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Various Methods For Assessing The Nutritional Value Of Feed For Breeding Sheep Breed Dzhalginsky Merino.

Vladimir Ivanovich Trukhachev*, Sergey Aleksandrovich Oleinik, Vitaly Yuryevich Morozov, Tatyana Sergeevna Lesnyak, and Sergey Pavlovich Sklyarov.

Stavropol State Agrarian University, Zootekhnicheskiy lane 12, Stavropol, 355017, Russia.

ABSTRACT

The article deals with the assessment of the nutritional value of the feed of the annual ration for feeding sheep of the Dzhalginsky merino breed in the conditions of the steppe regions of the Stavropol Territory. In order to optimize the cultivation of various sex and age groups of sheep in the pasture period, various methods were used for remote assessment of the vegetation index, which reduces the time to reach production parameters by 6-7%. It has been established that sheep of the Dzhalginsky merino breed are characterized by resistance to changing climatic conditions and are adapted to growing under drought conditions.

Keywords: food, nutritional value, vegetation index, sheep, Dzhalginsky merino.

Corresponding author

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INTRODUCTION

Modern urbanization of society and population growth on a global scale determine the need for changes in farming methods. By the middle of the XXI century, an increase in the global food demand by the world is expected to be about 2/3 compared with the current level. At the same time, global climate change, increasing costs in the cost of production of energy products, as well as reducing the quantity and quality of fertile land will pose a serious obstacle to ensuring the production of the required amount of food. The introduction of the modern concept of digital agriculture is designed to improve production efficiency and reduce existing costs in food production.

One of the ways to improve the efficiency of modern agriculture is the use of remote aerospace monitoring, which allows to ensure timely obtaining information about the dynamics of the vegetative activity of crops and pasture plants, assess their potential yields, level the negative impact of diseases and pests, assess the biological productivity of pasture production areas.

The advantage of using remote sensing methods is the possibility of obtaining homogeneous and comparable data obtained simultaneously for vast territories. The developed innovative system of grazing livestock based on the use of digital aerospace technology and telemetry and is a new modern direction of development of the livestock industry, which is designed to solve the many problems of improving the efficiency of grazing animals.

Currently, various vegetation indices are used, for example, NDVI, which are obtained on the basis of an analysis of the spectral brightness in the red and near infrared zones and which allow the characterization of vegetation cover [10]. The principle of this method is based on the hypothesis that carrying out some mathematical operations with different channels of remote sensing of the earth will allow you to gather the necessary and reliable information about the nature of the growing season in plants. It was also shown that the highest correlation dependence of the established index with the physicochemical parameters of green plants was recorded in fairly narrow ranges of red (650-700 nm), green (500-550 nm) and near infrared (900-940 nm). (Prasad S. et al. [11]).

Considering the fact that remote monitoring methods are increasingly penetrating into the pasture livestock system, it is of practical interest to study the possibility of using aerospace monitoring in industrial sheep farming, which focuses not only on traditional wool production, but also on growing young mutton, the demand for which increases the last time [8, 9].

A radical change in the direction of demand for sheep products leads to quite complex changes in the industry. Thus, in the practice of modern sheep farms, there is a sharp increase in the economic importance of the production of mutton, the revenues from which reach 3/4 and more of the total revenue. In these new conditions, it has become economically advantageous to breed fine-woold sheep, which combine high wool productivity and meat qualities well, with excellent adaptive abilities to breeding conditions, especially in steppe regions. It was these factors that necessitated the creation of a new competitive breed of fine-wool sheep with genetically determined meat productivity. As a result of many years of directional breeding and breeding work, a new breed of sheep was created - the Jalga merino in the Stavropol Territory.

The main breeding method for creating a new breed was the use of complex reproductive mating. At the beginning of the local queens of the fine-fleeced breed, the Novokavkaz merino crossed with the sheep of the Caucasian and Australian merino breeds. On the obtained breeding stock used sheep producing Stavropol breed of sheep. At the final stage, the best queens with the imported Australian merino breed sheep were again used. As a result of the implementation of a detailed cross-breeding scheme and conducting targeted selection and selection of parental pairs, a herd was created with high meat and wool productivity, which for the whole complex of productive qualities differs significantly from the original maternal Stavropol breed of sheep. At the same time, the sheep of the Dzhalginsky merino breed were characterized by good adaptability to the conditions of the dry steppes of the Stavropol Territory.

