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USING OF NATURAL-MATHEMATICAL METHODS IN PROFESSIONAL ACTIVITIES

ИСПОЛЬЗОВАНИЕ ЕСТЕСТВЕННО-МАТЕМАТИЧЕСКИХ МЕТОДОВ В ПРОФЕССИОНАЛЬНОЙ ДЕЯТЕЛЬНОСТИ

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Abstract. The purpose of this work is to review the work in the field of optimization of animal feeding in the conditions of the Republic of Sakha (Yakutia). Some results of the scientific and educational-research activities of the Department of General Zootechnics in the direction of optimizing animal feeding in the RS (Y)

are given. In the works of A.I. Grigoreva - the effectiveness of local non-traditional feed additives, such as local mineral, sapropel, zeolite-sapropel, salts, vitamin-mineral and others, in feeding farm animals is noted. It was found that the inclusion of non-traditional feed additives in the diet of young cattle contributed to an increase in growth rate by 12.91%. The use of experimental complex feed additives from natural raw materials in the feeding of young cattle contributed to an increase in growth rate by 6.7%. In another experiment, it was found that the inclusion of local non-traditional feed additives in the diets of goats contributed to an increase in milk yield by 13.38 and 23.57%. Therefore, the use of local non-traditional feed additives from local natural raw materials in the feeding of farm animals can increase the productivity of animals in the conditions of the Republic of Sakha (Yakutia).

Аннотация. Цель настоящей работы – обзор работ в области оптимизации кормления животных в условиях Республики Саха (Якутия). Приводятся некоторые результаты научной и учебно-исследовательской деятельности кафедры «Общая зоотехния» в направлении оптимизации кормления животных в РС (Я). В работах – отмечаются результативность местных нетрадиционных кормовых добавок, таких как местных минеральных, сапропелевых, цеолито-сапропелевых, солей, витамино-минеральных и других в кормлении сельскохозяйственных животных. Было установлено, что включении нетрадиционных кормовых добавок в рацион молодняка крупного рогатого скота способствовал повышению скорости роста на 12,91 %. Использование экспериментальных комплексных кормовых добавок из природного сырья в кормлении молодняка крупного рогатого скота способствовал повышению скорости роста на 6,7 %. В другом опыте – было установлено, что включение местных нетрадиционных кормовых добавок в рационы коз способствовало повышению удоя на 13,38 и 23,57 %. Следовательно, использование местных нетрадиционных кормовых добавок из местного природного сырья в кормлении сельскохозяйственных животных позволяет повысить продуктивность животных в условиях РС (Я).

Keywords: scientific activity, results, research, north, agriculture.

Ключевые слова: научная деятельность, результаты, исследования, север, сельское хозяйство.

At present, natural-mathematical tools are used everywhere in all scientific areas and disciplines. Also, new directions in science, interdisciplinary research are developing more effectively, cooperation of science-technology-education is more integrated. With the development and needs of society, the need to improve the mathematical instruments in research is increasing. Being introduced such disciplines as "Mathematical Methods in Biology", "Experiment planning methods and biometric processing of research results", "Optimal solutions", "Statistical methods in the industry", as well as additional modules within individual professional and special disciplines.

In this case, we will consider some of the achievements, Master in Zootechny, Master of Mathematics, **Alexandra Ivanovna Grigoreva** - Senior Lecturer of Federal State Autonomous Educational Institution of Higher Education North-Eastern Federal University named after M.K. AmmosovaRepublic of Sakha (Yakutia), Yakutsk city (ex. Yakut State University named after M.K. Ammosova) in the field of cooperation on initiative scientific topics - agricultural and technical sciences (agrobiotechnology and forestry).

Results of Scientific Research Awarded Diploma of the 1st degree of the participant of the project "II International Book Edition", "Best Young Scientists - 2020" among scientific and educational institutions of the Commonwealth of Independent States (organizer union of companies in the form of association “National Union “Bobek””, 09/28/2020), Nur-Sultan, Kazakhstan (2020).

Now interdisciplinary research is being carried out everywhere, specialists have several specialized educations that allow them to work in new areas of professional activity. The educational process in the preparation of bachelors and masters is also improving, which requires the improvement of curricula - the inclusion of relevant additional modules and new disciplines. For example, the discipline "Digitalization in the agro-industrial complex", "Information technology in professional activities (Zootechnics)".

The author's article substantiates the need for digitalization of the agro-industrial complex of the Republic of Sakha (Yakutia). An algorithm is presented: data collection - analysis - storage of tabular information on computers - transfer of a copy to the main database (server), further processing, systematization, creation of a final report. In this case, this is an assessment of fodder lands, which is most promising for such traditional industries of the North as cattle breeding, reindeer

breeding and horse breeding. It is proposed to use the data of the actual analysis of grasses of natural lands - in the form of a report. Further, the creation of a cartographic basis from open sources (various databases, where materials of remote sensing of the earth are available). The next is linking to old maps of the area in software like GIS. Next, work with open topographic data, the stage of data transformation. The next step is the creation of a matrix base for the selection of contours - polygons. Further, on this basis, the creation of a map of the vegetation of the area. In this case, the assessment of fodder lands will be only by area. To assess the actual feed stocks, additional correction is required - departure, additional binding and work to eliminate errors [1].

In scientific paper [2] Senior Lecturer A.I. Grigoreva the prospects of using geoinformation technologies in the educational process of preparing bachelors of the direction of the agricultural profile are presented.

