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**SCIENTIFIC RESEARCH
OF THE SCO COUNTRIES:
SYNERGY AND INTEGRATION**

上合组织国家的科学研究：协同和一体化

International Conference



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国际会议

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这些会议文结合了会议的材料 – 研究论文和科学工作者的论文报告。它考察了职业化人格的技术和社会学问题。一些文章涉及人格职业化研究问题的理论和方法论方法和原则。

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CONTENTS

ECONOMICS

产品质量作为粮食安全的基础

Quality of products as basis of food security

Shumakova Oksana Viktorovna, Kryukova Olga Nikolaevna,

Mozzherina Tatyana Gennadyevna.....13

协同经济理论

Synergetic economic theories

Letunova Olga Vladimirovna.....20

石化综合体发展的特殊性及其人力资源形成问题

Peculiarities of development of the petrochemical complex and the problem of forming its human resources

Khlopova Tatiana Vladimirovna, Petrushkin Sergei Ivanovich.....25

打击制裁：伊朗和俄罗斯的经验

Countering Sanctions: The Experience of Iran and Russia

Larin Sergey Nikolaevich, Noakk Natalija Vadimovna,

Znamenskaya Alexandra Nikolaevna.....29

对劳动力潜力的复杂评估

Complex assessment of labour potential

Mikhaylova Natalia Sergeevna, Lyubina Valentina Alekseevna.....37

上海合作组织内的经济合作领域

Areas of economic cooperation within the Shanghai Cooperation Organization

Kamyshanchenko Elena Nikolaevna, Rastopchina Yuliya Leonidovna,

Chanhao Zen.....45

中国作为快速消费品行业的零售跨国公司：美国与欧洲模式

China as a host of retail TNCs in the FMCG sector: American vs. European model

Kraponina Iuliia Eduardovna.....52

俄罗斯联邦人口生活水平地域差异的社会经济政策模型及其增加

Model of socio-economic policy of leveling territorial differences in living standards of the population in the Russian Federation and its increase

Kapanina Elena Alexandrovna.....59

欧盟和EAEU国家整合的超国家治理的财政和经济特征

Financial and economic features of supranational governance of integrating states in the EU and in the EAEU

Mergaliyeva L......64

人口生活水平发展的滞后：对收入差异的分析（以俄罗斯远东为例） Stagnation in the development of the standard of living of the population: an analysis of income differentiation (on the example of the Far East of Russia) <i>Zinovieva Nadezhda Vitalievna, Ptashkina Ekaterina Sergeevna</i>	75
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JURISPRUDENCE

论法律多元化作为宪法原则 On legal pluralism as a constitutional principle <i>Adygezalova Gyulnaz Eldarovna</i>	85
以提高俄罗斯退休年龄为例，在数字经济中转变劳动立法的社会经济可行性 Socio-economic feasibility of transformation of labor legislation in the digital economy on the example of increasing the retirement age in Russia <i>Panina Elina Konstantinovna</i>	90

PHILOSOPHY

系统的方法和思维的发展 Systematic approach and the development of thinking <i>Shagiakhmetov Marat Ravgatovich</i>	95
--	----

PEDAGOGY

地方高校农业工程专业能力的形成 Formation of professional competences of agricultural engineers of regional universities <i>Ivanov Mikhail Semenovich, Parnikova Tatyana Alexseevna</i>	101
“隐藏的教育”背后隐藏着什么 What is hidden behind the «Hidden education» <i>Kirillova Anna Viktorovna, Kuskova Svetlana Vladimirovna, Chernik Valerii Eduardovich</i>	107
为 社 会 和 职 业 适 应 目 的 而 制 定 具 有 健 康 限 制 的 年 轻 人 教 育 活 动 的 组 织 模 式 The development of organizational model for educational activity of young people with health limitations for the purpose of their social and vocational adaptation <i>Khilko Anna Alexandrovna, Filimonyuk Lyudmila Andreevna</i>	113
培养成人在补充教育系统中跳舞，以满足创造性自我实现的需要 Training adults dancing in the system of supplementary education as a means of satisfying the need for creative self-realization <i>Potapov Ilia Alekseevich, Filimonyuk Lyudmila Andreevna</i>	122

PHILOLOGY

- 播客技术是在外语课程中发展教育认知能力的一种手段
Podcasts technologies as a means for development of educational-cognitive competence in foreign language lessons
Kniazev Nikita Yurievich.....126
- Zhusupbek文学作品研究
The research of Zhusupbek's literary works
Tlebaldina Nurgul Kazanbaevna, Doskeyeva Shaiza Assanovna, Mukhazhanova Raushan Murathanovna.....130
- 电视演讲中使用的基本语法结构和单位
Basic grammatical structures and units used in television speech
Kabysheva R.B., Kokebayeva B.S., Kasenova Z.K......135
- 写诗自由诗：尝试代表新方法
Writing Free Verse Poetry: An Attempt to Represent a New Approach
Kiselev Eugene.....141

HISTORY

- 为了纪念老师
To a memory of the teacher
Minakina Lilia Nikolaevna, Kuklina Lyudmila Borisovna, Odinets Alexander Dmitrievich, Suchilina Maria Igorevna.....146
- 家谱作为辅助历史学科：发展史
Genealogy as an Auxiliary Historical Discipline: The History of Development
Kiselev Eugene.....151

POLITICAL SCIENCES

- 亚美尼亚危机的主观数字
Subjective figures of the crisis in Armenia
Ghevondyan Robert Vladimirovich.....155

PSYCHOLOGY

- 教育学科社会安全模型创建的价格因素
The valeological factors of social safe models creation for education subjects
Eremeeva Tatiyana Sergeevna, Kora Natalia Alekseevna.....161

SOCIAL PSYCHOLOGY

- 年轻的国内企业家的自我控制和能力：一项实证研究
Self-control and competence of young domestic entrepreneurs: an empirical study
Noakk Natalija Vadimovna, Kostina Tatiana Anatolyevna.....168

MEDICINE

- 慢性心力衰竭患者左室重构与舒张功能的研究
Left Ventricular Remodeling and Diastolic Function in Patients with Chronic Heart Failure
Zakirova G.A., Kamilova U.K., Rasulova Z.D......175
- 强直性脊柱炎患者免疫炎症标志物的研究
The study of immunoinflammatory markers in patients with ankylosing spondylitis
Alyavi B.A., Islamova D.N......180

AGRICULTURE

- 富含维生素的夸克生产技术研究
Research on the production technology of vitamin-enriched quark
Alimardanova Maria Kalabaevna, Jetpisbaeva Bagila Shahimardanovna, Matibaeva Aynur Ibraevna......183
- 在哈萨克斯坦东南部的条件下Alatau品种的新型乳制品«Akyrys»的外观和宪法规范
Exterior and constitutional specifications of new dairy type of «Akyrys» of the Alatau breed in the conditions of the Southeast of Kazakhstan
Jetpisbaeva Bagila Shahimardanovna, Nuralieva Ulzhan Auezhanovna......188
- 在“R-Kurta”农场繁殖的哈萨克斯坦小型品种幼羊的肉类生产力
Meat productivity of young sheep of Kazakh fine-fleeced breeds breeding on «R-Kurta» farm
Kulataev Beibyt Turganbekovich, Nuraliyeva Ulzhan Ayezhanovna, Yessentureyeva Gulmira......192
- 哈萨克斯坦羊毛品种的生产和繁殖品质
Productive and reproductive qualities of Kazakh fine-fleeced sheep breeds
Kulataev Beibyt Turganbekovich, Nuraliyeva Ulzhan Ayezhanovna, Kydyrbaeva Aigul....199

TECHNICAL SCIENCES

- 关于提高初级棉加工纤维质量的问题
To the question of improving the quality of fiber in the primary cotton processing
Agzamov Mirsolikh, Yunusov Salokhiddin Zununovich, Agzamov Mirkhosil Mirsalikhovich, Inagamov Akmalkhoja Khotamovich......205
- 扁豆粉在肉类半成品中的应用
Use of lentil flour in meat semi-finished products
Abzhanova Sholpan Amankeldykyzy, Baybolova Lazzat Kemberbekovna, Matibaeva Aynur Ibraevna......212

建模松弛特性机油 Modeling relaxation characteristics motor oils <i>Bodnar Oleg Borisovich, Anischenko Ilya Viktorovich</i>	216
为PJSC Rostelecom设计和开发会计和订购材料的网络应用程序 Design and development of web-application for accounting and ordering materials for PJSC Rostelecom <i>Bratcev Vladislav Ernestovich, Dorofeev Roman Sergeevich, Dorofeev Andrey Sergeevich</i>	226
关于改善棉花清洗厂车间工作条件的问题 To the question of improving working conditions in the workshop of ginning of the cotton-cleaning factory <i>Agzamov Mirsolikh, Rakhmatov Mashkhur Bakhtiyarovich, Djalilova Makhfuz Salikhovna, Agzamov Mirkhosil Mirsalikhovich</i>	235
使用卷积神经网络的轮式机器人控制系统 The control system of the wheeled robot using a convolutional neural network <i>Azarchenkov Andrey Anatolevich, Lyubimov Maxim Sergeevich, Lushkov Vladislav Igorevich</i>	240

Foreword

We thank all participants of our conference "Scientific research of the SCO countries: synergy and integration" for the interest shown, for your speeches and reports. Such a wide range of participants, representing all the countries that are members of the Shanghai Cooperation Organization, speaks about the necessity and importance of this event. The reports of the participants cover a wide range of topical scientific problems and our joint interaction will contribute to the further development of both theoretical and applied modern scientific research by scientists from different countries. The result of the conference was the participation of 56 authors from 7 countries (China, Russia, Uzbekistan, Kazakhstan, Azerbaijan, Tajikistan, Kyrgyzstan).

This conference was a result of the serious interest of the world academic community, the state authorities of China and the Chinese Communist Party to preserve and strengthen international cooperation in the field of science. We also thank our Russian partner Infinity Publishing House for assistance in organizing the conference, preparing and publishing the conference proceedings in Chinese Part and English Part.

I hope that the collection of this conference will be useful to a wide range of readers. It will help to consider issues, that would interest the public, under a new point of view. It will also allow to find contacts among scientists of common interests.

Fan Fukuan,

Chairman of the organizing committee of the conference

"Scientific research of the SCO countries: synergy and integration"

*Full Professor, Doctor of Economic Sciences,
member of the Chinese Academy of Sciences*

前言

我们感谢所有参加本次会议的“上海合作组织国家的科学研究：协同作用和整合”，感谢您的演讲和报告。代表所有上海合作组织成员国的广泛参与者都谈到此次活动的必要性和重要性。参与者的报告涵盖了广泛的主题性科学问题，我们的联合互动将有助于不同国家的科学家进一步发展理论和应用的现代科学研究。会议结果是来自7个国家（中国，俄罗斯，乌兹别克斯坦，哈萨克斯坦，阿塞拜疆，塔吉克斯坦，吉尔吉斯斯坦）的83位作者的参与。

这次会议的召开，是学术界，中国国家权力机关和中国共产党对维护和加强科学领域国际合作的高度重视的结果。我们还要感谢我们的俄罗斯合作伙伴无限出版社协助组织会议，准备和发布中英文会议文集。

我希望会议的收集对广大读者有用，将有助于在新的观点下为读者提供有趣的问题，并且还将允许在共同利益的科学家中寻找联系。

范福宽，
教授，经济科学博士，中国科学院院士，会议组委会主席“上合组织国家科学研究：协同与融合”

产品质量作为粮食安全的基础

QUALITY OF PRODUCTS AS BASIS OF FOOD SECURITY

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为国家人口提供高质量产品的问题与经济相关，因为对质量的兴趣，包括环保农产品和生态旅游，正在全世界范围内增长。本文讨论了伪造和代理市场的食品质量，状况和趋势问题。本文重点介绍了确定质量水平的方法，定义了差异化评估指标清单，并描述了调节产品质量的机制。有条不紊的开发可以用来改善农产品的质量管理机制。

农产品（生产）质量的运营管理应包括用于满足质量要求的业务性质的方法和活动。目前，质量管理的概念中包含了新的要素和方面，因此农产品生产和销售以及国家结构的各种主题的整合与合作是必要的。

关键词：质量，安全，管理，经济实体，消费者，国家

Annotation. *The problems of providing the country's population with high-quality products are relevant in the economy, as the interest to quality, including environmentally friendly agricultural products and ecotourism, is growing all over the world. The article discusses the issues of food quality, condition and trends in the falsified and surrogate market. The article highlights methods for determining the level of quality, a list of differentiated valuation indicators is defined, and a mechanism for regulating product quality is described. Methodical development can be used to improve the quality management mechanisms of agricultural products.*

Operational management of the quality of agricultural products (production) should include methods and activities of an operational nature used to meet quality requirements. At present, new elements and aspects are included in the concept of quality management, therefore integration and cooperation of various subjects of production and sale of agricultural products as well as state structures is necessary.

Keywords: *quality, security, management, economic entities, consumer, state.*

Introduction

Quality is a complex and universal category, with many features and different aspects. The process of quality management includes the development of a quality policy, the definition of goals and objectives, the division of powers and responsibilities of performers, as well as the implementation of control and quality improvement functions [4]. Depending on the purpose of use and consideration, several methods of quality management can be distinguished. Methods of quality management are methods and techniques for implementing management activities and impact on managed objects in order to achieve the set quality objectives. In the practice of quality management, mainly administrative, technological, economic and psychological methods are used. In order to solve the problem of searching for optimal means for improving the quality of agri-food products, it is necessary to use all existing methods and methods, and their competent combination through the use of management functions within enterprises, consumers and government agencies.

The purpose of this study is the development and justification of proposals for improving the mechanism for managing the quality of products in the agro-food market.

Objects and methods

The object of the study are organizational-economic and social relations related to providing consumers with quality and safe agricultural products.

During the research, the following methods were used: generalization, abstraction, comparative comparison, analysis, synthesis, monographic, positive and normative analysis, computational and analytical developments, etc.

Research results

Market transformations exacerbated interest and revealed a significant deficit in the theoretical interpretation of the concept of quality management at the enterprise, caused by an underestimation of the relationship between product quality and its competitiveness in system interaction with the quality of the functioning of the economic system.

Based on the practical and scientific experience of these specialists, a conclusion is made about the need to develop quality management systems to ensure that the level of processes corresponds to the dynamics of changes in customer requirements.

The quality of the product is determined by standards. Under the standard are aware of the register of criteria and conditions imposed on the product. To characterize the quality of products, international and interstate standards are applied, to which our country, the state standards of the Russian Federation, industry standards, enterprise standards, formed for the internal needs of enterprises and their associations, -technical and engineering communities, technical conditions. Technical regulations ensure the interconnection of different consumer value systems

with respect to the quality of food products [1].

The higher the quality of agricultural products, the higher the sale price, and, therefore, the profitability of production. Suppose that wheat with a gluten content of more than 23% is used for food purposes. The price of such grain is 1.5-1.7 times higher than that of forage. However, some commodity producers decide to increase profits by reducing production costs, i.e. the use of low-quality raw materials, which have a harmful effect on the final product.

A large-scale check conducted by Roskashchestvo in conjunction with Rospotrebnadzor and Rosselkhozadzor in May 2018 showed that more than 13.5% of the domestic stores are falsified. However, industry experts believe that the real share of counterfeits reaches 70%. In their opinion, in the price segment 150-330 rubles per kg butter for samples was not purchased, and after all the proportion of falsification here is 99%. Coordinator of the project "For Honest Products!", Member of the working group of the Committee on Economic Policy of the Federation Council of the Russian Federation Alexander Brazhko notes that in the price segment 330-500 rubles per kg of oil violations were detected in 7 samples from 5 manufacturers. In the segment of 500-650 rubles per kg - in 3 samples from 2 manufacturers. But to oil more expensive than 650 rubles per kg, there were no complaints at all. In the crisis, the purchasing power of the population declined, and Russians began to buy cheap oil more often, which made this product an attractive commodity for falsification. In the production of a product that is sold as butter, ingredients are used to reduce its cost: vegetable fats (price 60 rubles per 1 kg), beef and pork fat (130 rubles per 1 kg). This content is not indicated on the oil label.

The growth of the quality of agricultural products is of great economic importance. Thus, the increase in the sugar content of beets by only 1% is equivalent to the surplus production of about 100,000 tons of sugar per year. An increase in starch content in potatoes by 1% can give an extra 300,000 tons of starch.

What is the problem of the quality of agricultural products? First, the problem is abstract, generating understanding of the conceptual apparatus. Secondly, the problem of ensuring the quality of agricultural products. Third, the problem of improving the quality of agricultural products. Fourthly, the problem of the system approach, which makes it possible to provide and improve the quality of the agricultural product, depending on certain impartially developing situations in which the enterprise operates [3].

The agro-food market is an intricately segmented structure that possesses a set of specific properties that are determined by the specifics of the formation of demand and supply of foodstuffs, and thus a pronounced social orientation [2]. In the agri-food market there is now a significant amount of falsification and surrogate. No food is falsified in sizes such as milk. For example, the overall level of falsifi-

cation in the dairy market of the Russian Federation in 2016 was 25.3%, in 2017 - more than 50%. On the territory of the Omsk region in 2017 identified falsified butter - 62% of the volume of oil sold in the regional market. A quarter of all food products are steadily falsified, that it is a question of all kinds of products, except for eggs. In the fish market, falsification is reduced to the substitution of names, "pumping" fish with polyphosphates, so that the glaze retains more moisture. The scammers are winning, and companies that produce high-quality products are economically disadvantaged.

This problem is primarily due to the fact that the quality of raw materials from which food is produced, the low level of production (the technical equipment of production, the technological equipment of production, the sanitary level of production), the quality control of the agricultural product on the part of the enterprise itself and the controlling bodies, insufficient level of certification and standardization. All of the above is directly related to the production activities of the agricultural enterprise. However, we must not forget that after production, it is necessary to manage quality at all stages of promoting agricultural products to the buyer - from the production of agricultural products, processing, transportation, storage to sale to the consumer.

The quality problem should first of all become the main agricultural product for the commodity producer, and secondly, the quality problems should be solved at the state level.

At present, the problem of product quality splits into the problem of ensuring and improving (or improving) the level of its quality. From the point of view of ensuring the problem of product quality is solved by implementing a set of organizational, technical and economic measures aimed at achieving the established requirements of regulatory documentation.

The quality assessment system as a set of responsibilities, procedures and resources that provide a general guide to quality assessment is based on a quantitative measurement of the determining properties of the quality indicators of agricultural products. At the initial stage of solving the problem, it is necessary to determine the current level of quality. Different methods are realized by means of differentiated indicators.

The combination of methods and indicators of product quality assessment indicates that the problem is labor-intensive and multifaceted and it is possible to find a solution only when implementing a set of measures such as: increasing the importance and multiplying the creators' responsibility for guaranteeing a high technological level and product quality; restructuring on the scientific and coordination basis of technical control of economic entities; growth of the technical level of creation; training and redeployment of personnel, and the development of creative initiatives of the population, and so on.

The mechanism for regulating product quality is as follows. Due to the study of the nature and size of the need, industrial, economic and organizational potentials of a particular enterprise, the regulatory tasks for the quality of the product are determined. On this basis, the design and technological development of production and the production of products in the required quantities start.

The first element of quality management is the standards that organize the accumulated experience and new scientific and technical information.

The second element of the quality management mechanism is planning, carried out in the form of various programs "Quality". In these programs, a set of cases for the achievement of quality is planned, communication of all the participants in the process of creating products is maintained. The developers of these programs are aimed at the need to cover the programmatic activities of all, without exception, facts that affect the research, production and use of products.

The third element is the evaluation of the quality of products by observation, verification and certification technologies. In new circumstances, the economic function of these methods of quality management is increasing, because only with truthfulness and impartial evaluation can the macroeconomic and microeconomic mechanism itself work by rules.

Improving the quality of products and services is the most important direction to increase the efficiency of economic activities of an economic entity. In this regard, the role and importance of integrated product quality management and the efficiency of production, sales and supply is growing. Evaluation of the level and quality of products is objectively the basis for taking managerial impact in the management system.

To ensure the quality of services or products of the enterprise and to "tune" this quality to the expectations of consumers (customers), a quality management system is called for. The wide use of quality systems should be facilitated by the development of a number of measures in the educational and consulting fields of activity, and in turn, measures to motivate the use of quality systems.

1. Policy in the field of education. The introduction of effective quality systems initiates high competence, the knowledge of employees and managers of all levels of methods and technologies of quality management, the foundations of designing quality systems based on progressive Russian and foreign experiments and international standards.

2. Policy in the sphere of formation of consulting activity. To support enterprises to introduce quality systems and to increase the efficiency of these systems, a network of highly qualified consulting organizations should be improved.

3. Policy in the field of the development of certification of quality systems. Certification of quality systems seems to be an impartial proof of their effective functioning in enterprises. The state is obliged to support the entry of organiza-

tions and certification bodies into international and local unions and protocols, as well as the accreditation of certification organizations and testing laboratories abroad.

4. Policies to support the introduction of quality systems when exposing federal applications for the supply of products for municipal and regional needs. Orders for the supply of products under government contracts are required to be dispersed at enterprises, institutions and organizations that have quality systems certified by the relevant authorities.

The problem of increasing the quality of products is worried in all countries of the world. Studies in this area show that solving the problematic issues of ensuring the growth of product quality in almost all countries of the world is a national movement. So, for example, in the US, Italy, Japan, Britain, Germany, France, product quality management is at the state level. In many countries there are associations for the implementation of quality control in industry, National Councils for quality and reliability, statistical quality management, standards associations and other organizations.

Conclusion

Thus, the problem of the quality of agricultural products is comprehensive, since agricultural products are not only the products of direct consumption, but also the means of production for the processing industry and for agriculture proper. Thus, the growth of the quality of agricultural products assists the most undivided satisfaction of the needs of the population and the organization of circumstances to increase the efficiency of production in its further industrial cycles: seeds and feed of the best quality, the most productive livestock replenishing the basic livestock - the essential conditions for the growth of production, cost and increase in profitability of production.

The quality of agricultural production is characterized by differentiated complex and generalizing characteristics. Differentiated indicators describe the individual consumption features of diverse types of products.

The analysis of scientific publications, systematized within the framework of the proposed concepts, showed that in the circumstances of a market economy, quality appears to be the number one problem. The quality of products, which is the basis of food security, is one of the basic categories that establish a way of life, a social and financial basis for the development of man and society. The quality problem can not be solved without the joint participation of experts, engineers, directors.

Regulation of organizational-economic and social relations to ensure the quality of agricultural products is carried out for the effective introduction of a quality and safety management system. In order to prevent possible problems and to ensure the safety of the product at all stages of production - from the manufacturer of

animal feed to the counter of the store, the QMS must operate with the economic entity before the finished product reaches the warehouse or the point of sale of the finished product.

The production of high-quality agricultural products depends on flawless land, clean air, impeccable water and many other factors. Only a collective action can be achieved by solving a worldwide all-encompassing international problem - making quality food.

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协同经济理论
SYNERGETIC ECONOMIC THEORIES

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文章证明辩证矛盾是协同经济理论的基础。 这些理论实现了辩证法的基本原则 - 世界统一的原则和现象的普遍联系。 经济系统在协同理论中体现为对立统一; 因此, 在协同经济中, 熵和反熵过程作为自组织经济系统的过程发生。

关键词: 协同学, 辩证法原理与范畴, 熵, 反熵过程, 完美形态, 信息经济思想

Annotation. *The article proves that dialectical contradictions are at the basis of synergetic economic theories. These theories actualize the basic principles of dialectics-the principles of the unity of the world and the universal connection of phenomena. The economic system is reflected in synergetic theories as the unity of opposites; accordingly, in the synergetic economy, entropy and anti- entropy processes take place as processes of a self-organizing economic system.*

Keywords: *synergetics, principles and categories of dialectics, entropy, anti-entropic processes, perfection formations, information economic thinking*

In the conditions of modern economic development, synergetic economic theories are alternative theories of the market and planned economies, therefore their careful development is actualized. At the basis of any scientific theory, including economical, is the system of cognition, logic and thinking, in the knowledge of which the adequacy of economic theory to the corresponding type of society is elucidated.

The basis of synergetic theories are the general laws and principles underlying the processes of self-organization of systems. Synergetic economic theories reflect the variety of properties and relations of the object and, thus, actualize the basic principles of dialectics - the principles of the unity of the world and the universal connection of phenomena. These theories are determined by the presence of contradictions, namely dialectical contradictions, which are the source of self-movement and self-development. B.L. Kuznetsov writes: "Economic synergetics con-

siders intrasystem changes not only as an adaptation to changes in the external environment (as is done in classical theories of economic growth), but as a spontaneous process in a heterogeneous system, as a collective action of forces heterogeneous in nature, mechanisms capable of some conditions and circumstances to a coherent, spatially and time-coordinated action resulting in the translation of the system into a new qualitative state" [1] A new qualitative state of the system emerge due to resolution of contradictions. Since thinking acts as a movement of thoughts, which is generated by the resolution of contradictions, a significant role is played in dialectical contradictions in information (creative) economic thinking. Contradictions appear as one of the decorations of perfection, one of the essences that is characteristic of synergetic economic theories. Systematic, ordering, organization, complexity, dialectical contradictions act as one of the decorations of perfection.

Dialectical contradiction presupposes the existence of such categories as the opposite, the unity of content and form (the content is formalized and the form is substantial), the inseparability of essence and phenomenon (the essence is, and the phenomenon is essential), etc. Exploring the contradiction as a category of thinking, G.S. Batishchev writes: "Thus, paradoxically, the category of dialectical contradiction is taken as a category of theoretical thinking and at the same time ... is regarded as completely devoid of any kind of specificity emanating from the subject. Its whole feature as a category of thinking entirely comes down to the fact that it only reveals in its function, in its active methodological role in cognition, in its existence as a substantial form of cognitive activity, its universal universality as the forms of the most objective, material reality, in itself and for itself" [2, p.9]. As can be seen, firstly, the dialectical contradiction is revealed as a meaningful form of cognitive activity, that is, it reflects reality as it exists. Secondly, the dialectical contradiction reveals in its function the universality of reality, which means the realization of the universal connection of phenomena in which there are their formulations. These designs have their definitions, functions, properties, qualities. Dialectical contradiction, having the function of universality, appears as one of the decorations of perfection, which reveals the system, order, order according to the principle of the unity of the world and the principle of the universal connection of phenomena.

Synergetic economic theories allow us to reveal contradictions of reality, links in nature and society. This possibility of dialectical thinking, which underlies the construction of synergetic theories, is based on the assimilated laws and categories of dialectics. The economic system is reflected in synergetic theories as a unity of opposites, essence and phenomenon, form and content, possibilities and reality. W.-B. Zhang writes: "The synergetic economy emphasizes linearity and non-linearity, stability and instability, continuity and discontinuity, constancy and structural change as opposed to the properties of pure linearity, stability, continuity and

constancy. Nonlinearity and instability in a synergetic economy are viewed more as sources of the diversity and complexity of economic dynamics than as sources of noise and accidental phenomena, as is done in the traditional economy" [3, p. 13]. However, the sources of diversity and complexity of the economic system are sources of anti-entropic processes, and the very diversity and complexity act as a decoration of perfection. Presence of decorations essentially distinguishes a synergetic economy from liberal and conservative as traditional economic models.

In synergetic economic theories, economics appears as an integral system, all elements of which are interrelated and comprehended as images of reality. Guided by the theory of synergetics, the concept of "entropy" appears as an image of reality and therefore is equivalent to such concepts as "disorganization", "chaos", "disorder", etc. It is important to note that the negentropic (anti-entropic) processes in relation to the negentropic principle of information developed by E. Schrödinger and L. Brillouin are interpreted as information processes. The point is that L. Brillouin relates this principle only to the objects of physics, and his research is conducted within the theory of knowledge as the theory of representation. In the theory of knowledge as a theory of reflection, the concept of "entropy" is an image of reality and receives a comprehensive development. L.P. Evstigneeva and R.N. Evstigneev writes: "The economy forms a special" cosmos" - social, where the infinite is intertwined with the finite, evolution combines with stability, the object and the subject have a systemic nature. However, within the limits of its adequate complexity, they are inextricably linked with chaos and its organization, entropy and dissipation. That is, the economy can serve as an object that is quite sufficient for a systematic study of the synergetic aspects of the world in which we live "[4., p. eleven]. It is obvious that in the synergetic economy entropy and anti-entropy processes take place as the processes of a self-organizing economic system.

Entropy as a form of motion is the content of the negentropic principle of information. In accordance with this principle, information is revealed as a newfound definition of the negative contribution to entropy. Synergetic logic, as the logic of the images of reality, assumes the source of self-movement and self-development, in accordance with which the appearance of perfection arise and disappears. In this respect, information (creative) thinking in accordance with the negentropic principle of information and the negentropic principle of information reality implies the realization of a negative contribution to social entropy.

In synergetic theories reasonings are built, comprehending images of reality, and on this basis practical actions are carried out, proceeding from the present state of things. L.P. Evstigneeva and R.N. Evstigneev writes: "Synergetics opens the world of insoluble paradoxes as the norm of reality and the property of synergetic logic" [4, p.13]. It is important that the property of synergetic logic is the study of reality as images of reality. Following the synergetic logic, there is a need to cre-

ate perfect (harmonizing) economic relations functioning in unity, as integrity, as a system. Perfect system connections assume that nothing can be dislodged from the system and nothing can be brought into it from outside without damaging the system. Economic processes, in accordance with synergetic theories, are aimed at improving relations and relations between people, between nature and society. On the basis of the processes of creation and re-creation, harmony is formed as one of the decorations of perfection, and economic thinking is revealed as information (creative) thinking.

Information (creative) economic thinking, realized in synergetic economic theories, does not dissect the whole, abstractly singling out parts, but, on the contrary, develops the economic process as an organic whole, reproduces a concrete integrity in the development of economic processes. As V. D. Popov writes, "economic thinking, like thinking as a whole, is the unity of the sensible and rational, abstract and concrete, empirical and theoretical reflection of economic relations by the human consciousness" [5, p. 146]. Obviously, in this concept we are talking about information (creative) economic thinking, revealing itself in the unity of levels of knowledge.

Scientific knowledge involves a certain theory of knowledge, methodology and logic of research. Outstanding American economist and Nobel laureate Milton Friedman drew attention to the methodology of scientific research and, in particular, to the methodology of economic theory: "The general superficial acquaintance with the subject of economic theory gives rise to contempt for special knowledge about it. Social scientists more than other scientists need to understand the methodology they use" [6, p.3]. The search for the most effective ways of economic development raises the need for scientific knowledge of economic processes for the discovery of the theoretical and methodological basis of economic phenomena, and hence the methodology of economic thinking.

The English economist, the founder of the Keynesian direction in economic theory, John Maynard Keynes, writes: "Economic theory is not a set of ready-made recommendations that are directly applicable to economic policy, but rather a method rather than a doctrine, an intellectual tool, a thinking technique, helping the one who owns it, to come to the correct conclusions "[7, p.52]. Undoubtedly, in order to obtain correct conclusions, it is necessary to be guided by an adequate methodology of cognition, to possess the "technique of thinking", which consists in understanding what kind of economic theory is being built in the system of which theory of knowledge.

The methodology of the research as a general philosophical basis allows us to determine by what methods the goal of the scientist in the system of scientific cognition of reality can be achieved. The set of methods of research acts as a system of principles and methods for organizing and constructing theoretical and

practical activities, as well as the doctrine of this system. Distinguishing research methodologies, differences in principles of construction, methods, forms of organization and methods of scientific knowledge are revealed. The non-distinction of the methodological foundations of economic and social problems causes the emergence of eclecticism in the study, which may lead to erroneous conclusions and incorrect actions. P. Heine writes: "Economic thinking is like a drug. Having truly mastered some ways of economic reasoning once, you will then everywhere find an opportunity to use them. You will notice that much of what is said and written about economic and social problems is a mixture of the sensible and the meaningless "[8, p. 33]. From this point of view, the analysis of the Russian economy's reforms calls for a revision of established concepts and theoretical ideas about economic development projects and the identification of an adequate research methodology.

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石化综合体发展的特殊性及其人力资源形成问题
**PECULIARITIES OF DEVELOPMENT OF THE PETROCHEMICAL
COMPLEX AND THE PROBLEM OF FORMING ITS HUMAN
RESOURCES**

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本文致力于俄罗斯的一个重点行业。研究课题的相关性取决于21世纪的石化工业已成为世界工业中最年轻和最前途的部门之一。文章分析了该行业的特点。值得注意的是，尽管存在所有基本先决条件，但仍有许多障碍阻碍了化学和石化产品生产的有效运作和发展。本文着重讨论了石化企业高技能人才缺乏的问题，没有解决方案就无法充分发挥俄罗斯石化工业的潜力。

关键词：石化综合体，发展特征，人才潜力，人才短缺

Annotation. *The article is devoted to one of the key industries of Russia. The relevance of the research topic is conditioned by the fact that the petrochemical industry of the 21st century has become one of the youngest and most promising sectors of the world industry. The article analyzes the features of the industry. It is noted that, despite the existence of all the fundamental prerequisites, there are a number of barriers that hamper the effective functioning and development of the production of chemical and petrochemical products. The article focuses on the problem of the deficit of highly skilled personnel for the petrochemical complex, without the solution of which it is impossible to fully realize the potential of Russian petrochemical industry.*

Keywords: *petrochemical complex, features of development, personnel potential, shortage of personnel*

Today, the chemical and petrochemical industries in Russia are the basic segment of the industry, the development of which is of great economic, defense and social importance. In this area, 1200 large and medium-sized enterprises operate with a total number of employees of more than 700 thousand people. The share of the chemical complex in the structure of industrial production of the Russian Fed-

eration is about 6%. In terms of investment in fixed assets, the chemical complex ranks third among all branches of Russian industry (5.4%) [3]. The nomenclature of the enterprises of the industry makes up more than 70 thousand items of various goods, 40% of which are consumer goods, the remaining 60% belong to the production goods [1]. The main consumers of these goods are light industry, agriculture, engineering, defense and fuel-energy complexes.

As key industries, the chemical and petrochemical industries play an important role in the development of science and technology. They are characterized by high labor productivity, their development provides creation of high-tech jobs in various sectors of the economy: from heavy industry to electronics, automotive, pharmaceutical industry, construction, agriculture, industries producing consumer goods. A combination of the chemical industry with the processing of oil, gas, coal, with ferrous and non-ferrous metallurgy, the timber industry forms whole industrial complexes.

Being one of the promising directions of the economy, the production of chemical and petrochemical products has some features.

This production is characterized by a high level of labor automation and technological development. The chemicalization of the economy and the expansion of its applications promote the production of high-tech and science-intensive products (including renewable raw materials) in various branches of the economy, and products with increased requirements for environmental safety [5]. This in turn allows preserving and multiplying the country's competitive advantages in the world market.

The chemical complex is characterized by the highest rates of labor productivity among the majority of manufacturing industries. Thus, labor productivity in the chemical complex exceeds similar indicators of engineering, automotive and telecommunications services, second only to the production of pharmaceutical products [6].

Chemical industries are characterized by high capital intensity, occupying leading positions among such industries as pharmaceuticals, metallurgy, automotive and pulp and paper production.

The chemical industry is one of the most knowledge-intensive industries. The basis for the competitiveness of chemical complexes is the development of new types of products with specified properties and control of key technologies. The production of high-tech products of high conversion requires considerable investment in basic and applied scientific research. Specific investments in innovations in the chemical complex exceed similar indicators in engineering, automotive and telecommunications, second only to pharmaceutical production [2].

It should be noted that domestic petrochemicals have a number of fundamental competitive advantages, manifested, first of all, in the form of access to raw

materials, the largest domestic market, and touched for the development of branch science.

However, there are a number of systemic barriers that do not allow the full potential of the Russian petrochemical complex. These include the deterioration of production capacity, the lack of facilities for deep processing of raw materials, the lack of effective mechanisms to take into account the economic interests of producers and stimulating them to achieve deeper processing of hydrocarbon raw materials and others.

At the same time, the personnel problem, in particular, the shortage of qualified personnel, is of particular importance at the present stage. According to various estimates, from 40 to 60% of enterprises experience staff shortages [4].

For quite a long time the enterprises used the personnel reserve of highly skilled workers and engineers and technicians who were trained in the Soviet period. At present, the system of training personnel for petrochemistry, especially the middle level, is practically destroyed. And retraining and advanced training of personnel, especially in large companies, recently began to pay close attention, often using foreign experience, teaching methods and foreign teachers. Preparation of the primary level still faces a number of serious problems. As reasons for the shortage of young specialists of the required qualifications:

1) Lack of a system of vocational guidance, especially in the field of training of workforce. A significant part of the youth is oriented to the profession prestigious, from its point of view, but not in demand on the market.

2) Destruction of the mentoring institute. Virtually destroyed the professional continuity of generations.

3) Backward educational and laboratory base of higher and secondary educational institutions. Separated from innovative processes in production, the system of vocational education does not have time to meet the dynamically changing requirements of employers.

4) The severance of links between vocational training and professional work, as a consequence of the lack (and often even the absence) of the training practices of students. Together with the lack of job security guarantees, this situation leads to a deformation of motivation for learning and weakens the desire to work in the future in the specialty obtained.

5) Reducing the number and changing the qualitative composition of scientific and pedagogical personnel. Effective use in the educational process of modern equipment, training software packages requires appropriate qualification of the teaching staff.

The scarcity of qualified personnel is one of the main barriers hampering the implementation of the program for the development of the chemical and petrochemical complex and turning competitive advantages into factors hampering the

growth of the competitiveness of domestic petrochemicals,

At the same time, today the level of development of technology and technology, software products, methods of organizing production and labor is not only high, but also, thanks to information integration, is sufficiently accessible. Therefore, it is practically impossible to win in competition only due to technical and technological and organizational advantages. In conditions of dynamic external environment, increased demand for information and creativity, it is necessary to form, develop and use a more powerful resource - competitive personnel of the enterprise. From the level of knowledge and skills, motivation and attitudes in the sphere of labor and vocational training, discipline and health of specialists at all levels, the competitiveness of enterprises largely depends.

Elimination of the identified personnel barriers will contribute to increasing the competitiveness of the Russian petrochemical complex as a whole and of each of its segments separately and, as a result, will allow to weaken the dependence of the country's economy on the import of science-intensive products and implement the innovative scenario of Russia's development.

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打击制裁：伊朗和俄罗斯的经验

**COUNTERING SANCTIONS: THE EXPERIENCE OF IRAN AND
RUSSIA**

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该文件证实了进一步扩大对俄罗斯经济的制裁限制的适得其反。结果表明，他们的经济实质远不是进行竞争斗争的市场方法，而且在许多方面都服从于反对世界主要大国的政治目标。作者评估了实施制裁限制的合法性，同时考虑到世界经济实践的以及它们对俄罗斯经济影响的历史经验。伊朗的例子简要概述了制裁对其经济发展影响的历史经验。本文介绍了制裁限制对整个俄罗斯经济发展及其石油和天然气部门作为主导部门之一的影响的评估。本文的主要目的是证明即使在制裁限制的影响下俄罗斯经济进一步发展的能力。为实现这一目标，我们采用了分析和综合经济信息的方法，以及系统化外国和俄罗斯科学家的出版物。研究结果表明，进一步扩大制裁限制无疑将对俄罗斯经济的发展产生负面影响。但是，在调动俄罗斯经济关键部门的内部储备和加速实施进口替代计划以最大限度地减少制裁限制的情况下，可以抵制制裁限制的负面影响。

关键词：俄罗斯经济，制裁限制，伊朗经验，影响评估，石油和天然气部门，发展前景。

Annotation. *The article substantiates the counterproductiveness of the further expansion of sanctions restrictions against the Russian economy. It is shown that their economic essence is far from the market methods of conducting competitive struggle and is in many ways subordinated to the political goals of counteraction against the leading world powers. The author gives an assessment of the legitimacy of imposing sanctions restrictions taking into account the practice of the world economy development and the expected consequences from their impact on the Russian economy. The example of Iran briefly summarizes the historical*

experience of the impact of sanctions on the development of its economy. The assessment of the impact of sanctions restrictions on the development of the Russian economy as a whole and its oil and gas sector as one of the leading ones is presented. The main purpose of this article is to justify the ability of the further development of the Russian economy, even under the influence of sanctions restrictions. To achieve this, we used methods of analyzing and synthesizing economic information, as well as systematizing publications of foreign and Russian scientists. As a result of the study, it was concluded that further expansion of sanctions restrictions will undoubtedly have a negative impact on the development of the Russian economy. However, counteraction to negative influence of sanctions restrictions is possible on the basis of mobilization of internal reserves in key sectors of the Russian economy and accelerated implementation of import substitution programs to minimize it.

Keywords: *Russian economy, sanctions restrictions, Iran's experience, impact assessment, oil and gas sector, development prospects.*

Introduction

Starting in 2014, the list and focus of the sanctions imposed by the US against Russia are constantly expanding. In July 2017, the US Congress passed a new Law on Sanctions, which was signed on August 2 by President D. Trump. Its official name is "Countering America's Adversaries Through Sanctions Act" No. 115-44 of August 2, 2017 [8]. To the "Adversaries" of the United States this law includes three countries - Iran, Russia and the Democratic People's Republic of Korea. It is in this order, from which it follows that the main enemy of the United States is still Iran. But this state of affairs does not give any "privileges" to our country. Rather, on the contrary, in relation to Russia, this Law not only tightens the existing sanctions restrictions, but also introduces new ones, extending them to the enterprises of the transport and oil-extracting industries, and also to support the construction of Russian export gas pipelines. In addition, Russian companies since the signing of this law can be credited abroad for a period of not more than 14 days. Contained in this law and a number of purely political "requirements" for the actions of our country in the international arena. However, on Aug. 27, 2018, a new package of US sanctions against Russia came into force, which was approved by the Decree of the State Department and signed by US President D. Trump. It provides for a ban on rendering any US assistance to Russia, stops issuing licenses for export to Russian state-owned companies of dual-use products that can be used for military purposes. The only exception was the materials necessary for cooperation in the space industry and the sphere of space orbital launches. Also, this package does not apply to products needed to ensure the safety of civil aviation flights.

Obviously, there is no need to expect the cancellation of sanctions restrictions

in the near future. However, even a systematic expansion of sanctions restrictions does not ensure the US achieve their goals: Russia's political course does not change, and the Russian economy, while coping successfully with their negative consequences and, moreover, a number of industries is gradually emerging into a growth trajectory. At the same time, it is only possible to obtain realistic estimates of the negative impact of sanctions restrictions on the development of the Russian economy after a longer period of time. In this connection, it seems quite interesting to analyze the economic essence of sanctions restrictions and the experience of developing the Iranian economy under their influence. In addition, it is quite obvious that quantitative assessments of the impact of sanctions restrictions on the development of our country's economy will also be repeatedly re-evaluated by experts and specialists as more detailed studies of the impact of directly sanctioned restrictions are cleared of the combined impact of a number of other factors.

Main part

1. The economic essence of sanctions restrictions

Throughout the entire historical development of the world community, sanctions have always been seen as an economic tool for conducting political struggle. The activity of applying sanctions restrictions as an instrument of political struggle increased after the end of World War II. At the same time, the United States, the leading and economically most developed country in the world, was the absolute leader in imposing sanctions restrictions. Since 1970, the United States has imposed various sanctions restrictions against the economies of different countries more than 95 times. Over the same period, EU member states initiated the introduction of 35 sanctions restrictions. In addition, sanctions were introduced at the initiative of the UN, but their number in this same time period was small - only 16 cases [1, p. 57]. The former USSR and Russia resorted to the introduction of sanctions restrictions only 7 times. The most intensively sanctioned restrictions were applied by different countries from 1991 to 1995 - during this period 34 cases of imposing different sanctions regimes were recorded [2, p. 283].

