.6 |
| Sheep and goats       | 10555 | 88.3 | 181 | 101.7 | 9359 | 84.4 | 1015 | 146.9 |
| Horses                | 4289 | 96.1 | 281 | 120.1 | 2725 | 82.2 | 1283 | 140.8 |
|                       | 4885 | 95.8 | 82 | 39.8 | 3597 | 89.9 | 1206 | 134.7 |
The years of 1976 to 1990 saw 16–19 thousand farm animals grazing in distant pastures including horses and young cattle. Since the mid-1990s, there has been a significant decline in the use of areas of distant pastures. Highland pastures are currently underused, and in some years they haven’t been used at all. At the same time, pastures near settlements are used all the year round, which causes irreparable damage of foliage and leads to their degradation; grazing load in some areas has increased by 7-10 times while trotted and depleted pastures are to be restored at significant economic costs by improving fodder production and cultural farming.

The development of distant pastures involves a whole set of activities, which is primarily related to areas inventory and identification, soil and geo-botanical surveys, assigning the areas to the land user, the determination of the seasonal feed volume for animals grazing there. This study requires a certain approach with the participation of diversified specialists and services.

The prerequisites and problems of the degradation of the free-range animal husbandry in Buryatia taking into account legal, economic, environmental, organizational and economic issues are shown in Figure 1.

**Figure 1.** Background and problems of degradation of free-range animal husbandry in Buryatia.

The process of distant pastures use should take place in two directions. Firstly: rural citizens should be able transfer their livestock to remote pastures for fattening. Secondly: distant pastures should be widely used for the sheep breeding and the production of cheap, ecological beef and horsemeat. These activities should be carried out only on a scientific basis, in order to avoid past mistakes, when the ratio between the feed capacity of land and the number of grazing livestock was ignored.

The analysis of the current use of grasslands areas shows that in Buryatia it is necessary to streamline and preserve the long-established system of distant-pasture livestock breeding, which uses cheap natural forage, necessary for the production of high-quality animal products.

For distant pastures of the Tunkinsky district, a number of measures are recommended that are aimed at preserving the most valuable plant associations, afforestation of galleys and landslides, preventing erosion and increasing the productivity of trotted grasslands. Rational use of distant grasslands should be based on the development of a methodology for drawing up schemes for the redistribution of grasslands by rotation. It is also necessary to work out the issues of on-farm organization of the territory.
in a schematic way, to carry out calculations on the feed intensity of the plots, to plan the location of the economic facilities.

Thus, the improvement of the organization of the use of distant pastures in Buryatia has two sides:

1. Creation of territorial conditions for the most effective use of this category of land in relation to the traditionally established forms of organization of agricultural production;
2. Consideration of climatic and socio-economic conditions in the process of organizing a given territory.

Also, when managing distant pastures, a number of factors are important that are associated with driving cattle over certain distances. These factors include: loss of weight during the transfer of livestock, the organization of water supply and, if necessary, the cost of construction of buildings.

The general scheme for the rational use of distant pastures in the area is shown in Figure 2. The scheme suggests factors constraining the rational use, advantages and solutions.

**Figure 2.** General scheme for the rational use of distant pastures in the area.

**4. Conclusion**

Free-range animal husbandry is a system that is justified both in environmental and economic terms. To obtain a long-term economic effect in the Republic of Buryatia, it is necessary to observe the basic
elements of rational grazing (gazing load, dates of beginning and end of grazing, compliance with optimal coefficients of elimination of phytomass, etc.). The rich herbage and natural sources of water supply significantly improve the taste of livestock products, and thus increase its competitiveness, while reducing feed costs. As a result, the cost of production is reduced by an average of 25-30% in comparison with the stable housing of cattle.

The development of free-range animal husbandry in Buryatia, in particular sheep, herd horse breeding and beef cattle feeding for the production of environmentally friendly products should be combined with the type of grazing animals, the type of pastures and the seasonality of their use. This moment is important, since it is necessary not only to keep the livestock, but also to get maximum production during the feeding period.

References
[1] Imeskenova E G, Butukhanov A B 2017 Rational use of natural pastures for free-range livestock breeding Buryat State Agricultural Academy. 4(49) 123–129
[2] Imeskenov C S, Korsunova T M, Imeskenova E G 2016 Natural, social and ethnocultural potential of the Tunkinsky district of Buryatia as an object of agricultural tourism Bulletin of the Krasnoyarsk State Agrarian University. 4(115) 28–34
[3] Van Veen S T W, Alimaev I I, Utkelov B 2005 Kazakhstan. Rangelands in Transition – the Resource, the Users, and Sustainable Use. Technical Paper. World Bank. (Europe and Central Asia Environmentally and Socially Sustainable Development Series, 31348).
[4] Lall J S 1981 The Himalaya: Aspects of Change (Delhi: Oxford University Press).
[5] Xinchun Z 2011 Pastoralism in Xinjiang: Implementing the pastoralist settlement programme to promote sustainable development of pastoralism in Xinjiang. In: Kreuzmann H, Abdulalishoev K, Lu Zhaohui, Richter J, editors. Pastoralism and Rangeland Management in Mountain Areas in the Context of Climate and Global Change (Feldafing, Germany: GIZ) pp. 182–188.
[6] Robinson S 2015 Pasture Management in Central Asia: Results of the First Practical Conference on the Promotion of Sustainable Pasture Management in Central Asia. Bishkek, 56 p.
[7] Imeskenova E G, Butukhanov A B, Komendanova T M 2015 Features of use and characteristics of distant pastures of Buryatia Bulletin of Krasnoyarsk State Agrarian Univ. 12 103–109
[8] Farb P 1969 Man's Rise to Civilization, as shown by the Indians of North America from primeval times to the coming of the industrial state (London: Secker and Warburg)
[9] Larin I V 1990 Grassland and pasture farming. (Leningrad: Agropromizdat) 600 p.
[10] Imeskenova E G 2009 Methods of the use and the quality feed of main types of natural grass stands of Buryatia, Dissertation, Ulan-Ude
[11] Methods of experiments on hayfields and pastures. 1971. VNIIK them. V.R. Williams (Moscow: Agropromizdat) 232 p.
[12] Kutuzova A A 1996 Guidelines for conducting scientific research on hayfields and pastures (Moscow: VNII of feed) 152 p.
[13] Annual reports on agriculture (1976, 1985, 1995). Data from the archive of the MC "Tunkinsky district"