According to the zootechnical classification, sheep are related to the wool direction of productivity, however, the wool in these animals is predominantly of medium fineness (20-23 microns) and in terms of its

physical-mechanical and technological properties, it meets the requirements of the international standard.

On the exterior, sheep of the Dzhalginsky merino breed is characterized as animals of medium and large size, relatively squat and slightly stretched, with proportional body shape and a strong constitution. The head of the uterus is light, with a straight profile; in sheep, as a rule, there is a small humpback. As a rule, rams are horned, and the uterus is horny. There is a moderate folding of the skin, for example, there are 1-2 well-developed folds on the neck, and on the body, folds appear in the form of wrinkles, which are clearly visible after shearing. Sheep breed Dzhalginsky merino are characterized by high wool productivity. The average sheared of pure wool in the herd in recent years amounted to 3.7 kg with fluctuations from 3.5 to 3.9 kg with the output of pure fiber 60-65%. The average cut of pure wool in females was 3.68 kg (lim 3.37 - 4.03 kg), in rams of the main group - 9.42 kg (lim 8.25 - 10.81 kg). In terms of the wool productivity of sheep, the Dzhalginsky merino sheep are among the best fine-fleeced breeds in Russia.

Meat qualities are well developed in new breed sheep, so the live weight of producing sheep is, on average, 122 kg, and the queens - 55 kg. The sheep-yearlings of the repair group reach a body weight of 80 kg, and bright - 42 kg, which is much higher than the requirements of the standard for sheep wool productivity direction.

Repairing young sheep of this new breed also has a high growth energy. Thus, during the fattening period, the average daily gain in live weight reaches 214 grams, and when slaving sheep at the age of 9-11 months, they receive carcasses weighing 19-26 kg. The output of lambs in queens of the Dzhalginsky merino breed is 115-120 heads per 100 queens and in the best flocks 130-140 lambs.

Thus, the introduction of the aerospace technology application methodology to optimize the production of mutton using sheep of the Dzhalginsky merino breed is of scientific and practical interest, since animals of this new breed are able to display outstanding meat qualities and are adapted for growing conditions in the arid zone of Stavropol.

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MATERIALS AND METHODS

Pasture feeds for research were selected during the main growing season of plants (June-July), the main feeds (silage, hay, haylage) were selected after they were harvested in accordance with the agrotechnical technological scheme and studied by standard generally accepted methods.

The chemical composition of the feed was determined in the laboratory of the Scientific and Technical Center “Feed and Metabolism” of the Stavropol State Agrarian University on the equipment of the firms INGOS (Czech Republic), FIBRETHERM (Germany), VELP SCIENTIFICA (Italy).

Moisture of the feed was determined by the difference between the mass of the sample before and after drying at 130 ° C for 40 min and calculating the mass fraction of moisture [7].

Raw protein feed was determined by ashing the organic matter of the sample to be analyzed with sulfuric acid in the presence of a catalyst, alkalizing the reaction product, distilling and titrating the released ammonia, calculating the mass fraction of nitrogen and calculating the mass fraction of crude protein by multiplying the result by converting the mass fraction of nitrogen to the mass fraction of raw protein, equal to 6.25 (according to Kjeldahl) [4].

Crude fiber was determined (according to Genneberg and Shtoman) by a method based on the sequential processing of the sample of the test sample with acid and alkali solutions, ashing and quantitative determination of the organic residue by the gravimetric method. The content of crude fiber is expressed as a mass fraction in% or in grams per 1 kg of dry matter [3].

The crude fat in the feed was determined by the method of extraction of crude fat from a sample

of diethyl or petroleum ether in the Soxhlet apparatus. removing the solvent and weighing the non-fat residue [1].

Crude ash in the feed was determined by determining the mass of the residue after combustion and subsequent calcination of the sample [2].