However, in recent years, sanctions restrictions have been applied less often, as many governments have realized that the peculiarity of this instrument of political struggle is a mutual negative impact on the development of the economy for both the country subject to sanctions restrictions and for the country that introduces them. At the same time, refusing to reconcile with the end of the era of unilateral domination in the world economy, the US governing bodies, having no legitimate grounds, sharply intensified the practice of imposing sanctions restrictions against our country. Today they do not even bother to find the real reasons for their introduction.

On the basis of the foregoing, it can be argued that the economic essence of sanctions restrictions is the targeted introduction of a set of restrictive or prohib-

itive measures that, according to their initiators, can significantly slow down the economic development of the country that came under their influence with the aim of changing its policies at the international level [7].

2. The experience of countering the sanctions constraints of the Iranian economy

For the Russian economy, the greatest interest is the assessment of the impact of sanctions restrictions on the Iranian economy. This is due to a number of the following circumstances:

1) since many different sanctions regimes have been used against the Iranian economy for many years, its experience gives grounds for understanding the possible consequences of their impact in case of the most unfavorable development of events in relation to the Russian economy;

2) the development of the economies of Russia and Iran is significantly dependent on the export of hydrocarbon raw materials, therefore, the possible consequences of the negative impact of sanctions restrictions can be more easily and more accurately predicted by the example of Iran's economy;

3) scenarios for imposing sanctions restrictions initiated by the US and the EU member states, with a difference in the formal pretexts and regimes of their actions are very similar: in relation to Russia, the Crimea's accession became a pretext, and in relation to Iran, the development of a nuclear program not only in peaceful , but also for military purposes;

4) Finally, comparisons with the effect of sanctions restrictions on Iran's economy are of increasing interest in the event that Russia may implement a policy of reducing its dependence on the US dollar.

The Iranian economy has already experienced the consequences of various sanctions regimes. One of these consequences was the forced refusal of Iran to use the dollar to conduct international settlements. It was Iran that initiated the implementation of mutual settlements with countries that did not join the sanctions regimes of the United States (mainly those in Asia), in national currencies, and thus proved the possibility of using this tool to support the development of their economies. As a result, by 2013, the share of Iran's foreign trade with Asian countries exceeded 90%. At the same time, Europe, North and South America accounted for only 3% of Iranian exports [6].

According to the IMF, the impact of sanctions restrictions on Iran's economy led to a decrease in its growth rate to 0.4% in 2012, while the value of the national currency - rial - fell by 40% [9]. The consequence of the influence of sanctions restrictions was the probability of bankruptcy of more than two thirds of Iranian enterprises. However, according to various experts, the most serious negative consequences for the Iranian economy were such sanctions regimes as the ban on the use of the global interbank SWIFT payment system and the ban on the import of

Iranian oil and gas to the US and EU member states. As a result, in 2013, Iran's GDP fell by 6.6% [6].

However, the practice of sanctions wars has shown that countries that act as initiators of imposing sanctions restrictions bear economic losses. Moreover, these losses are comparable with the expected damage for the country in respect of which they were introduced. So, in the case of Iran, the average economic losses of the countries initiating the introduction of sanctions restrictions have approached 6% of GDP. One of the consequences of the sanctions imposed on Iran for the United States from 1995 to 2012, according to the National American-Iranian Council, was the loss of \$ 175 billion of potential export revenue from trade with Iran. The US Department of Commerce estimated that a loss of 1 billion dollars in export earnings is equivalent to a loss of 1.4 thousand to 1.6 thousand jobs a year [5, p. 47]. It is not difficult to calculate that imposing sanctions restrictions against Iran costs for ordinary Americans by depriving more than 250,000 jobs annually. Those who joined the sanctions restrictions against Iran of the leading EU member states also suffered significant economic losses. According to various European experts, Germany's losses in the period from 2010 to 2012 amounted to 23.1 to 73 billion dollars, Italy - from 13.6 to 42.8 billion dollars, France - from 10.9 to 34.2 billion dollars [6]. For each of the above-mentioned countries, the magnitude of economic losses was comparable to the amount of damage from the introduction of sanctions restrictions against Iran. However, the economies of these countries have suffered negative consequences much more easily than the Iranian economy, since the countries themselves are economically more developed. In addition, based on purely political considerations, these problems were practically not covered in the media of these countries.

The results of a brief analysis of the impact of sanctions restrictions on the Iranian economy show that it has had negative consequences for the economies of all countries participating in the introduction of sanctions regimes. At the same time, the real losses of the economies of these countries turned out to be comparable to the damage caused to the Iranian economy. This circumstance serves as an additional confirmation of the opinion that imposing sanctions restrictions does not bring them to the initiators of the expected dividends either economically or politically. At the same time, the experience of a fairly long stay of the Iranian economy under the influence of sanctions restrictions will undoubtedly be useful for the Russian economy.

3. Assessment of the impact of sanctions restrictions on the development of the oil and gas sector of the Russian economy

To date, most oil and gas companies have been able to adapt to the current sanctions restrictions and macroeconomic conditions of doing business. Now they focus on improving the efficiency of their operations and building up key assets in

Russia and are less likely to seek opportunities for international expansion of their business. Sanction restrictions practically did not affect the traditional production of hydrocarbons in the main continental deposits and even contributed to the increase in the volume of geological exploration. However, so far, Russia does not have its own software, which is necessary for processing geological prospecting data and conducting supercomputer calculations. For the successful development of the oil and gas sector in conditions of sanctions, this problem must be solved first.

Nevertheless, in certain areas of development of the oil and gas sector, the sanctions restrictions had a rather strong negative impact. So, for example, almost 90% of modern technologies of extraction of hydrocarbon raw materials on the shelf belong to foreign developers. It is the problems of limited use of foreign mining technologies that became the prime cause of temporary freezing of a number of projects by Russian oil and gas companies in this direction, and only then did the causes of the economic plan play their role. Among the most temporarily suspended projects were Rosneft and ExxonMobil in the Arctic shelf and in the Black Sea.

The impact of sanctions restrictions will inevitably have a negative impact on the Russian oil and gas sector, as it will entail financial losses from a reduction in hydrocarbon production. Estimates of these losses in terms of volume and time vary and depend mainly on how large the decline in production will be. A number of forecasts in the long term are expected to reduce hydrocarbon production in the range of 3-5%.

Assessing the negative aspects of the impact of sanctions restrictions on the development of the oil and gas sector of the Russian economy, one can not but note its positive aspects [3, p. 77]. They affected mainly domestic oilfield services and machine-building enterprises, which in the conditions of sanctions restrictions began to be more actively engaged in import substitution, introduce high-quality Russian developments and develop measures to support them. So, from January 1, 2017, the RF Government introduced a 15% priority, provided that Russian oil and gas companies purchase Russian-made goods and services. As a result of these measures, today there are concrete examples of import substitution - both for technologies and for components. So, there has been a serious breakthrough in telemetry systems for inclined and horizontal drilling.

One of the most promising in the field of developing domestic technologies for import substitution is Gazprom Neft's project to create a complex of domestic technologies and high-tech equipment for developing reserves of the Bazhenov suite. It provides for the transition from foreign to the implementation of domestic technologies of import substitution by 2025. estimated The project cost was estimated by the company at 7.5 billion rubles, of which 90% was its own funds.

This project was developed by Gazprom Neft prior to the introduction of sanctions restrictions and therefore its implementation is proceeding in a planned manner. With its successful implementation, the target level of production of Gazprom Neft from the deposits of the Bazhenov suite by 2025 may be about 2.5 million tons per year [4].

Conclusion

Undoubtedly, the introduction of sanctions restrictions had a negative impact on the development of the Russian economy in general and its key sectors in particular. Some estimates of this influence are given in this article. However, breaking the first shocks, the Russian economy was able to minimize the impact of negative trends in a short space of time and to enter the path of gradual growth. To do this, it was necessary to formulate development strategies through import substitution, and in their composition to develop mechanisms to attract domestic and foreign investments, to identify effective ways of carrying out structural and technological modernization of domestic production in key sectors, and to improve the quality of intellectual capital and management institutions.

Based on the foregoing, it can be concluded that, despite the negative impact of sanctions restrictions, the current state of development of the Russian economy gives quite a lot of reasons for optimism. This is primarily due to the successful modernization of domestic industries in key sectors and the gradual decrease in the dependence of the Russian economy on not always reliable foreign counterparties. At the same time, successful implementation of import substitution strategies and programs in key sectors opens new opportunities for the development of private business, creates new jobs and increases employment of the country's able-bodied population.

Thanks

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对劳动力潜力的复杂评估
COMPLEX ASSESSMENT OF LABOUR POTENTIAL

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本文考虑了劳动力综合评估应用的特点，这是一个平衡指标体系，反映了三个时间方面：积累的潜力，劳动潜力的使用，劳动潜力的使用和发展前景。

关键词：劳动力潜力，劳动生产率，劳动力潜力利用效率，人员结构，人员竞争力。

***Annotation.** The article considers the features of the application of the integrated assessment of labor potential, which is a system of balanced indicators, reflecting three time aspects: the accumulated potential, the use of labor potential, the prospects for the use and development of labor potential.*

***Keywords:** labor potential, labor productivity, efficiency of labor potential utilization, personnel structure, competitiveness of personnel.*

The mechanism for managing the labor potential of employees assumes its analysis, including the determination of the quantity, quality, conformity and measures of using this potential for the purposes of the organization. Analysis of labor potential, as a rule, the majority of researchers carry out on qualitative indicators, without orientation on indicators of efficiency of use of the personnel.

For the formation of quality management decisions, there is a need to link the indicators of the effectiveness of the use of labor resources and the effectiveness of management processes [2]. For this purpose, it is advisable to use a combination of various indicators used in statistics and economic analysis in assessing the labor potential, or in other words, complex performance indicators [1].

To evaluate the potential, we can use the system proposed by Sheshukova T.G. [4]. The author proposes a system of three indicators for assessing the potential: competitiveness, the structure and composition of personnel, and the efficiency of the use of labor resources (Table 1). The method of assessing the labor potential

using a balanced scorecard system will be considered using the example of the Distance of civil constructions (hereinafter referred to as the Distance). When assessing the level of wages, a coefficient is used that shows the ratio of the average wage in the enterprise and in the region as a whole.

Table 1. Factors affecting the labor potential

Indicator of the assessment of labor potential	Interpretation of calculation results
Competitiveness in the labor market	
Ratio of average salary to industry average (Кзাপп.л.)	The higher the value of the coefficient, the higher the competitiveness of the organization in the labor market and, consequently, the greater the probability of attracting and retaining qualified personnel.
Salary growth index (TP _{CM3II})	The value of the index is more than 1 indicates an increase in real wages. The value of the index less than 1 indicates a decrease in real wages.
Staff structure	
Age structure of the staff (specific weight of different categories) (R ₁)	Describe the prospects for staff development.
Personnel structure by educational level (specific weight of different categories) (R ₂)	
Efficiency of use of labor	
Labor productivity growth index (I ₁)	Characterize the effectiveness of the use of labor resources. Exceeding the index of labor productivity over the index of wages testifies to the effective use of labor potential.
The ratio of the labor productivity growth index and the average wage growth index (I ₂)	

In addition to comparison with the regional level, the average indicators for the industry can be used as a reference for the study. In the work to assess competitiveness, the ratio is used with the average monthly wage calculated for the enterprises of the given industry located in the same region. Based on the data presented, the ratio between the average monthly salary for the Distance and the average salary for the industry is calculated. Data on the average monthly salary for the Distance are shown in Table 2.

Table 2. Estimating the average monthly salary

Index	2016 year	2017 year
Average monthly salary by Distance	25 500	26 700
Average monthly salary by industry	38 800	40 500
Wage level factor	0,657	0,659

In assessing the competitiveness of an enterprise in the labor market, the wage growth index is important. It is defined as the ratio of wages in the reporting period to the base or previous period. To analyze the labor potential of the enterprise, it will be more expedient to calculate the growth rates of wages using chain indices. In our case, the wage growth index will be 1.047. Based on the analysis of data, we can conclude that for the past year for the company characterized by a slight increase in wages.

For an aggregate assessment of the impact of indicators on the competitiveness factor of an enterprise in the labor market, it is necessary to study which states can take indicators depending on the values (Table 3).

**Table 3. Impact of indicators on cumulative competitiveness assessment
Labor market Distances**

Salary growth index	The ratio of the average monthly wage with wages in the region	
	less than 1	more than 1
Less than 1	1	3
More than 1	2	4

State 4 is characterized by a positive dynamics of wage growth and its excess over the industry average. States 1 and 3 indicate the changes that occur, one indicator gives grounds for a positive forecast of changes, while the second indicator indicates the presence of negative trends. When assessing the states 1 and 3, it is necessary to take into account the absolute values of the indicators, to consider the force of influence of each of them. State 2 indicates the presence of pronounced signs of noncompetitiveness of the enterprise in the labor market. Comparing the obtained indicators, we come to the conclusion that for Distantness is characterized by a state of noncompetitiveness in the labor market, since the value of the coefficient of the wage level is less than 1.

When analyzing the impact of the structure of personnel in the context of different criteria on the labor potential of the enterprise, the study uses weighted averages. At the first stage, the characteristics inherent in the elements of the structure are chosen, they are the properties that stem from the very essence of structuring the personnel of the enterprise according to a certain feature.

At the second stage, the elements of the structure are ranked according to the degree of significance, the manifestations of the main characteristics determined at the previous stage. Each element of the structure is assigned a specific weighting factor, its purpose is to describe the qualitative characteristic of an element in a quantitative way. As the main method of ranking, the Fishbein rule is applied.

The third stage calculates the weighted average value for each analyzed struc-

ture. On the basis of the values obtained, an analysis of structural quality changes is carried out for several years. At the same time, two options for structuring the organization's personnel are taken as a basis: by age categories, by level of education. By age, the staff is divided into three age groups: up to 30 years inclusive, from 30 to 50 years inclusive, over 50 years. In accordance with this, the significance of the experiment for each age group will be determined according to the Fishber rule in the following way: $N = 3$ (three age groups); r_i - the significance of the criterion for the age group; $i = 3$ - age group up to 30 years; $i = 2$ - age group from 30 to 50 years; $i = 1$ - age group over 50 years old.

The second characteristic is the ability to learn, absorb and apply the knowledge and innovations that employees have. The change in this characteristic is inversely proportional to the age processes, i.e. in younger categories this quality develops better. In accordance with this, the values of the parameter i will look like this: $i = 1$ - age group up to 30 years; $i = 2$ - age group from 30 to 50 years; $i = 3$ - age group over 50 years old.

In the model of assessing the structure of labor resources, it is also necessary to take into account the prospects for the development of each age group [3]. When estimating this indicator, weighting factors are also assigned. When you define them, you can use a different approach. As a basis of ranking from the point of view of perspective, the characteristic of the age group from 30 to 50 years is taken. It is hypothesized that this group will make the most of its abilities and will continue to use them for a long time, accordingly, a coefficient of 1. In comparison with this age group, employees under the age of 30 are more promising, as their abilities develop, and employees are older 50 years are less promising, since the peak of development of abilities has already passed. To reflect these trends, the corresponding values of the assessment of the prospects are more than one and less than one, respectively. Deviation from a unit is constructed using a certain minimum step, the amplitude of the spread of values in 20% is applied to the calculation, as a result, the minimum value is 0.9; and the maximum is 1.1. The results of calculating the reference weight factors for the estimation of all age categories are presented in Table 4.

Table 4. Assessment of qualitative characteristics of different age groups

Age group	Experience	Ability to learn, assimilate and apply innovations	Evaluation of prospects	Aggregate efficiency
Up to 30 years	0,1667	0,5	1,1	0,0916
From 30 to 50 years	0,3333	0,3333	1	0,1111
Older than 50 years	0,5	1,1667	0,9	0,0750

To evaluate the influence of all three parameters and the formation of an integral index, a multiplicative model is constructed. It is a product of the importance of two separate characteristics of the evaluation of prospects for a particular age group. The results of calculating the weighted average of the age structure are shown in Table 5.

Table 5. Assessment of the age structure of staff

Age group	2016 year	2016 year
Up to 30 years	0,0041	0,0048
From 30 to 50 years	0,0007	0,0008
Older than 50 years	0,0008	0,0007

These calculations indicate a decrease in the labor potential of the Distant office due to a change in the age structure of the staff, as a change in the balance is observed in favor of increasing the share of employees over 50, while redistribution occurs at the expense of reducing the proportion of workers aged 30 to 50 years, i.e. the most active and effective part of the work collective.

The second important feature on which it is necessary to structure the personnel is the level of education. To include the results of the analysis of the educational structure in the final model of the labor potential, it is necessary to express the evaluation of the structure in the form of one effective indicator. To do this, it is proposed to rank the levels of education and assign them the corresponding values of the weights (Table 6).

As an element of the model of labor potential, one can use the weighted average of the level of education at the distance. Weighted average value = $(K_1 \times X_1 + K_2 \times X_2 + K_3 \times X_3 + K_4 \times X_4) / (X_1 + X_2 + X_3 + X_4)$. Based on the above values of the coefficients, as well as the actual data of the enterprise, the weighted average value of the education level is calculated.

Table 6. Rating of educational level of employees

The level of education	The ratio of the calculation according to the Fishburn rule	Share of (X_1, X_2, X_3, X_4)	
		2016 year	2017 year
Higher education	$K_1 = 0,4$	15,1	16,1
Secondary vocational education	$K_2 = 0,3$	9,9	12,8
Secondary general education	$K_3 = 0,2$	72,6	68,6
Secondary incomplete education	$K_4 = 0,1$	2,4	2,5

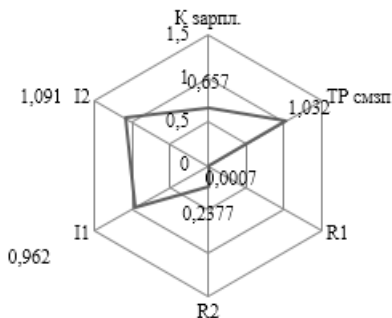
An analysis of the change in the structure of the labor potential of the Distant School according to the level of education indicates that the qualitative educational structure has improved slightly. The share of employees with higher education has grown, while the number of the least educated workers has remained the same.

The third factor, which has a significant impact on the change in the labor potential of the enterprise, is estimated using indicators of the effectiveness of the use of labor resources. When assessing the effectiveness of the use of labor resources, two indicators are used to assess the labor potential: the labor productivity growth index (I_1) and the ratio of labor productivity growth rates and the average monthly wages (I_2) (Table 7).

Table 7. Ratio of labor productivity and wages indexes

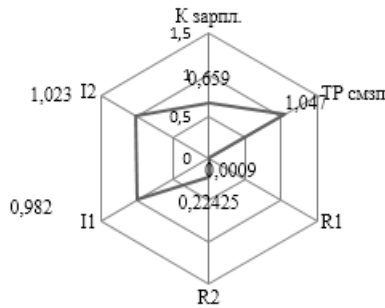
Index	2016 year	2017 year
Total output, thousand rubles.	84 218	79 555
Average number of staff, pers.	252	242
Labor productivity, thousand rubles.	334	328
I_1 - Labor productivity growth index	0,962	0,982
I_2 - Ratio of the labor productivity growth index and the average wage growth index	1,091	1,023

According to the results of the analysis, quantitative indicators are determined, which are formed by factors influencing the magnitude of the labor potential (Fig. 1). The result of calculations of the integrated assessment of labor potential is the summation of weighted estimates of indicators, assuming that the sum of the weights of all indicators is equal to one. When adding all the indices calculated by the Distance, the sum of the weights is 0.65. This value is interpreted as low and requires taking measures to improve the labor potential of the Distant.



— The magnitude of the indicators forming the labor potential in 2016

Figure 1. Complex assessment of labor potential Distance.



— Величина показателей формирующих трудовой потенциал в 2017 году

Figure 1. Complex assessment of labor potential Distance (continuation).

In order to increase the competitive advantages of the Distance by improving the use of labor potential, a mentoring system is proposed. In the context of reforming the pension system of the Russian Federation with an increase in retirement age, the Mentoring Institute can be viewed as a necessary element of the well-being of the elderly.

The termination of work is accompanied by many elderly citizens by changing their way of life, breaking off familiar ties, new attitudes from others and the need to re-structure time in a new way. In connection with this phenomenon, psychologists use the term "pension illness". The disease can be explained by the fact that throughout his life a person worked and found work in the satisfaction.

After retiring, a new social situation requires adaptation. The more a person was more satisfied with his work at work and his job position, the higher the probability that it will be more difficult for him to adapt to the new social environment. Retirement for him can mean a rejection of all that is important, valuable and productive in life.

The mentoring system allows all important skills and experience to be left inside the company, to improve the well-being of the elderly and effectively use the existing labor potential

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上海合作组织内的经济合作领域
**AREAS OF ECONOMIC COOPERATION WITHIN THE SHANGHAI
COOPERATION ORGANIZATION**

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本文介绍了上海合作组织成员国经济互动分析的结果，探讨了相互的贸易周转，确定了经济互动的主要领域。

关键词：上海合作组织，相互贸易周转，经济互动方向。

Annotation. *The article presents the results of the analysis of the economic interaction of the member states of the Shanghai Cooperation Organization, explored the mutual trade turnover, identified the main areas of economic interaction.*

Keywords: *Shanghai Cooperation Organization, mutual trade turnover, directions of economic interaction.*

The main directions and goals of economic cooperation of the SCO countries are defined in the Intergovernmental memorandum on the main goals and directions of regional economic cooperation, the beginning of the process to create favorable conditions for trade and investment. The document was adopted in September 2001 at the first meeting of the heads of government of member states [1, p. 109]. In September 2003, at the meeting of the Council of Heads of Government (Prime Ministers), the Program of multilateral trade and economic cooperation of six countries was approved. It is oriented to a long-term perspective - until 2020 [2, p. 168].

Economic cooperation within the framework of the SCO has already achieved certain results: active development of cooperation is observed in the fields of transport, energy and information. In addition, over the next 20 years, the SCO member countries agreed to step by step to free movement of goods, capital, services, technologies in the intraregional market and subsequently build a free trade zone within the SCO.

The idea of a free trade and economic zone of the SCO is as follows: to the

general benefit to reduce the cost of goods turnover and trade costs for the participating countries: to stimulate regional investments; form a division of labor at the sub-regional level, combine the structure of regional industry with resources. The new system of industrial division of labor must integrate into the global system and unite the population of the region, amounting to 2.8 billion people, into a single Eurasian market [2, p. 171].

In the Chinese-Russian economic relations, the priority of cooperation development today is the construction of a free trade zone in the Far East - outside the SCO sphere.

In the Central Asian region, unquestionably, Kazakhstan is the leader. The pace of economic growth of the republic is high, the process of expanding economic openness is under way. Kazakhstan demonstrates a strong commitment to the idea of regional cooperation and at the same time has a common border with China, the length of which is 1,782 km [2, p. 171]. Kazakhstan is a kind of connecting bridge between the countries of Central Asia and China on the Eurasian continent. Therefore, as soon as the Sino-Kazakhstan free economic zone is formed, it should become the element that will advance the implementation of the SCO free trade zone.

A special place is occupied by Uzbekistan's relations with such a large member of the SCO as China. Today, Uzbekistan's cooperation with this strategic partner in the economic sphere is particularly successful, with the most-favored-nation treatment for both sides. In Uzbekistan, there are 136 joint ventures created with the participation of China's investments, 26 representative offices of Chinese companies. Their sphere of activity is light industry, processing of agricultural products, information technologies.

Another important component is the Uzbek-Russian relations. In 2016, the volume of mutual trade between these countries increased by 42% and exceeded 3 billion US dollars [3, p. 242]. In Uzbekistan there are more than 450 joint ventures formed in partnership with Russian investors. In turn, in Russia there are almost 300 joint ventures with the participation of Uzbekistan's investments [3, p. 242].

On the example of the major SCO member states, we will consider the changes in trade between Russia, China and the SCO countries for the period 2015-2017.

Table 1. The level of trade between Russia and the SCO countries, 2015-2017, billion US dollars

Year	2015	2016	Absolute change	Rate of increase, %	2017	Absolute change	Rate of increase, %
Goods turnover	78,3	80,0	1,7	2,3	104,5	24,5	30,6
Export	40,6	48,3	7,7	18,9	56,3	8,0	16,5
Import	37,7	31,7	-6,0	-15,9	48,2	16,5	52,0

Compiled from the following materials: [4].

As can be seen from the data in Table 1 over the past three years, the level of trade turnover between Russia and the SCO has grown. However, the share of exports in the trade balance exceeds the share of imports. In addition, in 2016 there is a decrease in imports. This indicator as a whole has a positive characteristic.

The main contribution to such a positive dynamics is made by Russia's cooperation with China, an increase in exports. In addition, Kyrgyzstan and Uzbekistan make a significant contribution to the positive dynamics of trade turnover.

Taking into account that the main share in the total volume of trade in the SCO space belongs to China, we will consider the changes in China's trade with the participating countries (Table 2).

Table 2. The level of China's trade with the SCO countries, 2015-2017, billion US dollars

Year	2015	2016	Absolute change	Rate of increase, %	2017	Absolute change	Rate of increase, %
Goods turnover	179,9	186,7	6,8	3,8	217,6	30,9	16,6
Export	121,0	126,9	5,9	4,9	150,3	23,4	18,3
Import	58,9	59,8	0,9	1,5	67,3	7,5	12,5

Compiled from the following materials: [4].

Based on the results of this analysis, we see an increase in China's trade turnover in the SCO space. And both exports and imports have also increased. However, the growth rate of exports exceeds the growth rate of imports. This is due to the position occupied by China in the international market. It is worth noting that online trading has developed actively.

The first place in terms of the share of trade with the countries of the SCO space belongs to China (38%). This is explained by the fact that in China the state actively supports the development of export-oriented enterprises. In the country since 1976 there is a zero tax on raw materials and materials necessary for the production of goods offered for export. It is also worth noting that in China high import duties have been introduced. In addition, the state subsidizes enterprises that produce export products.

Russia as a result of 2015 is in fourth place. This is due to a sharp increase in the dollar, the fall of the ruble against the backdrop of the global political situation - the situation with the accession of the Crimea, the imposition of sanctions, Russia's participation in the conflict in Ukraine. Thus, Russia incurred certain losses due to a decrease in the level of trade with the SCO member countries.

In 2016, China also takes the leading position in terms of the share of trade. We can assume that this is facilitated by the active development of online stores. In addition, various technoparks and incubators are being created in China, the state

is sending huge sums for the development of technology and science. The state program aimed at the development of science suggests allocating 1.58 trillion dollars for research and development of technology in the period from 2016 to 2020.

At the same time, we see that in 2016, Russia rose from the fourth place to the third. However, in general, in the commodity turnover in the SCO space, imports predominate in Russia (mainly from China). Thus, Russia needs to actively develop foreign trade with the SCO member countries, it is necessary to develop certain programs and measures aimed at supporting companies that produce export products.

Over the past three years, the share of China in trade turnover exceeds 30%. The country remains on the first place in terms of export and import among the SCO member countries. This feature allows China to provide the highest level of gross domestic product (GDP) in the SCO space. Russia, though it does not occupy a leading place, remains the main participant in the integration association. At the same time, with the entry into the SCO of India and Pakistan in 2017, it can be assumed that these countries will not take the last places in the rating over time.

It is also worth paying attention to the dynamics of mutual investments of the SCO leaders (Figure 1).

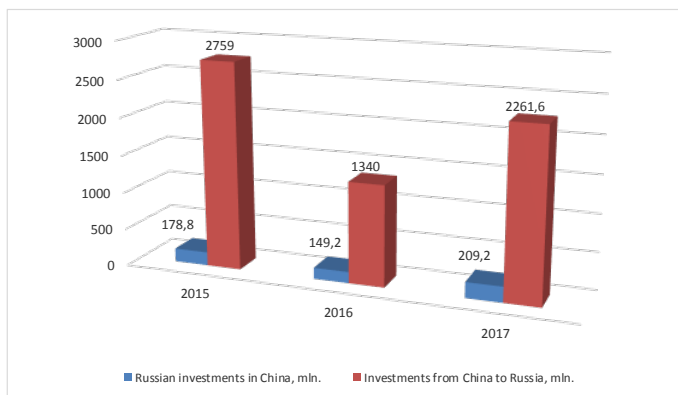


Fig. 1. The volume of mutual investment between Russia and China, 2015-2017.

Compiled from the following materials: [5].

Investments from Russia to China are almost two times lower than investments sent by China to Russia. This situation is due to the fact that Russia has a huge economic potential. Chinese investors are attracted by the development of miner-

als, forestry, energy, trade, construction and services.

In turn, the level of Russian investment in China remains low due to the presence of interest in our country in other areas. Thus, most of the Russian investments are directed to the Republic of Cyprus, the Virgin Islands Netherlands, Austria and Switzerland. This is due to the fact that many Russian entrepreneurs are actively conducting their business in the territory of these countries.

At the same time, despite the global economic crisis that led to the weakening of the leading countries, Russia and China remain the main leaders of the SCO countries. At the same time, the SCO is strengthening its positions. In addition, China is gradually assuming the role of a locomotive not only in the organization, but also in the world economy.

With the economy all these years it was more difficult. Despite the existence of more than one hundred joint projects, none of them has ever been implemented. Except for the allocation by China within the SCO of a liaison loan to Kyrgyzstan and Tajikistan. The global financial crisis placed the issues of ensuring economic security at the forefront. And the solution of these issues outside collective action is not visible. And this objectively creates the prerequisites for the activation of the economic direction in the activities of the SCO.

Let us single out the main directions of economic cooperation among the SCO member states [6, p. 45].

First, it is worth paying attention to the financial system, based on the dollar. Given that in the SCO space the US dollar is not the official currency of any of the member countries, it is logical to diversify the international monetary system. However, taking into account the circumstances that 80% of all international money payments are provided at the expense of the dollar, that the gold and foreign exchange reserves of all the SCO member countries are mainly formed at the expense of the dollar component, that settlements between them are made in dollars, and the question is posed from the desired area. To date, neither the yuan nor the ruble even within the framework of the SCO is able to act as an alternative to the dollar. The only thing that can be offered is to begin to make interstate settlements of the SCO member states in national currencies. This will both avoid double counting and related losses, and will help strengthen national markets. Moreover, the practical implementation of this practice does not require the creation of special institutions, it is enough to simply take a political decision.

Secondly, since the economies of most of the SCO member states are export-oriented, they depend heavily on the conjuncture of the foreign market and the solvency of the population of the countries that consume their products. The main such country is the United States, which, producing 20% of world GDP, consumes 40% [7]. Consequently - any action aimed at undermining the US economy will return as a boomerang. This is especially true for China, which is not only de-

pendent on exports of its goods to the United States, but also on the quality of its assets. Without the American market, the People's Republic of China can hardly expect to continue the development trajectory on which it has been for the last two decades.

Third, the main task of today for national economies is to maintain the solvency of the population and domestic demand. National anti-crisis programs, of course, play the main role in this task. However, coordination of efforts within the SCO framework can play a positive role. It would be useful to organize a meeting of the financial and economic circles of the SCO member states, during which it would be possible to analyze the situation in the financial market in the SCO region, exchange views, draw lessons from the current situation and draw conclusions.

On the other hand, it is necessary to use the geographical advantages of Member States. It is, first of all, the implementation of joint large transport and logistics projects. It can be both automobile and railroads connecting the SCO member states.

Another area is large water and environmental projects, the need for which is felt both in China and Russia, and in the Central Asian region [8, p. 53]. In addition, it is in the field of ecology that prospects are opened for the creation of a mechanism for scientific and technical cooperation and the introduction of scientific and technological achievements in production.

The third direction is joint projects related to ensuring food security of the SCO member states [8, p. 53]. To implement these projects, there are appropriate environmental conditions, and a proven scientific basis. Today this topic is very relevant. Moreover, it is in the field of agricultural production and processing of agricultural products that we can realize the task of developing a real and competitive sector of the economy.

Finally, the fourth direction is the accelerated implementation of the idea of creating an "Energy Club", and in the future - the formation of a single energy space within the SCO framework [9, p. 29]. At the first stage, it could go about creating an organizational framework for a constantly functioning multi-level platform for examining the entire complex of energy issues, including a comparison of the energy strategies of states, policies and joint projects based on the philosophy of harmonizing the interests of producers, consumers and energy transmitters. On the second - on the practical implementation of the proposal of Kazakhstan on the Asian energy strategy.

Based on the results of the analysis, the following can be concluded: the bulk of the trade turnover in the SCO space falls on China. Russia is the second in this rating. It is also worth noting that the level of Russian exports to the SCO countries is also increasing. Prospective areas of economic interaction are transport, energy

and nature management. The institutionalization and finalization of all mechanisms and possible options for cooperation in the economic sphere has not been finalized at the moment.

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中国作为快速消费品行业的零售跨国公司：美国与欧洲模式
**CHINA AS A HOST OF RETAIL TNCs IN THE FMCG SECTOR:
AMERICAN VS. EUROPEAN MODEL**

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本文致力于中国零售环境作为跨国公司的接收国。作者试图分析哪种适应亚洲市场的模式更有效 – 美国或欧洲。以实惠的价格实施紧缩或优质的战略 – 更接近中国消费者的是什么？这个问题是作者研究的主要目的。

关键词：跨国公司（TNC），沃尔玛，家乐福，中国，中国零售市场，SWOT，战略。

Annotation. *The article is devoted to Chinese retail environment as the receiving country of the transnational corporations. The author tries to analyze which model of adaptation to the Asian market is more effective - American or European. The strategy of austerity or good quality at affordable prices - what is closer to the Chinese consumer? This question is the main aim of the author's research.*

Keywords: *Transnational corporation (TNC), Walmart, Carrefour, China, Chinese retail market, SWOT, strategies.*

The Asian market of consumer goods is a very critical phenomenon by itself, and the Chinese market, which is already able to provide almost everything for and by itself, is even more so complicated. Anyway, the second economy of the world is causing mixed reactions among the more economically developed countries. In order to understand which model is more able to adapt to the Chinese realities of retail, with what strategy China gets along more warmly, it was decided to analyze the two largest giants of retail trade – American Walmart and French Carrefour.

So, let's start with «the greatest». What is Walmart? Walmart is a strategy of rigid, total economy, the maximum range at the minimum prices. One of the priorities of the Walmart strategy is its focus on internationalization, expansion of the geography of its presence. International expansion helps the company not only to grow, but strengthen its leadership positions from year to year, leading international ratings. Expanding over the international area, the company diversifies its sources of revenue and benefits from economies of scale.

Table 1 – SWOT analysis of Walmart [3].

<p style="text-align: center;"><i>Strengths</i></p> <p>1) investment opportunity; 2) well-recognized brand; 3) introduction of innovative technologies; 4) customer loyalty; 5) lower prices; 6) huge range of products.</p>	<p style="text-align: center;"><i>Opportunities</i></p> <p>1) focus on previously unexplored markets in Latin America and Asia; 2) development of online trade and delivery; 3) economic recession; 4) the advantage of an efficient supply chain together with innovative technologies will affect further expansion and cost reduction; 5) partnership with large companies offering various types of services: health insurance, travel services, coffee houses, etc. 6) absorption of small competitors and merger with various retailers will further strengthen the position.</p>
<p style="text-align: center;"><i>Weaknesses</i></p> <p>1) small geographical presence abroad; 2) the company's tendency to hire more part-time than full-time employees; 3) reduce profit margin to keep prices at the highest possible level; 4) sale of low quality goods; 5) ill-considered investment decisions; 6) participation in court proceedings; 7) complexity in local management due to the size of the company; 8) staff turnover.</p>	<p style="text-align: center;"><i>Threats</i></p> <p>1) increase of salaries and health insurance of employees; 2) increased resistance to further expansion from local organizations and government; 3) the growth of the economy can lead to the fact that the consumer will abandon the goods at a low cost in favor of a better product; 4) serious competition; 5) increased attention to the ethical work of the company (low wages and poor working conditions); 6) the possibility of aggressive German discount policy to gain a foothold in the American market; 7) growing competition on the online platform.</p>

According to the analytical portal CayenneApps (a web application that conducts SWOT analysis of the world's largest companies), the impact of the strengths and weaknesses of Walmart are equally strong, so: the forces allow you to use the company's capabilities by 77% and overcome possible threats by 66%, at the same time as weaknesses limit the use of opportunities by 62% and increase the impact that threats have on the company by 81% [3].

Nowadays the market where Walmart mainly operates is oversaturated and in some areas is still experiencing the effects of a painful recession. As mentioned earlier, among the weaknesses that threaten the development of the company, there are poorly prepared investment decisions, which caused the withdrawal from the markets of South Korea and Germany. After eight years of trying, Walmart was unable to keep its 85 German stores. There were several reasons for this result. First, the lack of analysis of local markets and the specific expectations of local

customers. Moreover, ineffective management practices did not fit into the local cultural context.

To maintain stable growth Walmart decided to focus on the consumer markets of Latin America and Asia (especially India and China). Thus, the company opened its first hypermarket Walmart and Sam's club in 1996 in Shenzhen; today there are more than 400 outlets in more than 170 cities in China. Despite the rather rapid expansion, there are still some difficulties in adapting to the realities of the Chinese economy and market.

The main competitive advantage of the company EDLP (Every Day Low Prices) – has not received proper implementation in China, because local markets are already crowded with low price goods. In this regard, the trading giant decided to proceed as follows:

- 1) Walmart supercenter - the main format, hypermarkets ranging from 6400 to 24200 sq. m.;
- 2) Sam's club-store - warehouse with membership system, a large selection of imported goods;
- 3) Neighborhood Market - small grocery stores;
- 4) and Discount Compact Hypermarket (DCH) – discounters with general purpose goods and a modest assortment of groceries [1].

So the formats 1 and 2 are located in major cities of China such as Beijing, Shanghai, Guangzhou and Shenzhen. Formats 3 and 4 was decided to transfer to the 2 and 3 levels cities with a lower level of income.

Walmart also adjusted its strategy by changing the slogan to "Save money - live better" with an emphasis on the last part. Taking advantage of the power of its name, Walmart directed the consumer's attention to the concept of being healthy, i.e. to use safe, environmentally friendly products. Thus, the slogan implies that saving customers' money can help improve their quality of life. And the quality of products is the basis and the first guarantee of life quality.

A typical strategy that is used by the majority of international retailers is localization. However, often such tactics of behavior puts retailers in a difficult position: to unify their activities through up-down management or to build management on a more flexible system of down-up. At the beginning of its activities in the Chinese market, Walmart used its American authoritarian style of up-down management, but soon due to the uneven retail environment and the unbalanced development of the local market, the applied management system gave a crack: constant delays in decision-making led to inefficient work and loss of business opportunities. In 2007 Walmart headquarters delegated its authority to select suppliers and set prices for products at the local level.

Among the weaknesses of the company should be noted an increase in staff turnover. As for China the management did not pay enough attention to the cor-

porate culture of personnel training and the level of its management, focusing only on large-scale expansion. It is also worth to notice that the staff turnover rate in 2012 was 31%, which was the highest in the industry. Therefore, in order to improve its image, Walmart decided to strengthen management in working with personnel, to build a corporate culture on the principle of "open door" - solving issues and problems in open atmosphere, what is lead to the high level of staff loyalty. Step by step, this problem has been solved and today Chinese Walmart has almost no part-time staff [1].

It should also be noted that Walmart, like any other global network retailer, takes into account the buying habits and needs of Chinese customers. In China, there is a wide variety of goods, both local and imported, but there is no free flow of these goods due to individual markets. And for a country with "Cult of food", both to foreign and national cuisines, it is unforgivable. In this connection, Walmart used its supply chain management skills to facilitate the flow of goods. In the country, with highly developed logistics infrastructure and the boom of e-Commerce, the best solution was to unite with the local logistics O2O (online to offline) electronic platform. In 2016 Walmart entered into an agreement with JD.com and New Dada, which through the New Dada network offered its customers a two-hour delivery of products ordered from Walmart stores through the JD Daojia Dada application. Delivery was initially available to customers within a 3 km radius for more than 20 Walmart stores, by the end of 2016 the number of stores included in this program doubled.

So despite not the simplest situation on the retail market of China, Walmart succeeded in a foothold here, as evidenced by the geography of distribution and the number of open stores. Despite the above-mentioned threats, which are typical for both Chinese market and in general for other countries where Walmart is located, a well-known brand and investment opportunities can open many doors for the company. The largest retailer has the ability to easily create partnerships with large companies that provide various services, such as health insurance, travel agencies, coffee shops. Its investment potential gives them the opportunity to absorb smaller competitors and merge with various retailers, which can strengthen its dominance on the market. Also China still has the regime of the planned economy and Chinese society is quite traditional in its nature, so such feature as the loyalty to major famous brands takes place here.

In the list of the largest trading companies of the world the French retail company Carrefour (the operator of the eponymous retail network) is the second largest after Walmart (Approx.: here we mean the Corporation of "retail" trade, without wholesale warehouses and cash-and-carry formats). The distribution geography of Carrefour is about the same as Walmart's: stores are located in Europe, North Africa, Asia and South America, the difference is that in North America the

company doesn't have its outlets.

Among the main provisions of the company's strategies, analysts note those that were developed during the company's establishment in 1963, it is important that these principles of the concept are observed to the present time:

- one-shop-shopping - is to provide the buyer the opportunity to purchase everything he needs in one place;
- mandatory formation and compliance a flexible pricing system with regular discounts;
- indispensable presence of each shopping facility with free parking area.

Today among the wholesale and retail TNCs of FMCG Carrefour has the widest geography of presence (35 countries) and almost half of the money turnover is provided by foreign branches.

Unlike the American Walmart, which has its stores everywhere, but mostly in the downtowns of cities or districts, Carrefour favorably has its hypermarkets on busy highways or near cities, where the renting price is lower.

As for the pricing methods, there are also differences with the American competitor. If the strategy of Walmart is a mode of "total savings", the prices of Carrefour are kept 5-10% lower than in traditional stores. Carrefour works with a very narrow number of manufacturers and suppliers, thus providing them with constant sales and receiving additional discounts. However, the biggest problem of Carrefour is the reputation of the seller with high prices, so not so long ago the company decided to focus on increasing the share of goods under its own brand, the prices of which are lower than those of products from well-known manufacturers. [5]

Specialists also emphasize the carefully developed organization of technological processes. There is an optimal placement of goods in the sales areas of shops, carefully cultivated cleanliness and effective, but not self-sufficient advertising. According to experts feedbacks "with Carrefour's emergence on the market, all other players are simply forced to improve the quality of services".

A key factor in Carrefour's success both on the domestic and international markets is a pronounced decentralization of management. Issues of assortment planning, pricing, staffing, technical equipment of enterprises were transferred to local store managers. This made it possible to solve issues faster, more accurately and efficiently.

This was especially necessary in the expansion of the network abroad in countries with constantly changing economic conditions – Taiwan, Argentina, Brazil, where the need for quick decisions makes the independence of store managers in the field a necessary condition for their functioning. At the same time, the decentralization of operational management didn't reduce the importance of strategic management.

Table 2 –SWOT analysis of Carrefour. [6]

<p style="text-align: center;"><i>Strengths</i></p> <ol style="list-style-type: none"> 1) wide geographical presence; 2) well-recognized brand; 3) multi-format strategy; 4) popular own brands; 5) focus on high quality products. 	<p style="text-align: center;"><i>Opportunities</i></p> <ol style="list-style-type: none"> 1) using brand awareness on the emerging markets; 2) focus on growth through accumulation strategy and innovative marketing; 3) usage of the analytical database.
<p style="text-align: center;"><i>Weaknesses</i></p> <ol style="list-style-type: none"> 1) limited presence on emerging markets of Asia and the Middle East; 2) periodically negative media news spoil the reputation; 3) very modest use of Internet space for e-Commerce development; 4) modest range of offered own brands. 	<p style="text-align: center;"><i>Threats</i></p> <ol style="list-style-type: none"> 1) the growing level of competition with discounters, both French and foreign retailers; 2) ever-increasing labor costs and economic downturn slow income growth; 3) fluctuations in currency exchange rates.