Also A.I. Grigoreva conducted research in the field of improving the feeding of farm animals and birds in the conditions of Yakutia. In her article [3] studied the physiological characteristics of young cattle when non-traditional feed additives are included in their diet in the conditions of Central Yakutia. The paper gives a description of the experimental feed additives, as well as the conditions of animal feeding. Also, for justification, a characteristic of the main soil conditions is given, which is the rationale for assessing the deficiency of certain macro- and microelements in feed. The results of studying the dynamics of live weight and growth rate of experimental animals with the inclusion of non-traditional experimental additives in their diets are presented. It was found that the use of experimental additives contributed to an increase in the growth rate by 12.91% (the best result). When studying the morphobiochemical composition of the blood of experimental animals, it was found that all indicators were within the normal range. Also, there are minor differences between the groups - in the direction of blood stabilization in animals from two experimental groups that received experimental supplements.

In another scientific work A.I. Grigoreva studied the effect of experimental complex feed additives from natural raw materials on the meat productivity of cattle in the conditions of Yakutia [4]. This paper presents the chemical composition of the components of the experimental feed additive, as well as the composition of the diet of experimental animals. In the diets of experimental animals, a deficiency was found in some nutrients (macro- and microelements). The inclusion of experimental complex feed additives in the diets of experimental animals made it possible to increase the growth rate by 6.7% (the best result), to obtain a larger carcass by 8.0%..

In another experiment, the influence of experimental non-traditional feed additives on the milk productivity of goats in the conditions of Central Yakutia was studied [5]. The paper gives a description of the basic diet in terms of the composition of feed and its nutritional value, as well as mineral provision. It was found that the use of experimental non-traditional feed additives in goat feeding contributed to an increase in milk yield by 13.38 and 23.57% (P> 0.95), milk fat by 0.06 and 0.09%, milk protein by 0.02 and 0.04% respectively. In the study of clinical indicators of the animal organism, characterizing the physiological state, it was found that all the studied parameters did not go beyond the limits of the norms. This proves the harmlessness of experimental non-traditional feed additives in goat feeding.

In another article A.I. Grigoreva [6] the results of studies on the study of the effect of mineral feed additives on the growth and development of young geese are presented. The experimental mineral supplement was given at 3 and 5% of the dry matter of the diet. As a result, it was found that the experimental mineral supplement affected the growth rate of birds. Changes caused by the inclusion of experimental mineral supplements in the diets of birds contributed to an increase in growth rate by 12.63 and 17.3%. The study of the biochemical composition of the blood of birds also did not establish deviations, while the difference was insignificant. Pathological anatomical autopsy of the birds showed that the internal

organs were normal. This proves the effectiveness and safety of experimental mineral supplements in bird feeding.

It should also be noted that the results of research activities with A.I. Grigoryeva were introduced into the educational process of preparing bachelors and masters in the direction «Zootechny» by discipline: "Modern problems of Zootechny" (bachelor's, MSc), "Innovative technologies in animal husbandry" (bachelor's), "Fundamentals of scientific research in animal husbandry" (bachelor's), "Animal feeding" (bachelor's), "Introduction to the profession – Zootechny" (bachelor's), "Control of the conditions of growing, keeping, reproduction and feeding of breeding animals" (MSc), "Modern technologies in animal husbandry" (MSc), and etc.

Scientific activity of A.I. Grigoreva was awarded:

2022: Letter of thanks from the Faculty of Agrotechnology, Arctic State Agrotechnological University - for active participation in scientific activities, Yakutsk city

2021: Letter of thanks of the Head of the Department "General zootechnics", Faculty of Agrotechnology, Arctic State Agrotechnological University - for great work and contribution to the development of the Department "General zootechnics", Yakutsk city

2021: Letter of thanks from the Elges Municipal Administration of the Verkhoyansk District of the Republic of Sakha (Yakutia) - for scientific and practical assistance in the field of horse breeding, for the introduction of local non-traditional feed additives in the feeding of horses, Khayysardakh village

2021: Letter of thanks from Artyk Travel LLC - for scientific and practical assistance in the direction of feeding farm animals, Yakutsk city

2021: Letter of thanks from the Department of Agriculture of the Ust-Aldansky ulus of the Republic of Sakha (Yakutia) - for the introduction of local non-traditional feed additives in horse breeding in the Ust-Aldan ulus, Borogontsy village

2020: Letter of thanks from the International Scientific and Practical Conference "Science and education: experience, problems, development prospects" Section 2.6 Innovations in veterinary medicine and biotechnology, Krasnoyarsk State Agrarian University, Krasnoyarsk city

2020: Diploma of the best graduate in the nomination "Scientific activity", Arctic State Agrotechnological University, Yakutsk city

March 4, 2020: Diploma for participation in the III student All-Russian Scientific and Practical Conference "Problems of technical service in the agro-industrial complex", Samara State Agrarian University, Samara city

2019: Diploma for participation in the V All-Russian Scientific and Practical Conference "Improving the efficiency of the forestry complex" Institute of Forest, Mining and Building Sciences, Petrozavodsk State University, Petrozavodsk city

12/16/2019: Letter of thanks from the Organizing committee of the Scientific and Practical Conference "Kompleksnyye voprosy agrarnoy nauki dlya APK respubliki" [Complex issues of agricultural science for the agro-industrial complex of the republic], Yakut State Agricultural Academy, Yakutsk city

2018: Diploma of the participant of the Regional Scientific and Practical Conference "Agrarnaya nauka: vyzovy i perspektivy" [Agricultural Science: Problems and Prospects], Yakut State Agricultural Academy, Yakutsk city

2018: Letter of thanks from the Organizing committee of the Scientific and Practical Conference "Regional'nyye voprosy razvitiya sel'skogo khozyaystva Yakutii" [Regional issues of development of agriculture in Yakutia], Yakut State Agricultural Academy, Yakutsk city.

In conclusion, I would like to note the prospects for the development of cooperation in the field of animal husbandry and fodder production.

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