Calcium in feed was determined by the method of ashing organic matter of the sample analyzed, treating the resulting ash with a solution of hydrochloric acid, precipitating calcium in the form of calcium oxalate, followed by dissolving the precipitate with a solution of sulfuric acid to form oxalic acid, which is titrated with potassium permanganate [5].

Phosphorus in the feed was determined by dry ashing of the sample with calcium carbonate and heating the residue with hydrochloric and nitric acids (for organic feed) or in wet ashing of the sample with a mixture of sulfuric and nitric acids (for mineral compounds and liquid feed). An aliquot of the hydrolyzate is mixed with the molybdovanadate reagent and the optical density of the resulting yellow solution is measured at a wavelength of 430 nm [6].

Groups of animals for research formed on the principle of steam analogs from young sheep of the Dzhalga merino breeding farm of the Stavropol Territory of Russia. The number of bright in each group was 100 heads, age 4 months. The control growing period was 60 days. Accounting for live weight was performed by standard zootechnical methods by weighing animals.

In our studies, groups of sheep were grazed on pastures, the botanical composition of which consisted of legume-cereal plants (25: 75%): onobrychis, medicago, festucapratensis, loliumperenne. The pasture ecosystems were studied using an AC-32-10 unmanned aerial vehicle and a DJI 900 hexacopter, a Canon M10 camera and a vegetation index calculation software (NDVI).

Studies were conducted in the centers of collective use: The Center for Collective Use "Educational and Scientific Testing Laboratory (UNIL)", the Center for Collective Use "NTC Feed and Metabolism" and using a unique scientific installation "Laboratory of Milk Quality Selection Control" based on FSBEI HE «Stavropol State Agrarian University».

RESULTS AND DISCUSSION

The nutritional value of the annual feed ration of feed and pasture feed consumed by experimental sheep of the Dzhalginsky merino breed in the conditions of the steppe regions of the Stavropol Territory is presented in Table 1. On average, 1 kg of live weight gain of a young sheep was spent on nutritional nutrient 0.21 feed unit.

Table 1: Nutritional value of feed, M ± m

Indicator	Pasture feed		Feed the main diet
	GroupI NDVI = 0.4	GroupII NDVI = 0.5	
Crude protein,%	4,23±0,03	4,60±0,03	10,14±0,02
Total humidity,%	40,72±5,45	46.98±5,45	44,58±3,87
Crude fiber,%	24,39±1,67	16,32±1,67	11,12±0,91
Crude fat,%	0,68±0,03	1,20±0,03	1,67±0,27
Crude ash,%	2,95±0,04	4,22±0,04	4,01±0,25
Calcium,%	0,70±0,01	0,40±0,01	0,43±0,01
Phosphorus,%	0,17±0,01	0,15±0,01	0,22±0,02

The nutritional value of feed is mainly characterized by indicators such as crude protein, crude fat, and crude ash. The numerical value of these indicators in the average sample of pasture feed, with an average value of the growing index of 0.5 (group II) was higher than in group I by 0.37, 0.50, 1.27 abs. %, respectively. At the same time, the crude fiber index in group II was lower compared to group I by 8.04 absl. %

Table 2 presents the productive qualities of ewes for 60 days, depending on the vegetative index of pasture plants.

Table 2: Productive qualities of ewes

Indicator	Группа	
	GroupI NDVI = 0.4	GroupII NDVI = 0.5
The average live weight at the start of the experiment, kg	23,12±0,32	23,10±0,21
The average live weight at the end of the experiment, kg	33,64±0,61	34,48±0,56
Average daily weight gain, g	175,30±3,11*	187,40±2,53*

* Statistically significant differences with p <0.05

In the arid steppe zone of the Stavropol Territory, remote sensing methods were used for various pasture plots. By optimizing the cultivation of ewes during the pasture period using various methods of remote assessment of the vegetation index, in group II it became possible to obtain a statistically significant increase in the average daily increase in live weight by 6.5% compared with group I, where the figure was 175.3 g.

CONCLUSION

At pasture rearing of young dam sheep of the Dzhalginsky merino breed, it was expedient to apply remote sensing methods to optimize the cultivation of ewes in the pasture period and to increase the average daily live weight gain by 6.5% compared to the control group, where the figure was 175.3 g.

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