As for the Chinese market, the French Carrefour first opened its stores in China in 1995 and currently operates more than 250 supermarkets in 70 cities.

The overall strategy chosen by Carrefour in China was to create a decentralized system of activities. The company was divided into 4 parts: South China, East China, North China and Central China; with personnel managed by local residents. In addition, Carrefour adapts its offer to local demand. The company is known for its large stores. In China, Carrefour had originally planned to open stores with an area of 10 000 sq. m., but after taking into account the local context of the Carrefour stores was changed to 3,000 square meters, because the Chinese go to the supermarket to buy some daily products in small quantities. Initially, Carrefour also entered the Chinese market by forming joint ventures with local companies. The firm has signed direct agreements with local authorities in various provinces to obtain licenses to set up its stores. [4]

Already in the early 2000s, Carrefour was known as the largest foreign retailer in China. However, after the arrival of other retail giants, its market share has significantly shaken. Thus, according to reports published in 2017, the French Auchan network has a 14% market share in China, the previously studied American Walmart – 12.2%, and Carrefour occupies the third position with 9.9%.

In order to satisfy local preferences, Carrefour has customized its offer according to local preferences. So, it has already been said that China is a country with a high level of development of online trade, so to remain competitive, Carrefour has signed a long-term cooperation agreement with Tencent (the largest Chinese investment company, includes services such as social networks, music and web portals, e-Commerce and payment systems) and Yonghui (a network of small supermarkets specializing in deep knowledge of fresh products). [2] Upon completion of these investments, Carrefour will remain the largest shareholder in

Carrefour China.

Through this partnership, Carrefour will improve its online visibility, increase its offline and online retail traffic, and take advantage of Tencent's advanced digital and technological expertise to develop new smart initiatives. Tencent will continue to develop the retail services offered on its social platforms and promote the use of Weixin as well as Weixin Pay and other services in the Carrefour ecosystem.

In fact, it is quite difficult to say whose strategy is best adapted to the Chinese market, who will conquer the Chinese retail market. The most likely answer in this case is that no one. Foreign trade networks are firmly established in the Chinese market, but none of them and their local competitors is not close to the dominance in China such as Walmart in America. [2]

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俄罗斯联邦人口生活水平地域差异的社会经济政策模型及其增加
**MODEL OF SOCIO-ECONOMIC POLICY OF LEVELING
TERRITORIAL DIFFERENCES IN LIVING STANDARDS OF THE
POPULATION IN THE RUSSIAN FEDERATION AND ITS INCREASE**

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本文探讨了解决现代条件下一些最紧迫任务的问题：为提高人口生活水平，减少社会经济不平等和贫困创造条件。考虑经济类别的相互关系和相互影响：有效就业，经济增长，人口生活水平。以俄罗斯社会经济政策模式的形式，提出了一个解决区域发展问题的综合机制，其中包括国家进一步发展的两个优先方向。

关键词：人口生活水平，社会经济不平等，有效就业，经济增长，贫困。

Annotation. The article touches upon the problems connected with the solution of some of the most urgent tasks in modern conditions: creating conditions for raising the standard of living of the population, reducing its socioeconomic inequality and poverty. The interrelation and mutual influence of economic categories is considered: effective employment, economic growth, living standards of the population. A comprehensive mechanism for solving regional development problems was developed and proposed in the form of a model of Russia's social and economic policy, which includes two priority directions for the further development of the country.

Keywords: living standard of the population, social and economic inequality, effective employment, economic growth, poverty.

The search for ways and opportunities to reduce the social and economic inequality of regions, the solution of the problem of economically unjustified and socially unfair differentiation of incomes are currently the most important directions of the state's activity. The smoothing of interregional differences in our country as a necessary condition for accelerating its social and economic development must be accompanied by an improvement in the standard of living of all members of society.

In the documents of the long-term development of our country, among which is the "Concept of long-term socio-economic development of the Russian Fed-

eration for the period until 2020", "The Strategy of the National Security of the Russian Federation until 2020", Long-term socio-economic development forecast of the Russian Federation for the period up to 2030 Years with a pronounced social coloring and recognizing socio-economic inequality as one of the problems of modern society, the main targets of the social -economic policies to overcome it (Table. 1) [1, 3].

Table 1. The main targets of the socio-economic policy of Russia to overcome inequality until 2030.

Targets	2017	2030
Average size of labor pension	1,6 BSM	2 – 2,7 BSM
The coefficient of replacement by a retirement pension for the old age of lost earnings	34 %	40 % (until 2020)
Absolute poverty level	13,2 %	6-8 %
The differentiation of the population by income level	15.3 times	12 times (until 2020)
Security of housing	25.2 m ²	25 – 28,5 m ²
Unemployment rate	5,2 %	4,1-4,7%

To achieve the specified targets, a standard list of measures is proposed, but attention is not paid to improving the distribution relations, since the conditions and prerequisites for raising the standard of living of the majority of the population are determined not only by the amount of resources, but also by the nature of their distribution among members of society. It should be added that the declared priorities of spatial development are weakly based on the competitive advantages of the regions.

It should be noted that the existing documents of the social and economic development of the regions, which are an effective and effective tool for achieving the goals set, provided that it is correctly implemented, has not yet provided a radical change in the socioeconomic situation in regional development: territorial differentiation is gradually decreasing, but still goes beyond socially acceptable framework.

At the present stage of economic development, in order to realize the strategic and tactical goals and objectives of the development of the Russian Federation, it is necessary to create conditions for raising the standard of living of the population, reducing its socioeconomic inequality and poverty that impede economic growth in the country. In connection with these, we propose a comprehensive mechanism for solving the problems of regional development in the form of a model of Russia's social and economic policy, which includes two priority directions for the further development of the country (Figure 1).

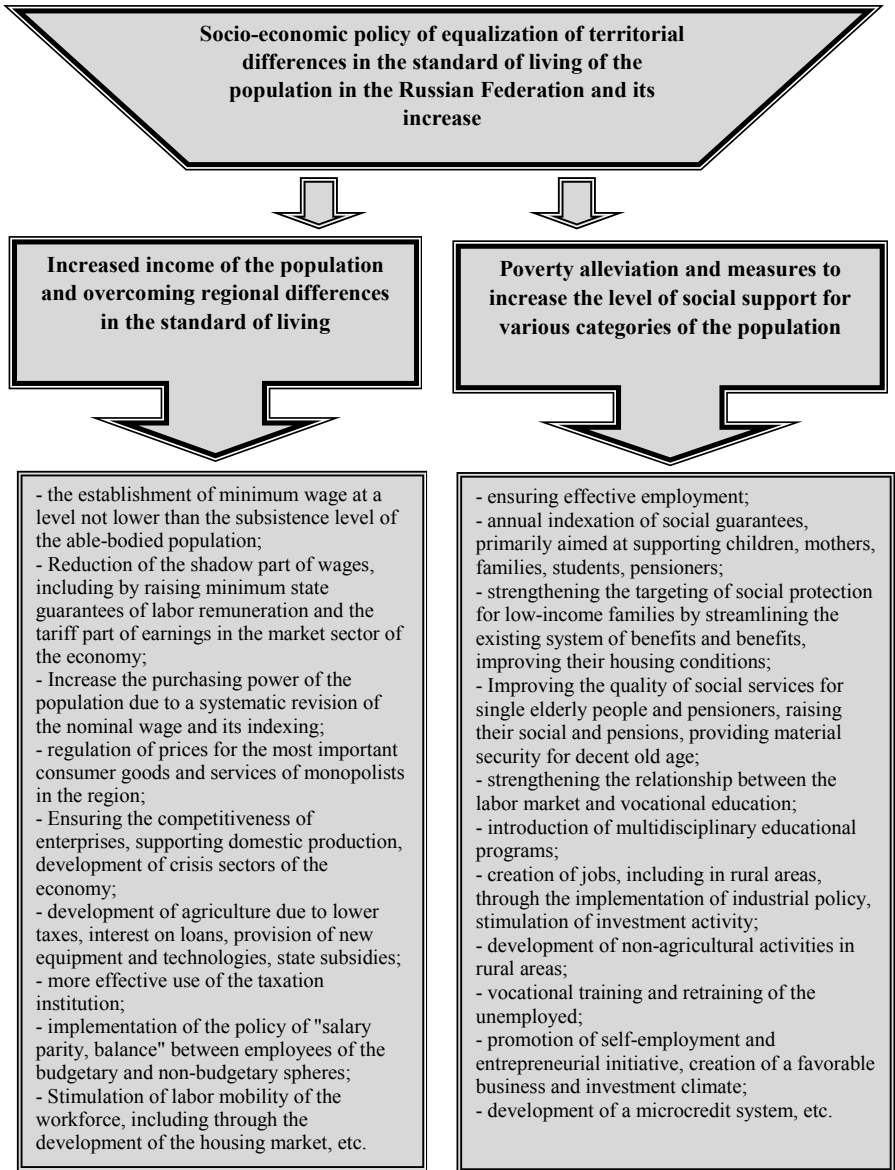


Fig. 1. A model of socio-economic policy for smoothing territorial differences in the standard of living of the population in the Russian Federation and increasing it

The proposed model of socio-economic policy has a system-wide character, establishes general federal rules, determines the general prerequisites for regional development, that is, it is a national one, since it is aimed at creating an institutional environment for regional development, has no selective purpose, affects all regions in one of the most important aspects their development.

It should be noted that in connection with the existing deep structural differences between the regions of our country, each of which requires special approaches and the use of special development tools, this model in each separate region should be supplemented by appropriate regional development programs aimed at solving its priority tasks, that is, there should be a differentiated approach to different territories within the framework of a nation-wide regional policy.

Priorities of regional development for the regions-leaders and regions-outsiders can not be the same. In more prosperous regions, existing ones need to be developed and new comparative advantages sought. In depressed regions, due to the lack or shortage of competitive advantages, the restructuring of the economy and the search for new directions for growth and development come to the fore. All these measures will be successfully implemented only if certain conditions are set, which are set by the single state policy of Russia.

An indispensable condition for an effective policy of raising the incomes and living standards of the population, increasing the share of the middle class in the population structure and reducing poverty is sustainable economic growth, the achievement of which is possible on the basis of ensuring efficient employment that generates decent income for the population and, as a result, forms effective demand. The purchasing power, as a component of the standard of living of the population, is a direct vector of the development of the economy, its stimulant.

Ensuring effective employment contributes to sustainable and dynamic economic growth in the country through increasing purchasing power and increasing social productivity of labor, which creates the prerequisites for improving the standard of living of the population [2].

It should be emphasized that the main reason for the socioeconomic inequality in Russia lies in the ineffective functioning of the mechanisms for the distribution and redistribution of resources, so that at present the economic effect obtained from economic growth by various groups of the population is extremely unequal.

In view of the current situation, the problem of high interregional inequality in the standard of living of the population in Russia needs to be resolved in a territorial context, taking into account the specific features of each region, as well as by individual socio-demographic and income-wealth groups in order to smooth socio-economic contrasts in the country.

The proposed model of socio-economic policy and recommendations of a strategic and tactical nature allow creating conditions for sustainable socio-economic

development of the country, improving the socio-economic status of all members of society and reducing inequalities between them. Recommendations can serve as a basis for the development of regional programs for raising living standards and making sound economic and management decisions.

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综合国家超国家治理的财政和经济特征在欧盟和EAEU
**FINANCIAL AND ECONOMIC FEATURES OF SUPRANATIONAL
GOVERNANCE OF INTEGRATING STATES
IN THE EU AND IN THE EAEU**

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今天，世界的政治和经济地图正在发生变化。因此，今天传统的经济增长中心让位于新的，更有活力的行动者；正在形成区域地缘政治伙伴关系，正在积极实施雄心勃勃的跨境项目。在不久的将来，所有这些过程都会极大地影响未来世界秩序的基本要素的发展。这种“种族”的成就只能通过积极参与才能确定，不仅要超越可能的竞争对手和竞争对手，还要超越国际体系本身的发展动态。

关键词：欧盟，EAEU，经济一体化，EURASIA

Annotation. *Today, the political and economic map of the world is changing. Thus, traditional centers of economic growth today give way to new, more dynamic actors; regional geopolitical partnerships are being formed, and ambitious cross-border projects are being actively implemented. Already in the near future, all these processes can dramatically affect the development of basic elements of the future world order. Achievements in this "race" can be determined only by active participation in it, by outstripping not only the likely competitors and rivals, but also the development dynamics of the international system itself.*

Keywords: *EU, EAEU, economic integration, EURASIA.*

The EAEU as one of today's new regional growth centers has great ambitions to spread its influence on the world economy. This is proved by numerous statements from high tribunes by Russian and foreign politicians and economists. In some cases, EAEU in terms of functioning, integration stages and structure is compared with the European Union as the closest organization. Experts consider the EAEU as a new economic force that will give impetus to a new round of economic prosperity in the world. Therefore, financial and economic characteristics of supranational management of such associations as the European Union and the Eurasian Economic Union are of great interest.

Undoubtedly, integration associations based on the economies of several countries at certain stages have completely different goals and tasks. The role of su-

pranational institutions is significantly expanded at final stages of economic rapprochement. Management of certain sectors and spheres of the national economy are completely transformed into external management. The EAEC and the EU are now somewhat different in terms of their policy methods; thus it is difficult to analyze the external management of these associations. The top down implementation of economic policies without reliance on national interests today for the Eurasian countries is not understandable, unlike the powerful European supranational apparatus that works in the interests of the entire region - Europe.

First and foremost, functioning effectiveness of this supranational body or any other structure depends on the economic well-being of those countries that are members of the association, the powers with which it is vested, its financial security, and compliance with institutional principles.

Table 1. The main economic characteristics of the EU and EAEU in 2015

Indicators	European Union	Eurasian Economic Union					
		Belarus	Russia	Kazakhstan	Kyrgyzstan	Armenia	Arithmetic mean
GDP, billion USD	16270	54,61	1325	173,2	6,65	10,57	1570,03
GDP per capita, USD	37800	17700	25400	24300	3400	8500	14160
Economic growth, %	1,9%	-3,9%	-3,7%	1,2%	3,5%	3%	0,6%
Index of industrial production	2,9%	-6,5%	-3,6%	0,1%	0,9%	2,5%	-1,3%
Annual inflation, %	0,1%	13,6%	15,5%	6,7%	6,5%	3,7%	9,2%
Share of services in GDP, %	70,6*	49,8%	62,1%	62,5%	56,3%	51,9%	56,5%
Share of agriculture, %	1,6*	8,9%	4,6%	5%	17,7%	19,4%	11,1%
Share of industry in GDP, %	24,6*	41,3%	32,6%	32,5%	26%	28,7%	32,2%
Exports, billion USD	2259 *	26,19	341,5	46,29	1,610	1,626	415,59
Laborforce, million people	232,2	4,546	76,58	8,989	2,732	1,56	94,407
Refinancing rate of the Central Bank	0,05%*	20%*	15,73%	16%	24,25%	10,5%	17%

Source: compiled by the author according to data taken from Eurostat and national statistical agencies of EAEU countries.

Table 1 clearly shows differences in the economic situation in the EU and in the EAEU in 2015. Total GDP of the European Union exceeds that of the EAEU by more than 10 times, which amounted to 1.5 trillion USD in 2015. GDP per capita in the EU exceeds that of the EAEU by more than 2 times (37, 800 USD dollars against a weighted average of 14,160 USD). At the same time, economic growth in Europe is characterized by an increase of 1.9% per annum. Against the backdrop of the current situation, this means that Europe is gradually overcoming the crisis.

Indeed, the economic basis dictates its impartial rules as regards development of economic alliances. One can draw an analogy comparing the developed and developing countries, since the financial and economic gap clearly demonstrates their prospects.

Comparing the two unions, the European Union is in a better position taking into account its index of industrial production (+ 2.9%), share of services in GDP (70.6%), exports (2.3 trillion USD), the number of people employed (232.2 million people), refinancing rate of the Central Bank (0.05%). It is known that the EU population makes just a bit more than seven percent of the world's population; however, the Union generates 23.7 percent of world GDP, as evidenced by relevant Eurostat data.

In contrast to the EU, the EAEU lags behind in the economic aspect. In recent years, the EAEU countries have been characterized by an economic slowdown, negative index of industrial production, high inflation rate and high refinancing rate of the Central Bank. In 2015, one could notice low aggregate economic growth rate of 0.6%, (economic growth was shown by Armenia, Kyrgyzstan and Kazakhstan) along with low index of industrial production (-1.3%). The share of services in GDP was 56.5%, the volume of exports was 415.5 billion USD, the number of people employed was 94.4 million and refinancing rate of the central bank was 17%.

The economic situation in Russia alone was even worse. It seems that the war of sanctions has hit the Russian economy, since the EU is its main trading partner. A large role was played by the Devaluation of national currencies and reduction of energy prices played a substantial role as well. Negative economic growth ("minus" 3.7%) was determined by dependence on the global prices for crude oil and metals. Official inflation was 15.5%, which was the most negative trend among the EAEU countries.

In Kazakhstan, indicators mentioned in Table 1 demonstrated relative economic stability. Thus, GDP has a positive trend: the economic growth was 1.2% per annum, which was a great achievement against the background of crisis phenomena. Annual growth of the industrial production index was at the level of 0.1% (without noticeable changes). Inflation rate maintained at around 6.7% in annual terms. In terms of share of services in GDP, Kazakhstan accounts for 62.5%. The higher the

share of services in GDP, the more it indicates the country's post-industrial development. For example, in the EU this indicator is at the level of 70%. In the UK, it makes 98% of GDP. At the same time, it should be noted that 2015 for Kazakhstan marked a significant sudden decrease in the value and natural volume of exports. Besides, in Kazakhstan, the value of exports decreased by 2 times in 2015, as compared with 2014, when it amounted to 80.24 billion USD. This was negatively affected by devaluation, changes in the exchange rate of the national currency (tenge) as well as decrease in the cost and demand for energy. Accordingly, imports decreased as well and the foreign trade balance showed a positive trend.

Kyrgyzstan is characterized by the smallest size of the economy in comparison with other EAEU countries. Thus, the aggregate GDP was only 6.6 billion USD; GDP per capita was 3,400 USD in 2015. But economic growth against the background of the global crisis amounted to 3.5%. Kyrgyzstan is not a supplier of energy resources to the world market; therefore, it is not so much affected by volatility in the oil market. At the same time, its index of industrial production grew by 0.9% per annum, the share of services in GDP was 56.3%, the share of agriculture in GDP of his country is large - 17.7%. The volume of exports in Kyrgyzstan was 1.6 billion USD, at the same time, the number of people employed in the economy was 2.7 million people. In this country, the highest refinancing rate of the Central Bank was observed - 24.25%.

In addition to gold, the Kyrgyzstan's export is based on ten commodity groups (vegetables and fruits, milk and dairy products, tobacco, cotton, textiles, inorganic chemicals, electricity, cement, electric incandescent lamps), covering more than 50% of exports, and together with gold, their share reaches about 90% of total export operations.

Despite the smaller number of able-bodied population (only 1.6 million people compared with Kyrgyzstan), Armenia in 2015 had total GDP of 10.6 billion USD and its GDP per capita was 8,500 USD. At the same time, positive economic growth amounted to 3% of the annual value, and its index of industrial production was 2.5% per annum. Armenia is an agrarian country where the share of agriculture in GDP is 19%. The share of services in GDP was 51%. Armenia's refinancing rate of the Central Bank was about 10% in annual terms. The volume of exports was 1.6 billion USD. Exported goods include cast iron, raw copper, non-ferrous metals, diamonds, mineral raw materials, food products.

Armenia depends on energy supplies (gas and oil). The Zangezur Copper and Molybdenum Combine was the country's largest taxpayer in 2011. Traditionally, this country is involved in mining and processing of building materials: tuff, felsite, travertine, basalt, perlite, limestone, pumice, marble etc. Trade with the EU countries in 2015 amounted approximately to 1,220.6 million USD (share - 25.7%, decline - by 23.7%); trade with other countries amounted to 2,142.7 mil-

lion USD (share - 45.2%, decline by 19.2%). Armenia has a negative foreign trade surplus (1,767.1 million USD). In 2011, according to Forbes magazine Armenia ranked second after Madagascar among 10 worst economies in the world [10].

The Eurasian Economic Commission believes that key barriers to monetary integration include insufficient integration of economies and restrictions on capital flows. Thus, according to the results of 2014, the share of the EAEU mutual trade in the total volume of foreign trade turnover was 11.7%. For comparison: in the European Union, the volume of mutual trade in goods, services and mutual investments is 60%. [11]

A coordinated macroeconomic policy is extremely important for the EAEU countries. This mechanism provides macroeconomic stability, formation of common economic principles, harmonization of key indicators in order to improve stability and to deepen integration of member states. Full coordination of macroeconomic policies is of utmost importance for the future EAEU development. This includes the need to achieve similar and moderate inflation rates, accessibility to financial resources and similar refinancing rates, stable and sustainable growth rates, debt sustainability, balanced foreign trade and fiscal policies.

In general, the EU is ahead of the Eurasian Economic Union in terms of economic parameters. This association has its own significant financial resources, and it does not depend on the budgets of its member states. The size of the EU budget is determined and approved by the European Council and by the European Parliament. In particular, in 2016, budget expenses made were 144 billion euros and the revenue side of the budget was 155 billion euros [12].

One should consider that the EU budget, for example, in 2011 was about 140 billion euros, while the national budgets of all 27 EU member states exceeded 6,300 billion euros. In other words, public spending of all 27 EU member states in 2011 exceeded the EU budget by almost 50 times. According to data provided by the European Commission, in 2010 every citizen of the EU spent only 67 cents on average per day to finance the Union's annual budget.

In addition, there are two types of financial plans in the EU –the annual and the long-term one (the seven-year budget). Thus, according to the seven-year budget estimates for 2014-2020, expenditures at the level of 1,025 trillion euros are envisaged [13]. The EU defines long-term expenditures in accordance with economic and political priorities, sets annual maximum amounts that will be spent on each direction. With such a multi-year financial structure, the annual budget cannot grow because of control over it, and focuses on real priorities. The EU never has a budgetary gap, there is no debt accumulation, and the organization spends only what it receives. According to the definition taken from the official website of the European Commission, "EU regional policy is an investment policy. It supports job creation, competitiveness, economic growth, improved quality of life and sus-

tainable development. These investments support the delivery of the Europe 2020 strategy”.

The EU budget for 2014-2020 aims mainly at supporting SMEs, which account for about 99% of the total number of European firms and create about one third of all jobs in the private sector. Thus, financing of various assistance programs for SMEs through the European Regional Development Fund will be doubled from 2014 to 2020 - from 70 to 140 billion euros.

Revenue part of the EU budget is formed both from own financial sources (VAT deductions of 1.4%, customs duties, taxes on imports of agricultural products from third countries and other sources) and deductions from GDP of all EU member states in the amount of 1.2-1.3%, depending on their share in the EU GDP. Own resources of the EU budget imply the following deductions:

- 1) deductions, bonuses, additional and compensation payments, other payments levied upon trade with third countries within the framework of the common agricultural policy;
- 2) customs duties referring to the Common Customs Tariff, similar customs payments levied upon trade with third countries;
- 3) national VAT deductions;
- 4) percentage deductions from GDP;
- 5) other own resources (tax on staff salaries, interest revenue on capital, etc.).

The budget is used to finance the common agricultural policy; trans-European networks in transport; assistance to the least developed EU regions; support to the developing countries outside the EU and the administrative apparatus of the Union. The EU administration requires about five percent of the budget, politics - about 95%.

In 1980s, up to 70% of the budget was allocated for agriculture. In the EU, agricultural subsidies are distributed exclusively through the common budget, that is, the EU member states do not provide any funding themselves. The bulk of the EU financial support within CAP is intended for direct subsidies for farmers. Countries such as the UK, where agriculture is of secondary importance, receive much less support than countries such as France, where this sector of the economy is far more important. This poses an unsolvable problem, because according to CAP principles, funds are collected proportionally from all member states, and allocated depending on CAP terms. In view of the fact that importance of the agricultural sector is different in each country, the amounts allocated to different countries differ as well.

Table 2. EU budget expenditures 2015 (EUR million)

Budget expenditures	
“Smart inclusive growth”	63 905,00
“Sustainable growth: natural resources”	56 486,00
“Global Europe”	138,00
“Security and citizenship”	1 935,00
Special instruments	192,00
Administration	7 451,00

Source: the EU official website (http://ec.europa.eu/budget/figures/interactive/index_en.cfm)

The EU budget also includes expenditures on migration - 3.9 billion euros, small and medium-sized enterprises - 14.3 million euros, the program "Horizon 2020" - 184.5 million euros. According to the long-term strategy, the European Commission plans to increase the working time of employees in various EU bodies from the current 37.5 hours per week to 40 hours and increase the retirement age for them from 63 to 65 years. By 2018, the organization also intends to reduce the number of officials by 5% [14].

One should note that every year the EU budget loses hundreds of millions of euros because of various fraudulent schemes. According to OLAF data, only proven fraud in 2015 amounted to about 888.1 million euros, in 2014 - 901 million euros, in 2013 - 402.8 million euros. Budgetary expenditures present a rather significant problem. In particular, fraudulent actions related to various subsidies and business aid, are quite frequent. Based on the results of previous investigations, OLAF managed to provide financial recovery of 187.3 million euros in 2015, 206.4 million euros in 2014, 117 million euros in 2013. In 2016, OLAF investigations were mainly conducted in Romania, Bulgaria and Hungary [15].

The difference between the EU budget and the EAEU budget is that it is the main financial basis of integration activities within the European Union and an important tool for supranational regulation of the participating economies. Thus, one of specific features related to functioning of the EU financial system is that, unlike other international economic organizations, the EU has an independent budget that unites the majority of common financial investments.

Unlike the EU, the EAEU does not have such material and financial resources today. The EAEU is a young association, its goals and tasks are still not fully understood, reforms are proceeding rapidly and administrative innovations are often ahead of economic realities. According to the document "On the Draft Decision of the Supreme Eurasian Economic Council" On the Budget of the Eurasian Economic Union for 2016" published on the official website of the Eurasian Econom-

ic Commission, revenue of the EAEU in 2016 was approved in the amount of 7,734,627 thousand RUB and expenditures – in the amount of 7 734 627 thousand RUB, which is about 123 million USD. Thus, the EU annual budget in 2016 exceeds that of the EAEU by 1300 times.

Contributions were distributed as follows: Russia - 6.599 billion RUB (85%), Kazakhstan - 549.932 million RUB (7%), Belarus - 352.699 million RUB (5%), Kyrgyzstan -146.957 million RUB (2%) and Armenia - 85.854 million RUB (1%). In the Single Economic Space within the Eurasian Economic Union, the lion's share belongs only to one country - Russia. Some Russian experts, such as Sergei Glazyev, regard this situation as ineffective: "Costs allocated for functioning of the supranational body increased by 16 times within two years! And since Russia is the main donor, decisions taken by the supranational body became more expensive for us - by 25 times than before. The Eurasian integration itself slowed down. Earlier we planned that the formation of a single economic space would be completed by 2017; however, presently the terms have moved to 2024. This is our payment for the creation of an EC-style supranational body, which is controlled in Brussels." [16]

One should understand that this tremendous burden on the part of Russia at this stage still does not provide sufficient funding for the conduct of a common economic policy. In the future, with the EAEU development, contributions of Russia and other countries will have to grow along with improvement and expansion of powers and activities of the supranational body. A very substantial budget is envisaged at the final integration stage, which implies functioning of free market of goods and services.

At the moment, the entire amount of 123 million USD from the EAEU budget is spent on administration, salaries of employees, business trips, organization of conferences, seminars, round tables. Thus, the document approved the departmental budget structure of the EAEU budget for 2016, approved by the Decision of the Supreme Eurasian Economic Council No.100 dated 23 December 2014 in the amount of 27,689.34 RUB with regard to the expected consumer price growth rate of 7% (Table 3).

Table 3. Departmental expense budget structure of the Eurasian Economic Union for 2015 (thousand RUB) [17]

Items/ subitems	Item name	Amount
Total		Total
Estimated budget of the Eurasian Economic Commission		6 348 272,70
Functioning of members of the Board and departments of the Eurasian Economic Commission, including the Secretariat of the Chairman of the EEC Board and secretariats of members of the EEC Board		5 847 924,70
200	Expenses	5 728 299,70
210	Remuneration of labor and accruals for payroll payments	2 468 053,40
211	Salary	1 785 439,70
212	Other payments	269 342,10
213	Accruals for payroll payments	413 271,60
220	Payment for works, services	3 247 271,00
290	Other expenses	12 975,30
300	Non-financial assets	119 625,00
Creation, maintenance of functioning and development of the EAEU integrated information system		463 208,00
200	Expenses	463 208,00
220	Payment for works, services	463 208,00
meetings of the Supreme Eurasian Economic Council, Eurasian Intergovernmental Council and Council of the Commission		37 140,00
200	Expenses	37 140,00
290	Other expenses	37 140,00
Estimated budget of the Court of the Eurasian Economic Union		290 332,10
Functioning of judges and administration of the Court of the Eurasian Economic Union		290 332,10
200	Expenses	259 089,80
210	Remuneration of labor and accruals for payroll payments	142 798,00
211	Salary	105 112,80
212	Other payments	18 596,10
213	Accruals for payroll payments	19 089,10
220	Payment for works, services	114 592,10
290	Other expenses	1 699,70
300	Non-financial assets	31 242,30

Source: the EAEU official website (<http://www.eurasiancommission.org/>)

Budget revenues of the Union are formed through financial contributions of its member states, established by the Supreme Eurasian Economic Council (herein-

after - the Supreme Council). Budgetary expenditures of the Union are directed at financing various activities of its bodies, holding meetings of the Supreme Council, the Eurasian Intergovernmental Council and the Council of the Commission.

In general, the financial and economic component surely plays a key role in all initiatives, and it is especially clearly traced in large-scale projects, such as the EAEU. Unfortunately, tough confrontation between Russia and the West significantly undermined Eurasian integration processes. This crisis has already become a real barrier for the Eurasian integration. In the current situation, one should not just copy the EU experience in implementing supranational governance, trying to artificially adjust Eurasian integration processes to the EU development stages, which are described in various textbooks on the world economy. Economic development in the Eurasian space is unique; one should find new models of the world economy - mixed economies along with supranational bodies, when state planning is combined with market economy.

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人口生活水平发展的滞后：对收入差异的分析（以俄罗斯远东为例）
**STAGNATION IN THE DEVELOPMENT OF THE STANDARD
OF LIVING OF THE POPULATION:
AN ANALYSIS OF INCOME DIFFERENTIATION
(ON THE EXAMPLE OF THE FAR EAST OF RUSSIA)**

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文章详细介绍了远东联邦区各地区的人均收入，分析了人口收入分布，确定了与人口收入分配相关的严重问题，贫困指标和收入低于生活水平的人的比例最小。

关键词：收入，支出，生活水平，收入差异。

***Annotation.** The article details the average per capita income by regions of the Far Eastern Federal District, analyzed the distribution of income of the population, identified acute problems associated with the distribution of income of the population, poverty indicators and shares of persons with incomes below the subsistence minimum.*

***Keywords:** income, expenses, living standards, income differentiation..*

Income as a socio-economic category is the inflow of cash and tangible assets received as a result of a certain activity by a state, a legal entity or an individual [1].

Because of the diversity of areas of activity, incomes are classified according to various criteria:

- in the form of receipt (natural and monetary income);
- by sources of receipt (wages, social transfers, material assistance, income from property, income from entrepreneurial activity, borrowed income);
- by factors of production (wages, income from capital and investment resources, income from the use of land and natural resources, income from entrepreneurial activities);
- by the method of obtaining income (legitimate, having a legal form, from which taxes are paid, illegitimate, divided into incomes of criminal origin and

income from economic activities with which taxes are not paid).

Incomes are inextricably linked with the level and quality of life of the population. The quality of life of the population is understood as the degree of satisfaction of the material, spiritual and social needs of man [1].

In Russia, there are a number of socio-economic indicators used to measure the standard of living of the population. Such indicators include monetary incomes and expenditures of the population, their structure and use; real incomes of the population; indicators of differentiation of incomes of the population (distribution of the population by income level, concentration of incomes, coefficient of stratification of society - the Gini index); level of poverty; living wage.

The most common indicator of changes in the level and quality of life of the population is the dynamics of incomes and expenditures of the population, which demonstrates the ability of citizens to accumulate money [2].

According to the Federal State Statistics Service, the monetary incomes of the Russian population in 2015 amounted to 53101 billion rubles, in 2014 - 47,921 billion rubles, in 2013 - 44,650 billion rubles, in 2012 - 39904 billion rubles. Those. By 2015, the total amount of money income of the population increased by 25% compared to 2012 [4,5].

The average per capita monetary incomes in the regions of the Far Eastern Federal District for the period from 2000 to 2015 are presented in Table 1

Table 1. Average per capita monetary income by regions of the Far Eastern Federal District for the period from 2000 to 2015, in rubles.

Region	2000	2005	2010	2011	2012	2013	2014	2015
Far Eastern Federal District	2497,6	8892,1	20807	22870	25504	28929	31974	36575
including:								
The Republic of Sakha (Yakutia)	3967,7	11391,4	23088	25617	28701	31528	34205	37857
Kamchatka Krai	3452,4	10834,5	27010	28965	31764	35371	37030	39494
Primorsky Krai	1799,8	7126,8	17298	19160	21679	24343	28340	34081
Khabarovsk region	2500,4	9450,8	22479	23766	25689	29382	31703	37677
Amur region	1825,2	5874,2	14323	17790	21800	24671	26765	29704
Magadan Region	3724,5	11106,5	27801	30452	36620	42463	45846	48734
Sakhalin Oblast	2792,8	12548,0	30727	32268	32721	39971	44690	48852
Jewish Autonomous Region	1488,8	6269,5	15348	16525	18450	20417	21935	24118
Chukotka Autonomous District	4731,9	20253,1	38147	43049	48533	52695	57310	57333

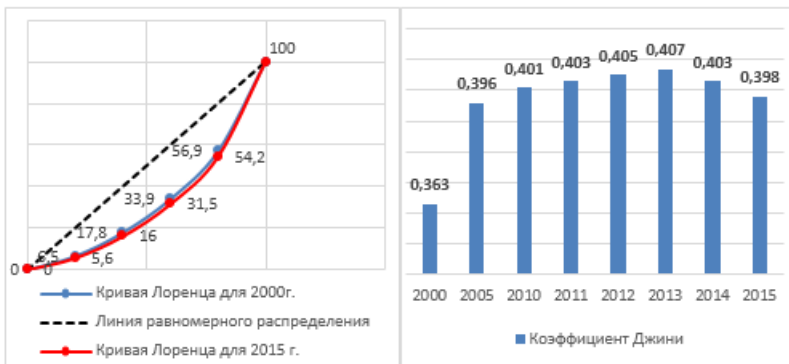
Compiled by the author using [5,6]

Analyzing the average per capita income in the Far Eastern Federal District and its regions, we can draw some conclusions. In such regions as: Magadan Region, Sakhalin Region, Kamchatka Territory, and Chukotka Autonomous

District, the level of per capita monetary incomes is the highest. For example, in the Chukotka Autonomous Okrug in 2015, the average income was 57,333 rubles, which is the highest in the Far Eastern region. For the whole analyzed period, per capita monetary incomes increased by 52,601.1 rubles, which in relative terms made up 1 111.6%. Basically, such high rates are due to the fact that the Chukotka Autonomous District is dominated by mining and gold mining. In the economies of the Kamchatka Krai, the Sakhalin and Magadan regions, the leading role is played by the fishing industry. In connection with this, the level of average per capita monetary incomes is also high. The income level in the Kamchatka Krai, in comparison with 2000, increased significantly, namely by 1,043.96%, which in absolute terms - 36,041.6 rubles. In the Sakhalin and Magadan regions, cash income increased by 1,649.21% and 1 208.47%, which in absolute terms is 46,059.2 rubles and 45,009.5 rubles, respectively.

In order to visually examine the distribution of the incomes of the population in the Far Eastern Federal District, we will construct the Lorenz Curve in dynamics for some of the regions. The Lorenz curve allows us to estimate the inequality in the distribution of incomes for 20 percent of the population, provided that the first group is the group with the lowest incomes, and the fifth group is the group with the highest incomes. The development of inequality in the distribution of income shows the dynamics of the Gini coefficient, which characterizes the distribution of the total income of the population between its individual groups. With a uniform distribution of income, the Gini coefficient tends to zero.

The Lorenz curve and the Gini coefficient for 2000 and 2015 for the Republic of Sakha (Yakutia) are shown in Figure 1.



Compiled by the author using [4, 5, 6]

Figure 1. The Lorenz curve and the Gini coefficient for 2000 and 2015 for the Republic of Sakha (Yakutia)

Based on the presented schedule (Fig. 1), it can be said that for 15 years the differentiation of the incomes of the population has been somewhat reduced. However, a large proportion of the population's income is concentrated in the fifth group, namely in the group with the highest incomes. So, in 2000 43,1% of monetary incomes were concentrated in the fifth group, in 2015 the share of incomes was 45,8%. In order to more accurately consider the inequality of the distribution of the incomes of the population, we calculate the Gini coefficients in dynamics for the entire analyzed period. This coefficient shows the inequality of the money income of the population in the form of a deviation from the actual distribution of income.

During the entire analyzed period, a significant increase in the Gini coefficient was observed. In 2000, the ratio was fixed at 0.363 points and significantly increased, as early as 2013 the coefficient was 0.407 points - the maximum value for the entire period. One of the most important factors affecting the Gini coefficient is wages, as this is one of the most important incomes for the population. After that, the coefficient began a gradual decline. Thus, it can be concluded that the inequality in income distribution in the Republic of Sakha (Yakutia) has been growing since 2000 - 2013, and is gradually decreasing. And this means that inequality in the distribution of income of the population is also decreasing.

The Lorenz curve and the Gini coefficient for 2015 for the Kamchatka Territory are shown in Figure 2.



Compiled by the author using [4,5,6]

Figure 2. The Lorenz curve and the Gini coefficient for 2015 for the Kamchatka region.

In the Kamchatka Krai, income differentiation for the period 2000 - 2015 has not changed much. The main income of the population is also concentrated in the fifth group, with the highest incomes. In more detail, considering the inequality in the distribution of income, we also calculate and graphically represent the Gini

coefficient (Fig. 6).

This coefficient in the Kamchatka Territory, also significantly increased over the period 2000 - 2012, and then began to decline gradually. This means that the income distribution becomes more even and the differentiation is reduced.

The Lorenz curve and the Gini coefficient for 2000, 2015 for the Primorsky Territory are shown in Figure 3.

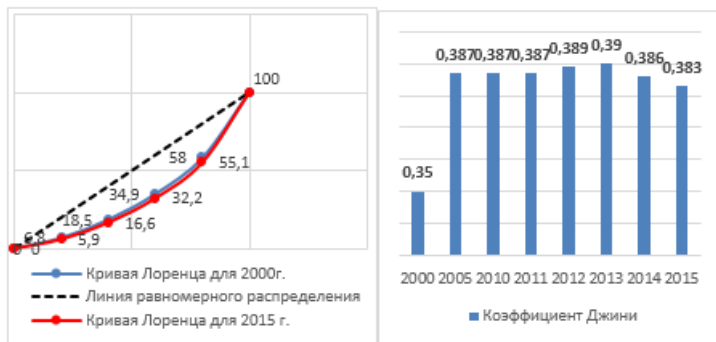


Compiled by the author using [4,5,6]

Figure 3. The Lorenz curve and the Gini coefficient for 2000, 2015 for the Primorsky Territory

Comparing the distribution of incomes in Primorsky Krai for 2000 and 2015, it can be said that the differentiation of income distribution of the population is growing (Fig. 7). Figure 7 graphically illustrates the Lorenz curve, which characterizes this phenomenon. As can be seen in the figure, the income distribution curve for the population for 2015 is more distant from the line of uniform distribution than in 2000. This means that the differentiation only increases, and does not tend to decrease. Analyzing the dynamics of the Gini coefficient (Fig. 4), we can conclude that since 2000 the indicator has grown, but since 2010 it remains practically on the same level and is changing by small jumps in growth and fall. In 2014 - 2015, the value of the indicator remained the same.

In Khabarovsk Krai, the inequality in the distribution of incomes for the entire analyzed period has practically not changed. Looking at the Lorenz curves, built in dynamics for the period from 2000 to 2015, we can say that the differentiation of costs has slightly increased. The main share of income falls on the fifth group with the highest incomes.



Compiled by the author using [4,5,6]

Figure 4. The Lorenz curve and the Gini coefficient for 2000, 2015 for the Khabarovsk region

The Gini coefficient in the Khabarovsk Territory increased significantly by 2005, compared to the base period. Since 2005, the level of the ratio has not changed, the changes were insignificant in terms of growth, the indicator reached its maximum in 2013 and amounted to 0.39 points. A further trend is observed in the direction of a gradual decline. The Gini coefficient for the Amur Region is shown in Figure 5.



Compiled by the author using [4,5,6]

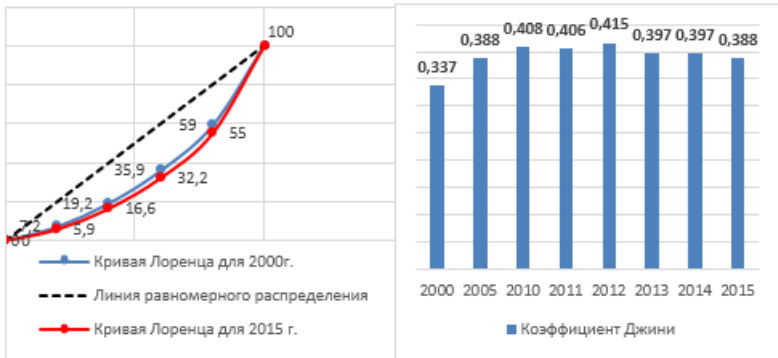
Figure 5. The Lorenz curve and the Gini coefficient for 2000, 2015 for the Amur region

Analyzing the distribution of income in the Amur Region for 2000 and 2015,

it can be said that the differentiation of the distribution of the incomes of the population has practically not changed, and only has increased slightly. As can be seen in the figure, the income distribution curve for the population for 2015 is more distant from the line of uniform distribution than in 2000. This means that the differentiation only increases, and does not tend to decrease.

Considering the dynamics of the Gini coefficient (Fig. 5), it can be concluded that since 2000 the indicator has grown in relation to 2015. However, in 2005 there was a jump in the fall of the indicator by 0.013 points. After that, there was a significant increase to the level of 0,392 points in 2014. In 2013 - 2014, the value of the indicator remained the same, and in 2015 slightly decreased.

The Lorentz curve for 2000-2015 in the Magadan Region are shown in Figure 6.



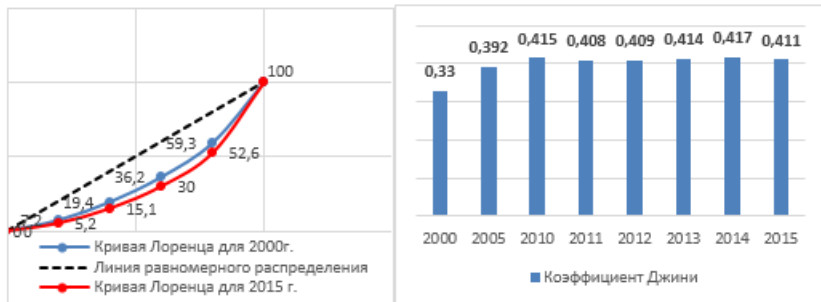
Compiled by the author using [4,5,6]

Figure 6. The Lorenz curve and the Gini coefficient for 2000, 2015 years in the Magadan region

In the Magadan Region, the inequality in the distribution of incomes for the entire analyzed period increased slightly. Looking at the Lorenz curves, built in dynamics for the period from 2000 to 2015, we can say that the differentiation of costs has slightly increased.

After a significant increase to the level of 0.415 points in 2012, the coefficient began to decrease smoothly until 2015. Since the maximum level of the Gini coefficient was fixed in 2012, the strongest inequality in income distribution was observed this year. By 2015, the differentiation slightly decreased, but remained above the 2000 level.

Comparing the distribution of income in the Sakhalin Oblast for 2000 and 2015, it can be said that the differentiation of income distribution of the population has significantly increased (Fig. 7).



Compiled by the author using [4,5,6]

Figure 7. Lorenz curve and Gini coefficient for 2000, 2015 in the Sakhalin region

As can be seen in the figure, the income distribution curve for the population for 2015 is more distant from the line of uniform distribution than in 2000. This means that the differentiation only increases, and does not tend to decrease.

Analyzing the dynamics of the Gini coefficient (Fig. 8), it can be concluded that since 2000 the indicator has grown significantly by 2010, and remains within 0.417 - 0.411 points. Sakhalin Region, the Far Eastern Federal District, where there is the greatest inequality in the distribution of income.

In the Jewish Autonomous Region, inequality in the distribution of incomes for the entire analyzed period also increased. The Lorenz curves, constructed in dynamics for the period from 2000 to 2015, show that inequality in income distribution only increases.



Compiled by the author using [4,5,6]

Figure 8. The Lorenz curve and the Gini coefficient for 2000, 2015 in the Jewish Autonomous Region

Analyzing the Gini coefficient for the entire period, it can be said that the coefficient varies abruptly, but as a whole it has grown significantly in relation to 2000.

Considering the distribution of incomes in the Chukotka Autonomous Okrug for 2000 and 2015, it can be said that the inequality in the distribution of the population's incomes has increased. (Fig. 9).



Compiled by the author using [4,5,6]

Figure 9. The Lorenz curve and the Gini coefficient for 2000, 2015 in the Chukotka Autonomous Okrug

As can be seen in the figure, the income distribution curve for the population for 2015 is more distant from the line of uniform distribution than in 2000. This means that the differentiation has slightly increased.

Analyzing the dynamics of the Gini coefficient (Fig. 20), it can be concluded that since 2000 the indicator has gradually increased to 2014, and only in 2015 slightly decreased. In the Chukotka Autonomous Okrug, as well as in the Sakhalin Oblast, there is the greatest inequality in the distribution of income to the population from 2000 to 2015, in the Far Eastern Federal District.

having carried out an analysis of the standard of living of the population in all regions of the Far Eastern Federal District, one can say that the standard of living is rising, the population is growing, per capita incomes, as well as the average monthly wage is also increasing. For more effective social and economic development of the DFO, state programs are required [3].

One of the main programs in the social and economic development of the Far East is the Federal Target Program "Social and Economic Development of the Far East and the Baikal Region for the Period until 2025". This program was approved by the Government of the Russian Federation on October 25, 2013 [7]. One of the

most important tasks of this program is two priority areas, such as economics and demography. For the further social and economic development of the Far East, state regulation seeks to further reduce the unemployment rate, as well as increase the employed population, primarily by improving working conditions and creating new jobs [7].

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论法律多元化作为宪法原则
ON LEGAL PLURALISM AS A CONSTITUTIONAL PRINCIPLE

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本文考虑了确定法律多元主义原则内容的问题。从不同的法律理解方法的角度给出了法律多元主义的可能观点。提出了法律规范中法律多元主义的最佳变体。

关键词：法律多元化，法律渊源，法律一元论，宪法

***Annotation.** The article considers the problem of determining the content of the principle of legal pluralism. Possible points of view on legal pluralism from the perspective of different approaches to understanding the law are given. The optimal variant of legal pluralism in the norms of law is suggested.*

***Keywords:** legal pluralism, the source of law, legal monism, the Constitution*

The concept of pluralism became especially popular in the domestic legal literature after the emergence of the Constitution of the Russian Federation in 1993. As is well known, the term "pluralism" is not used in the Basic Law of the Russian Federation, however, article 13 speaks of ideological and political diversity. In the comments, in the educational and scientific literature, these principles have received the name of ideological and political pluralism and have become traditional.

Under the principle of ideological pluralism, for example, "the right of an individual, social groups, political parties and public associations to freely develop theories, views, ideas on the economic, political, legal and other structure of the Russian Federation, propagate them, publicly defend their ideological positions"¹. Political pluralism is understood as a multi-party system, competition of political parties, the existence on the legal grounds of political opposition.

The freedom of conscience, freedom of religion, declared in Article 28 of the Constitution of the Russian Federation, and freedom of thought and speech in article 29 allow us to speak about the pluralism of opinions that is characteristic of a law-based state and a democratic political regime.

In the last Constitution of the USSR, 1977, freedom of speech, press, assembly,

¹ Tsechoev V.K., Shvanderova A.R. Theory of State and Law: Textbook. - Moscow: Prometej, 2017. 330 p.

etc. was also guaranteed. (art.50), the right to unite in public organizations (art.51), freedom of conscience (art.52), but these rights, unlike the current Constitution of the Russian Federation, were conditional. This is evidenced by such phrases as "in accordance with the interests of the people and in order to strengthen and develop the socialist system" (art.50), "in accordance with the purposes of communist construction" (art.51).

As we noted in other works², interest in legal pluralism is due not only to the emergence of new constitutional norms, but also to globalization, the spread of intersystem contacts and the processes of harmonization and unification of law. In such circumstances, the inevitable emergence of the problem of preserving the identity of peoples, the specifics of the development of individual countries and the reflection of this in law. We proposed to distinguish three main points of view on the notion of legal pluralism:

1. The first approach is connected with the ideas of Eurasianism, the meaning of which is to recognize and affirm that there are different civilizations and cultures, different cycles of peoples' development, cultures and civilizations, pluralism of value systems and, accordingly, philosophical, religious and legal. As a result, it can not be assumed that the legal reality is universal. In this case, legal pluralism is opposed to the idea of **legal monism, or legal monotheism**, which absolutizes the legal system of Western European civilization and offers it as a universal, universal equivalent for all other peoples³.

2. Some authors understand the concept of legal pluralism, which deny the idea of creating law exclusively by the state and recognize the existence of a multitude of competing legal orders⁴. This, first of all, is reflected in G. Gurvich's theory of social law, in the concept of A. Levi-Bruhl⁵.

3. The third approach has an anthropological and legal basis. A.I. Kovler noted that "in legal anthropology the general concept of legal pluralism as a legal situation in which the legal existence of a person is determined simultaneously by the rules of official (state) written law and the norms of the so-called traditional or customary law and other quasinormative regulators has already been established"⁶. Thus, legal pluralism is expressed in the availability of the possibility of regulating

² Adygezalova G.E. Sociology of Law: Textbook. - Krasnodar: KubSU, 2009; Problems of legal pluralism in theory and practice: monograph / ed. G.E. Adygezalova. - Krasnodar: KubSU, 2013; Adygezalova G.E. Fundamentals of legal conflictology and sociology of law. - Krasnodar: KubSU, 2017.

³ Dugin A. Legal pluralism as a Eurasian understanding of law: lecture at the Russian Academy of Civil Service on 04.03.2005. URL: <http://www.evrazia.org> dated 20.05.2007.

⁴ Antonov M.V. Sociology of Law of Georgii Davidovich Gurvich // *Pravovedenie (Jurisprudence)*. - №2. – 2003. P. 228.

⁵ Anthology of the world's legal thought. Vol. 3: Europe. America: XVII-XX centuries. / Ed. O.A. Zhidkov. - Moscow, 1999. P. 650–655.

⁶ Kovler A.I. Anthropology of law and legal pluralism (human rights and peoples' rights) // *The Deer is always right. Studies in legal anthropology* / Ed. N.I. Novikov. - Moscow, 2003. P. 24.

identical legal situations both by the norms of official law and by customary law (namely customary law, and not custom).

At present, the number of authors who use the notion of legal pluralism has increased⁷, but there is still no established definition. This concept was not included in the conceptual apparatus of neither the theory of state and law, nor branch sciences (in particular, constitutional law). The principle of legal pluralism, in our opinion, should be enshrined in the Constitution of the Russian Federation, along with ideological and political diversity, as modern states with this principle face in legal reality, and domestic jurists have been trying to reveal its content for 20 years. But at the same time, it is not necessary to express the principle normatively and establish it as a constitutional one, without having formed a definite position on the content of the notion of legal pluralism.

One can not but agree that the idea of a plurality of ideas about law is inseparably linked with legal pluralism and opposes narrow-normative legal understanding. It is possible to present various approaches to the definition of legal pluralism from a legal point of view.

First of all, it is advisable to consider the concept of legal pluralism at the level of one state, within the national legal system, and only then in relation to several states in the sphere of international law.

So, we can talk about legal pluralism, as a variety of ideas and ideas about law. This is especially true for a state in which the positivist approach to understanding the law dominated for many years. Currently, both in the scientific and in the educational literature there are various points about the law, new approaches are emerging, including an integrative approach in legal understanding that is characterized by a broad definition of law.

With this view of legal pluralism, a coincidence is found with the principle of ideological pluralism, which presupposes, among other things, the diversity of ideas about law.

One can understand by legal pluralism the recognition by the state of the diversity of sources of law (as an external form of expression of law). For example, if a state officially recognizes both a normative legal act, a normative legal agreement, and generally recognized principles and norms of international law, and a legal precedent (including judicial precedent), and legal custom, and legal doctrine, this may indicate a legal pluralism. At the same time, the state

⁷Basedov Yu. The right of open societies - private and state regulation of international relations: general course of private international law. - Moscow: NORMA, 2016. 384 p.; Kostogryzov P.I. Legal Pluralism in Bolivia: Problems and Perspectives of Community Justice // Rossijskij juridicheskiy zhurnal (The Russian Juridical Journal). - №4. - 2013. P. 122-131; Mazhorina M.V. Evolution of legal understanding and enforcement: paradigm shifts in private international law, or When will international commercial arbitration end the law? // Lex russica. - №10. - 2017. P.88-102; Vinnitsky D.V. International Tax Law: problems of theory and practice. - Moscow: Statut, 2017. 463 p.

should clearly determine the ratio of these sources and the rules for resolving legal conflicts.

In this sense, lawyers prefer to talk more about the possibility of legal regulation of the same situations in the territory of one state by various legal norms, first of all by a normative legal act or legal custom. Although it is possible to look at this from another point of view: the state applies dispositive regulation, establishing a certain legal order and allowing for other regulation at the level of the subjects of the federation, administrative-territorial units, taking into account the peculiarities of culture, local customs, traditions. Such an approach is impossible if, under legal pluralism, we understand the possibility of simultaneous regulation of a situation by a normative act and any other source of law other than a legal custom. It is due to the fact that legal regulation requires a clear definition of the ratio of legal norms to legal force, otherwise legal conflicts will be irresistible, and the implementation of the law will become chaotic. Thus, such an understanding of legal pluralism can only allow for the possibility of double legal regulation in the territory of a part of the state and in relation to a part of the population only through legal custom.

As another possible approach to understanding legal pluralism, one can call pluralism of the interpretation of norms. But there are also a lot of questions. Legal interpretation must be unique and definite, otherwise collisions are possible, and the order of their resolution must also be specific. Recognition at the state level of the diversity of interpretation of law can lead to uncertainty of the law, therefore it is possible again only in recognition of the diversity of ideas about the law, which brings us back to ideological pluralism.

In addition, there are known states in which the features of the Romano-Germanic and Anglo-American legal systems coexist. This situation can also be attributed to the expression of legal pluralism.

Summarizing, it can be argued that legal science and practice require a scientific and official recognition of the principle of legal pluralism, by analogy with ideological and political diversity. This principle should guarantee the implementation of the constitutionally enshrined rights and freedoms of man and citizen. It is most reasonable to understand, under legal pluralism, the diversity of sources of law (external forms of expression of law), each of which must take its place in the hierarchy of sources. The possibility of the same legal regulation within the framework of one state by different legal norms will result from the admitted diversity of sources of law.

This principle is especially relevant for multinational states, but, fixing it, it is necessary to clearly understand the content of this principle, so as to take into account the interests, needs of different social groups, not provoke the uncertainty of law, increase in legal conflicts, problems in the implementation of law and, as a consequence, the state of inorganic society.

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以提高俄罗斯退休年龄为例，在数字经济中转变劳动立法的社会经济可行性

**SOCIO-ECONOMIC FEASIBILITY OF TRANSFORMATION OF
LABOR LEGISLATION IN THE DIGITAL ECONOMY ON THE
EXAMPLE OF INCREASING THE RETIREMENT AGE IN RUSSIA**

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俄罗斯联邦2018年进行的养老金改革的主要社会和经济前提被认为是：人口危机，数字经济的发展，非国家养老基金的作用，联邦预算的有限资金，优惠职业类型；这证实了变化的有效性。养老金改革的主要风险是50岁以上公民就业问题。在这方面，有人建议：引入工作术语“退休前”，为50岁以上的公民创造“保障劳动力市场”，为退休人员确定最低工资标准。提供特殊的工作时间和休息时间，考虑到年龄和健康状况，介绍“劳动保障”的概念和退休前的个性化数字会计。有人提议提出一项关于就这个问题起草法案的倡议。

关键词：养老金改革，养老基金，法律，预算，数字经济，养老金领取者，缴费，员工，劳动法，员工。

Annotation. *The main social and economic preconditions of the pension reform carried out in the Russian Federation in 2018 are considered: the demographic crisis, the development of the digital economy, the role of non-state pension funds, the limited funds of the federal budget, preferential types of professions; which confirm the validity of the changes. The main risk of pension reform is the issue of employment of citizens over 50 years. In this regard, it was proposed: to introduce the working terminology "pre-retiree", to create a "guaranteed labor market" for citizens over 50 years old, to establish a minimum wage for the pre-retiree. provide for a special mode of working time and rest time, taking into account age and health status, introduce the concept of "labor guarantees" and personalized digital accounting of pre-retirees. It was proposed to come up with an initiative to draft a bill on this issue.*

Keywords: *pension reform, pension fund, law, budget, digital economy, pensioner, contributions, employee, Labor Code, employee.*

Sooner or later any working citizen thinks about the future pension. A pension is a compensation for wages that is not received due to old age, occupational

disease, disability or loss of breadwinner.

July 19, 2018 the State Duma in the first reading adopted the Draft Law on raising the retirement age. The main proposed amendment to the bill is to increase the retirement age for men and women by 5 and 8 years, respectively - that is, **from 60 to 65 for men and from 55 to 63 for women**. The transition to new values is proposed to be implemented gradually **from January 1, 2019**, increasing the age of retirement annually **for 1 year**.

The proposed parameters of the reform can be adjusted according to the statement of the President of the Russian Federation on August 29, 2018, in which Vladimir Putin proposed to soften the retirement age for women and increase the standard for them only for 5 years, i.e. up to 60, and also to provide for the easing of the age for citizens who will have to retire in the first two years of the new law (a reduction in the standard for 6 months). The relevant amendment to the bill, Vladimir Putin instructed the Government to prepare for its consideration in the second reading in the State Duma. Whether such a decision will be adopted or not, it will be known in the autumn of 2018.

There are a lot of different assessments of the ongoing pension reform. The articles of the journal "Expert", Maxim Mironov's articles, the analysis of E. Zabolotsky, the work of S.A. Vlasov are interesting.

On August 25, Vladimir Putin delivered a speech on the pension reform and spoke about its causes and prospects. Prerequisites for such a development of events, the president called various factors, including - the demographic crisis, changes in life expectancy, as well as economic reasons.

In 2018, the expenditures of the budget of the FIU will amount to 8.5 trillion rubles, including expenses covered by insurance premiums - 4.87 trillion rubles. and expenses covered by subsidies from the budget of 3.6 trillion rubles.

The main and most important reason for the deficit of the pension budget are small and low-income receipts. With a population of 146.8 million people, only 37% of the population are employed, who receive an average wage of 36,000 rubles. At a rate of 22%, one worker pays an average of 7 thousand 920 rubles to the FIU. per month. Pay contributions to the FIU 54 million people, and retirees in Russia 42 million people.

Let's designate the main socio-economic preconditions for the ongoing pension reform:

1. The demographic crisis.

Today, many older people go to retirement than come to work in the young. In 1970, about 3.7 workers per pensioner accounted for pension funds to the Pension Fund, in 2018 the ratio is 1.3 - for one pensioner, there are 1.3 employees. For balance, the ratio should be 1.8-2.0. As a result, there is a growing deficit of the Pension Fund, which has to be filled from the state budget.

2. Development of the digital economy.

The program on the creation and development of the digital economy was approved by the decree of the Government of the Russian Federation of July 28, 2017 No. 1632-r. According to the Program, the digital economy is "economic activity, the key factor in the production of which is data in digital form, which contributes to the formation of an information space, taking into account the needs of citizens and society in obtaining high-quality and reliable information, the development of the information infrastructure of the Russian Federation, the creation and application of Russian information telecommunication technologies, as well as the formation of a new technological basis for social and economic sphere "[1 s.3-4].

The development of the digital economy plays a double pension role: first, it leads to the emergence of new professions; second, they are released and replaced by the robotics profession with dangerous and harmful working conditions. In the first case, it is important that digital professions are legalized, and their owners could count on retirement in old age. It is necessary to introduce new professions, legalizing various forms of self-employment. According to the Ministry of Labor, today in our country there are approximately 12 million self-employed citizens who do not pay contributions to the pension fund. Rosstat claims that there are 25 million. This is a huge number of officially not registered working part of the population of the country that do not pay contributions to the Pension Fund.

In the second case, workers employed in hazardous and hazardous industries who have the right to early retirement are replaced by robotics, retrained and employed in other sectors. This leads to a decrease in the financial burden on the Pension Fund for the payment of early retirement pensions.

Priority direction of the implementation and development of the Program for the creation and development of the digital economy should be additions related to staffing, robot replacement, retraining and legalization of new professions and forms of self-employment.

3. The emergence of non-state pension funds.

One of the reasons for the budget deficit of the Pension Fund was the implementation of the pension reform in 2002 and the emergence of non-state pension funds. The pension of each citizen consisted of three parts - insurance, which is 14% of the deductions, the base, equal to 6%, and the funded one, which is equal to 2%. A cumulative part of their pension savings each citizen could dispose of his own will. For example, to transfer it to a non-state pension fund (NPF) that managed it, and the amount of pension increased with the profit received.

A significant part of pension accumulations of citizens has leaked to non-state pension funds. Most of these funds no longer work.

In the conditions of the Russian economy, it is necessary to develop a clear legislative framework regulating the work of private pension funds in order to protect the pension interests and material savings of citizens. Successful work of the APF

would help reduce the financial burden from the Pension Fund and multiply the welfare of the Russian pensioner.

4. Limitations of the federal budget.

According to FZ of 15.12.2001 N 167-FZ "On compulsory pension insurance in the Russian Federation" article 17. "1. The budget of the Pension Fund of the Russian Federation is formed from: insurance contributions, federal budget funds, income from the placement of ... mandatory pension insurance, ... pension savings of insured persons ..., other sources not prohibited by the legislation of the Russian Federation", we see that in the law there is no self-sustainability of the budget of the FIU, it is financed, including from the budget.

In Europe there are no deficit-free Pension Funds. At the moment in Russia, the cost of financing the FIU from the budget is not more than 7-8% of GDP. According to E.D. Zabolotsky, the maximum share of GDP for the maintenance of the state component of the PS in 2013 was typical for Greece (16.2%), the minimum for the Netherlands (6.9%) [2, p.481].

The pension fund should not pay for itself, i.e. there must remain the possibility of co-financing (transfer) from the budget. Nevertheless, it is important to understand the limitations of budgetary funds, the limit of the federal transfer to the budget of the Pension Fund.

5. Benefits.

To date, 30% of the working population of the country can qualify for an early retirement pension. This leads to a serious pension load.

Articles 30-32 of the Federal Law No. 400-FZ "On Insurance Pensions". regulates the procedure for obtaining pension security for a special category of citizens. We are talking about those employees who have reached the established age and have the statutory service record. These categories include: workers employed in hazardous and dangerous industries, professions with increased emotional and psychological stress, social categories of citizens, employees of the Far North, civil servants and law enforcement officials.

With the transition to digital technology, technical and robot substitution, infrastructure improvement, the introduction of safe techniques and technologies, a number of preferential occupations require a revision of the retirement age, possibly excluding them from the list of professions with early retirement. This would help reduce the percentage of the able-bodied population claiming an early pension and, as a consequence, the burden on the Pension Fund.

Thus, we observe a pronounced socio-economic soundness of the pension reform. There are a number of risks that will accompany the pension reform. The main, in my opinion, is the issue of employment of citizens over 50 years. In this regard, it is necessary:

1. Introduce the working terminology "pre-retiree" - an able-bodied citizen who

has reached the age of 50 years. Introduce appropriate changes to Chapters 3 and 4 of the Labor Code of the Russian Federation of December 30, 2001 No. 197-FZ (as amended on 03.08.2018).

2. Create a "guaranteed labor market" for citizens over 50 years of age. At the same time, the specificity of the market should not be to create low-paid and low-skilled jobs and professions such as a watchman, cleaner, kiosk, etc., but posts corresponding to the level of education, experience and qualifications of the pre-retiree. Introduce the relevant changes in the "Law of the Russian Federation of April 19, 1991, N 1032-1 (as amended on July 3, 2013)" On employment in the Russian Federation "

3. Set the minimum wage of the pre-retiree. Introduce appropriate changes to Chapter 21 of the Labor Code of the Russian Federation of December 30, 2001 No. 197-FZ (as amended on August 3, 2013).

4. Provide for a special regime of working time and rest time, taking into account the age and health status. Consider the possibility of establishing a reduced workweek, additional leave and days off. To make a list of works on which the employment of pre-retirees' labor is prohibited. To make appropriate changes to Part IV, section XII "Specific features of labor regulation of a particular category of workers" of the Labor Code of the Russian Federation of December 30, 2001 No. 197-FZ (as amended on 03.08.2018). Introduce the chapter "Specific features of the regulation of work of pre-retirees or workers over the age of 50 years.

5. Introduce the concept of "labor guarantees", the period during which the dismissal of the pre-retiree is prohibited. Women at the age of 55 years of age, men at the age of 60 years. To make appropriate changes to Chapter 13 of the Labor Code of the Russian Federation of December 30, 2001 N 197-FZ (as amended on 03.08.2018).

6. Introduce a personalized digital account of pre-retirees in order to track employment and exclude the possibility of unemployment. Amend the Federal Law "On Individual (Personalized) Accounting in the Mandatory Pension Insurance System" dated 01.04.1996 No. 27-FZ (last version).

This issue requires serious legislative development and revision of some existing laws and codes. Ensure the social security of citizens of pre-retirement age and will reduce the economic tension of the pension budget. I think it right to come up with an initiative to draft a bill on this issue.

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系统的方法和思维的发展

SYSTEMATIC APPROACH AND THE DEVELOPMENT OF THINKING

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作者采用系统的方法，在系统统一中考考虑思维和表征，在公共意识中表现为思维本质与世界观的相互关系。在西方哲学中占主导地位的世界观概念的二元论与思维的线性特征和认知方法的分裂性有关。辩证法，克服反对线性思维的逻辑，是向下一个层次的过渡 - 与世界系统统一概念相关的系统思考。

关键词：思想，观念，世界观，二元论，唯心主义，唯物主义，辩证法，系统统一。

***Annotation.** The author uses a systematic approach that considers thinking and representations in systemic unity, which in the public consciousness is manifested in the interrelationship between the nature of thinking and worldview. The dualism of worldview concepts dominating in Western philosophy is associated with the linear character of thinking and the fragmentarity of cognitive approaches. Dialectics, overcoming the logic of opposing linear thinking, is a transition to the next level - to systemic thinking associated with the notion of a systemic unity of the world.*

***Keywords:** thinking, ideas, worldview, dualism, idealism, materialism, dialectics, systemic unity.*

Introduction

The systemic approach is a manifestation of the systemic nature of thinking associated with the worldview view of the systemic unity of the world. The systemic approach introduces the category of systemic unity that encompasses unity not only on the basis of identity, but also on the unity of the non-identical and heterogeneous. An example of such a systemic unity is the interaction of thinking and representations as the primary structure of consciousness: thinking forms and changes ideas, but also relies on them, as on the level reached, the inverse influence of representations manifests itself in the formation of a stable design of thinking, its logic.

In the public consciousness, thinking interacts with the dominant system of representations, the most conservative part of which is the world view, is connected with the nature of thinking. Such a systematic analysis allows us to understand the mechanism of influence of the world outlook on the process of cognition. Every single act of cognition can not be correlated with the world view, but it necessarily contains thinking, the character of which is connected with it. On the other hand, thinking, developing in the process of cognition, at a certain stage makes the object of rethinking and worldview views.

Linear Thinking

In Western philosophy, at the present time, the dualistic worldview in the form of a transcendental truth (or God) over reality or spiritual and material substances or the "intelligible world" and "sensually perceived" (I. Kant) dominates, this worldview is associated with a linear character of thinking that sees only one-sided nature of the relationship, as between cause and effect or "primary," linearly and one-sidedly defining "secondary". The logic of opposition and the understanding of unity are connected with the dualism of the world view only on the basis of identity and the opposition of the non-identical, as true and false, spiritual and material substances, man and nature, the individual and society, and so on.

The dualism of the worldview directs thinking in opposite directions: either the objectivism of transcendental truth, or subjectivism with its relativism: "The world has a vanishing existence between God and existence" - K. Jaspers. [1, p.431] Such a split was naturally realized in two leading directions of Western philosophy: transcendentalism and existentialism, led to a gap between theoretical and practical thinking, to the division of philosophy itself.

However, in the philosophy of G.W.F. Hegel and Marxism manifested a change in the nature of thinking associated with dialectics, which makes it possible to comprehend in the unity of the opposite. G.W.F. Hegel convincingly showed that opposites "mediate" each other while in inextricable relationship, these are only "one-sided definitions", held by the linear character of thinking in their "isolation": "But in fact, one-sided is not something unshakable and existing for oneself, but is contained as a whole as withdrawn." [2, p.139]

But in idealism and materialism, dialectics is used fragmentarily. An analysis of the structure of the ideological conceptions of idealism and materialism sufficiently clearly shows that idealism and materialism unite substances in opposite hierarchies: the spirit over nature or matter over consciousness, not dialectically, but in accordance with the linear character of thinking, as a linear and one-sided definition of "primary" secondary". Forming worldviews in the form of two opposite hierarchies of the same elements, idealism and materialism naturally become interdependent, but also dialectically interdependent opposites, the same as the concepts of consciousness and matter, spiritual and material

substances. Idealism and materialism combine the use of dialectics with the linear-hierarchical character of thinking with its logic of opposition and cause-and-effect relationships, however, dialectics brings thinking to a new level that allows us to comprehend the dialectical relationship of consciousness and matter, idealism and materialism. The changing nature of thinking begins to enter into a contradiction with worldview concepts and their dualism.

Idealism, bringing unity into the realm of the "absolute spirit" (G.W.F Hegel), preserved a dualistically torn out structure of the world view, in which the transcendental truth stands above reality, and therefore it did not come into direct contradiction with the dualistic worldview that preceded it. But the dialectics of G.W.F. Hegel was rejected by Western philosophy, despite the fact that no one has ever refuted G.W.F. Hegel. This rejection of dialectics is not rationally justified, this choice is irrational and made only for ideological reasons. The American philosopher R. Rorty writes: "This attempt to distance oneself from time and change, to forget Hegel and to join Kant, is now widespread in the English-speaking philosophical community." [3, p.24]

The manifestation of the inability of linear thinking to comprehend in a unity dialectically interconnected, mutually defined concepts and phenomena is the idea of demarcation - attempts undertaken by Western philosophy throughout the 20th century to distinguish knowledge from ignorance, rational from irrational, science from culture, objective from subjective, which quite naturally failed success. V.I. Moiseyev, after reviewing the development of the philosophy of science, writes that the main problem "is a gradual crisis of the idea of demarcation and an almost complete loss of understanding of the specificity of scientific knowledge." [4, p.214]

The manifestation of the linear nature of thinking associated with a dualistic world view is the fragmentariness of approaches to the comprehension of reality, the contradictory nature of the process of cognition, the isolation of theoretical thinking from reality, the fragmentation of the sciences, the data of which are not reducible to a picture of the world that is adequate to reality.

The rejection of Western philosophy from dialectics, dictated by the desire to "distance oneself from time and change," is tantamount to abandoning the development of thinking. Western philosophy, relying on the Kantian tradition, which is considered not subject to revision, has created obstacles for its own development, remaining at the level of dualistic in its nature linear thinking. Systemic unity of thinking and ideas is manifested in Western philosophy in accordance with the inadequacy of the dualism of the world outlook and the fragmentarity of the cognitive approaches of linear thinking.

Transition to systemic thinking

Materialism is more monistic, objective truth (Marxism-Leninism) loses

transcendental character and is as close to reality as a guide to its transformation. Greater unity of the hierarchy of the objective over the subjective strengthens their interaction, directs thinking toward the cognition of material reality, stimulates its activity and development. Widely used dialectics became the basis for the development of systematic research and the formation of a systematic approach, as manifestations of the growing systemic thinking that in the 1980s in Russian society began to manifest itself in the rejection of antagonism and negation of the opposite, in the ability to combine what was previously thought antagonistically incompatible. Antagonism and denial are connected with the dogmatic attitude to the worldview as an absolute truth, the rejection of antagonism and denial is associated with a change in attitude towards a worldview that becomes more critical and creative. The crisis of materialistic ideology is not the result of a defeat in the "cold war", but a manifestation of the development of the thinking of Russian society.

The restructuring of the political regime is connected with the transitional state of the social consciousness of Russian society. The systemic nature of thinking does not yet have support in the system worldview, the ideas of idealism and materialism and the linear character of thinking associated with them dominate. Systematic thinking is manifested in the fact that the representations of idealism and materialism are no longer perceived as absolute truth and are peacefully combined, and the linear nature of thinking has shaped the notion of the historical defeat of materialism and the need to follow the opposite, the example of Western society. In about 20 years our society has passed the path that the Western society took 200-300 years, in the 90s we plunged into the period of "wild capitalism", and then we built a social state with a market economy. Thanks to the systemic character of thinking, we have an opportunity to comprehend in unity not only idealism and materialism, as dialectical opposites, but also the experience of Western society and our socialist past, taking all the best. But the systemic nature of thinking can become dominant only when relying on a systemic worldview.

The regularity of this direction of development is confirmed by considering thinking, as an active element of human consciousness, relative to the real person surrounding the person. The scientific picture of the world, described using a systemic approach, includes the alternation in nature of two types of systems:

- systems of objects of one kind, for example, types of matter, plant species, animal populations, are discrete systems with a free nature of interrelations, united by a common attitude to the environment, this unity on the basis of identity,
- single integral systems of elements of diverse quality, the unity of which leads to the emergence of a new level of quality, this unity is not the same and heterogeneous.

Analysis of the development of thinking about the systemic organization of

nature allows us to identify the pattern of growth of its systemic nature, on the other hand, shows the incompleteness of this process. Unity on the basis of identity is understood by linear thinking in the process of the formation of increasingly abstract concepts and categories, as thought systems based on the common and identical. This process naturally leads to attempts to justify the unity of the world on the basis of identity, relying on the concept of the god of Christian monism or the category of being. The comprehension at the initial stage of precisely this kind of systems is also quite understandable, since it is revealed by simple observation and contemplation of nature.

But linear thinking with its logic of opposition and one-sidedness of cause-effect relationships can not comprehend the unity of the non-identical and heterogeneous in single integral systems, for example, the complementarity of heterogeneous atoms that form a new substance (H₂O) or the interdependence of dissimilar elements in a living organism. For such a reflection, a new level of the quality of thinking is required, the transition to which is dialectics. Inability to comprehend the unity of the non-identical and heterogeneous is shown inadequacy of the linear nature of reality thinking: "We are accustomed to think in terms of linear causality, but now we need new" means of thinking "- I.Prigozhin and I.Stengers. [5, p.266] Dialectics is a transition to systemic thinking, emphasizing the contradictions generated by linear thinking, it does not cover the forms of systemic unity observed in nature: complementarity and interdependence. Dialectics allows us to overcome the opposition of opposites, the systematic approach allows us to comprehend their systemic unity, overcoming the logic of opposition and the contradictions of linear thinking.

The systemic approach forms a picture of the unity of the world, the most important element of which is the systemic unity of man and nature. With the advent of reason, man did not come out of nature, he went beyond the local system of biogeocenosis and, settling around the planet, entered into interaction with the nature of the planet as a whole, starting the formation of a new natural system "man and nature." The formation of this system occurs cyclically, like all natural processes, in four stages: from the unity of primitive man and nature, through two stages of contradictions: dependence and domination, to the stage of dialectical, conscious unity to which we are now passing. Cyclic formation of the system is a systemic regularity due to the systemic unity of the two elements, one of which is active and developing, and the second more conservative, listed stages are all possible options for their interaction. [5] The system character of thinking is overcome by the opposition of man and nature: man is also a part of nature, and an autonomous element of interaction with it. Given that the interaction of man and nature is mediated by the system of "public consciousness and public practice," each new level of interaction between man and nature is associated with the

process of cognition. The stages of the contradictions between man and nature are connected with the inadequacy of the worldview concepts and the related nature of thinking, and the onset of the stage of unity is associated with the formation and dissemination of an adequate reality of the worldview, based on the idea of the systemic unity of the world with which the social practice of the dialectical unity of man and nature is connected.

In this most general picture of the process of historical development, the driving force is not the "self-unfolding of the idea" (idealism) or the objective course of history in the form of a change in socio-economic formations (Marxism), but the interaction of the person with the surrounding reality, the level of which is associated with the development of consciousness, as a system of interaction of thinking and thinking.

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地方高校农业工程专业能力的形成
**FORMATION OF PROFESSIONAL COMPETENCES OF
AGRICULTURAL ENGINEERS OF REGIONAL UNIVERSITIES**

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工程思想使用计算机建模成功开发，形成了设计对象的图形 - 动态功能 - 结构图像，为实现预期提供了稳定的激励。

关键词：计算机建模；功能结构图动力学图像；土豆收割机迷你收割机

Annotation. *Engineering thought successfully develops using computer modeling, forming a graph-dynamic functional-structural image of the design object, which gives a steady incentive to achieve the intended.*

Keywords: *computer modeling; functional-structural graphodynamic image; potato harvester mini-harvester*

In modern conditions, the distinctive specificity of the successful agroengineer's activity is the ability to compose **a holistic view of a functioning technical system**, combine scientific and artistic styles of thinking to make non-standard creative decisions in conditions of uncertainty, randomness of the influence of natural, human and other factors. Of particular importance are the rationalization and design capabilities, technical and technological competencies necessary for the implementation of their own ideas, involving in the creative and creative process of other professionals and workers [1-3]. But, as the results of our and other [4] studies show, in the majority of students it is difficult to form logically structured images of thoughts due to the lack of developed spatial imagination, the ability to solve problems in space.

The purpose of this work is to present the results of the introduction into practice of pedagogical technology developed at the Yakut State Agricultural Academy on the basis of the activity approach, which combines the substantive and procedural aspects of the educational curriculum that promote self-organization and the development of students' creativity.

When setting up this experimental work in 2011 to unite the contents of the educational process in a single whole, the following provisions were adopted. First of all, the elements and sections of the educational process should be aimed at

updating the former unconscious experience of students. Proceeding from the fact that the content of education is nothing more than an organic system in which the acquisition of new knowledge is based on cumulative experience, enhanced emotional-sensory attitude to reality (In the works of V.S. Lednev, I.Ya. Lerner, P. F. Kubrushko and others). *The second provision:* the implementation of the experimental educational process **should be carried out in an environment as close as possible to the real production.** Such a requirement is justified by the fact that the knowledge, skills, and competences acquired in the study of the subjects of the curriculum are only tools whose expediency is revealed in the course of studying and developing the functional and operational properties of completed creative products. *The next position* is to achieve high motivation for students to study the disciplines of the curriculum by ensuring **the fullest visibility and effectiveness of the creative process** [5].

The implementation of the experimental educational process was carried out by including computer simulation methods in the disciplines of compulsory and variational parts of the curriculum for the preparation of bachelors in specialty 110800 "Agroengineering", as well as in the subject of optional and independent studies of students. The primary inclusion of methods of computer modeling was dictated by the need to ensure the development of students in visual-figurative thinking, to ensure the organic connection of the calculated, graphic, tabular, symbolic, descriptive and empirically established sections of thematically united work. In the application of methods of computer modeling students develop the verbal-logical, visual-effective and other types of thinking that ensure the integrity of the development of trainees by implementing the "microtechnology of perception", processing and applying new knowledge [5].

The original intent of the target installation, which is aimed at achieving significant creative, physical and other efforts of students during a long educational process, belongs to the field of professional responsibility of the graduating department. Therefore, after careful analysis and discussion, it was decided as the target setting that satisfies the principles of introducing the activity approach, which actualizes and concentrates the students' creative efforts, to adopt a new, original, special machine for harvesting potatoes grown in small areas.

According to the concept of M.S. Ivanov, the potato harvesting machine should be designed for operation on potato fields of up to 3 hectares. The machine should perform the following functions: to dig up potatoes, separate the potato tubers from the tops and serve the potato tubers in the receiving boxes. Distinctive features of the machine should be: small size, low damage to potato tubers and other technical characteristics that are allocated by students, together with teachers, in the development of the technical design for the design of the machine.

High activity of students is observed in the generation of ideas based on the

principle of machine operation, the design of individual units and assemblies, the basic arrangement and layout of the machine, its appearance during the annual "brainstorming". Students of the 2nd and senior courses are divided into teams. The generation of ideas is fixed by functional-structural graphic images of the machine, its separate units, units on paper and electronic media. An open discussion of new and previously proposed solutions to the actual (from the former "unconscious" experience) machine greatly enhances the motivation of students of various courses to study the disciplines of the curriculum. This is confirmed by the content of speeches and judgments of students in a brainstorming session, in which justification or critical conclusions are made with the use of new knowledge and competencies acquired during the school year in accordance with the main plan and a special structural and technological module.

In the course of this experiment, the importance of new computer technologies in enhancing the creative initiative of students, enhancing the formation of competencies in the field of future professional activity was revealed. Studying the working processes of potato harvesting by machine methods by the students, the direct discussion of new variants of working principles and designs of the mini potato harvesting machine, put forward at annual brainstorming sessions, provided the transition from mental images to real objects.

Practically, by the beginning of the second academic year of the experimental educational process, a group of students produced the details, nodes, mechanisms and frame of the first experimental potato harvesting machine. Tests of the performance of individual units of the first experimental machine revealed significant errors and shortcomings of the adopted design solutions. The subsequent analysis of the software developed by means of computer programs AutodeskStudio 3D Max 9.0v. and SolidWorks of the functional-structural virtual image of a mini potato harvesting machine, ensured the establishment of optimal designs of the main aggregates: a bar stock, a drum-screw separator with small-diameter spiral rods that simultaneously perform the functions of a screw and sieve (Fig. 1).

A more detailed analysis of the existing principles of separation of tubers from earthen lumps, problems of heap separation by existing drum separators, led to a transition from a mental image to a real study of the operating model of the drum separator in co-creation mode with the teacher. It was carried out on the principle of subject-manipulative design, and was calculated on the ease of imagining the functional and structural relationships of the parts of the projected machine, and as a result of increasing the motivation of the activity from its effectiveness.

In the process of practical implementation of the current model, there were ideas of separation and removal of the tops (from the root) with the help of two rotating pneumatic wheels located above the share, and the technological nature of the helical arrangement of the wires forming the reticulated wall of the reel.

But the work stopped after the creation of the reel and the frame of the future machine. This was due to a lack of initiative on the part of students.

In our opinion, the weak technological readiness (ie lack of skills in working with metals) of students and the low level of development of spatial imagination led to a "dead end" of the "logical way of thinking". Here the reason for the "failure" can still be that we have missed the stages of bearing and schematization of the technical idea, before proceeding to the subject-manipulative construction.

These two ideas (the removal of the tops and the screw-like net of the reel), which appeared as a result of practical design, require bearing, the mental composition of images from real design elements, with the fitting and development of the missing functional detail in the projected node, and their embodiment in the graphodynamic functional-structural image cars.

Bearing an idea is important, because increases motivation and encourages the emergence of a clear image of the design object, where fantasies and intuitions are not excluded.

Therefore, as expected only after a while, a graphic sketch appeared, embodying all conceived ideas of the functional-structural image of the general view of the unit and its kinematic scheme for driving the elements of the structure. At this stage of the design, the gear ratios of the drives have been calculated and the operating principle of the botulist has been developed. This image became the basis for creating a mini-combine virtual image mini-combine.

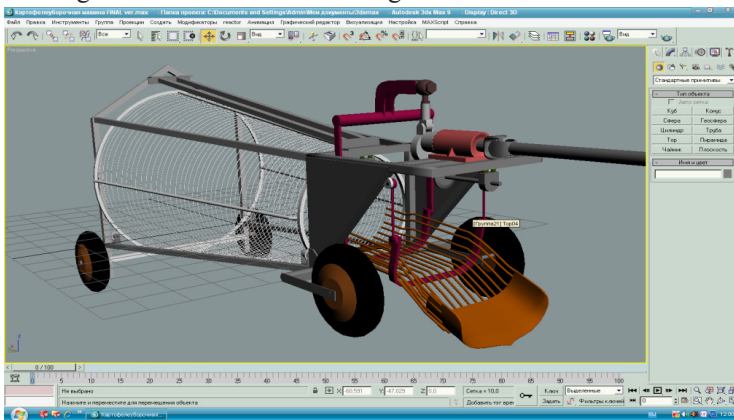


Figure 1. Graphical 3D model of the projected machine

We found that computer modeling contributes more to the fact that the project becomes clear for discussion and adoption of a collective decision. In the creative process, motivation is maintained due to the promptness of the emergence and implementation of various ideas into the main idea of the project. Thus, the thinking process becomes purposeful and technological, i.e. managed in terms of achieving

the goal [6].

At this stage, the necessity and, even, the need for the subsequent materialization of the design object is realized. At the stage of construction, i.e. at the transition from the mental image of the object to its practical creation, there are makings of initiative self-organization and creativity of students, as well as activity in the collective description of the design and operation principle of the created machine from its virtual image.

Thus, engineering thinking develops successfully and is motivated by computer modeling, forming a graphodynamic functional-structural image of the projected machine, which gives a steady stimulus for the realization of the conceived.

During the work on the potato harvesting combine, the students of the experimental group collected enough materials for the preparation of final qualifying and competitive research projects:

1. Reel separator of a potato harvesting mini-combine.
2. Forklift-rotary bogtrainer of a potato harvesting mini-combine.
3. Active share of potato harvesters.
4. Calculation of the working parameters of the drum separator of the potato harvesting mini-combine.
5. Rotational and finger working tool of the potato digger.
6. Drum potato mini combine.
7. Rotary-finger V-belt small-sized machine for cleaning potatoes.

Thus, the conducted experiment showed:

1. Formation of professional competence among students is possible with a step-by-step solution of the technical problem (activation of creative thinking, constructing a graphodynamic image of the design object, building a 3D model, and creating a prototype).
2. Students with a practical type of thinking are able to master the practical skills of creating prototypes.
3. The requirements of the thesis require theoretical development of the project, and hence the construction of a 3D model.
4. Using this form of work (from the stage of brainstorming to constructing a graphodynamic image of the design object, building a 3D model) develops visual-figurative and verbal-logical thinking of students, raises the motivation, efficiency of the activity and its effectiveness.

In modern agricultural production, the share of elementary physical labor of a person is significantly reduced. The productive labor of people living in rural areas becomes mechanized, electrified, automated. Therefore, the main task of training qualified bachelors - engineers and other specialists for the agricultural sector of the economy in higher educational institutions is the filling of educational programs and educational process with new methods aimed at increasing the intel-

lectual and creative abilities of students. The development and implementation of new educational programs undoubtedly contributes to the efforts of the teaching and teaching community in the acquisition of necessary professional competencies by students in their chosen areas of future production activities.

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“隐藏的教育”背后隐藏着什么
WHAT IS HIDDEN BEHIND THE "HIDDEN EDUCATION"

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本文侧重于“隐藏课程”的定义。作者试图为俄罗斯教学实践和理论界定其新颖性。隐藏课程的本质被视为学生参与文化和其他活动，这些活动与课程，课程和教育过程没有直接关系。他们定义了能够形成个人行为的文化环境，并为他/她的自我实现和自我认同提供了条件。

关键词：专业教育，教育因素，课外活动，隐性课程，专业文化。

Annotation. *The article focuses on the definition of “hidden curriculum”. The authors make an attempt to define its novelty for the Russian pedagogical practice and theory. The essence of hidden curriculum is viewed as students’ partaking in cultural and other activities which are not directly related to the curriculum, programmes and the educational process in general. They define the cultural environment which is able to form the experience of an individual’s behavior and to provide conditions for his/ her self-realization and self-identification.*

Keywords: *professional education, factors of education, extra-curriculum activities, hidden curriculum, professional culture.*

Development of integration processes, increased research in the sphere of comparative pedagogical science, search for ways to improve education and upbringing of an individual make it necessary to introduce new concepts in the scientific terminology – both newly developed and borrowed from foreign research works.

The concept of “hidden education” came to the Russian pedagogical science from abroad through partial transformation of the notion “hidden curriculum”. This term is getting more and more used in the national sociological and psychological-

pedagogical literature (N. Borytko, A. Kirillova, D. Levites, A. Tubel'sky, I. Frumin, V. Chernik and others.)

As we have found out, the concept “hidden education” was first used by the American educational sociologist Ph. Jackson [16] to draw attention to the fact that school does not only communicate knowledge as is often considered to be its main function. All social realia, in which school, teachers and pupils work should be considered in its activities.

This idea was further developed by other researchers. J. Henry, analyzing a lesson, wrote that its “participants do not learn the study material only, but also the “noises” which cannot be controlled by the influence of authority. At the same time teachers do not care that the “noises” are actively perceived and, naturally, “secretly” assimilated by their pupils” [15, p. 36].

R. Meighan [17] indicated that the hidden curriculum as compared to the formal curriculum does not teach through school and teacher (Italicized by us. - Authors). The things a pupil learns may be never said at the lesson or mentioned in the classroom. These things are learnt through life organization and partaking in it. This idea is further developed by M. Haralambos and M. Holborn who specified that the hidden curriculum (hidden education) consists of what pupils learn through experience rather than within the subjects they study.

However, looking back at the history of the Russian pedagogical science we consider that the idea and the essence of the hidden education are not new.

The founder of the pedagogical science in Russia K. Ushinskij primarily stated that the specially organized “school upbringing does not make the whole education”. Real school is made up of various factors constituting historical life of a nation (religion, nature, family, traditions, laws, industry, literature, etc.) Life around will always contribute its beliefs to the development of both - teachers and pupils, it will add a special colour to teachers' lectures and will influence susceptibility of pupils [8].

In the article “On the use of pedagogical literature”, one of his early works related to upbringing, K. Ushinskij wrote, “The atmosphere of the institution is of great importance, but this atmosphere does not live within its walls or on paper. It is part of most educators' character and is passed onto the educated” [9].

We can also read some speculations on the school atmosphere in the works of L. Tolstoj: “School has something indefinite, something that cannot be controlled by a teacher, something that is absolutely unknown to the pedagogical science and at the same time contributing to the essence and success of education – this is the school atmosphere ... This school atmosphere is something that is quickly passed from one pupil to another or even to a teacher, it is something that can be revealed in the sound of the voice, in the eyes, in the movements, in the tension of the competition, - something quite tangible, necessary and absolutely precious...”

[5, p. 173].

So, K. Ushinskij and L. Tolstoj identified the idea of hidden education with the spirit of the educational institution. P. Lesgaft and A. Makarenko associated hidden education with the notion of the mode and style of school life and its activities, explicit and implicit rules of an organization. V. Sukhomlinskij defined it as a context.

In modern research works the term “hidden education” is used quite widely, however, it is still not well-established. Thus, I. Frumin analyzes the institutional context of teaching and learning and mentions the existence of a certain school second reality, which he describes as “hidden reality”. Under hidden reality he understands a number of various factors of school life which make both direct and indirect educational influence, being a condition for one or another way of development of the learning process and explicit processes of organizing teachers and schoolchildren in the school [10, p. 10].

According to A. Tubel'skij, speaking about the hidden content of education, it is necessary to consider the mode of school life [6]. It is the mode of school life, its style which will make it possible, on the one hand, to find ways to solve the problem of the content of education, and, on the other, to create conditions that reveal an individual's potential as successfully as the content of the school lessons.

To define a group of hidden factors, A. Ostapenko introduces the concept of “subtext of the pedagogical system”. According to the author, this subtext consists of the subject-spatial school environment, the local subculture of relations within school (mode of life) and the sign-symbolic reality of the school, built on the principles of temple and conciliarity [3, p. 25].

Analysis of modern research works revealed that the idea of hidden education is being actively developed within the context of gender approach. In particular, Ye. Yarskaya-Smirnova defines the “hidden curriculum”, first, as organization of the institution itself, including gender relations at work, gender stratification of the teaching profession; second, as the content of the subjects taught; third, as the style of teaching. According to the author, these three dimensions of the hidden curriculum do not only reflect gender stereotypes, but also support gender inequality [13].

E. Ruzankina understands under the “hidden programme” the special structure and style of instruction, the content of an academic subject, the selection of tasks and examples that have an imperceptible effect on the pupil and make him/ her accept the role that is imposed by society [4]. This influence of the hidden education can be seen, for example, in school textbooks. The drawings, that show activities of family members, depict the mother in the kitchen, the father - watching TV, the grandmother - knitting socks, and the grandfather - reading a newspaper. These drawings implicitly form life scenarios and schoolchildren's behavior patterns, by

and large - imposing certain stereotypes.

It should be noted that the process and the result of the hidden education are basically formed by psychological theories, for example, the Theory of Attitude and Set of D. Uznadze. The author experimentally proved that as a result of preliminary experiments (in our case - creation of special conditions in the educational organization), a subject forms a certain internal state, called a set. This set is a real, quite effective factor that gives a certain direction to the subject's activity when conditions that correspond to the activation conditions of this set develop. This gives dominant importance to preliminary expositions [7].

Different researchers refer various aspects to such "preliminary expositions", or structural components of hidden education: differentiation of schoolchildren according to their abilities; hierarchy of real power within school; language of the class; mode of school life; traditions; symbols; facial expressions and gestures of a teacher; possibility of feedback and joint activities of teachers and children, etc. In fact, these conditions form an environment that is not formally established and is often not noticed and understood by the majority of the participants of the educational process. This environment helps form the experience of the learners' behavior, assists their socialization, self-realization and self-identification.

Here comes an example of how future music teachers can be introduced to their professional culture. The experience gained by many students while preparing opera performances of both Russian and foreign classics cannot be overestimated: "Iolanta", "Eugene Onegin" by P. Tchaikovsky; "La Traviata", "The Masquerade Ball" by J. Verdi; "Tosca", "Bohemia" by D. Puccini and others. Many students played just secondary roles in these performances and still acquired really valuable for them experience.

The very staging of these performances became possible due to the creation of the Murmansk Philharmonic Orchestra. Most of the orchestra musicians themselves are former students and nowadays teachers. Today's students have an opportunity to get their professional training and orchestral upbringing in this orchestra.

Moreover, the students got real-life experience of participating in the dialogue of various cultures: the above-mentioned and other opera performances were staged in collaboration with representatives of various performing schools and traditions (Mariinskij Opera and Ballet Theater, Royal Norwegian Opera, etc.).

It is difficult to overestimate the influence of a well-established professional on a young person who is just beginning to learn the basics of the profession. Master classes that are held in Murmansk during the festival "Musical Offering to the City" are really valuable in this connection. For example, the high morals of the musician, his outlook, erudition, well-developed taste, speech, his ability to "present" himself and other qualities were revealed to future teachers and performers

at the master classes held by the People's Artist of Russia A. Skavronsky. He was a representative of the old Russian pianistic school, a bearer of the best traditions, learnt by him from the great teacher and musician A. Goldenweiser. Being the founder of such form of communication with the audience as "conversations at the piano", A. Skavronsky possessed creative anxiety, desire to do good, involvement in the most important phenomena of art and life. Students admired his ability to clearly, non-standardly express his beliefs, views on this or that musical phenomenon.

Concerts, master classes, informal meetings with V. Tropp, N. Luganskij, D. Matsuev and other performers left an indelible impression on the students. The influence of such personalities is difficult to overestimate. By their activities and professional obsession they instill interest in studying and loving music, develop taste, generally, make an impact on the attitude towards the profession and a person's realization in it.

Students' leisure associations have a considerable potential, for example, the student theater "TAFFL" (Theater Association of the Faculty of Foreign Languages) which was created in the now distant 1995 with our participation. The members of the association did not only organize events at their university (initiations to students, students' skits, faculty humorous and family parties, etc.), but also initiated and became participants in many interesting events, competitions and festivals.

It is no coincidence that the model of the educational work, initially tested and approved at the Faculty of Foreign Languages, and then on the university-wide scale, laid the model for the youth policy in the whole area - in the Murmansk region.

Thus, the analysis of psychological-pedagogical and sociological literature, as well as various educational practices showed that the idea of "hidden education" is not new for the Russian pedagogical science.

The essence of hidden education lies in the implicit way of introducing learners to culture through various activities that are not provided by existing curricula and programmes and are not directly related to the educational process. Sometimes these types of activities go far beyond the institutional framework. However, all their content, the nature of the organization and the relationships established between learners, learners and teachers and other participants of the process, determine the cultural environment, in which a person's behavioral experience, his/ her self-realization and self-identification are implemented.

Finally, we consider that in the context of modernization of education, special attention should be paid to hidden education. Effective activities of an educational organization are determined not only by its educational programmes, textbooks, material-and-technical provisions, but also by implicit, hidden factors

that alongside with the formalized educational process form the unity, integrity of the environment that contributes to the development of a personality. At the same time, the problem of hidden education should be considered not only on the stage of school education, which is the subject of most research works, but on all stages of education.

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为社会和职业适应目的而制定具有健康限制的年轻人教育活动的组织模式

**THE DEVELOPMENT OF ORGANIZATIONAL MODEL FOR
EDUCATIONAL ACTIVITY OF YOUNG PEOPLE WITH HEALTH
LIMITATIONS FOR THE PURPOSE OF THEIR SOCIAL AND
VOCATIONAL ADAPTATION**

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本文认为，对健康有限的年轻人的社会和职业适应是一种相互适应学生和教育组织变化条件的过程；本文提供了一个模式，在面向社会和职业适应的包容性中等职业教育的背景下，为有健康限制的年轻人组织教育活动。

关键词：包容性，发展，模式，中等职业教育，社会和职业适应。

Annotation. *The article considers social and vocational adaptation of young people with health limitations as a process of mutual adaptation to changed conditions, both for students and educational organization; the article provides a model of organizing educational activity for young people with health limitations within the context of inclusive secondary vocational education, aimed at social and vocational adaptation.*

Keywords: *inclusion, development, model, secondary vocational education, social and vocational adaptation.*

Rapid development of national economy, increasing competition in the labor market and the introduction of new educational standards constantly toughen the requirements to professional qualification of future specialists. People with health limitations and disabilities find it most difficult to comply with the requirements to professional qualification.

In accordance with the concept of long-term social and economic development of the Russian Federation for the period of up to 2020, a required condition for

the development of innovative economy is the upgrade of educational system as a basis for dynamic economic growth and social development of society, as well as the factor of public well-being and national security [4].

The strategic objective of national educational policy is to expand access to high-quality education, which complies with the requirements of economy's innovative development and contemporary needs of society and every person [5].

Therefore, the competitive ability of national economy significantly depends on the quality of labor force, its professional competence, socialization and cooperation. In this context an important condition is the development of activities to ensure the availability of high-quality education and successful socialization of young people in course of their professional occupation. Thereby special focus is on vocational training and socialization of young people with disabilities and other persons with health limitations of working age, who represent a vulnerable group.

According to the information of Federal State Statistics Service, there are 12314 thousand disabled persons in the Russian Federation, including 628 thousand disabled children. However, the employment level within this group of persons in the working age is 11.9%, the level of unemployment is 19.0% [7].

Dissertational researches of S.V. Laktionova (2008), I.N. Zaitseva (2011), O.B. Gudozhnikov (2016) are dedicated to the issues of social and vocational adaptation of students with health limitations and disabilities to vocational education. Inclusive education in general is considered in the works of T.G. Zubareva (2009), N.P. Artyushenko (2010), Yu.V. Shumilovskaya (2011), including the systems of secondary vocational education by N.I. Morozova (2007), I.G. Rossikhina (2010), A.A. Lebedev (2010), T.I. Dubrova (2012).

The analysis of available scientific researches in this field makes it possible to emphasize that pedagogical theory and practice have not sufficiently studied the organization of educational activity for people with health limitations and disabilities within vocational educational institutions, as well as the capabilities of their social and vocational adaptation and support in accordance with the requirements of present-day innovative development and in the context of FSES (Federal State Education Standard) implementation.

More than 15 thousand children with health limitations reside in Stavropol region, among them more than 10 thousands are children with disabilities. Obviously, the number of children with health limitations and disabilities tends to increase. This trend sets an important objective for the educational system and the society in general – to create adequate educational conditions for every child - regardless of his/her health status - as one of the steps on his/her way to independent and productive life in present-day society [7].

Children with health limitations and disabilities, who have graduated from educational institutions (179 people with health limitations and disabilities graduat-

ed from educational institutions in Stavropol region in 2016/2017) are potential applicants to the institutions of vocational education. Consequently, they represent a significant part of labor force that should be employed not only for humanity reasons, but also from the viewpoint of rational economics [5].

It is the system of vocational education that is capable to become the starting point for persons with health limitations and disabilities on their way to vocational socialization in the present-day society. Thus, the organization of vocational training and employment for people with health limitations and disabilities is one of the topical issues of the contemporary Russian educational system.

Although the number of students with health limitations and disabilities increases, many of potential applicants face difficulties with their vocational self-identification by the selection of their profession. These difficulties may arise due to the following reasons: specific aspects of individual deviations, intensity of deviations, inadequacy in disability awareness and their influence on the selection of profession.

According to the data of comprehensive observation over people's living conditions, 83.8% of disabled persons aged 15 and older, which are employed in economics, have a diploma-certified profession (vocation), whereas 16.2% do not have a diploma certification.

Profession and performed work match for only 35.1% of those surveyed. 15.6% of disabled persons perform work, which is similar to their profession and 49.3% do a job, which does not conform to their vocation [7]. In this context it is important to ensure proper organization of vocational guidance, vocational counselling and profession selection.

Below listed are typical difficulties, which educational institutions face in course of their vocational guidance activities with young people with health limitations within the system of secondary vocational education: the absence of system for vocational guidance of young people with health limitations and disabilities to guide them to the selection of profession within the scope of secondary vocational education; the absence or insufficiency of special conditions, required to perform vocational guidance and teaching of young people with health limitations and disabilities; stereotypeness in profession selection by young people with health limitations and disabilities, insufficient cooperation with local employers and social organizations on the issues of profession selection within the scope of secondary vocational education; insufficient professional competence of the teaching staff in terms of vocational guidance of young people with health limitations and disabilities [1-3].

The acquisition of vocational education is one of the most important life values of the people, which contributes to their vocational socialization and equal participation in economic and political life of the country.

It is the vocational education that is capable to create conditions for professional formation, development and self-fulfillment of individuals, as well as to enhance the achievement of key development objectives of the country and society. However, social and vocational adaptation is the process that does not end with the acquisition of vocational education. It is only the starting point. Definitely, educational level and quality provide possibilities for further professional promotion, but they are not the only factor of professional development. This specifically refers to young people with health limitations and disabilities, whose employment and professional independence present a serious problem in market economy conditions. With the availability of excessive labor power with no health problems it is more profitable for the employer to hire such workers than to create special conditions for persons with limitations.

We have developed and partially implemented a model of organizing educational activity for the young people with health limitations, aimed at their social and vocational adaptation within the scope of secondary vocational education (Fig. 1).

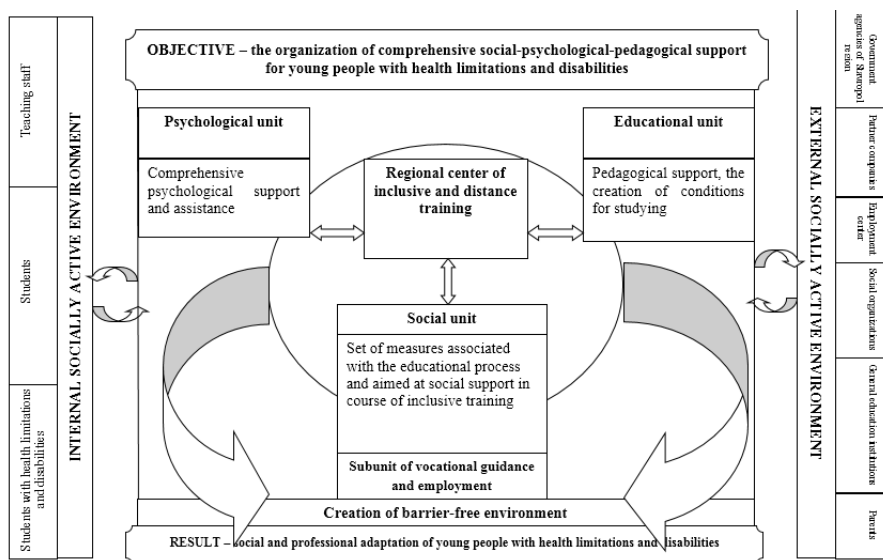


Fig.1 Model of organizing educational activity for the young people with disabilities

Comprehensive social-psychological-pedagogical support does not only comprise a number of different corrective, preventive, protective, legal, rehabilitational and health-improving methods, but means comprehensive activity of the specialists, aimed at correction, development, teaching, educating and so-

cializing of young people with health limitations and disabilities.

In order to organize comprehensive social-psychological-pedagogical support for young people with health limitations and disabilities it is necessary to involve all specialists and teaching staff of the institution of secondary vocational education.

The elements of comprehensive support system are: organizational and pedagogical support (organizational unit); psychological and pedagogical support (psychological unit); social support (social unit).

Psychological support (psychological unit) of young people with health limitations and disabilities is a comprehensive technique of psychological support and counselling for students with health limitations and disabilities, their parents (legal representatives) and teachers, who educate these students.

The tasks of psychological support are: timely diagnostics and psychological support for young people with health limitations and disabilities in course of their development, education and socialization; efficient use of psychological diagnostics data and monitoring researches data for adequate forecasting, creation of individual educational routes for students and improvement of education quality; supporting young people with health limitations and disabilities in accessing senior courses of psychological knowledge and skills, which are needed to acquire profession, develop career and achieve success in life (preparation for employment).; organization of preventive work, aimed at timely prevention of potential psychological problems in course of studying for the young people with health limitations and disabilities; organization of psychological education for all participants of the educational process: improving psychological competence of the teaching staff on the issues, related to teaching, development and education of young people with health limitations and disabilities; providing psychological support for the parents (legal representatives) of young people with health limitations and disabilities in order to improve their psychological and pedagogical competence in the field of children-and-parents relationship, solving the issues and tasks of their children development and strengthening cooperation with parents (legal representatives); developing inclusive culture of the participants of educational process within the institution of secondary vocational education.

The initial stage of education includes individual and group consultations with the parents of new-comers with health limitations and disabilities, where information on these students is collected (aspects of their deviations, individual peculiarities, the need to create special conditions for the period of studies, etc.).

At the same time observation over young people with health limitations and disabilities is carried out during lessons, breaks and other events. It allows to find out the way young people with health limitations and disabilities form their relationship with others: their reason to enter into relationship, the way of expressing

sympathy, attentiveness and joy, the way of rendering or non-rendering assistance to others, the way of accepting assistance, the way of developing relationship with opponents after the quarrel, etc.

The principal emphasis of work is on performing preventive activities. Activities with episodes of training are developed and carried out in association with educational psychologist of the institution of secondary vocational education and involve both first-year students and young people with health limitations and disabilities. These activities are primarily aimed at maladaptation prevention and enable smooth inclusion of these students into their peers' company.

Training activities with the use of rehabilitation techniques and individual consultations are carried out for students with health deviations; these activities are also aimed at maladaptation prevention.

Pedagogical diagnostics is arranged and performed for students with health limitations and disabilities as a part of cooperation with head teachers, who perform this diagnostics.

The results of conducted diagnostic studies serve as a basis for compiling social-psychological-pedagogical characteristics for students with health limitations and disabilities and developing recommendations for teachers on modes and methods of work with these students. This work is performed in collaboration with head teachers.

Pedagogical support (educational unit) of young people with health limitations and disabilities is carried out based on the results of psychological-pedagogical diagnostics and involves teachers' activities, aimed at the selection of optimal educational strategy, the creation of individual development programs for students and the determination of individual educational paths.

The tasks of pedagogical support are: providing timely assistance for young people with health limitations and disabilities in their development and studies within the educational system of the institution; the analysis of monitoring researches for efficient forecasting and development of individual educational routes for young people with health limitations and disabilities, as well as the improvement of education quality; supporting young people with health limitations and disabilities in obtaining knowledge and skills, needed to acquire profession, develop career and achieve success in life (preparation for employment); supporting teaching staff of the institution of secondary vocational education in their work with young people with health limitations and disabilities, as well as the adjustment of educational space for these students; organizing activities, aimed at preventing potential problems in course of adaptation and studies of young people with health limitations and disabilities; organization of psychological education for all participants of the educational process: improving psychological competence of the teaching staff on the issues, related to teaching, development and education of young people with

health limitations and disabilities; providing psychological support for the parents (legal representatives) of young people with health limitations and disabilities in order to improve their psychological and pedagogical competence in the field of children-and-parents relationship, solving the issues and tasks of their children development and strengthening cooperation with parents (legal representatives); providing young people with health limitations and disabilities with printed and electronic educational resources, adjusted to meet their health limitations; selection and development of learning materials, taking into account students' personal characteristics and health status; developing inclusive culture of the participants of educational process within the institution of secondary vocational education.

Social support (social unit) of young people with health limitations and disabilities implies the creation of favorable conditions for the development of personality for these students, as well as providing students with comprehensive support in self-development and self-fulfillment in course of their adaptation to the institution of secondary vocational education and professional training, acquiring social competences and establishing partnership relationship between the family and the institution.

The tasks of pedagogical support are: vocational guidance for the graduates of the institution of secondary vocational education with health limitations and disabilities; social and cultural rehabilitation of young people with health limitations and disabilities; social support of inclusive education for young people with health limitations and disabilities, their parents (legal representatives) and teachers, who work with these students; developing social and cultural environment of the institution of secondary vocational education to ensure successful adaptation, socialization and integration of young people with health limitations and disabilities within the institution; professional activities, aimed at maintaining social well-being of young people with health limitations and disabilities in course of their education; organizing volunteer movement to provide adequate assistance and support for young people with health limitations and disabilities in terms of inclusive education.

At the initial stage social certificates for students with health limitations and disabilities and their families are compiled based on the results of questionnaire survey.

At the same time observation over young people with health limitations and disabilities is carried out during lessons, breaks and other events. It allows to find out the way young people with health limitations and disabilities form their relationship with others: their reason to enter into relationship, the way of expressing sympathy, attentiveness and joy, the way of rendering or non-rendering assistance to others, the way of accepting assistance, the way of developing relationship with opponents after the quarrel, etc. Keeping in mind the fundamental idea of

inclusive education and in order to ensure the most efficient integration of these students into institution society, the major role is assigned to social and cultural rehabilitation of young people with health limitations and disabilities, their participation in different events. This enhances their creative potential, supports the development of communication skills, gaining experience in social interaction, acquiring new skills and expanding their social circle.

Young people with health limitations and disabilities receive assistance in solving personal, professional and other questions over the entire period of education.

Counselling for young people with health limitations and disabilities is provided as a part of supporting activity within the inclusive educational process; it is intended to provide assistance in overcoming difficulties, related to professional training and interpersonal communication. Additionally, parents (legal representatives) and teachers are consulted on the issues of social and legal assistance.

As mentioned above, the process of social support for young people with health limitations and disabilities includes the organization of vocational guidance, which begins prior to their admission to the institute of secondary vocational education and includes the preparation of graduate students for further professional activity in competitive environment on labor market and for the use of acquired competences in their work activities. Therefore it is reasonable to separate a subunit of vocational guidance and employment within the scope of social unit.

Vocational guidance should be performed in two ways: pre-professional training and vocational guidance for graduate students.

The main aspects of vocational guidance are: professional informing – informing different social groups about current types of manufacture, the situation in labor market, the content and development prospects of profession market, etc.; professional counselling – providing assistance in professional self-identification; professional selection – determining professional suitability for a specific vocation; professional, productional and social adaptation – a scope of measures to encourage professional formation; cooperation and establishment of contractual relationship with local employers.

Social support for young people with health limitations and disabilities within the scope of vocational guidance should take into account functional and organizational model of vocational guidance.

The organizational structure of vocational guidance is based upon the resources of professional educational institution and comprises the following components: facilities and resources, educational materials and human resources.

The functional structure of this model includes: information support and vocational guidance support. Vocational guidance for persons with health limitations and disabilities within vocational educational institutions should facilitate their conscious and adequate professional self-identification.

3. Comprehensive (social-psychological-pedagogical) support implies psychological and pedagogical training of teaching staff to use information technologies in their work with students with health limitations and disabilities.

The development and implementation of a monitoring program over barrier-free environment within the institution of secondary vocational education enables to carry out the efficiency analysis of social and vocational adaptation model for young people with health limitations in the context of inclusive secondary vocational education.

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培养成人在补充教育系统中跳舞，以满足创造性自我实现的需要

**TRAINING ADULTS DANCING IN THE SYSTEM OF
SUPPLEMENTARY EDUCATION AS A MEANS OF SATISFYING THE
NEED FOR CREATIVE SELF-REALIZATION**

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本文探讨了在补充教育体系中培养成人跳舞的方法，以此来满足创造性自我实现的需要。调查显示，对于男性和女性来说，他们在舞蹈课上获得的情感和沟通非常重要。分析表明，由于在小组中跳舞，学生们几乎完全满足了他们对创造性自我实现的需求。研究结果使得有可能对教学活动进行调整，考虑到学生的兴趣，评估他们对教育过程的满意度并对其进行定性改进。

关键词：舞蹈，创造性自我实现，动机，补充教育

Annotation. *This article explores training adults dancing in the system of supplementary education as a means of satisfying the need for creative self-realization. The survey showed that for men and women, the emotions and communication that they receive in dance lessons are very important. The analysis showed that as a result of dancing in a group, the students managed to almost completely satisfy their need for creative self-realization. Result of research makes it possible to make adjustments in pedagogical activity, take into consideration the interests of students, assess the degree of their satisfaction with the educational process and improve it qualitatively.*

Keywords: *Dancing, creative self-realization, motivation, supplementary education*

In the hierarchy of needs, the need for self-realization is the highest. In the satisfaction of it the person finds the place in this world. The peculiarity of this need is that a person cannot fully satisfy it in a single act. Only satisfying the need for self-realization in various types of activities, the person finds its place in the system of the social relations and relationships.

Speaking about a comprehensive and harmoniously developed personality, it is

necessary to emphasize not only the richness and comprehensiveness of its abilities, but also the needs, in the satisfaction of which the person's self-realization is carried out in all aspects. Creativity is the derivative of an individual's realization of unique skills in a certain field. Therefore, there is a direct connection between the process of creativity and the realization of a person's abilities in socially significant activity, which acquires the character of self-realization [1].

Everyone has a need to realize their creative potential. This opportunity gives supplementary education. The importance of creative potential realization of children and adults is hard to overestimate. Adaptation to art gives a push to the development of the culture of society as a whole and of each individual person. In the system of supplementary education, there are various activities that can meet the needs for creative self-realization of the individual [2]. Dancing is especially popular. Dancing in groups promotes the formation of values: perseverance, the will to win, the desire for self-improvement, respect, trust and team spirit. The development of these values among students promotes the formation of the basic culture of the individual as a combination of moral, physical and aesthetic culture. Moral culture is instilled through education of humaneness, conscious discipline and culture of behavior. A unique combination of art and physical activity forms a physical and aesthetic culture.

For children of preschool age, school and college students there are many sports classes, activities and creative associations. Adults immerse in the routine of everyday worries once completing an education and getting a job. Many of them feel a craving for creativity, a need to "switch" to another type of activity, but in Stavropol city there is not many offers for this category of people.

The aim of the study is to improve the quality of learning process in the framework of supplementary education. It is important that the classes are built in such a way that its mastering is possible for everyone, taking into account the physical, psychophysical capabilities and meets modern demands of society. The project of the dance studio for adults is designed to attract the interest of an almost unreachable category of people of the age of 30 and up years old to art, to organize a site on the basis of the Stavropol City House of Culture for practice dancing and socializing [3].

There was a survey conducted among the students of the dance studio to identify the main aspects of dance education that motivate adult to engage in activities. All the results obtained are summarized and classified into four groups: 1) combating complexes (phobia of the stage, self-doubt, etc.); 2) physical activity and posture; 3) emotions and communication; 4) aesthetics and beauty.

There were interviewed 56 people (30 men and 26 women) from 35 to 65 years old, the duration of dancing was from 1 to 3 years. They needed to name one or several positive effects from the dance classes. The poll result is shown in Figure 1.

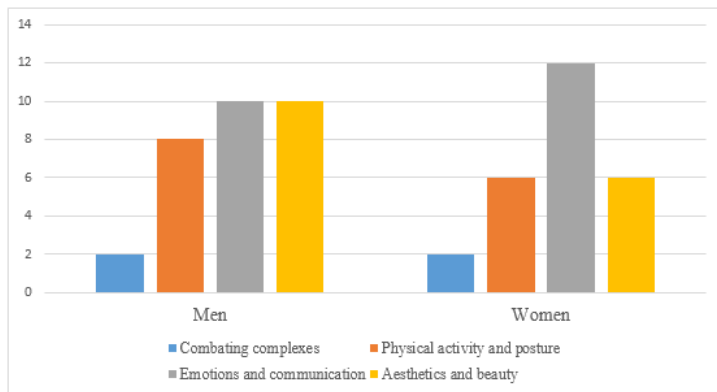


Figure 1. Motivation of adults involved in dancing.

An analysis of the results showed that for men and women, the emotions and communication that they receive in dance lessons are very important.

Also, a survey was conducted to determine the level of creative self-realization and the degree of satisfaction as a result of dance classes. On a scale from 1 to 10 (where 1 is unsatisfactory and 10 is excellent) the survey group had to assess the level of the need for creative self-actualization in general, and the level of satisfaction of this need at times "before" and "after" as people began to dance. The results of the survey are shown in Figure 2.

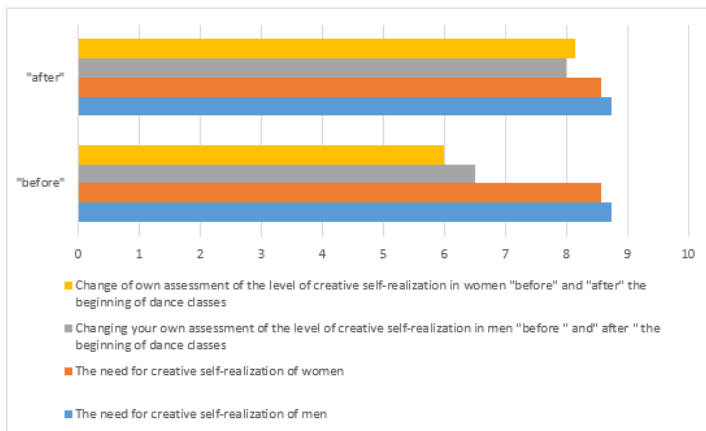


Figure 2. The need for creative self-realization of the dance studio participants for adults.

The analysis showed that as a result of dancing in a group, the students managed to almost completely satisfy their need for creative self-realization.

In order to maintain the interest among the students to the dance classes in the studio, different master classes, with invited teachers from the south of Russia, Moscow and Argentina, are held. Also, there are dance parties, where the participants can check their dancing skills, spend an evening in a festive atmosphere, dance and socializing, take place every month.

An increased interest in the project indicates its relevance. In September 2015, at the moment when the studio was founded, only 6 to 8 people were attending the classes. Now, about 35 to 40 people are actively engaged in and attending events, and about 100 people overall have completed the training. The main results of the successful implementation of the project are numerous positive feedback from the participants, gratitude, publications in the media, and social networks.

As a result of the study, it was possible to identify the main motivating factors that affecting the degree of satisfaction of a need for creative self-realization. Analysis of these factors makes it possible to make adjustments in pedagogical activity, take into consideration the interests of students, assess the degree of their satisfaction with the educational process and improve it qualitatively.

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播客技术是在外语课程中发展教育认知能力的一种手段
**PODCASTS TECHNOLOGIES AS A MEANS FOR DEVELOPMENT
OF EDUCATIONAL-COGNITIVE COMPETENCE IN FOREIGN
LANGUAGE LESSONS**

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本文探讨了使用外语播客扩大学生兴趣范围和提高外国语言感知能力的可行性。

关键词：外国交际能力，教育和认知能力，播客技术和播客。

Annotation. *The article examines the advisability of using podcasts in a foreign language to expand the sphere of interests of students and improve the ability to perceive foreign speech.*

Keywords: *foreign communicative competence, educational and cognitive competence, podcast technology and podcasting.*

In today's post-industrial society, we observe the trend of globalization and the ubiquitous informatization of countries, peoples and each individual in particular. The most important commodity in a postindustrial society is information and a variety of services that people provide each other to achieve their goals. Together with the transition to a new stage of social development, the society also needs modernization of teaching foreign languages. Taking into account the need for education, a new goal was set for teaching foreign languages - the formation of a communicative competence that is foreign in language, which in turn consists of elements that form this competence: speech, language, sociocultural, compensatory and educational and cognitive competence [3].

Competence (from Latin *competentia*) is knowledge in action, the ability of a person to use in practice the knowledge and skills acquired, to make decisions in conditions of uncertainty and to realize them [1, p.19].

The term "communicative competence" is introduced by D. Hymes. Communicative competence D. Hymes defines, as an internal knowledge of the situational appropriateness of the language; as the ability to be a participant in speech activity. D. Hymes was one of the first to demonstrate that the mastery of the language involves knowledge of not only grammar and vocabulary, but also the social conditions for their use [2, p. 180].

The foreign communicative competence, according to domestic researchers (I.L. Bim, V.V. Safonova, E.N. Solovova, etc.) represents the ability and readiness for foreign language communication with native speakers, the perception and understanding of partners, the adequate and timely expression of their intellectual intentions.

Having considered the concepts of foreign communicative competence, it is worth paying attention to educational and cognitive competence, since it is this competence that emphasizes the sphere of students' interests, their inner desire to broaden their horizons and satisfy cognitive needs, and a foreign language will serve as an ideal tool for achieving the set goals.

The presence of a communicative competence in another language means the ability of students to engage in educational and cognitive activities, and by it we mean the self-directed activity of the student in solving personally identifiable and socially relevant real cognitive problems, accompanied by the mastery of the knowledge and skills necessary for their resolution in extracting, processing and applying information [5].

Educational and cognitive competence will allow students to develop their general and special educational skills independently, to obtain information of interest to them, to conduct independent search and analysis of various sources in a foreign language, thereby expanding the universality of his cognitive abilities. Thus, students will own ways and methods of independent study of languages and cultures. Taking into account modern information technologies, it should be noted that the formation of educational and cognitive competence is possible only with the use of modern Internet technologies, in particular technology such as podcasting.

Podcasting is the creation and distribution of podcasts (audio or video programs) on the Internet, in mp3 format. The product of podcasting is a podcast - it's a separate sound file, as well as a constantly updated series of Internet resources that can have a certain subject, go out periodically or arbitrarily [4]. To listen to these records are programs and sites such as iTunes, Google Podcasts, Stocksbox, DoublePod Podcasts, SoundCloud and others. They monitor the automatic download of updates to podcast channels.

At the moment, podcast technology is one of the most popular means of studying foreign languages abroad, but in our country this technology has not been paid attention. The popularity of podcasts is dictated by their thematic diversity and the ability to listen to podcasts at any time, combining in parallel with other activities. It is also worth mentioning the authenticity of the language audio material and the ability to choose not only the topics of language learning, but any other that will match your interests, thereby speeding up the learning and perception of foreign speech. It is the freedom of choice that allows podcasts to become an effective way

of developing educational and cognitive competence. In general educational institutions, many students have a low level of motivation to learn foreign languages, but when they realize the possibility of obtaining relevant and interesting information in a foreign language, in areas that interest them (for example, technology, sports, cars, politics, fashion, podcasts with loved ones actors and musicians) can significantly increase the level of motivation of students to learn a foreign language, based on their personal hobbies and the range of information consumed in their native language.

At the moment, there is a large number of sites, Internet sites, applications on the computer and smartphone, which allow you to subscribe and get new editions of podcasts on selected topics with the ability to download to your device. At the moment, a lot of actors, musicians and famous personalities take part in podcasts as guests, and some celebrities have themselves opened their podcast channels and invite other people there for a friendly conversation in a relaxed atmosphere.

In the field of foreign languages, there are also a huge number of different podcast channels, for clarity, we will give some podcasts for studying German:

To learn German:

1) All podcasts of the **Deutsche Welle** resource (Includes many headings: DW Top-Thema, DW Langsam Gesprochene Nachrichten, Alltagsdeutsch and many others)

2) **Slow German**, an interesting channel with a variety of linguistic content and the availability of a text version of the releases.

3) **Pukka German**, the channel is focused on modern spoken German, which is a big plus.

4) **Learn German for Free**, an excellent channel for beginners, a large number of issues on household topics in different places.

5) **German Pod 101**, podcasts with interesting and exciting titles on various topics, there is a very convenient grouping by language levels.

6) **My Daily Phrase** German, a gradual and unhurried study of all the foundations of the German language.

7) **Coffee Break** German, the issues are a recording of the lessons of the teacher and student, there are a lot of interesting questions and answers to various topics.

On the example of this collection, we see only a small part of the interesting and informative channels created for the study of the German language. The number of channels on this subject is full of variety, but even if students do not want to choose this topic, they can always choose the topic of podcast channels related to their sphere of interest.

Conclusion.

The podcast technology is an excellent means of developing educational and

cognitive competence, as they allow not only to learn a foreign language from authentic sources, but also to receive foreign information that will satisfy the interests of the students. Students will be able to find language material that is really interesting to them and will cause positive emotions when it is learned. Thus, this will increase the level of motivation for learning and the standard lessons of a foreign language, will expand the cognitive abilities of students and show a direct correlation between the need to learn foreign languages and the personal information needs of students.

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Zhusupbek文学作品研究

THE RESEARCH OF ZHUSUPBEK'S LITERARY WORKS

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本文论述了Zh的文学作品的研究和科学方法。Aimauytov。它描述了那段时期的社会和政治情况，也提供了有关Zh. Aimauytov的生平和文学作品的信息。

关键词：小说，作者，文学，手稿，现实主义，科学家，研究。

Annotation. *The article deals with the research and a scientific approach to the literary works of Zh. Aimauytov. It describes social and political situation of that period of time, also gives the information about life and literary works of Zh. Aimauytov.*

Keywords: *novel, author, literature, manuscript, realism, scientist, research.*

There exists a large number of research papers on the outstanding person, who takes a special place in the history of Kazakh literature of the twentieth century, Zh. Aimauytov. After his being justified, the researchers argued quite much about his life, public activities and literary works as well as the writer's heritage. At that time, it was forbidden to tell the truth about Aymauytov. The social situation, the life of the writer, the complexity of time (era) and contradictions led to the fact that the writer's works had been remained unknown for many years.

It is known that the social and political works of Zh. Aimauytov served as the basis for several research works. Previously, the views on his literary works had been expressed by S. Saduakasuly, M. Auezov, G. Togzhanuly, S. Mukanov, later he had been mentioned by S. Kirabayev, Sh. Eleukenov, B. Maytanov, R. Turyzbekov, D. Doszhanov, R. Nurgali, S. Muratbekov, A. Sataev, B. Tazhibayev, B. Kenzhebeyev.

In reference to the writer's great heritage, K. Mukhamedkhanov once said: "Zhusupbek's literary heritage had not been explored in a proper way, moreover,

since the 1920s Aimauytov had been unfairly accused, slander and lies pursued him up to the death. This is the problem that should be considered separately. The reason for this was that the evaluation of his work, judgments written at that time were one-sided, according to the method of vulgar socialism". [1, 391 c]

In the article published by the encyclopedia "Adebiet" ("Literature") in the 1930s, it was noted that Aimauytov determined his position in literature by presenting a petty bourgeois ideology. His distinguishing feature in comparison with other writers is that the realistic authenticity of the life of Kazakhs is portrayed very well in his works. His favourite characters are the poor people, workers, peasants and intellectuals from the petty bourgeois society. In his works, the writer reveals the ideals of precisely this segment of the population.

The working peasant's destiny is pointed out in his many works, the "truth" of national chauvinism is represented as pessimism. Such works as the novel "Kartkozha", the stories "Kyzyl bicke", "Eles", "Kunikeydin jazigi", the play "Sherniyaz", the short novel "Nomad Kozhebai", etc. were written according to that theme. [2, 19-20 c]

Aimauytov had been engaged in criticism up to 1925. A well-known scientist Rymgali Nurgali analyzed the literary and aesthetic features of the novel "Akbilek" in his collection "A hundred novels of the Kazakh people" and said: "There are few characters and actions in the novel, the principles of drama are taken into account and the novel itself is brief and short. The author made memorable even those characters which took part in only one scene. Imagery, words, actions - all these are aesthetic constituent forms, characterization is a literary way that Zh. Aimauytov uses frequently.

The novel consists of four parts, three of them are skillfully joined together, there are no interrupted or unfinished situations, in general the psychological state is realistic, energetic and confident, the fourth part takes a different turn which is more publicistic. The secrets between Akbilek and Camila, the periods in school, the history of aristocrats and the relationship between Baltas and Akbilek are shown in general terms.

The novel "Kartkozha" is focused on the content of the aesthetic and literary genre, the life of Kartkozha begins with a description of his childhood. Having read a novel about the life of one person, you can call it a story.

Zhusupbek named his work "Angime (the third part)" when he first published it. Although the difficult, uneasy fate of the character is described from the social point of view of the writer, it portrays the life of the village in the revolutionary period, the reality of the life of that time proves that this is undoubtedly a novel. [3, 450 c]

The professor D. Iskakov said: "The novel is aimed at showing the life of one person. There is a feeling that it's a memoir autobiography. The novel is described

on behalf of the author, that makes it different from his other works."

The professor T. Kakishev emphasizes the method of realism and literary traditions when talking about the novels and dramaturgy of Zh. Aimaulytov.

The writer K. Kereikulov speaks about the heroism of the writer, the main points of the novel and an inner monologue that expresses character's state of mind very well. Zh. Aymaulytov has his own stylistic difference.

"Akbilek" is a novel, which describes the fate of a young girl Akbilek and the lives of inhabitants who live around Altay mountains. The life of the girl is difficult as she was profaned by the cruelty of the guardsmen, but the life of the people at that time was described accurately.

Zh. Aimaulytov had other names, for example: "Yermagambet", "Kyp-Kyzyl", "Shogaraki" - these three famous pseudonyms were pointed by the famous scientist T. Kozhakeev.

The candidate of Philology N. Kuantaiuly investigating the writer's literary works proved that those were indeed his names investigating the writer's literary works, in 1927 Zh. Aimaulytov admitted that the name "Tanashbai" was both his pseudonym and the name of his grandfather.

The researches about Aymaulytov were banned in the encyclopedia "Adebi-et" in the 1930 s. A series of sequential complex researches came out in 1989. Zh. Aimaulytov is a poet, writer, journalist, dramatist, translator and psychologist. Many people were interested in exploring the life and the works of the writer.

Zh. Aimaulytov and his works were evaluated by the socialistic views, as a result he was called a "nazi", "bourgeois", "enemy of the people", he had been called to a criminal prosecution and shot afterwards.

Rakimjan Turysbek in the research on the life and literary works of Zh. Aimaulytov wrote about the fate and natural talent of dramatist Zh. Aimaulyuly who is an outstanding Kazakh writer, poet, translator, as well as revealing his secretive thoughts and reasonings of his children and people following him."

Nowadays, the knowledge of the personality is a formed sphere in the Kazakh literature, therefore the name of Zh. Aymaulytov, his literary activity turns into an object of research and it is being re-evaluated from the modern point of view.

Thanks to the research of such scientists and writers as the K. Mukhamedkhanov, Sh. Satbayeva, S. Kirabaev, B. Kundakbayev, R. Sagymbekuly, R. Turysbekov, B. Baigaliev, D. Doszhanov, D. Kamzabekuly, A. Tasymbekov, N. Kuantayuly, G. Karipzhanov, A. Miraliyev, G. Piraliev, L. Mekeebaev, R. Doszhanov, the information about Zh. Aimaulytov became more accessible.

Zh. Aimaulytov was born on November 30, 1889 in the province of Semey, in Pavlodar region, in the village of Kyzyltau. There is information that Zh. Aimaulytov was born in the Pavlodar region of Bayanaul district, in the town of Kara Adyr, which is located in the foothills of Kyzyltau. In January 1928, S. Saduakasov, the

Commissioner of Public Education of the Kazakh SSR handed the questionnaires to the Kazakhs in order to gather information about the life and literary activity of authors. He wrote a biographical manuscript entitled "Whole hearted information". D. Alikhankyzy (the wife of S. Saduakasov) presented it to M. Auezov. This manuscript is kept in the archives of M. Auezov. On December 23, 1988, the scientist T. Akimov published this manuscript in the newspaper "Kazakh literature". In this document, Zh. Aimaulytov wrote: "I was born in 1889, in the village of Dandebay, which is located in the area of Karan Adiry in the foothills of Kyzyltau.

It is confirmed by the scientist K. Mukhamedkhanov, however S. Mukanov pointed out that Zh. Aimaulytov was born in 1893, an outstanding scholar and writer S. Kirabayev delivered the information that Zh. Aimaulytov was born in 1889. If one adheres to the information in one of the archival documents in 1926, before taking up employment in the pedagogical school in Shymkent city, Zh. Aimaulytov indicated 1889 as the year of his birth. The scientist T. Kabyshev in his article "When Zhusupbek was born" which was published in the newspaper "Semey tany" (Semey News) on November 10, 2000. proved that Zh. Aimaulytov was born in 1892, basing on the facts from Semey center of the documents.

In 1914, on January 3 it was indicated that he was 22 in the certificate of the teachers' seminary. In the certificate No. 11 given by the medical center on May 1, in 1914, it was written that Zh. Aimaulytov was born in 1892. Religion – Magomed. He had graduated with the excellent marks.

After Zh. Aimaulytov graduated from a two-year Russian-Kazakh school in Pavlodar, he had been given a certificate with the number 146 that said: "Zh. Aimaulytov was born on November 30, 1892". The same information was written in a document from the teachers' seminary on June 5, 1919.

Let's pay attention to the fragment from an autobiography written by Zh. Aimaulytov about his upbringing and the village where the writer grew up: "First of all, we had been continuously studying with mullah, secondly, we had been taught a needlework and sent to shoemakers and flutists by our father. Thanks to that, Akhmet and I became trained mullahs, shoemakers, flutists, dombra players and singers. Father and the elder sister Kadikesh could write, read and play the dombra. Kadikesh could write a poetry as well. Our mother Batima composed songs and taught women from the village. The eldest Ospan's son Kagazbay was kind to me. He taught me how to write and read in Russian".

From 5 to 15, Zhusupbek studied with Zhunis kozha, Shaimardan kozha, Kozhahmet mullah, Kapar kozha, Muhamedjan mullah in the village school that was opened by his brother Ospan. After graduating from this school at the age of 15, he became a mullah and taught children. Zhusupbek once said: "In Kartkozhe, the mullah who teaches is me. And Kartkozha's parents are my parents".

In 1907, a regional school was opened in Bayanaul, near Karaadyr, Zhusupbek

stopped working as Mulla and began teaching at school voluntarily. At this time, his brother Ospan lived and studied with Serebryannikovs, who worked as interpreters at the regional department. There he graduated from two schools in one winter, in 1908 he enrolled the agricultural technical school in Kerek. After two months of a school year, Kazakh children were expelled from the technical schools because of the uprising against the imperial government.

Until summer Zh. Aimauytov lived with the shoemaker Irgebai, he sewed boots, earned money, spent the summer at home, entered his school in the autumn and graduated. After graduation, he taught children in the village of Karazhas. In 1911, he entered a two-year Russian-Kazakh school with Suleimen's son Najiken and Sultan Anapievich, they studied at the expense of the school, graduated in 1914 and in 1914-1919 Zh. Aymauytov studied with M. Auezov, K. Satpaev in a pedagogical seminary in Semey. Young seminarians were engaged in public activities with the teachers Nazipa Kulzhanova and Nurgali Kulzhanov.

Zataevich said: "A young Kazakh journalist and poet Zh. Aimauytov is a talented performer and a great expert of Semey songs. His performing talent became famous for clarity and restraint.

In 1918 in February, the publishing house "Zhardem" published scientific and literary magazine "Abai" to the extent of 25-36 pages. In 1914, on November the magazine was banned due to the accusation, they threw out all the editions which were kept in the newspaper "Saryarka". In 1918, a young seminarian M. Auezov invested money and met with an influential person Kazakzhan Ukibayuly in order to restore the magazine.

After investing money in the magazine, M. Auezov informed Jusupbek about the departure to his native land and Zhusupbek decided to be in charge of the magazine "Abai". Auezov and Aimauytov worked together, but Zh. Aimauytov was the editor. Therefore, in 1918, in February, Aimauytov's main article was published in the first issue of the magazine. In this article Aimauytov described the life of Kazakh people and their oppression, mentioning that it was Abay who led everyone to a brighter future: "By calling the magazine Abay we demonstrate his authority and want to see his name in history. Abay is the founder of the literature, who researched the meaning of the words "humanity", "upbringing", "science". Therefore, these are the reasons we devoted the magazine to the honour of Abay".

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电视演讲中使用的基本语法结构和单位
**BASIC GRAMMATICAL STRUCTURES AND UNITS USED IN
TELEVISION SPEECH**

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在现代世界中，电视领域是大众媒体在实用潜力方面最受欢迎和最具影响力的领域之一。本土和外国代表研究媒体演讲的内容和结构类别

电视讲话具有一定的语法特征，这使得将其作为单独的语言分开是合法的。

特别是在谈到英语电视时，应该注意的是，在一段时间内它经历了很多变化，并且近年来在风格上接近说话。

关键词：语法特征，电视，语音，语言，媒体，报道

Annotation. *In the modern world, the sphere of television is one of the most popular and influential in terms of pragmatic potential of the mass media. Native and foreign representatives study the content and structural categories of media speech*

The television speech has a certain set of grammatical features, which makes it legitimate to separate it as a separate language.

Speaking of English-language television in particular, it should be noted that during a time it underwent a lot of changes and in recent years approached stylistically to speaking.

Keywords : *grammatical features, television, speech, language, media, report*

Grammatical features of English-speaking sounding media speech are subdivided into standardizing and expressive.

The first group includes the following grammatical means.

1) Constructs with It (It is alleged / believed / / estimated / said / known / thought / understood / said / revealed / revealed / likely / understood / reported / revealed / revealed / likely to do something, etc.) It's understood the 45 year old

suffered severe abdominal pains after a party at his house. He was reportedly taken by ambulance from his home on a stretcher. It has been revealed that a team of detectives will lead the investigation in Jill Dando's killing (BBC World News).

2) Combinations There is / are, This is. There is Hall Farm in Hingham, Norfolk (Sky News).

These are the kind of images that would alarm the EU as the sovereign debt crisis rages across the Continent (Sky News).

This is resistance to played out on the streets to a series of new austerity measures (Sky News).

3) Grammatical means of expressing a predicted action or event (infinitive constructions): to be (about) to do something/ to look set to do something/ to be bound to do something/ to be due to do something. Presence in Kosovo is to scale down (EuroNews); 26 year old was to set off from Teleri this morning on her 100-day trip (Sky News); Government looks set to carry on raising prices (Sky News). Territorial Army is likely to be trimmed from 56,000 force to 40,000 (Sky News); Ministers are due to meet in Brussels today to try to get to grips with the reform of the Common Agricultural Policy (BBC World News).

4) Complex Subject: birds appeared to have been left to decompose among the flock (Sky News). Vote is expected to pick up a bit (Channel Five).

5) A modal verb **could** expresses an action where its realization is remote or problematic.

But there are concerns it could bring huge financial problems for the state (Sky News). Huge trade deal could kick-start the US economy (Sky News).

This alarming survey could put crime high on the agenda on the next election, revealing that England and Wales are at or near the top of the crime league table among developed countries (Sky News).

6) Using verbs **to see / to witness** in an active voice with an inanimate subject in the sense of "becoming an eyewitness of an event".

Throughout Europe almost 13 cities witnessed spontaneous protests (BBC World News). Its smallest electoral subdivision saw the National Front of Marine Le Pen win around 15% (EuroNews).

The pointed means serve to depersonalize, neutralize the transmitted text, distance it from the creator, increase the reliability of the news reported. To the same group of combinations are referred the following phrases

The BBC/ Sky News understands (that)...

Sky sources say (that) ...

7) Complex Complex and its variety - causative construction - **to have something done**.

Now Sky News has secretly filmed ducks being deliberately killed and injured at a farm which supplied the birds to a supermarket as a high welfare free-range

product (Sky News).

His party lost a whopping 7000 votes and that leaves him facing some rather tricky questions, not least from his own backbenchers about the Tory strategy (Sky News). For once the UK's Independent Party wants Britain to follow the European lead (Sky News). Last Queen of Scots had her head chopped off (Channel Five).

8) Infinitive in a function of object, definition and circumstances of the goal.

At one stage the mobs surrounded a police Landrover repeatedly trying to smash the windows to attack the officers inside (Sky News).

It's a nation to do business with (Sky News). Survey was commissioned following a decision by France's lower house to ban the full veil early this week (Sky News). Those which were removed instead of being bagged up to avoid biohazards were left to rot in a skip (Sky News). A fifth of people alive in the UK today are likely to live to be 100 (Sky News). Duck are processed by premier brand to be sold on the shelves of Waitrose (Sky News).

9) The peculiarity of the sounding television speech is the widespread use in it of the continuous tenses both for the designation of the action taking place at the present moment and the planned event.

One of the most frequent verbal forms is the combination with the **verb being**, acting both as a component of the passive voice (to be being done), and in the role of an integral part of the participle.

And passengers say they are already being charged over the odds (Sky News). Being warned it may backfire on them (EuroNews). The former Conservative minister Kostis Hatzidakis being badly beaten (Sky News).

Among the other verb forms used in Continuous tenses, the following are distinguished:

The form of the future continuous tense **will / shall be doing something** to indicate the future action.

And the economic leader America will be nervously contemplating the prediction that within a decade the number two will have pulled level (Sky News).

When we return we'll be bringing you the very latest on the situation in south Omagh where they fear the worst on the foot and mouth (Sky News). We'll be starting to collect physical evidence from the scene (Sky News). will surely be dominating many of the newspapers too. So, will be seeing how they are reporting this story at 10.30 (Sky News).

- Stable verbs to describe the action occurring at the time of speech.

The company will be hoping no more than that ask for a full refund (Sky News).

But he'll be hoping for a warmer reception on his tour of Asia (Sky News).

It's not being the best of weeks for president Obama (Sky News) will be seeing

how they are reporting this story at 10.30 (Sky News);

- Modal construction **to have to**.

The global order is shifting and leaders are having to adjust to the rejuvelling of the pack (Sky News).

- Construction **to be going to**. Main battle ground are going to be tax, education and the health service (Sky News); is going to send a free rubber case to everyone who has bought one of its new iPhones in an attempt to fix problems with the handset reception (Sky News).

- Continued perfect tense for designating an action that took place over a certain period of time in the past.

On the continent they've been slaughtering livestock that might have come into contact with animals imported from Britain (ITN).

She's been wearing a burka for ten years (Sky News).

The presence of such a significant number of continuous forms in the sounding media texts is dictated by the specifics of the news. It is to cover events that have just taken place, continue to occur or will occur in the near future.

10) The possessive case with the names of countries, cities, districts, enterprises, firms, time of day, etc., instead of using appropriate adjectives or a combination of the indicated lexical units with the preposition **of**.

Damian Green says such legislation would be at odds with the UK's tolerant and mutually respectful society (Sky News). Meeting at the UN's Biodiversity Conference in Tokyo have released their latest red list of endangered species (Sky News). In Northern Ireland have released video of last night's rioting in Belfast after 48 hours of unrest, which has left more than 80 officers injured (Sky News).

Today's figures show the UK economy grew by 0.8 per cent from July to September (Sky News).

The possessive case has become so widespread in the sounding media that it is characterized by so-called wedging.

That's going to be a so-called crime plan unveiled by Jack Straw in a week or so time (Sky News).

To the second group - expressive morphological features of the sounding media (approximating it to the colloquial version of the language) - the grammatical constructions characteristic of the spoken style of the language are:

the use of the verb was in place of the verb were in a conditional mood.

- Simplified use of grammatical forms (skipping an auxiliary verb should be in a conditional mood after verbs expressing an obligation, request, order, etc).

NATO demanded that the withdrawal begin in 24 hours (EuroNews). They are not buying «the sorry, Sophie», instead insisting that the Press Complaints Commission investigate this whole matter (Sky News);

- the use of the infinitive without the particle **to** after the verb to help and its

derivatives).

In his hay day he was a national hero, helping Manchester United _become the first England club to win the European Cup in 1968 (Sky News).

- use the verb **to get** instead of the verb **to be** as an auxiliary in the passive voice and in combinations **to get something done and to have + infinitive**.

So, to get nominated with that kind of competition is very special, anyway (Sky News).

- use the verb to get instead of the verb to become.

It's getting a bit lonely in our virtual shopping centre (Sky News). The politicians can get talks moving in the next 24 hours, it could be still some time before NATO tanks rumble into Kosovo (Sky News). Country is so divided that they've got to sort out their international affairs first (Channel 5);

- grammatical reduction - omission as official words in sentences (relative pronouns, auxiliary verbs in interrogative sentences, verbs in a compound nominal predicate, prepositions, articles, unions), and significant words (ellipsis, when it comes to the syntactic features of a media speech).

The Prime Minister has been to the north east but could offer little more than sympathy to a group of workers [who are] about to lose their jobs (Sky News).

[Do you] Fancy a cup of tea? (Sky News).next morning some of the Serbs [are] dead. There were no prisoners (Sky News).year he celebrated his half [of the] century in the industry (Channel Five).

More [news] in half [an] hour (Sky News).French President Jacque Chirac urged Miloshevich to stand aside saying the coun-try would be in real danger if he did not [do it] (EuroNews).

Concerning structural and compositional features of a short television message, we can mention, that psychological features of the perception of sounding speech by ear determine the structure of the proposals of television and radio messages, as well as the order of words in them. On this basis, in such messages the group of the subject is placed in the first place. It is followed by the predicate, definition, object, adverbial modifier of place, time, mode of action. These features are standardized for a sounding media speech.

But wet it will become later (Sky News).

For expressive purposes, introductory clauses are often used.

Earlier this week, Volvo admitted it had been involved in price fixing with dealers (Sky News).again like yesterday thundery showers will be bubbling up mainly through the eastern part of England (Sky News).forced to depend on social welfare, the couple are bracing themselves for the next round of cuts.

The sentences in TV messages are basically simple sentences and are joined by conjunctions, **and, as, but, because, however, having said that** (the latter is characteristic only for unprepared speech - interview, conversation), meanwhile,

while, with, well.

... Burton-on-the-Waters is a typical Cotswold collection of pubs, cottages and a church. And it's up for sale at what face value looks like an extremely reasonable price (Sky News)

As in the literary language, various complex sentences of various kinds (objective, attributive, , comparative, concessions, aim, conditions) are allocated in the sounding mediaspeech, for example.

A TV documentary claims the Prince Charles wants his mother to retire, which Prince Charles has called ludicrous, outrageous and harmful (Sky News).on the streets of Northern Ireland an overwhelming majority of the population do not want to see a return to the bloody sectarian conflict that has caused some 3,500 lives (EuroNews).want to restart shipbuilding here but like every other UK yard, they are smart-ing from a Ministry of Defence claim that its £300 mln order for 6 ferries will probably go abroad (Sky News).up to six months confined in a tower with only two workmates for company, will drive most people mad (Sky News).

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写诗自由诗：尝试代表新方法

**WRITING FREE VERSE POETRY: AN ATTEMPT TO REPRESENT A
NEW APPROACH**

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The author of this article is sincerely grateful to Eugene Lobanov, poet, prose writer and scholar, for the priceless advice on writing this material.

这篇文章涉及自由诗歌写作的问题。自由诗歌在传统诗歌和散文之间占据中间位置，具有诗歌和散文的特征。从这个观点来看，史诗作品以及较长的诗歌被认为是散文。这篇文章包含一个表格，代表了自由诗歌真正的新观点。

关键词：自由女神像，诗歌，音节，埃达，卡勒瓦拉，玛纳斯，bylinas，散文，意象，米，微型。

Annotation. *This article touches upon the issue of free verse writing. Free verses occupy an intermediate position between traditional poetry and prose and they possess features of both poetry and of prose. Epic works as well as longer poems are considered to be prose from this viewpoint. The article contains a table, which represents a new outlook on what free verse poetry really is.*

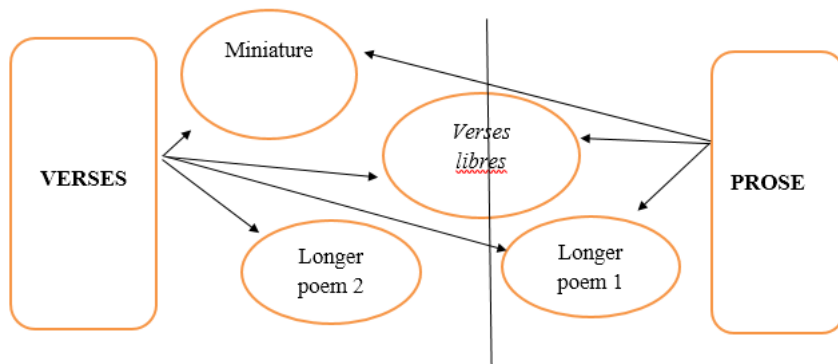
Keywords: *vers libre, poetry, syllables, Edda, Kalevala, Manas, bylinas, prose, imagery, meter, miniature.*

The free verse poetry (or the *vers libre* poetry) does not have a long history. This phenomenon is relatively new; however, it certainly has historical roots which date back to the times of Ancient Greece and Ancient Rome. The purpose of the present study is to trace the premises of the free verse conception and its development for it has already become the reality of the modern literature. We also set ourselves a task to expose the features of *verses libres* as a subject of poetry. Unfortunately, many of the modern authors write numerous “free verses” which in fact reveal their reluctance to find rhymes and follow the meter. Let us now examine this issue in detail.

First of all, let us define the “free verse”. “A *vers libre* is an independent type of versification, which appears on a certain stage of the development of

the versification culture. It is characterized by the fundamental rejection of all secondary means of verse formation. These means include rhyme, syllabic meter, the lines equal in the numbers of syllables and stresses, and regular strophic arrangement.” [1, p. 62]

There are the two main approaches: from the form and content viewpoints. If the form is expressed in verse (i.e. in meter and rhyme), therefore this is poetry. If the form is prosaic, then this is prose. If we look at it from the content viewpoint, then epics will be considered to be prose, even if it is written in verse. All ballads, legends, such as for example, Edda (Scandinavian epos), Kalevala (Finnish national epic), Manas (Kyrgyz epos), bylinas (Russian heroic epic) etc. are prose. Longer poems are also prose from this point of view. Blank verses as well as free verses possess two signs: prosaic and poetic. The meter is a poetic sign. If the text is metered, then it is poetry, however if a free verse poem has no meter at all, its poetic component is very vague. The lyricism, non-prosaic imagery etc. are the signs, which are no doubt poetic, they give us grounds to state that a free verse poem, which possesses these signs can be definitely called poetry. The vagueness of the criteria allows us to give blank verses as well as *verses libres* an intermediate position between poetry and prose just like different miniatures as well. (See the chart below) This is a totally new approach of the author of this article, the idea, however, was suggested by Eugene Lobanov. This point of view has not been stated hitherto.



So, we now state, that free verses may be perceived as prose. However, a “good” *vers libre* will definitely be written with the features peculiar to poetry, i.e., the speech will be metered, and the imagery will as well be poetic. The meter will not be fixed as in traditional poetry, but it will be there. For example, one line will be written in iambic pentameter; another one will be trochaic etc. Alternatively, the lines can resemble this or that meter, this is free verse after all! Generally

speaking, any free verse can be regarded as a “play of meters”.

Some examples of free verse poetry could as well be written as prose, their peculiarities will certainly remain, and big changes will not occur. Such poetry could well be a prosaic miniature, which would contain signs of poetry.

Here is an example of such transformation:

A White African Dress

by Jackie Kay

(an excerpt)

Yesterday, as I thought about what my father wore
That Sunday in Abuja when we first met,
A huge heron lit up my path through the woods
Far from the river bank where the bird
Usually stood, grave as a prayer.
[2, p.76]

Could be:

Yesterday, as I thought about what my father wore that Sunday in Abuja when we first met, a huge heron lit up my path through the woods far from the river bank where the bird usually stood, grave as a prayer.

Another example:

Hector Appears on the Battlefield

by Christopher Logue

(an excerpt)

Go close.
Besides his helmet and his loincloth Hector wore
A battle-skirt of silver mesh,
Its band, a needlepoint procession:
Sangárian tigers, each with a lifted paw.
[2, p. 78]

Could as well be:

Go close. Besides his helmet and his loincloth Hector wore a battle-skirt of silver mesh, its band, a needlepoint procession: Sangárian tigers, each with a lifted paw.

A prose writer can switch to writing poetry through *verses libres*, a poet can start writing prose having tried to write free verse poetry. For example, the writers of Ancient Greece were moving towards poetry from the prose through blank

verses. Alternatively, a poet can move in the opposite direction, if he/she feels that the poetic form fetters him/her. If one goes this way, they can obviously arrive at writing prose. In this case, the author leaves behind a form, which allows calling rhymed lines poetry.

Therefore, we can now deduce, that the laws of writing *verses libres* should pertain both form and content. In order to call a free verse poem poetry, it must have poetic imagery, the lyrical component should be poetic. The free verse poets are not perceived as poets by poets, and prose writers do not consider them prose writers.

If we consider the meter to be a sign of poetry, we can say, that the length of a poetic line depends on the topic. If a poet writes about events, which are happening fast (for example, a battle), the lines are usually short, if an author wants to say about a long-lasting process (for example, ageing), the lines will be much longer.

Some modern poets write their rhymed and metered poetry as prose divided into paragraphs. Such works have the signs of prose (paragraphs) and the signs of poetry (rhymes, meter and poetic imagery).

Many modern free verse writers submit their poems to different websites on the Internet. Some of these poems are of a very high quality, others are not. The author of the present article would like to make a concise analysis of a poem by a certain Jozef Neumann published on www.allpoetry.com

long haul / 3.02 am
the edge of the wing shoots
a pulsing flash into the dark /
pale herds of clouds way down /
drifting above black water /
passengers lined up in seat rows /
eyes shut / mouths dropped
open / their heads nodding
from time to time by tiny
turbulence / their minds
switched off / cabin lights, too /
cruising through solitary dreams /
wherever the wind blows.

As we can see, this poem touches upon rather trivial matters of life. The imagery is poor, the author writes about things which happen to us nearly every day. This appears to be more of a depiction of a moment of everyday life, this so-called “poem” is more of a note in a traveler’s notebook, rather than what we call poetry. The author uses clichés, such as “herds of clouds” or “solitary dreams”, which do not add strength to the poem.

Apart from what we have just considered, talented authors also post their poetry to the Internet. Here is another free verse poem called “Be free...” by Pakeeza Rizvi, an author from Karachi, Pakistan. This poem was published on the aforementioned website.

Be free...

Be free from the credulity of “I” the illusion of Somethingness
Come to surrender yourself,
To Kneel down to bow your head
Before thy lord the Great the Omnipotence,
Come and enjoy nothingness
Truly! it is the only way towards Everthingness

In this poem, Pakeeza Rizvi uses strong and powerful images such as “thy lord the Great the Omnipotence”, “nothingness”, etc. The author uses Old English words, such as “thy”, which are heavily stylistically marked. The poet creates new words, such as “somethingness”, which express her own vision of the Absolute she is writing about. This vision is unique; it belongs to Pakeeza Rizvi alone. The author shows great piousness and devotion to the Almighty God.

In order to successfully write free verse poetry, one should not forget about the defining signs of poetry: meter and poetic imagery. In a free verse poem, the meter, although sometimes irregular, should definitely be present. The imagery should characteristically belong to the poetic genre. Otherwise, this will not be poetry. Of course, one should avoid writing in a column when the same can be written as prose.

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为了纪念老师
TO A MEMORY OF THE TEACHER

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文章描述了伊尔库茨克州立医科大学药理学系形成阶段的描述；科学研究的对象及其最重要的成果。

关键词：西藏和中国的创始人，医学，科学遗产。

Annotation. *The article describes the stages of the formation of the Department of Pharmacology Irkutsk State Medical University are described; objects of scientific researches and their the most important results.*

Keywords: *founder, medicamentes of Tibet and China, scientific heritage.*

Shavrov Nikolay Pavlovich is the doctor of medical sciences, professor, founder and head of the Pharmacology's and Pharmachemistry's Department (1922 – 1929) of Irkutsk State Medical Institute.

He was born on December 2nd, 1884, at the station «Olovyannaya» of Zabaykalsky region in the family of a missionary priest. He graduated from the Vyazemsky classical gymnasium and entered unit of natural sciences of Faculty of Mathematics and Physics of Moscow University after moving to Moscow. While studying at the university, Nikolay Pavlovich thoroughly studied physics and chemistry, involved in theater, music and literature. After graduating from the university in 1910 he entered the Military Medical Academy of St. Petersburg [2].

In 1914, beyond finishing academy, the military doctor N.P. Shavrov went to the front, where he served as a doctor of the 17th Lancers regiment at first, next as a doctor of the 17th Hussar regiment and of the 1st Guards battalion (image 1). He was injured on the battlefield. Nikolay Pavlovich was awarded for a war service by six orders: the orders of St. Ann of the 4th, the 3rd and the 2nd degrees with swords and a bow, the orders of St. Stanislaus of the 3rd and the 2nd degrees with swords and a bow, the order of St. Vladimir of the 4th degree. He was also awarded by the light-bronze medal in the memory of the 300th anniversary of reign of the House of Romanovs.



Image 1. N.P. Shavrov

During the civil war N.P. Shavrov is the doctor of the Barabinsky regiment in the army of admiral A.V. Kolchak. After captivity (December 1919), he worked as a resident in the hospital in Novonikolaevsk city (Novosibirsk). N.P. Shavrov, being in the ranks of the 5th Army, arrived in Irkutsk, where in 1919 – 1922 years was as a laboratory assistant of the chemical-pharmaceutical laboratory of the 5th Army.

He organized the Pharmacology's and Pharmachemistry's Department with opening of the medical unit with the Physics and Mathematics Faculty of the Irkutsk State Institute (1922, image 2). He is a researcher, professor, head of this Department from 1922 to 1929 years. N.P. Shavrov had a faith to a principle of experimental verification of theoretical proposals, therefore Nikolay Pavlovich successfully and much experimented, read lectures for students. Since foundation of the Department, the chemical composition of medicinal herbs, including badan, was studied. The fund of medicinal and technical plants of Siberia, medicaments of Tibet and China were investigated. Later, in Tomsk, N.P. Shavrov studied the essential oils of siberian herbs in collaboration with professor N.V. Vershinin [3].



Image 2. The staff of the Department of Pharmacology and Pharmaceutical Chemistry of the Medical Faculty Irkutsk State Institute. N.P. Shavrov is fourth on the left

A scientific assignment to Moscow in 1923 allowed him to complete his dissertation "Catalase and protease in a parenteral administration of chloral hydrate". He defended it in 1925, and after received the title and post of pharmacology's professor of IRGOSUn. He became a member of the presidium of the Council Irkutsk unit of Osoaviakhim, treasurer of the Irkutsk unit of the Society of a studying of Siberia and its productive forces. He worked in the East Siberian unit Russian geographical society, participated in the preparation and holding of the first Siberian scientific research congress (1926).

He was invited to become a head of Chemistry's and Physics' Department in the Siberian Merchandising Institute of the Centrosoyuz USSR in November 1929 (Novosibirsk Institute of Nation's Economy). From 1932 to 1933 years he also worked as a director of the Siberian unit of the Research Chemical-Pharmaceutical Institute. He repeatedly participated in All-Union congresses of physiologists.

In 1933 he was arrested cause of so-called "white guard conspiracy" and was blamed for belonging to officer's insurgent organization "All-Union union" and creation of a few number of "counter-revolutionary cells in various sectors of intelligence". On August 20th, 1933, the OGPU collegium Nikolay Pavlovich was convicted on the article 58th, part 10-11 for ten years of imprisonment in concentration camps. Since September 1933 he served sentence in the Tomsk camp as a doctor. N.P. Shavrov in 1934 was allowed to teaching work in the universities of Tomsk at the request of Tomsk University. Since March 1934 he is a professor

of biology and technical chemistry of the Tomsk Industrial Pedagogical Institute, and since August 1935 he became a head of the Department of Biochemistry of the Tomsk State Medical Institute. In September 1935, according to the decision of the Siblag Administration, N.P. Shavrov was transferred to work at the Novosibirsk Medical Institute, where he worked as the head of the Department of Pharmacology until 1937 [1].

N.P. Shavrov was again blamed for counterrevolutionary activity while serving a sentence in the Novo-Ivanovo unit of Siblag (Chebulinsky area, Kemerovo region). By the decision of UNKVD's triple of the Novosibirsk region (December 25, 1937) he was sentenced to an execution and the verdict was realized on January 13, 1938. Nikolay Pavlovich was rehabilitated posthumously in 1957.

The scientific heritage of N.P. Shavrov includes three editions of the manual "A medical writing of recipes" (publishing house «Medgiz»), 2 theses and 30 articles. He wrote "A textbook of pharmacology" and the manual "Differential diagnosis and therapy of the most important acute poisonings", which didn't wait for publication.

The portrait of N.P. Shavrov is on the Department of Pharmacology at this moment and every student, which comes for new knowledge, knows the name of this great and unique person (Image 3).



Image 3. portrait of N.P. Shavrov on the Department of Pharmacology Irkutsk State Medical University

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家谱作为辅助历史学科：发展史

GENEALOGY AS AN AUXILIARY HISTORICAL DISCIPLINE: THE HISTORY OF DEVELOPMENT

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First published in Russian in Materialy devyatoy ural'skoy rodovedcheskoy nauchno-prakticheskoy konferentsii 19 – 20 noyabrya 2010 g. [Papers of the ninth Ural genealogical theoretical and practical conference. November 19 – 20, 2010], Yekaterinburg, 2017, pp. 85 – 87. Translated by the author.

本文讨论了家谱史作为一门科学学科的关键问题。本文提供了“家谱”一词的定义，并提供了有关欧洲国家和俄罗斯这一科学发展的主要里程碑的信息。重点是家庭历史如何被用来证明古代社会以及中世纪欧洲国家统治者权力的起源。还提供了关于国际宗谱社团活动的简要说明。

关键词：家谱，历史，亲属关系，libri memoriales, André Duchesne, Charles du Fresne, sieur du Cange, Luis de Salazar y Castro, Jacob Wilhelm Imhof, Johann Christoph Gatterer, John Dugdale, 耶拿大学，国际家谱联合会和纹章，国际家谱学院，国际家谱和家族史研究所，血缘传说，家谱书籍，辅助历史学科，古文字学，外交学。

Annotation. *This article discusses the key problems of history of genealogy as a scientific discipline. The article provides the definition of the term “genealogy” and gives information about the main milestones in the development of this science both in European countries and in Russia in their comparison. The emphasis is made on how family histories were used to give proof to the origin of the power of rulers in ancient societies as well as in medieval European countries. A concise account of the activity of international genealogical societies is also provided.*

Keywords: *genealogy, history, kinship relations, libri memoriales, André Duchesne, Charles du Fresne, sieur du Cange, Luis de Salazar y Castro, Jacob Wilhelm Imhof, Johann Christoph Gatterer, John Dugdale, Jena University, the International Confederation of Genealogy and Heraldry, the International Genealogical Academy, The International Institute of Genealogy and Family History, bloodline legends, genealogy books, auxiliary historical disciplines,*

paleography, diplomatics.

Genealogy, like most of other auxiliary historical disciplines, is one of the popular types of scientific activity. People of different jobs and with various qualifications devote themselves to this wonderful and interesting scientific discipline. They contribute their respective scientific shares to the development of the auxiliary scientific disciplines along with the professional researchers of History.

We shall now address to the definition of the term “genealogy”. The Big Russian Encyclopedia defines this term the following way: “genealogy (Greek γενεαλογία – lineage) 1. A totality of the ideas about the ancestral past of an individual, a group or an ethnos, 2. Pedigree tables and lists which contain the systematized chronological information, 3. An auxiliary historical discipline, which studies the history of families, the origin of persons, the establishment of alliances and composition of lineages”. [1]

In ancient oriental and Greco-Roman societies, the kinship relations of gods and goddesses were established. Afterwards they provided evidence of the divine origin of the power of kings in Mesopotamia and other regions and pharaohs in Ancient Egypt. The establishment of political unions and the origin of conflicts were to a degree presupposed by the character and conditions of the kinship relations. In medieval Europe the oral genealogies first appeared in the developed and numerous Celtic and Germanic tribes. “It was the Bible that served as an example of genealogical constructions – lists of rulers and high priests, memorial books – *libri memoriales* and of genealogy itself”. [1]

During the Middle Ages, the genealogies were deliberately altered or even falsified in order to represent one’s lineage more ancient and thus to raise its status in the public opinion. The transition of power to one’s children was also substantiated genealogically.

In the 15th century the history of the dynasties was founded, and genealogy became part of the social etiquette. Among the noble families of Europe having a good lineage was considered to be a sign of a good form. In the 16th century, genealogy became a scientific discipline due to the works of European historians. The French researchers André Duchesne and Charles du Fresne, sieur du Cange, a Spanish historiographer Luis de Salazar y Castro, the German historians Jacob Wilhelm Imhof and Johann Christoph Gatterer, and a British expert John Dugdale initiated the scientific study of the historical documents.

As an auxiliary historical discipline, the genealogy began to develop in Germany, where the critical methods of working with the genealogical data gained ground. The first Department of Genealogy was founded in 1721 in Jena University, which is also in Germany.

In the 20th century the interest towards genealogy increased immeasurably. The

researchers paid attention to the genealogy of merchants, burghers, peasants, etc. Many amateurs of genealogy, and not only professional researchers began to study this science. The mathematical, biological and other methods as well as genetic examinations are used in genealogy. “In 1929 the first Congress of genealogical and heraldic sciences experts took place in Barcelona. These congresses have been regular since 1953, the 27th congress took place in Edinburgh, United Kingdom. In 1971 the International Confederation of Genealogy and Heraldry was created, in 1998 the International Genealogical Academy was founded. It organizes international genealogical colloquia, which take place every two years – the first one took place in Moscow in 1999, the fourth one was held in Paris in 2005. The International Institute of Genealogy and Family History was organized in 2001 in Bologna, Italy. This Institute also holds genealogical colloquia: the first one was in Rome in 2003, the second one took place in San Marino in 2005. Genealogy is widely used in historical demography”. [1] The websites specializing in relatives search and genealogical databases are being created on the Internet.

In Russia genealogy first appeared in the 11th century. The term of the Greek origin was translated as “lineage”. This auxiliary science served the interests of the nobility during many centuries: it was mandatory to provide evidence of one’s belonging to the highest class, when one was admitted to the public service. In the feudal society it was necessary to know one’s relatives. The spiritual letters of the 15th – 16th centuries contain full information about all the relatives of the testate estate owner, when he left it to his relatives.

The bloodline legends played a major role. They “... were used in the political struggle of the feudal bosses, if the compromising list was created by means of the predefined selection and coverage of facts” [2].

It was right up to the 16th century that the lists were created primarily within one family or several related families. This was done to collect the definitive information about one’s lineage. When the genealogy books appeared, these lists were written as books. It was also during this period of time, when the genealogical exhibitions appeared. Their purpose was to strengthen one’s family history. “The practical genealogy development in Russia of the 16th century was initially influenced by a certain range of publicist and annalistic memorials. The first genealogical records appeared as their parts, later they influenced those memorials” [2].

In later times genealogy acquires new features, which are unrepresentative of the preceding centuries. In the practical genealogy, the editions of the different genealogy books of the 16th century retain their value. Before the 17th century, there were absolutely no laws requiring a subject to prove their noble origin if they were going to serve the tsar. In the 17th century many noble people from other countries came to serve in Russia. They were supposed to prove their origin, unlike the Russians, whose origin and class affiliation were well-known. Therefore, many

foreign, primarily Polish genealogical works began to play a major role [2].

Nowadays, genealogy is developing in a very close cooperation with other auxiliary historical disciplines – paleography, diplomatics and so on. Using the data of natural sciences has lately become very significant. They are used to age-date the sources. Actually, genealogy is one of the most dynamically developing historical disciplines; a large amount of people interested devote themselves to it.

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亚美尼亚危机的主观图
SUBJECTIVE FIGURES OF THE CRISIS IN ARMENIA

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获得独立后，亚美尼亚的新自由主义危机包含了社会的转型过程，创造了政治和经济生活的所有主观行动者。此外，社会变革导致一种情况，每个人只是整个系统中的一个齿轮。他或她可能随时改变，因为一个人不代表社会或国家的价值。亚美尼亚公民试图找到一种与外国有关的活动，包括商业，社会进程，改善生活条件或其他行动。他或她经常被疏远或边缘化，拒绝参与社交生活。这种情况的影响不允许在社会中发展社会联系并形成有影响力的社会结构以参与政治议程。此外，它可以防止更多的整合过程。

另一方面，亚美尼亚社会对国家提出了毫无根据的要求。这是后苏联社会妄想的结果，国家必须确保其公民的福利。这种观点的发展加强了社会对政治进程的不充分认识。它导致了危机主观人物的塑造。随后，他们成为公共政策的关键角色。

关键词：危机，债务，信息，通信，天鹅绒革命，安全。

Annotation. *The crisis of neoliberalism in Armenia after obtaining independence contains transformation processes in society that created all subjective actors of political and economic life. Moreover, social transformations lead to a situation, where everyone is only a cog in the overall system. He or she may be changed anytime because a person does not represent value for society or state. A citizen of Armenia tries to find a form of activity connected with foreign countries, including business, social processes, improving life conditions or other actions. He or she is often alienated or marginalized and refuses to participate in the social life. Impact of this situation does not allow to develop social connections within the society and form influential social structures to get involved in political agenda. Besides, it prevents more consolidation processes.*

On the other hand, the Armenian society has got groundless requirements from the state. It is the result of post-Soviet society's delusion that the state must ensure the welfare of its citizens. Developments of this opinion strengthen society's inadequate perception of political processes. It leads to the shaping of the crisis subjective figures. Subsequently, they become key actors of the public policy.

Keywords: *Crisis, debt, information, communication, velvet revolution, security.*

Hardt and Negri represent four forms of subjective figures that are created as a result of the crisis of neoliberalism[1]. All these figures exist in contemporary Armenia. Further, we will try to analyze each figure for the Armenian society and Armenian bureaucracy as a special level of social stratification.

The first figure is **the indebted**.

It was formed as a result of the hegemony of finance and banks[1, p. 14]. In the whole world, debt becomes usual way for solving everyday social problems: “loans become the primary means to meet social needs”[1, p. 14]. This negative impact on the one’s consciousness is expressed by his or her responsibility for the debt. The person is controlled by the system through the debt. And its result is the person’s continuous working and deficit time for social or political activity. This situation is very attractive for defective democratic regimes[2] in the bureaucratic countries.

The Republic of Armenia is one of the bureaucratic states in the post-Soviet space. Bureaucratic relationships predominate between the society and state. The vast majority of people have debts in the banks and financial organizations. The negative impact of such a situation is felt on all social processes when the society tries to oppose governmental decisions. There are numerous examples of individual’s indifference. As a result, one has not got any possibility to protect

his or her rights from the state or employer. If a person tries to oppose employer’s decisions, he or she risks losing an income source. Therefore, he or she will not be able to pay the debts or loans. It may cause the danger of losing everything.

Debt has become a natural component of individual’s and organization’s life in Armenia. Only diaspora donors’ resources help many people to survive. Their relatives send money and help to pay the bills in critical situations. Moreover, like individuals and organizations, the state also functions due to the loans from international creditors. In 2008-2016, Armenia’s public debt increased from 1577,2 to 4805,6 million US dollars[3]. It accounts for 42,23% of GDP[4]. We do not aim to discuss the effectiveness of usage of these credits. However, the influence of the debt on the country’s category is also more significant in the international relations because the ratio of debt and GDP describes the quality of management in the financial and political areas. Though “all official government documents related to public debt mention that debt is below the limits specified by the Armenian legislation and considered dangerous by international financial organizations”[5], debt’s existence blocks more country’s initiatives and functions in both international and domestic areas. As the individuals’ opportunities within the society, Armenia’s are also essentially limited in the international space. Armenia is a classical example of the indebted country.

While problems of the indebted in Armenia complement with the social-economic insoluble situation, the undeveloped structures of civil society and in-

sufficient impact level of the society on the process of political decision-making aggravate the state of affairs even more. Each member of the Armenian society has got different loans to satisfy his or her needs like getting education, organizing the holiday, improving the living place etc.

The second figure is **the mediatized**.

Contemporary information-communication tools increased the volume of information and reverse communication chances for individuals. On the one hand, it facilitates the process of mobilization and representation of individuals' interests through structures of civil society. Moreover, there are numerous examples of direct impact on officials. In many cases, it leads to making important public decisions. In this way, information-communication tools form a new culture of relations between the society and state. However, they also create the figure of mediatized. Individuals cannot bypass social networks every day because more aspects of their lives are connected with them.

On the other hand, it leads to more effective control from bureaucracy in the bureaucratic countries. Registered users in different social networks may get direct information from bureaucratic structures. Of course, that information is selected, filtered and systematized according to their interests. Furthermore, social activity of individuals may also be controlled. It is suggested that people work from home and other places that are not traditionally considered job spaces.

This fact means that you can work more than you realize. "With your smart phone and your wireless connections, you can go anywhere and still be on the job, which you realize quickly means that anywhere you go you are still working!" [1, p. 19]. In this case, bureaucratic machine can control you with economic levers.

The Economic lever has always been the most effective controlling instrument. Bureaucracy used it to encourage those who supported state's policy as well as to prevent consolidation of those who have reason to protest against their policy. One person may be in opposition, but he or she does not show it because the economic welfare depends on the system's sustainability. The bureaucratic machine knows and uses that fact.

There were 960000 Facebook users in Armenia in 2016[6]. It accounts for 31.7% of population. In fact, this percentage is higher because many people that are registered in Armenia do not live there. Mediatizing characterizes the Armenian society and bureaucracy and uses communication for its propaganda. Nevertheless, the bureaucracy has a dominant position: it prevents spreading of unwanted information, closes opposition channels, forwards its approaches etc. The majority regarded such incidents as "Electric Yerevan" as actions of the society's marginal part, rather than society's struggle for its rights.

The third figure is **the securitized**.

All information about us is located in different state's structures – schools, uni-

versities, embassies, medical institutions, security agencies, and so on. Social networks and virtual space suggest getting information about everybody. Everywhere you may become the observation object, starting from your home (for example, through social networks) to markets and streets (with cameras): “A walk down your street is likely to be recorded by a series of security cameras, your credit card purchases and Internet searches are likely to be tracked, and your cell phone calls are easily intercepted” [1, p. 22]. All these circumstances show the level of control over our lives. The bureaucratic state uses them to foresee the public reaction to its decisions.

There are more tools to control one’s life in Armenia. You can see police or red lines’ cameras on the street or find data about us in many institutions of state as well as much information about different parts of society in the statistical services. Power structures try to get information about every part of one’s life to form predictable behavior model about everybody. Accordingly, bureaucratic machine has all the necessary information to prevent any negative attitude from the society. Besides, that information allows strengthening their position as private and privileged class in the state. It resulted in the situation when political decisions are made without taking into consideration the society’s opinion because bureaucracy is sure that it will be able to force the adoption of their decision. As an example, we can remember the decision about increasing the transport fare in 2013. The decision was cancelled after six days of public protest [7].

The securitized figure includes all parts of the society in Armenia, including bureaucracy. All members of official structures are also controlled. Moreover, different members are used to controlling each other. Bureaucracy balances its all segments because hierarchical system cannot afford itself to be internally weak. Bureaucracy has gathered enough information about its members to control them during 26 years of independence. No one can break the inner discipline and hierarchical structure without a threat to his or her ability and position in society or power.

The last figure is **the represented**.

A represented person is one of democratic society’s basic ideas. However, the state’s type has decisive impact on the delegation process. The institute of political representation lost its significant role in the contemporary bureaucratic societies. One cannot participate in the electoral campaigns without any help from bureaucratic machine. On the one hand, you do not have enough resources. “The power of finance and wealth, first of all, takes away the possibility for people to associate and construct organizations able to sustain the ever-higher costs of electoral campaigns” [1, p. 26]. On the other hand, there is a close system of bureaucracy elite recruiting. It means that the elected representative must depend on bureaucracy. A person cannot protect society’s interests from officials. In this way, the major

principle of representation is not maintained: "The representative must act independently; his action must involve discretion and judgement; he must be the one who acts"[8, p. 209].

The representative acts for bureaucracy's interests in Armenia, because they coincide with his or her interests too. The value system of political representation is distorted. One is appreciated for work in the bureaucratic system and for increasing its power. His or her activity as social and political representative subordinates to the group's interests. As a result, reputation of the representative institute has declined in Armenia. The represented individual does not have a chance for promotion his or her interests through the representative, who was elected by him or her. Though a person does not agree with this state of affairs, he or she surrenders, because there are no resources in the society to change the situation. "The represented recognizes the collapse of the structures of representation but sees no alternative" [1, pp 27-28]. A person continues to play a role in the society, through which he or she summarizes the overall image about all crisis figures in Armenia.

Conclusion. Subjective figures of the crisis in Armenia involve all sides of defective democratic regimes. The indebted, the mediatized, the securitized and the represented is mainly an individual that relates with bureaucracy as well as with civil society organizations during his or her daily activities. This fact describes the social crisis in the state. After "Velvet revolution" The Armenian society needs systemic changes to overcome it.

Firstly, the openness of markets is essential. Armenia must eliminate monopoly for it. Debts percentage must be lowered. The government must find and take cheap money from the outside and inside creditors to provide it with better conditions. It can lead to multiplication of market players. The indebted will get a chance to relieve their dependent social situation.

Secondly, offline and online jobs development should go along with continuing liberalization of information flows. The social networks development process can lead to group protection of individual interests, so the mediatized and the securitized figures will unite to solve their social problems.

Thirdly, civil society's structures should strive to have an impact on the representative's political reputation. It will allow to balance the bureaucracy's influence and increase the importance of electorate's interests to some extent.

These measures may lead to chain reaction, and the negative effect of subjective figures of crisis can be diminished in short time.

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教育学科社会安全模型创建的价格因素
**THE VALEOLOGICAL FACTORS OF SOCIAL SAFE MODELS
CREATION FOR EDUCATION SUBJECTS**

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作者在理论层面考虑并证明在大学教育过程主体的社会保障条件建模过程中考虑到变化因素的可能性。

关键词：人身安全，社会保障，价值因素，危险情境，安全文化，心理保护

Annotation. *The authors consider and justify, at the theoretical level, the possibility of taking into account valeological factors in the process of modeling the conditions of social security of subjects of the educational process in the university.*

Keywords: *personal security, social security, valeologic factor, dangerous situation, safety culture, psychological protection*

The relevance of the issues raised is determined by the current social, economic and political situation in the country and the world, which has significantly changed the target orientation, the content characteristics and the functional of the education system. The emerging trends in social development stimulate the search for and introduction of advanced technologies, flexible organizational forms, the development of methods of teaching and education, the definition of effective ways of individualizing education to ensure social stability, the continuity of culture, and the preservation of the moral, physical and mental health of students.

The system of Russian education is at the stage of progressive reform with the aim of generalizing humanism and bringing it to international standards on the basis of the synthesis of scientific and pedagogical knowledge and world historical experience. The generalization and consideration of the experience of the formation of national educational systems in the context of the regularities of the current stage of civilization development will allow preserving the best national traditions, developing new approaches to its optimization, and avoiding mistakes

caused by biased one-sidedness and the hasty copying of foreign practices.

The historical stages in the formation and development of the Russian education system, as experience shows, reflect those trends that can be observed in other areas of human life. This "parallel evolution", in fact, provides an opportunity for a meaningful and comparative analysis of the role of education in the development of Russian society, as well as identify priorities that are characteristic of the modern period.

Since the 18th century, society has been actively developing along the path of technological development and increasing the importance of knowledge for universal progress and individual development of an individual. The scientific and technological revolution, the processes of virtualization and globalization naturally influenced the formation of new approaches to the construction of educational programs, changed the ideas about the purpose and content of professional education, and shifted the emphasis in the interaction of subjects of educational activity.

All-civilization transformations determined not only the indisputable advantages and achievements of modern technogenic society moving to its information structure (the achievements of science and technology - the breakthrough of mankind in the field of medicine, pharmacology, astronautics, robotics, information technologies, etc.) led to the expansion of the human habitat, time duration and improving the quality of active life, facilitating the exchange of information and resources, etc.), but also presented new demands the level and content of education that meets the needs of society.

In this regard, the main goal of modern education is the formation of a healthy, socially sustainable, adapted to the conditions of life and a happy personality. Education and its institutions today perform not only traditional functions, but also are responsible for the formation of social safety conditions for all participants in the educational process. An important factor in the realization of the multifunctionality of education is the consideration of the valeological components of the educational environment, which has a significant impact on the security of the individual. Accordingly, the importance of taking into account the influence of various factors on the effectiveness of the educational process, including health status, working capacity, the ability to rehabilitate and restore the vital forces of subjects of education, is increasing.

The purposeful use of the historical experience of the formation of professional education and relevant contemporary trends corresponds to an objective approach to understanding the socio-economic, socio-cultural, mental, theoretical, methodological, organizational, pedagogical and other conditions for its development (these issues are covered in the works of E.P. Belozertsev, P.L. Atutov, S.Ya. Batyshev, Yu.V. Gromyko, O.V. Dolzhenko, V.K. Rozov, V.N. Sagtovsky, V.A. Slastenin, etc.).

The axiological, culturological, formational, civilizational approaches make it possible to identify objective conditions (existing independently of the consciousness and will of a person) for the formation of professional education and the actualization of its role in social development. A subject-activity factor captures and explains the changes occurring in vocational education, the activities of its subjects, leading to these changes.

The actualization of the value of valeological factors in education is related to the importance of forming a common valeologic culture of university students (N.P. Abaskalova, V.A. Ananiev, I.I. Brekhman, E.N. Vainer, S.V. Popov, A.G. Shchurov, etc.), as well as modern requirements to the solution of educational, educational, developmental and health problems in the system of higher education (presented, in particular, in the works of E.N. Vainer, A.V. Leif, V.B. Mandrikova, L.G. Tatarnikova, I.A. Ushakova, and others).

The main problems of this study are: the study of factors that negatively and positively affect the process of life of students in higher education, as well as their adaptation to the current training load; determination of ways to optimize the educational process in a higher educational institution in order to ensure the social and personal security of all subjects of the educational process; creation and approbation of the model of valeological support of the educational process in the university taking into account the potential impact of various factors.

The purpose of the study is to analyze the valeological factors of modeling the conditions for ensuring the social security of the subjects of the educational process, starting with teachers, and ending with the students' challenge.

Tasks:

- to characterize the importance of individual valeological factors (individual-personal, social-environment, service-protective) in the educational sphere;
- to monitor the influence of valeological factors on the effectiveness of the educational process in the university;
- to analyze the valeological component of the model of providing personal safety of participants in the educational process in the university.

The Amur State University acted as a *base for the research*. For comparison, data from close studies presented in open sources.

When studying the phenomenon of personal security, the main subject in the semantic continuum "danger-safety" is student youth. At the same time, it is necessary to take into account the starting position of the system historical-evolutionary methodology of human science, the most important of which is that "the key to understanding the nature of man lies not in himself as some bodily object, but in those various systems in which his life is realized" [1, from. 81]. Due to this special meaning is acquired by the polysystemic consideration of the personality, which involves the disclosure of a sequence of factors that affect the security of

the individual.

Personality security in the educational process is conditioned by three factors: the human factor, the factor of the environment, the security factor, among which the first two are considered basic [3]. Any person in his own way interprets the generally accepted consideration of the importance of a dangerous situation. This interpretation is based on the psychological characteristics of a particular person. It follows that the attitude towards a dangerous situation is determined by the significance of the danger attributed to it by society, and its personal meaning for the individual (intellectual and emotional perception). Man not only assesses the degree of danger - it causes him emotional feelings. Understanding the role of the human factor in the occurrence of violations is important not only from the point of view of their prevention in the future, but also from the point of view of the formation of an effective safety culture, in which the principle of justice prevails with regard to liability for violation.

Successful vocational training is closely linked with the formation of conditions for the preservation and maintenance of health, improving the performance and development of the personal potential of all subjects of the educational process, which is determined by three factors: the human factor, the factor of the environment, the security factor, among which the first two are considered basic [3]. As shown by the available empirical data (studies by V.B. Mandrikov, I.B. Meermanova, A.V. Shilovskaya, etc.), the approximate ratio of the various factors of health provides for the allocation of four groups:

- genetic factors - 15-20%;
- the state of the environment is 20-25%;
- medical care - 10-15%;
- conditions and people's way of life - 50-55%.

The specific values of the contribution of individual factors to the health indicators obtained depend on the age, sex, and individual typological features of the subjects. The factor of the physical environment acts indirectly, and different people behave differently under the same conditions: some - activate internal resources, try to resist the "pressure of the environment", guided by their principles, beliefs, while showing the strength of mind. Others, on the contrary, with the first "strike" of the environment, run from danger to an illusory world, for example, with the help of psychoactive substances. For a brief moment, this state of "rest" and "well-being" saves a person from danger, but drugs do not solve the problem, but only exacerbate the situation, contribute to the emergence of a real threat - the emergence of drug dependence.

It should be noted that the factors mentioned, acting separately or in combination, can act, firstly, as a source of information that allows a person to predict the likely consequences of alternative methods of influence; Secondly, human activi-

ties are carried out in specific environmental conditions. The consequences of this activity are the result not only of intentions, but also of limitations caused by the nature of the environment. Thus, the perception of the environment is necessarily and dialectically related to the action in this environment. It is an active process in which the perception of the environment largely determines the actions of a person.

The security of the person is influenced by its background environment, which is composed of people living in close proximity to it (teenage, youth groups, street companies, neighbors, courtyards of informal character). Actually, the degree of destructiveness of relationships with the background environment and the intensity of these relationships can affect the formation of various personality deviations, including the introduction to the use of psychoactive substances.

So, the environment organically intertwines into the image of "I" and regulates behavior. The significance of the environment is so great that under certain conditions the identity of the individual can become predominantly "environmental". Hence the quality of the environment, its psychological indicators, especially psychological safety, are significant not only for interpersonal interaction, but also for the psychological mechanisms of human functioning.

The security factor is a means by which people use to protect themselves from unsettling and dangerous situations. They can be social, physical and psychological (mechanisms of psychological defense). The level of security depends on the degree of constructiveness and activity of human behavior and activity. At the same time, an adequate condition for constructive behavior is the adequate socialization of instincts, needs and motives of activity, i.e. satisfaction of human needs in a socially acceptable way.

A stable experience of one's own psychological security is important throughout the whole path of the person's ascent to social maturity. The absence of such a positive emotional state is quite natural in the early stages of ontogenesis, cardinally exacerbates the feeling of loneliness, insecurity in oneself, generates fear and an unreasonable sense of guilt.

To ensure the personal safety of students, specialists (psychologists, social educators, teachers, etc.) are obliged to identify in the educational environment those young men and women who suffer from loneliness, feeling psychologically unprotected. It is necessary to influence their social environment so that a particular young person has no reason to feel personally and socially vulnerable, to carry out purposeful and systematic work to restore his adequate self-perception and awakening personal resources from various [2].

In the process of modeling the conditions of social security of subjects of the educational process in the university, three interrelated tasks are most often solved:

- Building an internal environment that assures the health and educational na-

ture of the educational process and the safety of its participants (the introduction of health education technologies and a scientifically based training regime, provision of motor activity, health infrastructure, healthy nutrition, etc.);

- improving the culture of health of participants in the educational process (teachers, students, partner employers, other professionals), their readiness for a healthy lifestyle;

- creation of conditions for correction of health disorders, rehabilitation and rehabilitation of weakened students, as well as students with disabilities of health (development of individual educational routes, individual and group health programs, non-specific primary prevention of socially caused diseases, etc.).

When modeling the conditions for ensuring social security of subjects of the educational process in a university it is expedient to rely on the principles: системного подхода – тесное взаимодействие различных специалистов всех уровней системы образования и всех субъектов образовательного процесса;

- an integrated approach - the use of various means, methods and techniques for the organization of health-building activities;

- Individual approach - taking into account individual-typological, psycho-physiological and age-specific trainees when organizing and implementing the educational process;

- Personality-oriented approach - emphasis on the development of the structures of the personal level of psychological health of students (self-awareness, value-semantic, motivational spheres of personality);

- a positive approach - shifting the emphasis from combating negative consequences and correcting development deficiencies to building the resource potential of the individual with the support of its strengths. Within the framework of this approach, it is not so much the implementation of medical measures aimed at treating already sick people that is of particular importance, but rather the creation of a socially adapted, personally oriented environment conducive to the formation of a positive attitude towards one's health;

- the existential-humanistic approach - the recognition of the active role of the individual in the preservation of somatic, psychological and social health, the belief in the ability of the learner to make choices in the direction of health, the creation of favorable socio-psychological and pedagogical conditions for such a choice;

- the priority of effective care for the health of students and educators - suggests that everything that happens in an educational institution, from the development of plans and educational programs to the verification of their implementation, should be evaluated from the standpoint of the health effects of participants in the process;

• integral representation about the individual health of the individual - makes it necessary to approach the definition of the concept of health as a system category. In our opinion, the main methodological error in the health-saving activity of the educational institution was the focus on physical health, while other aspects of health, as a whole, remain outside the scope of the review, which significantly reduced the effectiveness of the institution's health-saving activities.

Thus, several factors determine the social and personal security of subjects of educational activity, among which the human factor and the environmental factor are the main ones. In the event that the effect of external and internal factors does not lead to a deterioration in the functioning and development of the organism, the mind and psyche of man as a whole, and does not prevent the achievement of certain desirable goals for an individual, one can speak of the security of the individual. Awareness of the opportunities for young men and girls to meet their basic needs and ensure their own rights in any, even unfavorable situation, in the event of circumstances that may block or impede their implementation and a relatively stable positive emotional experience, indicate the presence of psychological security of the individual. A necessary condition for the formation of an adequate sense of psychological security is psychological defense, as a special regulatory system for stabilizing the individual, aimed at eliminating or minimizing the feelings of anxiety associated with the awareness of conflict.

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年轻的国内企业家的自我控制和能力：一项实证研究
**SELF-CONTROL AND COMPETENCE OF YOUNG DOMESTIC
ENTREPRENEURS: AN EMPIRICAL STUDY**

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本文描述了对俄罗斯年轻企业家进行实证研究的中间结果。作者的创业能力模型是基于这项研究。作为一种工具，使用了评估中心和Cattell的16因子问卷。进行定性和定量数据分析。

关键词：俄罗斯企业家，自我控制，能力

Annotation. *The article describes the intermediate results of an empirical study of young Russian entrepreneurs. The author's model of entrepreneurial competencies is based on the research. As an instrument, the assessment center and the 16-factor questionnaire of Cattell were used. Qualitative and quantitative data analysis was carried out.*

Keywords: *Russian entrepreneurs, self-control, competence*

Introduction.

The materials presented in the article reflect the results of an interdisciplinary study of young domestic entrepreneurs conducted by the authors' team. The study involved 116 people - young people (average age 25-30), 70 men and 46 women, who are already engaged in entrepreneurship (have their own business), or are at the beginning. The research is based on the author's model of entrepreneurial competencies [1].

Main part

1. Assessment center as a tool for analysis.

One of the main instruments of the conducted research, as before, was the Assessment Center. As is known, the subject of the analysis in the Assessment Center (hereinafter AC) is the quality, but referring mainly to the professional sphere of human activity - leadership, ability to cooperate, focus on result, responsibility,

etc. These are behavioral characteristics and precisely those that provide success in professional activities. They are identified in the process of performing certain simulations of real activity exercises. Basic methods of study are, along with tests and questionnaires, observation and interviews. Experts are used as subjects of observation and evaluation. Thus, the goal of an integrated approach to assessing personality is set. AC is a standardized, complex method of multiple competency assessment, which includes expert assessment of the behavior of assessees in the processes of performing imitative simulation in which the working problem situations of real work activity are modeled. AC allows you to make effective management decisions in the following areas: recruitment; attestation of personnel; rotation, relocation of employees; development and training of employees; motivation of employees.

According to many researchers, the main advantages of this method are:

- high validity and predictability of the results;

The key factors that determine this are: firstly, the assessment center cases are modeled on the basis of actual working situations that the participant will encounter; secondly, each competence is identified based on the application of at least 2 methods; thirdly, for each participant, several experts are observing (which makes it possible to significantly reduce the subjectivity of evaluation).

- multifunctionality of the results: you can take several decisions on a group of participants at once (for example, what to develop in a particular participant, what are its advantages in a certain competence among the others, what kind of rotation to perform, etc.);

- saving time: the assessment of a group of people at once as a result of a single assessment center;

- visibility of the result: the proposed results are offered for each participant, level and specific features of the development of certain competences;

- the identification of not only the effectiveness of the activities of the person he is already executing, but also of his potential capabilities and abilities to successfully carry out some other work.

Conducting an assessment of staff competencies by this method includes three stages: preparatory, during which the evaluation objectives are determined and competency models are developed; the development of a scenario (one or several) of the assessment, the modeling and adaptation of exercises, the definition of a set of evaluation techniques, training of experts; the very procedure for evaluating staff competencies in this method, which includes conducting business games, professional cases, group discussions, individual interviews and testing. Evaluation participants are usually given the opportunity of feedback. Based on the results of the staff competency assessment procedure, a general integration session is held and a report is drawn up.

2. The tasks of the empirical research.

The main task of carrying out the empirical research was to identify the connection between the *self-control* factor and other characteristics of the respondents. *Self-control* factor was identified as one of the parameters that play a possible regulatory role in the activities of the entrepreneur and, as a consequence, manifested in the experimental behavior of our sample.

At the first stage, the respondents were divided into 3 groups according to the level of values obtained during the filling of the Cattell questionnaire for factor Q3 (low self-control-high self-control), conventionally named: a group with *low self-control*, a group with *medium self-control*, a group with *high self-control*. Then the data was compared with the values of other factors of the Cattell questionnaire. The data was analyzed using the SPSS program. Spearman's rank correlation test was used. The results are shown in Figure 1. The results of groups with different levels of values are marked with different colors.

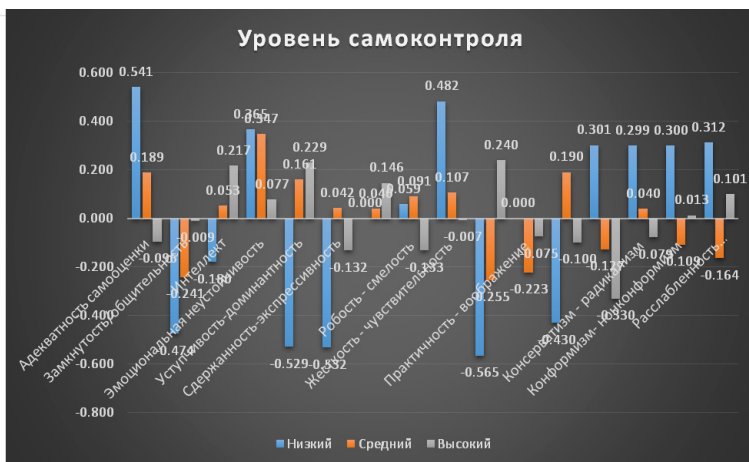


Fig. 1. Relationship between the level of values of the self-control factor and other factors of the Cattell questionnaire.

The relationships we have obtained are not very high, but they can be interpreted as a trend. Therefore, we consider it necessary to analyze the obtained picture of the relationships, since it gives an idea of possible directions for the subsequent analysis. The most distinct connections were manifested in the group with low self-control (see Figure 1). We see a strong enough connection (for this sample) of self-control, on the one hand, and the following factors: factor MD (adequacy of self-esteem) - (for $p = 0.05$, $r = 0,524$); factor A (closed-communicative) - (for $p = 0,05$, $r = -0,474$); factor E (subordination-dominance) - (at $p = 0,05$, $r = -0,529$); factor F (restraint-expressiveness) - (at $p = 0,05$, $r = -0,532$); factor I (stiffness-sen-

sitivity) - (at $p = 0,05$, $r = -0,482$); factor L (credulity-suspiciousness) - (at $p = 0,05$, $r = -0,565$); factor N (straightness - diplomacy) - (at $p = 0,05$, $r = -0,430$ - at the level of the trend). Thus, respondents with low self-control (in this interpretation of the questionnaire, this means - from the key characteristics - the internal conflict of self-representations, lack of concern about the fulfillment of social requirements, lack of discipline) show increased self-esteem (tend to overestimate oneself, their capabilities), are more inclined to being uncommunicative. In some situations, a decrease in self-control for them means an increase in such manifestations as independence, dominance and stubbornness. On the other hand, attempts to take control of the situation can also lead to the appearance of such characteristics as severity, rigidity in relation to people. Thus, there is some inconsistency of the data obtained.

In the course of the previous study and comparison of data collected with the help of the competency model, on the one hand, and the Cattell questionnaire, on the other, a number of contradictory phenomena related to the discrepancy between the results obtained were also revealed [2]. The qualitative and quantitative analysis of the data obtained at that time made it possible to draw a preliminary conclusion that the results of the methods used (the Assessment Center, the Cattell questionnaire) in a number of cases have a general tendency, but at the same time are very different. There was a tendency for respondents to raise the level of having the desired characteristic when filling in the Cattell technique, i.e. to some manipulation of data. This trend was analyzed by us in publications devoted to the study of self-esteem of the individual and the methods of verbal self-presentation. In particular, it was revealed that in the process of filling classical psychodiagnostic techniques, respondents have the opportunity to construct a desired image of themselves and conceal non-desirable qualities. At the same time, understanding the formulations of the methodology (for entrepreneurs it is a question of Cattell's questionnaire) can be extremely individualized, which made it possible to manipulate (perhaps unconsciously) in the answers [3; 4].

It was suggested that the possible reasons for the discrepancy between the data, one of which is the phenomenon of the uniform development of mutually exclusive personal abilities and qualities, as indicated by the researchers of the individual psychological characteristics of representatives of the business environment, for example, the ability to analyze and act simultaneously [6]. Similar results were obtained on a sample of modern entrepreneurs [5].

Let's return to the results obtained at the current stage of the study (see Fig. 1) comparing the values for *self-control* in the sample as a whole with the so-called *productivity* (average score for all values in 11 competencies (AC toolkit)). Here again, a group of respondents with low values of Q3, which demonstrates an average degree of significance (but in values higher than in the other two samples),

again draws attention to the relationship between productivity (AC) and factor Q3 - self-control (Cattell questionnaire) (see Fig. 2).

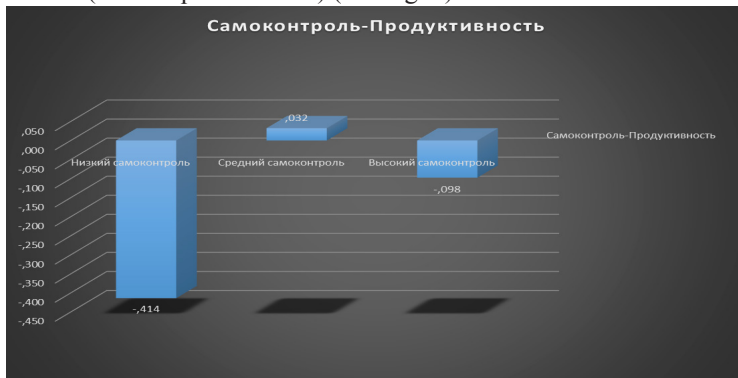


Fig. 2. Relationship between productivity (AC) and factor Q3 - self-control.

Let's see how the character and strength of the relationship change when comparing *self-control* - and values for specific competencies (see Figure 3). Virtually all connections (even if only as trends) have a negative sign. Let us assume that in our sample an increase in self-control - in the above interpretation - is associated with a decrease in the values for all competencies. And back - the increase in the values of competence is associated with a decrease in *self-control*. Thus, *self-control* in this case takes on the function of some regulator (obstacle) of the manifestation of competences. This is especially evident in the graph on the example of competences *creativity, innovation and readiness for development*.

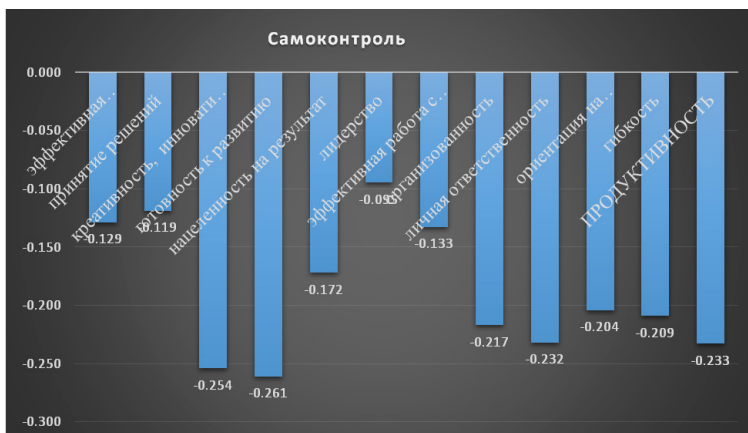


Fig. 3. Communication of self-control and values by competence.

Finally, the next step was to put forward a hypothesis that significant connections of the *self-control* factor with other investigated characteristics can manifest themselves when the sample is divided by gender. The resulting picture (see Figure 4) differs somewhat from the previous one (see Figure 3): the female sample partly "breaks" the monotony of the general graph. Nevertheless, higher values are shown in the lower (negative) part of the graph, which again leads us to the hypothesis of a rather negative connection between the *productivity* (in terms of competencies) of our respondents demonstrated by them in the AC and the *self-control* characteristics (according to Cattell's questionnaire). As trends, the following links can be noted: women have a much stronger relationship between the MD factor (adequacy of self-esteem) and *self-control*; *self-control* and factor O (self-confidence - anxiety) manifests itself; in men, self-control is largely due to factor C (emotional stability-instability), and positive connection (at $p = 0.05$, $r = 0,456$) and this is, in fact, the only case when one can talk about a connection (rather, about the trend).

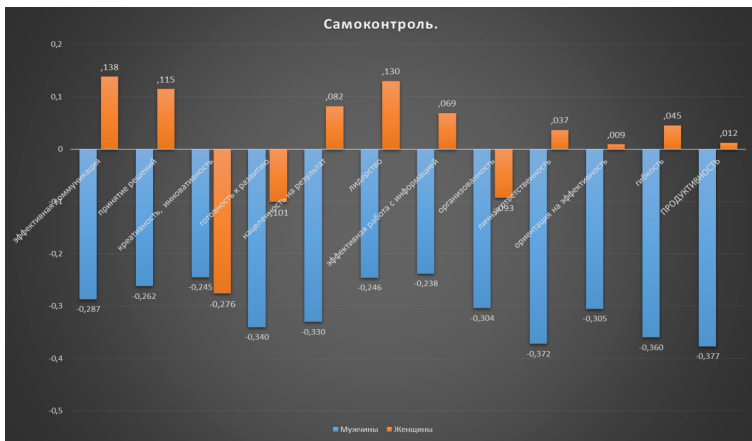


Fig. 4. The relationship of self-control and the values of competence (gender aspect).

Conclusion

Summarizing the work done, it can be concluded that the data obtained in the course of solving the stated task partly confirm the results of the previous stages of the empirical study of young Russian entrepreneurs. In particular, the phenomenon of uniform development of mutually exclusive personal abilities and qualities again manifests itself, as well as the fact that the data of verbal tests (especially those so widespread as Cattell's questionnaire) may not always be correct.

Thanks

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慢性心力衰竭患者左室重构与舒张功能的研究
**LEFT VENTRICULAR REMODELING AND DIASTOLIC FUNCTION
IN PATIENTS WITH CHRONIC HEART FAILURE**

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Annotation. *The aim of the study was to of ventricular remodeling and diastolic dysfunction in patients with chronic heart failure (CHF) I-III functional class (FC). In patients with CHF left ventricular remodeling leads not only to re-structure of left ventricular (LV) which accompanied by dilatation and thinning of the cavity, reducing myocardial contractility, but also to changes of geometric shapes of left ventricular and to diastolic dysfunction of LV with domination of the disturbance of relaxation.*

Keywords: *chronic heart failure, ventricular remodeling, diastolic dysfunction left ventricular*

The chronic heart failure (CHF) remains to be one of the most important problems of a modern cardiology owing to a wide circulation and the adverse forecast, despite the significant progress in optimization of its treatment. The urgency of the studied problem is caused by CHF wide incidence universally and among cardiovascular diseases (CVD). The disease sharply worsens the life quality of patients, increases the risk of lethality by 4 times, and death rate of patients within a year makes 15-50% [1,2]. About 50% of patients with CHF, despite the use of combination therapy, die within 5 years after the onset of clinical symptoms [3,4]. A five-year mortality of 50% was observed in those with diastolic heart failure, which is similar to that of primary systolic heart failure. The epidemiology of diastolic heart failure differs somewhat from systolic heart failure 5 [5]. In various retrospective studies, the reported incidence of diastolic heart failure varies between 20-40% [6,7]. The cause of this complication is that the remodeling process becomes maladaptive in character with progressive dilatation of the LV, an alteration of its geometry, and final fall of the pumping function. Every time patients with

either systolic or diastolic heart failure are re-hospitalized, they have a 20-22% increase in their mortality [8,9].

Purpose of the study. To study left ventricular (LV) remodeling and diastolic function (DF) of in the patients with I-III functional class (FC) with CHF.

Material and methods. There were studied 91 patients with CHF. Control group included 20 healthy subjects. The clinical condition of the patients was assessed by 6MWT, the scale of assessment of the clinical state (SACS) modified by V.Y.Mareev (2000). The processes of cardiac remodeling and vessels were studied by echocardiography (EchoCG). Analysis DF was made on the basis of measurement of maximal velocity of LV early filling (E), maximal velocity of the late filling of the atrium (A), the ratio E/A, increase of LV isovolumetric relaxation time (IVRT). All patients underwent an electrocardiogram, the full range of clinical, functional and biochemical examinations. The structure of the basic therapy was as follows: ACE inhibitors have taken 92% of the patients, an ARB - 8%, BAB - 99,4%, diuretics - 36%, spironolactone - 68%, aspirin - 94%, nitrates - 28%, statins 98,2 % of patients. Statistical analysis of the data obtained. Obtained in the study data were subjected to statistical analysis on a personal Pentium-IV computer using the software Microsoft Office Excel-2012 package, including the use of built-in statistical processing functions. We used the methods of variational parametric and non-parametric statistics with calculation of the arithmetic mean of the studied index (M), standard deviation (σ), standard error of the mean (m), relative values (frequency,%), the statistical significance of the measurements by comparing mean values was determined by the Student criterion (t) with the calculation of error probability (P) in checking normal distribution (kurtosis criterion) and the equality of general variances (Fisher's exact test). For statistically significant changes was taken the confidence level of $P < 0,05$. Statistical significance was calculated for qualitative variables using the χ^2 test (chi-square) and z-test (Glantz). To analyze the dependences features steam Pearson correlation coefficient (r) was calculated.

Results. Study of tolerance to physical exercise as a result of 6MWT in examined patients with chronic heart failure showed that initially patients with CHF FC I passed distance of $461,5 \pm 14,21$ meters. In CHF FC II and III this distance was $332,4 \pm 16,47$ and $228,3 \pm 10,13$ m respectively. The clinical condition of patients by SACS was characterized by increasing indicators of SACS with disease progression: in patients with CHF FC I this index was $3,6 \pm 0,76$ points, in FC II patients - $5,7 \pm 0,90$ points (i.e., 57% higher than FC I), in FC III it was $8,8 \pm 0,81$ points (i.e., 142,8% higher on FC I), respectively.

The study of left ventricular remodeling processes revealed that the patients examined in the initial stages of CHF as a result of the adaptation process remained normal levels EF and Fs with unreliable rise ESV, EDV, EDD and ESD

versus the normal values. By increasing the degree of heart failure progressively decreased LV ejection fraction and Fs, as basic indexes of systolic function. In patients with CHF FC II heart failure there was EF decrease in 17,4% ($P<0,05$) versus the indicators of EF in patients with CHF FC I, which was also followed by the fraction decrease in anteroinferior LV in systole (Fs) in 21,4% ($P<0,05$), respectively, versus the indicators Fs in patients with CHF FC I. In patients with CHF FC III the disease progression was followed by the reliable decrease: EF in 30,3% ($P<0,001$) and Fs in 31,5% ($P<0,01$), respectively, versus the indicators of the patients with CHF FC I.

Indicators of EDD and EDV in patients with CHF FC II were some higher than the indicators in patients with CHF FC I. The indicators of ESV in patients with CHF FC II were authentically higher at 30,1% ($P<0,001$) and 16,2% ESD ($P<0,01$), respectively, versus the ESV and ESD indicators in patients with CHF FC I. The increase in LV EDV in patient at the initial stage of remodeling is the early compensatory response to reduction of contractility and kinetics of walls and allows supporting the stroke volume (SV) and LV EF. The indicators of the meridional systolic myocardial stress (MS) characterizing the load on LV walls in patients with CHF FC II were higher at 23,5% ($P<0,01$), probably, due to increase of intra-myocardial tension of LV. Despite the increase in intra-myocardial tension of ventricles, dilatation of chambers of heart the stroke volume indexes remained within normal range, there was only a trend towards a decrease in the stroke volume.

In patients with CHF FC III was followed by more expressed LV restructuring, the degree of LV dilatation increased and it characterized by the increase: EDD in 15,2% ($P<0,001$) versus the indicators of patients with CHF FC I and EDV in 31,4% ($P<0,001$). Indicators of ESD were authentically higher at patients with CHF FC III at 35,4% ($P<0,001$), respectively versus the indicators of patients with CHF FC I, and the indicators of ESV increased more in 67,1% versus the indicators of patients with CHF FC I. Increase of intra-myocardial pressure in the end and systolic period was characterized by reliable increase of MS—in 35,4% ($P<0,02$) versus the indicators of patients with CHF FC I.

Study of structural and geometrical parameters of the left ventricle in investigated patients depending on the indicators of EV revealed that in patients with $EF>50\%$ reliable changes of indicators of geometrical parameters were not marked, whereas in patients with $EF<50\%$ the reliable decrease SV, increase LV EDV and ESV, which confirmed the marked lesions of LV myocardial contractility.

Analysis of diastolic function showed reliable decrease in the maximum rate of early left ventricular filling (E) versus the control ($P<0,05$), increase of the maximum rate of late atrial filling (A) ($P<0,05$), decrease the ratio of E/A ($P<0,01$), the degree of reduction of indicators E и E/A, which were more pronounced in

patients with CHF FC III ($P < 0,05$, $P < 0,01$).

Analysis of the results revealed the CHF patients types of diastolic dysfunction were distributed as follows: in patients with disturbances of relaxation (I type) were determined in 38 patients (47,5% I type) of cases, pseudonormalization – in 19 patients (24,3% II type), restrictive changes (III type) - in 14 patients (18% of cases, normal diastolic function were identified in 9 patients (11,5%) of patients. Patients with CHF were divided into 2 groups to assess the interrelation of violations of left ventricular function and left ventricular diastolic dysfunction: group with preserved left ventricular systolic function ($EF \geq 50\%$) and a group with a reduced $EF < 40\%$. Analysis of the prevalence of left ventricular diastolic dysfunction of various types showed that severe violations of left ventricular diastolic function - pseudonormal and restrictive types - were significantly more frequent in patients with reduced left ventricular systolic function.

Conclusion. Analysis of the prevalence of left ventricular diastolic dysfunction of various types showed that severe violations of left ventricular diastolic function - pseudonormal and restrictive type - were significantly more frequent in patients with reduced left ventricular systolic function. Thus, in patients with CHF left ventricular remodeling leads not only to re-structure of LV which accompanied by dilatation and thinning of the cavity, reducing myocardial contractility, but also to changes of geometric shapes of left ventricular and to diastolic dysfunction of LV with domination of the disturbance of relaxation.

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强直性脊柱炎患者免疫炎症标志物的研究

**THE STUDY OF IMMUNOINFLAMMATORY MARKERS IN PATIENTS
WITH ANKYLOSING SPONDYLITIS**

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本研究的目的是研究强直性脊柱炎（AS）患者的免疫炎症标志物。检查了145名AS患者。纳入研究患者的标准是：患者的知情同意；患者年龄从18岁到70岁不等。AS患者的促炎和抗炎细胞因子水平更充分地反映了免疫过程的活动程度和疾病的临床表现。因此，细胞因子是AS中炎症过程的许多遗传连锁相互作用的标志物。

关键词：强直性脊柱炎，免疫炎症标志物，细胞因子

Annotation. *The purpose of this study was to study immunoinflammatory markers in patients with ankylosing spondylitis (AS). 145 patients with AS were examined. The criteria for inclusion in the study patients were: informed consent of the patient; the age of patients from 18 to 70 years. The level of pro- and anti-inflammatory cytokines in patients with AS more adequately reflects the degree of activity of the immunological process and the clinical manifestations of disease. Consequently, cytokines are markers of the interaction of many pathogenetic links of the inflammatory process in AS.*

Keywords: *ankylosing spondylitis, immunoinflammatory markers, cytokines*

Seronegative spondyloarthritis is a group of interrelated, clinically intersecting chronic inflammatory rheumatic diseases, which includes idiopathic ankylosing spondylitis (AS) (the most common form), reactive arthritis, psoriatic arthritis (PA), and enteropathic arthritis (EA) associated with inflammatory bowel diseases. The clinical spectrum of diseases was much wider than initially realized, therefore, some less definite forms were classified as undifferentiated spondyloarthropathies [1-3]. This group of diseases is seronegative, i.e. patients in the blood lack antinuclear antibodies and rheumatoid factor. The high prevalence of SSA (0.6-1.9%), the predominant development of diseases in persons of young able-bodied age and the chronic progressive course, often leading to early disability of

patients, determine the urgency of studying this group of diseases [4-6].

The aim of this study was to study immunoinflammatory markers in patients with ankylosing spondyloarthritis (AS).

Material and methods. 145 patients with AS were examined. The criteria for inclusion in the study patients were: informed consent of the patient; age of patients from 18 to 70 years; the intensity of night pain in the spine according to VAS ≥ 40 mm (100-mm visual analogue scale) or severe pain in the peripheral joints (≥ 40 mm for 100 mm VAS) and the presence of at least one inflamed joint; presence of primary sacroiliitis, psoriasis, uveitis at the time of examination or in anamnesis, dactylitis. Among the examined patients, axial spondyloarthritis (axSpA) was diagnosed in 60 patients, peripheral spondylitis (peripSpA) in 85 patients. The mean age was 42 ± 8.2 years. The diagnosis of axSpA and peripSpA was verified by ASAS diagnostic criteria for axial and peripheral spondylitis (2012).

The level of cytokines IL-1, IL-4, IL-6, IL-10 and TNF- α was determined in the blood of patients by means of enzyme immunoassay on the enzyme immunoassay analyzer Humareader Single. This method is based on visualization of insoluble products of the enzymatic reaction, absorbing light with a known wavelength, in amounts equivalent to the concentration of the substance being determined.

We assessed the burden of family history of SpA, the presence of previous intestinal and genito-urinary infections. The cases of late diagnosis (> 10 years) decreased 4 times (from 69.1% to 17.3%), and the number of patients diagnosed in the first 5 years increased 6-fold (from 6.2% to 37.5%).

Direct positive correlation links were established: $r = \pm 0.53$, $p < 0.05$ between the level of fibrinogen and TNF- α ; $r = \pm 0.40$, $p < 0.05$ between the level of fibrinogen and IL-1 in the blood plasma. At the heart of the pathogenesis of AS lies two closely related processes: antigen-specific (autoimmune) activation of CD4 + T-lymphocytes, characterized by excessive synthesis of interleukin IL-2, interferon- γ and IL-17 and disbalance between hyperproduction of proinflammatory cytokines, mainly macrocygous, such as TNF- α , IL-1, IL-6, IL-8 and anti-inflammatory cytokines IL-4, IL-10, with the production of the first nad second. Taking into account the role of cytokines in the development and progression of autoimmune inflammation, we determined the levels of some cytokines (IL-1, IL-4, IL-6, IL-10, TNF- α) in the blood serum of PeA patients.

The concentrations of IL-1, IL-4, IL-6, IL-10 and TNF- α in the control group were 3.9 ± 0.62 ; 8.4 ± 1.91 pg / ml; 4.1 ± 0.58 pg / ml; 1.41 ± 0.87 pg / ml and 4.9 ± 0.57 , respectively. As can be seen from the table, in patients with AS, an increase in IL-1 of 1.6 pas ($p < 0.05$) is noted at the first degree of activity and 3.6 ras ($p < 0.05$) with the second degree of activity, respectively.

The content of IL-6 increased in 9.4 and 10.4 pas ($p < 0.05$) in both groups, respectively, with TNF- α of 6.4 ras ($p < 0.05$) in patients with a low degree of

arthritis activity and in 52.7 pas ($p < 0.05$) in the group with moderate activity in comparison with the control group. Moreover, the content of IL-6, and especially TNF- α in patients with a higher activity of disease was significantly higher.

A significant increase in the content of IL-10 in 2.5 times in the group with the first degree of activity of the inflammatory process and 6.2 in the pas ($p < 0.05$) in patients with a second degree of activity in comparison with the control was revealed.

In patients with minimal and moderate activity of the inflammatory process, a significant increase in the content of IL-4 in 2 times ($p < 0.05$) was observed.

The revealed significant differences in the content of IL-10 between groups of patients with I and II degrees of activity of disease seem to reflect the depletion of such compensatory homeostatic mechanisms that mediate regulatory anti-inflammatory potential, as the disease progresses.

Thus, the level of pro- and anti-inflammatory cytokines in AS patients more adequately reflects the degree of activity of the immunological process and the clinical manifestations of disease. Consequently, the cytokine network is the original coordinator of the interaction of many pathogenetic links in the inflammatory process with AS.

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富含维生素的夸克生产技术研究
**RESEARCH ON THE PRODUCTION TECHNOLOGY OF VITAMIN-
ENRICHED QUARK**

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Development of general food market in the Republic of Kazakhstan is directly related to improving the quality of produced products and improving the production technology of new products with high nutritional and biological value. The approach of new dairy products development has changed due to the increase of social consuming capacity.

Currently, the main goal of the food science is to effectively alter the chemical composition of food products to reduce their calorific value. In dairy industry, this issue was solved by enriching the taste of milk dairy products as a result of the reduction of fat and the addition of various additives. These issues were investigated by U.Sh. Shomanov, M.K. Alimardanova, L.A. Ostroumov, G.Sh. Sharmanov, G.Sh. Sharmanov, M.H. Shigayeva, A.V. Vitavskaya, M.M. Musylmanova, N.B. Gavrilova, Z.S. Seitov, F.T. Dikhanbayeva and other scientists in their work. Human nutrition is one of the most important factors determining its health. Rational, healthy nutrition helps preventing diseases, prolonging human life and protecting the body from the adverse effects of the environment.

Nowadays, compound milk-vegetable food products, enriched with vegetable proteins, food fibers, pentinic substances, vitamins A, B1, B2, D, E, and lactic microflora are produced. Production of combined milk products is aimed on accurate definition of products' amino acids, carbohydrates, minerals, vitamins and microelements.

Public authorities pay more attention to the increase of the vitamin content of food products and the increase in their nutrition structure. Food products, as well as milk and dairy products, not only provide the physiological needs of a person, but also protect the human body against adverse environmental conditions. State authorities have identified the basic principle of healthy nutrition: human health is the most important thing for the country.

Traditional technology uses quark as main raw material for quark production. However, the result of analysis of scientific, technical and patent literature reflects

the effectiveness of the use of goat milk in dairy products production in the near and far abroad. It is proven by its high nutritional and biological value. Therefore, organoleptic parameters, physicochemical composition and properties of goat milk and their biological value were studied comparatively with cow milk during the study (Table 1).

In comparative study of cow and goat milk, we found that the physical parameters are: titration acidity 18 OT, freezing temperature - 0.54 0C, boiling point 850C, active acidity - high in cow's milk, and goat milk density - 1031 g / m3.

In addition, the chemical composition of milk was investigated. Common milk protein is called casein protein. But the main ingredient of milk fat is a complex mixture of glycerides or triglycerides. Milk is an unstable compound that changes under high temperatures, light, enzymes, acids, alkaline. Carbohydrates in milk are observed in the form of lactose. Lactose - hexose - disaccharide consisting of galactose and glucose. It is known that milk sugar has two forms, known as α and β , which are constantly exchanged together.

According to the data in Table 1, goat milk is closely related to cow's milk, but not higher than cow's milk in dry milk (12.5 and 13.3%), protein (3.4 and 3.6%), (3.5 and 3.6%) and lactose (4.8 and 4.9%).

One of the most important indicators that characterizes the raw material used in the quark production is protein. And protein biology depends on the amount of protein contained in its substitute amino acids.

Table 1. Comparative physicochemical composition of goat and cow milk

Indicators	Cow milk	Goat milk
	Weight fraction, %	
Dry ingredients, including	12,5 ± 0,5	13,3 ± 0,5
Moisture	87,5 ± 0,5	86,5 ± 0,5
May	3,6 ± 0,1	4,6 ± 0,1
Protein	3,4 ± 0,15	3,6 ± 0,15
Lactose	4,8 ± 0,2	4,9 ± 0,2
Mineral substances	0,7 ± 0,02	0,2 ± 0,02
Density, kg / m3	1029,0 ± 0,0005	1031,5 ± 0,0005
Acidity, ° F	18 ± 0,1	16 ± 0,1

The amount of protein in goat's milk shown in the table was 3.6 g, casein - 2.8 g, lactose - 4.9 g and oil - 4.6 g. In goat's milk compared to cow's milk, protein, casein, fat, and dry matter are high. The casein is about 80% of the total protein in cow's milk and 70% of goat's milk.

Nowadays, as a result of the conflict of science and technology, there are new qualitative new methods that are based on the use of non-traditional raw materials to increase the biological and nutritional value of products. In this regard, the ex-

perts are facing new challenges. The main problem is to find the source of cheap raw materials and to use technology for the production of high-lactic acid products with high duration of storage, biological value and quality characteristics. One of the components that constitutes the basis of human life is vitamins and minerals. Vitamins and minerals are rich in plants. Plant raw materials used for dairy product enrichment are rich in pectinic substances and food fibers. Pectinic substances - enhance the viscosity of the finished product by bringing together the high molecular weight polymers. As a result, a space grid, which completely covers the volume of the liquid product and is used as a frame, is formed.

Berries enriched pastes - have nutritionary and medicinal properties. They restore stomach, liver and metabolism. Therefore, paste products are widely used by children and gastrointestinal tract and heart disease patients.

Preparation of berry puree. The berries are washed, unwanted, damaged roots are selected. Wash it for the second time and blanch it until ready for 20 minutes. It cools to 20 ° C and crushing in the kitchen combine and then traced to the smallest dispersed berry mass on the recirculation machine.

Organoleptic, physical and chemical parameters of experimental samples were studied for the study of composition of the new product. This pasta-like milk is essential for the production of protein products. In addition, the berry filler adds nutrients to non-dairy products and changes their nutritional value by changing the paste composition. Such harmony can be favorable and provides nutritionary qualities for pastry products. The modern person is characterized by a high protein content and low calorie intake. Prerequisites for growing protein demand are currently being met by these requirements. The composition of the milk powder paste added with berg supplemented by organoleptic parameters is shown in Table 2.

Table 2. Organoleptic indicators of quark with berg supplement

Indicator name	Description
Appearance	The shape is well-preserved, glossy mass
Consistency	Homogeneous, plastic, paste
Color	The filler is uniform
Taste and smell	Clean, lactic

The research showed the following physicochemical parameters of quark made of goat milk:

Table 3. Physical and chemical parameters of quark

№	Indicators	Value
1	Fat content,%	5,48
2	Acidity, 0 t	203,38
3	Humidity,%	70,63

The paste-like product was obtained as a result of the addition of bilberry as a plant additive to the obtained quark, the results are shown in the table:

Table 4. Physical and chemical parameters of quark enriched with 7% bilberry

№	Indicators	Value
1	Fat content, %	7,83
2	Acidity, 0 t	162,25
3	Humidity, %	71,95

Table 5. Physical and chemical parameters of finished product

№	Indicators names	Regulatory document	Actual results	OD on research methods
1	Microbiological indices: Milk acids microorganisms, CFU / g (cm ³), not more than	1*10 ⁷	2*10 ⁶	GOST 10444.11-89
2	Vitamins, mg / 100 g:A		0,046	GOST 54635-2011
3	C		6,3	GOST 24556-89

When designing a new product, it is necessary to take into account the need for all the necessary ingredients to provide the human body with vitality. The nutritional value is higher compared to those of conventional milk-protein products. Increasing the nutritional value of pasta-like products with vegetable slices is related to the introduction of biologically active non-vegetable products such as niacin, pantothenic acid, betaine, β-carotene, pectinic acid, ballast substances and other non-traditional dairy products.

Therefore it is important to consider the chemical composition of paste-like ingredients. Its chemical and nutritional value has been determined in the finished product's chemical composition. The results are shown in Table 5.

Table 6. Food and energy value of the product

Chemical composition	Quark with bilberry (paste-like product)
Fat, %	7,83
Protein, %	14,52
Carbohydrates, %	4,05
Starch	0,06
Energy value, kcal	144,75

The energy value was 144,75 kcal.

Human health is dependent on balanced nutrition. It is vitamins that provide nutrition and nutrition for our body with energy and textile material. Vitamins are a substitute for such food.

Vitamins provide the correct flow of biochemical and physiological processes in the body and affect the metabolism.

The severe deficiency of certain vitamins in the nutrition may sometimes lead to serious illnesses.

The organism does not demand much vitamins. The human organism does not synthesize or synthesized in insufficient quantities, that's why the vitamins are received ready in the form of food. The result of the research showed that the amount of vitamin A in the tested quark was equal to 0.04%.

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在哈萨克斯坦东南部的条件下Alatau品种的新型乳制品“Akryrys”的外观和宪法规范

EXTERIOR AND CONSTITUTIONAL SPECIFICATIONS OF NEW DAIRY TYPE OF "AKYRYS" OF THE ALATAU BREED IN THE CONDITIONS OF THE SOUTHEAST OF KAZAKHSTAN

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The international fiscal experts argue that the global food-related situation will be a major problem for the humanity in the near future, so it will be a priority for any country to develop the agro-industrial complex.

As far as global data is concerned, it is clear that the expertise of the experts is correct. Therefore, the development of agricultural infrastructure is a top priority for any country. At the same time, one of the most important directions of development for Kazakhstan is the capacity building of the agro-industrial complex. Head of State At the President's instruction, it was aimed at developing the country's In this regard, the Head of the State is constantly striving to pay special attention to the increase of the traditional Kazakh cattle breeding capacity.

Large black sheep plays an important role in the livestock economy of our country. Almost half of the funds allocated to the national economy will be provided by cattle breeding. Meat, milk and cereal products (fat, worm, cheese, sour milk products) and raw materials for light industry production are obtained.

Methods and forms of research It is well-known that the milk yields, the length and lifetime of the breed depend on their productivity. Therefore, the study of livestock productivity takes a great place in the theoretical and practical significance of farms, as well as in practice, primarily by the performance of the relevant cows. According to the "Methodology for Research and Experiments in Dairy Farming," 2 groups of beekeeping cows were grouped, taking into consideration their lifetime weight and age, the period of calving and origin, living conditions. The first group was the firstborn cows, and the second group was third and older cows. External and constitutional peculiarities of cows have been determined by quantitative assessment and obtaining basic criteria. Body

indices were calculated to be consistent with the typical characteristics of the body tissue. Morphofunctional features of cows' lines were carried out in accordance with the guidelines. The link between the body fat and the yield of milk is of great importance and is determined by a complex of herbivores in this group. For this reason, many scientists believe that it is necessary to increase the proportion of sorting and evaluation by typical animal characteristics. The constitution and exterior of dairy cows, especially the interest in quality of the network, are due to the widespread implementation of automated tools.

The results of the research Since milk productivity is associated with external exterior, it is important to focus on it. Scientists who have studied large black exteriors Pridorgogin, EA Bogdanov, PN Kuleshov, EF Lexington, IL Ivanov refers to it.

The constitution and exterior of livestock determine the clarity of the seeds, the conformity and harmonious development of the product depending on the direction of the product. Many scientists have suggested that the exterior and age features of cows can determine the milk yield. For this reason, the main criteria for cows of different ages were obtained (Table 1).

Table 1. Main dimensions of the new cereal beet brown type

Indicators	Beefcows		Couples	
	M±m	C, %	M±m	C, %
The height of the bride	130 ± 0,79	2,4	136 ± 0,44	1,2
Height of the bucket	133 ± 0,72	2,2	138 ± 0,60	1,7
Chest depth	67 ± 0,35	2,1	69 ± 0,33	1,82
Chest width	44 ± 0,6	5,4	45 ± 0,32	2,66
Width in a macro	46 ± 0,52	4,5	48 ± 0,37	2,93
The diagonal length of the	154 ± 0,75	1,9	164 ± 0,51	1,2
Chest volume	186 ± 0,59	1,27	191 ± 0,61	1,2
Bone size	18 ± 1,12	1,5	19 ± 0,34	6,4

According to the results of the table, the difference between the diameter and the height of the body was 10 cm and 6 cm respectively. These rates are legitimate due to the age characteristics of cows.

AK Samykbaev's research on algae cats revealed a large difference in comparison with our evidence. To ensure the proportionate development of cows groups surveyed, the exterior evaluation was complemented by physical fitness indexes (Table 2).

Table 2. Indexes of cats' body weight

Bodyindexindices	Beefcows	Cows with 3 or more calves
chronic	118	121
longlastingness	49	49
increase	102	102
breasts	66	66
bone	14,0	14,0
volumetricity	143	140

As a result of Table 2, the bulk index will start to decline due to the age of the new type of cats. This difference is due to the young age and low content of cows. Changes observed in bone and puerperium indices were not detected.

The link between the body fat and the yield of milk is of great importance and is determined by a complex of herbivores in this group. For this reason, many scientists believe that it is necessary to increase the proportion of sorting and evaluation by typical animal characteristics. The constitution and exterior of dairy cows, especially the interest in quality of the network, are due to the widespread implementation of automated tools. As a result of the morphophysical features of the studied network of large groups, they were found to be suitable for machine milking.

The main mass of cows was tubular, round and round shaped. The main dimensions of cows' networks are shown in Table 3.

Table 3. Morphofunctional indicators of the new "Finish" brown milk type

Dimensions, cm	Beefcows		Cows with 3 or more calves	
	M±m	C _v , %	M±m	C _v , %
network	92 ± 0,76	1,5	103 ± 0,60	2,4
line length	29,5 ± 0,4	3,3	34 ± 0,60	5,0
line width	28 ± 0,23	2,85	31 ± 0,97	11,0
length of the front breasts	6,7 ± 0,12	5,3	7,0 ± 0,11	4,5
the length of the back lugs	6,5 ± 0,12	5,6	7,1 ± 0,12	4,92
distance from the bottom to the floor	64,7 ± 0,55	2,56	60,4 ± 0,9	4,6
breast diameter:				
front	2,5 ± 0,02	7,8	2,7 ± 0,05	3,66
back	2,5 0,07	7,4	2,8 0,03	3,63

As the table shows, as the age of the cows in the larger group of colonies increases, the distance from the bottom to the floor decreases from 64.7 cm to 60.4 cm respectively. An important indicator of the evaluation of the functional properties of the network is the intensity of the milk, which is the milk size per

minute. As a result of evaluation of the functional properties of the network in our research, the infection in bees was 1.41 kg / min.

Finally, the analysis of the physical parameters of the cerebral palsy corresponds to the requirements of the cow's new "End" brown milk standard for milk cows. The milk yield intensity index improved by a new line of functional properties of the chains.

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在“r-kurta”农场繁殖的哈萨克小型品种的绵羊的肉类生产力
**MEAT PRODUCTIVITY OF YOUNG SHEEP OF KAZAKH FINE-
FLEECE BREEDS BREEDING ON "R-KURTA" FARM**

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Sheep farming has traditionally occupied a key position in animal husbandry of Kazakhstan, which has undergone significant changes for the last 10-15 years [1] the main regionalized sheep breeds in the country were mainly focused on the production of wool which is basically based the industry [2] is currently prevailing market price of 1 kg of wool and mutton expressed by the ratio 1: 5 wool was unclaimed and discounted products on the market, because the cost does not pay funds spent on it. For out of this situation in the coming years, the economy will be forced to carry out an experiment to crossing the fine-fleeced sheep with coarse wool ewes and meat greasy rocks in order to increase meat productivity. This trend in the near future could lead to the loss of the gene pool of fine-wool sheep, which was created over the years. Around the world, particularly in Australia, sheep farmers faced with a decrease in demand for wool, increasingly focused on the production of meat. One of the ways out of the crisis, the industry and the preservation of fine-fleeced sheep in the south-east of Kazakhstan is to use the genetic potential of the Kazakh fine-fleeced sheep breeds differ precocity [3]. [4] With good feeding and Kazakh fine-fleeced sheep as meat products and quality of the meat good as fat-tailed meat - greasy sheep. Productive qualities of sheep are formed on the basis of heredity under the influence of the environment in the process of growth and personal development - ontogeny. At the animal's organism has undergoes profound changes, manifested in increased body weight, qualitative complication of the structure and functions. Also, change the direction and intensity of metabolism, morphology and chemical composition of the tissue. The knowledge and skillful use of the ratio of the growth and development processes is of great scientific and practical importance. [5]. [6] in growing animals for meat is an increase in body weight during fattening, it is happening mainly due to deposits of fat with minimal increase in muscle mass - the most desirable component of meat products. The aim of this work is to study the growth characteristics of

rams, rams 2,4,6,8,10,12 month and different yarochek genotypes under similar conditions and feeding from birth to young in the implementation of the Kazakh fine-fleeced sheep meat breed.

Materials and methods of the experimental studies carried out in the "R-Kurta" breeding farm, Zhambyl district of Almaty region. Exploration were conducted under the same conditions and feeding under the zoo technical standards.

The results of exploration Sheep occupies an important place in the structure of the economy of the world community and Kazakhstan. As the main branch of agricultural production, it provides the population with high-value food products.

Intensive breeding and fattening are a common method used to increase the precocity and meat efficiency of young growth of any kind of farm animals [7], the production of food resources have always been and will be the first condition of human life and activities in all socio-economic systems in all forms of ownership and management.

The data and analysis indicate intergroup differences in body weight in newborns have lambs for all periods (Table 1). All along of advantage of sexual dimorphism in size of studies indicator in all cases remain at the side of the rams. Suffice it to say that their superiority was 0.1 kg live weight of Mutton 1 group (2.7%, $P > 0.05$), 2-group- 0.1 kg (2.8%, $P > 0.05$), 3-band - 0.1-0.2 kg (3.0-6.1%, $P > 0.05$). Established and interbreed differences in a real weight of calves at birth. Individual pots 1 group were superior to peer-group 2 largest real weight by 0.1 kg (2.7%, $P > 0.05$), and 3-band analogue - 0.3-0.4 kg (8.6 -11.8%, $P < 0.05$). Individual pots of 3-group peers yielded 2 group at 0.2-0.3 kg (5,7-8,8%, $P < 0.05$). A similar pattern and young female sheep was observed. In later age periods due to the different dynamics of the increase of the growth rate of young animals of different genotype, sex and physiological state of the observed increase in intergroup differences in body weight. Thus, 2-group- January 1 group rams advantage 2,4,6,8 month of Mutton on live weight at 2 months of age was 1.8 kg ($P < 0.05$), 6 kg (12.8%, $P < 0.05$), 3-group- 1.6 kg (13.0%, $P < 0.05$).

At the same time periods yielded bright 2,4,6,8 rams largest studied index of 0.6, respectively (4.0%, $P > 0.05$) 0.9 (6.4%, $p > 0.05$) and 0.5 kg (3.6%, $P > 0.05$). The difference in body weight between the youngsters I and II groups of rocks caused by castration of animals of group II, which was for them a potent stressor. Within 10-12 days after castration they moved less and ate bad food, which has a negative impact on the rate of growth during this period.

Analysis of a real weight of calves in the 4 months of age shows a significant manifestation of sexual dimorphism: rams all breeds superior young female sheep the same genotype.

Table 1. Dynamics of body weight rams, kg

Age, month	Groups					
	I		II		III	
	Significative					
	M±m	Cv%	M±m	Cv%	M±m	Cv%
Experienced group of Kazakh fine-fleeced sheep breeds						
Newborn	3,8±0,04	4,32	3,8±0,02	2,41	3,7±0,03	4,11
2	15,5±0,14	3,77	14,9±0,10	3,02	13,1±0,12	3,88
4	26,8±0,24	3,73	24,7±0,23	4,14	21,3±0,17	3,21
6	35,3±0,48	5,14	32,3±0,35	4,45	27,6±0,27	3,71
8	41,5±0,54	4,83	37,9±0,42	4,57	32,4±0,35	4,01
10	46,2±0,62	4,36	42,1±0,51	4,54	36,0±0,60	5,53
12	49,8±0,70	4,65	45,1±0,61	5,07	38,8±0,65	5,57
Control group of Kazakh fine- fleeced sheep breeds						
Newborn	3,7±0,04	4,48	3,7±0,03	3,18	3,6±0,02	3,09
2	5,0±0,10	2,70	14,1±0,08	2,62	12,5±0,09	3,04
4	25,1±0,15	2,47	23,2±0,17	3,32	20,0±0,23	4,77
6	34,9±0,20	2,16	31,2±0,21	2,80	26,9±0,25	3,54
8	40,8±0,27	2,51	36,7±0,29	3,25	31,9±0,32	3,72
10	44,6±0,29	2,12	40,0±0,33	3,09	35,3±0,35	3,33
12	48,8±0,33	2,26	44,8±0,32	2,66	37,4±0,40	3,52

Analyzing the interbreed differences in body weight, it should be noted the dominant position of young 1st group, which exceeded 2nd -peer group at this age at 1.3-1.7 kg (6.5~6.8%, P <0.05) and unique 3rd -group- in the 2.1-2.7 kg (10,9-12,3%, P <0.05). In turn, young 2-peer group exceeded 3 largest groups studied indicator at 0.7-1.2 kg (2,9-6,2%, P > 0.05). Suffice it to say that in the age one advantage over the young rams young female sheep 2,4,6,8mesyatsev and Mutton in live weight for 1st -group was 4.7 (10.4%, P <0.01) and 11.0 kg (28 , 3%, P <0.001), and the rams 2,4,6,8 months young female sheeps- over 6.3 kg (16.2%, P <0.01), 2nd -group - respectively 4.0 (8.9% , P <0.01), 11.4 (30.5%, P <0.001) and 7.4 kg (19.8%, P <0.001), 3rd - group - 4.9 (12.2% , P <0.001), 11.3 (33.4%, P <0.001) and 6.4 kg (18.9%, P <0.01). Consequently, the young hybrids observed increased expression of sexual dimorphism. At the same time, the live weight is noticeably inferior to other peer's genotypes. Young 1st group 3rd exceeded peer group index largest studied in 8 months of age at 2.4-2.8 kg (6,1-9,4% , P <0.01) at 12 months - na4,7-5,0 kg (10,4-14,8%, P <0.001), and young benefit of 2nd group was 1.7-2, respectively, 3 (3,8-7,2%, P <0.01), and 3,6-4,6 kg (10,7-11,4%, P <0.01).

In turn, the animals of 2nd group yielded 1st-group peers on live weight at the age of 8 months. at 0.7-1.5 kg (1,7-4,7%, P > 0.05) and 12-months- at 0.3-1.4 kg (0,7-3,7% , P > 0.05). Intergroup and interbreed differences in body weight due to the unequal growth of the intensity of the physiological state and the genotype of

young animals of different sexes. At the same time a leading position in the value of the studies index took rams (Table. 2). So, the 1st -group their advantage over young female sheep 2,4,6,8 months and Mutton with her mother on the growth rate reached 18-46 g (10,3- 31.5%, $P < 0.05$), from 4 to 8 months to 11-29 g (10,0-31,5%, $P < 0.05$), with 8 to 10 months to 8-18 g (11,4-30,0%, $P < 0.05$), with 10 to 12 months to 10-14 g (20,0-30,0%, $P < 0.05$), and for the entire period growing- 13-30 g (11,4-30,9%, $P < 0.05$) . On the 2nd -group difference in average daily weight gain in favor of the rams were respectively 17-42 (10,5-30,6% , $P < 0.05$), 18-30 (15,9-29,7%, $P < 0.05$), 9.6 g (10,0-15,8%, $P < 0.05$). And in the period from 8 to 10 months young female sheep inferior Mutton on the growth rate of 3 g (5.3%, $P > 0.05$), but superior rams in the period from 10 to 12 months. 9 g (12.7%, $P > 0.05$), which is probably a consequence of compensatory growth in

Table 2. Dynamics of average daily weight gain of young sheep, g

Age, months	Groups					
	I		II		III	
	Significative					
	M±m	Cv%	M±m	Cv%	M±m	Cv%
Experienced group of Kazakh fine-fleeced sheep breeds						
0-4	192±1,90	4,09	174±1,94	5,06	146±1,56	4,42
4-8	121±4,57	3,94	110±1,87	7,02	92±1,93	7,86
8-10	78±1,91	8,86	70±2,67	13,37	60±5,24	28,24
10-12	60±2,54	4,61	50±2,13	16,03	46±2,59	18,99
0-12	127±1,95	5,10	114±1,72	3,63	97±1,76	6,01
Control group of Kazakh fine- fleeced sheep breeds						
0-4	179±1,28	2,94	162±1,52	4,21	137±1,96	5,89
4-8	131±2,84	8,12	113±3,40	12,39	101±3,28	12,17
8-10	66±4,05	20,30	57±10,95	63,43	60±4,91	27,32
10-12	71±3,95	18,46	80±2,85	11,82	35±2,38	22,71
0-12	126±0,92	2,44	114±1,22	3,54	94±1,06	3,72

Due to low levels in the previous period. In general castrated young lamb 2nd group, surpassing young female sheep on average daily weight gain during the period growing by 20 g (21.2%, $P > 0.05$), yielded 12 g (10.5%, $P < 0.05$) rams the same genotype. Between groups differences in average daily gain of body weight, both for the individual age periods, and for all the time growing 3rd groups are similar to those of the 1st group. Suffice it to note that the suckling period rams castrated young lamb surpassed by the growth rate of 19 g (12.2%, $P < 0.05$), young female sheep- 42 g (31.8%, $P < 0.05$). In weaned after a period of 4 to 8 months. rams advantage was respectively 14 (12.8%, $P > 0.05$) and 38 g (44.7%,

$P < 0.05$), from 8 to 10 months to 13 (32.5%, $P > 0.05$) and 20 g (60.1%, $P < 0.05$), with 10 to 12 months to 6 (13.6%, $P < 0.05$) and 16 g (47.0%, $P < 0.05$), and for the entire period growing 14 (13.7%, $P > 0.05$) and 31 g (36.5%, $P < 0.05$). What regard to age dynamics of the studies index, the general law a decrease in growth rate with age. An exception is the slight increase in the average daily weight gain in the final period of growth from 10 to 12 months in rams and valushkov2 groups and rams 2,4,6,8,10 months and young female sheep 3 groups. At the same time, this increase was not statistically significant and insignificant.

The development of animal feed recipes - concentrates with different ratios of decaying protein and nutritious feeding of farm animals, including sheep, is closely linked with the production of animal feed. So far, a system of rationing of protein nutrition of ruminants, at the base, which is moist and undigested protein, under which it is proposed that the digestible protein is completely absorbed by the animal. However, as stated in the study this situation is true only for monogastric animals. Therefore, determining the level of the decaying form of the protein in the feed, the search for the optimal level of decaying protein in diets and on this basis, the establishment of standards of protein feeding of sheep is very promising.

In this regard, a crucial role is played by mixed fodder - concentrates, which may help regulate the level of decaying protein in the diet. Therefore, based on the level of decaying protein feed a part of the winter diet of rams, we have developed and tested recipes of mixed fodders - concentrates in relation to hay Silos concentrate feeding type. (Table 3).

Table 3. Recipes of animal feed - rams concentrates (% by weight)

Component	Recipe	
	№ 1	№ 2
1	2	3
Wheat bran	25,0	25,0
Corn bran	44,0	56,5
Soybean meal	25,0	12,5
Molasses (liquor)	5,0	5,0
Premix	1,0	1,0
In total	100	100
In 1 kg animal feed contained:		
Feed units	1,15	1,14
Exchanged energy, mJ	11,0	11,5
Dry matter, g	862,5	835,0
Crude protein, g	198,9	154,3
Including splits, g	116,6	84,8
No splits, g	82,3	69,5
Undigested protein, g	160,7	118,2

Crude fat, g	37,9	38,7
Crude fiber, g	56,5	52,5
Nitrogen-freeextractives,g	535,7	430
Starch, g	281,5	335
Sugar, g	112,7	110,8
Calcium, g	3,55	3,27
Phosphorus, g	6,34	6,16
Magnesium, g	2,55	2,29
Sulfur, g	2,16	2,99
Iron, mg	243	254
Copper, mg	8,49	6,76
Manganese, mg	41,44	37,3
Cobalt, mg	од	0,09
Iodine, mg	0,63	0,58

As can be seen from Table 3, the basic structure and nutritional value of animal feed recipes both was nearly identical, the difference was in the ratio of the individual components contributing to the creation of different levels of protein in the diet to disintegrate; Recipe №1 - contained 58,6%, №2- 54,9% protein splits.

The best productivity rates among experimental groups were allowed II experimental group receiving compound feed №2. The use of animal feed made up of components with low natural protein in the rumen disintegrating contributed more complete absorption of the nutrient feed substances.

Thus, the analysis of dynamics of indicators characterizing the weight growth, leads to the conclusion that certain differences caused by genotype animals, sex and physiological condition.

This advantage in all cases on the side of rams, Mutton characterized by minimal rates. However, the data indicate a fairly high level of efficiency of young growth of all genotypes.

Implementation of research results in practice, provide diet usefulness and thus significantly increase animal productivity, improve the quality of their products and reduce the cost of feed per unit of production and to increase the production of high quality lamb and mutton is necessary to use the genetic potential of sheep more efficiently Kazakh fine-fleeced breeds and implement meat youngsters aged 4-8 months.

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哈萨克羊毛品种的生产和繁殖品质
**PRODUCTIVE AND REPRODUCTIVE QUALITIES OF KAZAKH
FINE-FLEECED SHEEP BREEDS**

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In Kazakhstan, the most common breed is Kazakh fine-fleece, which is bred in the semi-desert and desert areas of the south-east of the country. However, the bulk of this breed of sheep in the level of productivity and, especially in the reproductive capacity does not meet the relevant requirements of the breed standard. Therefore, increasing the fertility and yield business lambs are urgent problems in fine-wool sheep. Therefore, the task of scientists and agricultural experts are to develop effective methods to increase reproductive ability of fine-wool sheep and lambs to save one year of age. Ways of increasing the fertility of sheep are selected and the selection of multiple pairs aimed acceleration pace of selection for the mentioned type of product [1]. The imbalance or dysfunction of any of these inter-related mechanisms causes a disturbance of the whole system. Typically, secretion of thyroid hormones is carried out on the basis of feedback, in which the increase in the concentration of subordinate hormone leads to a decrease in blood concentrations of the hormone regulated [1-4]. The reason for the low fertility of animals is insufficient or low levels of gonadotropin (LH, FSH) and estrogen hormones (estradiol-17 β , progesterone) in the preovulatory period and on the day of estrus, as well as violation of the interaction of gonadotropins and ovarian hormones [6,7,8,9,10]. Currently around the world paid much attention directed metabolism of the organism regulation of animals, which is of great theoretical and practical importance and is one of the most important problems. Artificial stimulation techniques can be mobilized reserve forces of the body, increase metabolism, and on this basis create favorable conditions for the restoration of the physiological state of the body, and thus, improves the growth and development of young animals in the prenatal and postnatal ontogenesis

For drugs of this series relates ovarian cytotoxic serum (OCS). The antigen for OCS ovaries were matured follicles of ewes with or are at the stage of ripening (Fig. 1.2). As producers were selected for immunization healthy and well-fed animals (sheep, withers, donkeys, horses). It should be noted that in recent years,

in a production environment is widely tested and implemented various types of cytotoxic serum directed action and generally stimulating [7-10]. Cytotoxic serum is serum specific to the appropriate cells of an organism. Effect of specific origin in them is the antigen (cell) -antibody (cytotoxin). The degree of this effect depends on the intensity of antigen-antibody reaction, which is the main mechanism of the effect.

Materials and Methods research. Science-production experiments were conducted in the breeding farm "R-Kurta" Zhambyl district of Almaty region of Kazakhstan for Kazakh fine fleeced sheep breed ewes 1st and 4-5th lambing. The experiments were performed on 20 ewes, selected on the basis of unique (live weight, productivity, feeding, content). Animals were divided by 10 goals to two groups: experimental and control. The animals of the experimental group in the 5-10-th day of a challenging dose of OCS was introduced after calving, twice two weeks before artificial insemination campaigns, with an interval between doses of 5-7 days. The control group of sheep serum was not introduced. Blood was taken for research before the introduction of OCS and after administration of the drug on the 7.14-th day, in the days of estrus manifestations of phenomena and two weeks after a fruitful insemination. The concentrations of sex (estradiol-17 β , progesterone) and gonadotropin (FSH, LH) hormones were determined by radioimmunoassay (RIA) on the γ -analyzer with a scintillation counter. By RIA benefits include: high sensitivity, specificity, reliability, accuracy, prostate, high performance and flexibility [15]. To determine the sex glands hormones used ready-made kits "of testosterone E125" produced by the Institute of Chemistry of the Academy of Sciences of the Republic of Belarus Reagents "of testosterone - E125". Progesterone, a hormone produced by the granulose cells of the follicular epithelium, luteal cells of the corpus luteum and the placenta. From this position information content in blood serum concentration is of great scientific and practical importance. The results of the research we have found low levels of progesterone in the blood prior to ovulation and fertilization. Most minimal levels of progesterone in the test groups was recorded in a hunting day ($0,06 \pm 0,01$ and 0.11 ± 0.02 ng / ml respectively). A small amount of progesterone is necessary to ensure that under certain ratios of FSH and LH blood normal ovulation occurred. The sharp decline of its concentration in a hunting day, apparently due to the fact that the peak of LH before ovulation causes a restructuring of steroid genesis: estrogen production slows down and synthesis of progesterone gradually increases, which corresponds to the initial period of luteal. A week after insemination, progesterone concentrations in ewes stimulated reaches up to $11,06 \pm 0,12$ ng / ml versus the estimate ± 0.06 days hunting $0,01$ ng / ml. In the control group the level of progesterone rose slightly ($7,12 \pm 0,11$ vs. $0,11 \pm 0,02$ ng / ml in the hunting day). From these studies it is evident that the progesterone concentration reached a maximum

value at 30 days or 2 weeks after insemination. In this period the concentration of progesterone in the experimental group reached the level of $18,19 \pm 0,20$, while in the control group $12,08 \pm 0,14$ ng / ml. It is known that the main function of progesterone is to provide blastocyst implantation and subsequent development of the embryo, and the overall favorable course of pregnancy. LH is a key hormone to stimulate the synthesis and release of sex steroids. Upon reaching a certain degree of follicular cells by direct N control start intensively synthesized sex steroids, in particular estrogens. The biological effect of LH on the ovaries also is to stimulate the development and maturation of follicles, the secretion of estrogen, ovulation implementation, the transformation of the ovulation follicle and corpus luteum secretion of progesterone them.

Data obtained from studies shows that LH from the pituitary gland into blood flows continuously, but different numerical values in terms of the sexual function is significantly varied. Initial data in the experimental groups were approximately equal ($3,31 \pm 0,21$ and $3,29 \pm 0,19$ ng / ml, respectively). Use of the drug significantly activates the production of LH. So, 7 days after the injections of the drug level increased from $3.31 \text{ N} \pm 0.21$ to 8.81 ± 0.24 ng / ml and in the control group - 3.29 ± 0.19 with up to $5,18 \pm 0.13$ ng / ml ($P < 0.05$). The highest peak of LH is marked during the hunt. During this period, due to increased pre-ovulation LH surge concentration reached its maximum value ($14,28 \pm 0,22$ ng / ml), i.e. the amount of LH in 4.3 times higher than its initial level ($P < 0.001$). In unstimulated animals exceeded baseline only 2.5 times ($8,15 \pm 0,12$ ng / ml).

After ovulation and fertilization in the experimental group of LH concentration in the blood is reduced to $5,39 \pm 0,18$ vs. $14,28 \pm 0,22$ ng / ml indicator hunting days, and in the control group to $3,90 \pm 0,16$ to $8,15 \pm 0,12$ ng / ml level of the day estrus ($P < 0.001$). FSH provides a growth and differentiation of follicles in the ovary and is necessary for the formation of a cavity of the follicle. However, the entire process of maturation of follicles can be completed only in the presence of N, ie, in close cooperation of both hormones. The rise of the level of FSH in the blood of ewes occurs in the pre-ovulation period during estrus and ovulation. In unstimulated animals compared to baseline FSH concentration at day 7 after injection is increased by 2.2 times and in a hunting day 3.7 times, and to control the degree of increase was not high, i.e. within a specified time increases respectively 1.76 and 2.48 times ($P < 0.05$). After insemination FSH levels in both groups gradually reduced, reaching the initial level. Analysis of the dynamics of gonadotropic and ovarian hormones in the blood of sheep showed that for each stage of ovarian development is characterized by a certain between hormones relationship. So, if before the onset of estrus and ovulation prevailed estradiol -progesterone (E / P) ratio after ovulation, on the contrary, prevails P / E ratio.

Therefore, it should be assumed that the use of the drug increases the fertility

and beneficial to the formation of the embryo during pregnancy. As a result of targeted research work on the development of technologies and breeding methods to create a flock of intensive type, which allows to increase the profitability of fine-fleeced sheep in climate conditions, "R-Kurta" farm Almaty region, as well as for the implementation of adapted to the new economic conditions of intensive technologies of production allow to the sheep do the following conclusions. The introduction of intensive technology allows you to achieve the highest sustainable farming, with the most effective return on invested option. Separation prolific type of sheep can increase fertility in the 37,0-44,0% and increase profitability to 27,0-35,0%, meat production per the uterus is increased by 13,1-14,8 kg and profitability 26,0-28,5% .Use of standard selection of multiple target sheep and application of the method of selection of sheep Kazakh fine-fleeced breed wool clipping contributes to the intensity of selection rate, improve the accuracy of the phenotype assessment .

Proceeds from the sale of meat and wool on a uterus with the introduction of intensive technology was 15,030 tenge, an increase of 3,840 tenge, or 25.5% when compared with the extensive reference of the technology industry. It reduces the cost of maintaining a uterus 800 tenge or 12.2%, earnings per uterus reaches 9230,0tenge, which is more in comparison with the extensive system on 4640 tenge or 50.2%.

Table 1. Effect of owaricytotoxic serum (OCS) for dynamic content and ovarian gonadotropin hormones in serum ewes in different periods of sexual activity ($M \pm m$, $n = 10$), ng/ml

Hormons	Groups	Before using OCS	The days after using drugs			
			7	14	21	30
Estradiol -17 β	Test	6,11 \pm 0,29	10,28 \pm 0,31 ^{xx}	19,36 \pm 0,32 ^{xxx}	7,11 \pm 0,14 ^x	5,01 \pm 0,12 ^x
	Control	6,09 \pm 0,24	8,30 \pm 0,34 ^x	12,44 \pm 0,25 ^{xx}	6,14 \pm 0,30 ^x	5,23 \pm 0,16
Progesterone	Test	0,43 \pm 0,08	0,21 \pm 0,04 ^x	0,06 \pm 0,01 ^{xx}	11,06 \pm 0,12 ^{xxx}	18,19 \pm 0,20 ^{xx}
	Control	0,45 \pm 0,06	0,32 \pm 0,05	0,11 \pm 0,02 ^x	7,12 \pm 0,11 ^{xx}	12,08 \pm 0,14 ^x
LH	Test	3,31 \pm 0,21	7,81 \pm 0,24 ^x	14,28 \pm 0,22 ^{xx}	6,61 \pm 0,15 ^{xx}	5,39 \pm 0,18 ^x
	Control	3,29 \pm 0,18	6,03 \pm 0,13 ^x	8,15 \pm 0,12 ^{xx}	4,18 \pm 0,09 ^x	3,30 \pm 0,16 ^x
FSH	Test	2,88 \pm 0,10	6,44 \pm 0,38 ^x	10,55 \pm 0,19 ^{xx}	3,34 \pm 0,08 ^x	2,03 \pm 0,08 ^x
	Control	2,91 \pm 0,11	5,12 \pm 0,14 ^x	7,23 \pm 0,17 ^x	5,51 \pm 0,11 ^{xx}	3,05 \pm 0,09
E/P	Test	14,21	48,95 ^s	322,7 ^{xx}	0,67 ^s	0,28 ^s
	Control	13,53	25,94 ^{xx}	113,1 ^s	0,86	0,43
LH/FSH	Test	1,15	1,21	1,35 ^s	1,98	2,66 ^{xx}
	Control	1,16	1,17 ^s	1,13	0,76 ^s	1,08

Note: ^xP<0,05; ^{xx}P<0,01; ^{xxx}P<0,001 – relatively at the beginning of test

The efficiency of sera owari cytotoxic serum (OCS) to improve reproductive performance of ewes.

Table 2. Dynamics of the arrival Sheep treated owari cytotoxic serum (OCS) in the hunt

Age of ewes	Groups	Total number of livestock	Days of the ewes arrival for the hunting and insemination							
			On the 20th day		On the 25th day		On the 30th day		More than 30 days	
			piece	%	piece	%	piece	%	piece	%
4,5 years	Test	520	208	40,0	259	49,9	41	7,8	12	2,3
	Control	552	215	38,9	177	32,0	121	22,0	39	7,1
18 months	Test	672	168	25,0	248	36,9	215	31,0	41	6,1
	Control	683	61	8,9	192	28,1	308	45,2	122	17,8

Analyzing the data of accounting insemination, it can be noted that the DSP in stimulating doses increases the reproductive ability of queens. They are intense, friendly and come to hunt more effectively and fruitfully inseminated, insemination campaign time is reduced by 6-7 days (Table 3). It's in the hunt and successfully inseminated on the 20th day after the treatment of 40%, on the 25th day of 49.9%, on the 30th day of 7.85% or more for 30 days - 2.35% queens experimental group fourth lambing. In the control group, respectively - 38.9%; 22.0% and 7.1% of queens. Note that the 25th day of insemination account in the test group was 90% sheep inseminated, which is 17.9% more than in the control group. At first ewes lambing in the parish of the hunt and the insemination of queens were as follows: in the experimental group on the 20th day of -25.0%, the 25th day - 36.9%, the 30th day - 31.0% and more than 30th days - 5.1% of the population were fruitfully inseminated. In the control group, 8.9%, respectively; 28.1%; 45.2% and 17.8%. Effect DSP especially noticeable when comparing these parameters in the first 15 and 20 days. Experimental groups inseminated First of lambing superior to the control by 16.1% and by the 25th day of the number of ewes inseminated reached: in the experimental group 62.0% and control 37.0%.

These results indicate that there is increased fecundity (14.1%), which reached adult ewes 118%, while the ewes lambing first 92% of the experimental groups of sheep. The use of dairy sheep semen diluents. In the southern area of breeding fine-wool sheep with a hot climate to intensify fine-wool sheep, increasing reproductive qualities of sheep, as well as increasing the production of lamb, sheep prolific recommended type. Conduct a focused selection, selection and pairing them according to the type of birth, given the number of lambs in the first lambing.

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关于提高初级棉花加工中纤维质量的问题
TO THE QUESTION OF IMPROVING THE QUALITY OF FIBER IN
THE PRIMARY COTTON PROCESSING

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本文介绍了减少锯齿轧花过程中棉纤维中缺陷和杂质含量的研究结果。研究表明，通过提出的轧花工艺，可以将纤维质量提高1-2级，主要是通过减少纤维和破碎种子的果皮含量。

关键词：原棉，杂草杂质，锯齿状桶，篦子，种子，纤维，堵塞，水分，再生器，被动，缺陷和杂草，轧花，净化原棉，果皮，破碎种子。

Annotation. *The article presents the results of studies to reduce the content of defects and impurities in cotton fiber during saw ginning. Studies have shown that with the proposed process of ginning, it is possible to improve the quality of fiber by 1-2 classes, mainly by reducing the content of peel with fiber and broken seed.*

Keywords: *raw cotton, weedy impurities, serrated drums, grate, seeds, fiber, clogging, moisture, regenerator, passive, defects and weeds, ginning, purifying raw cotton, peel with fiber, broken seed.*

It is known that for purification of raw cotton, from weed impurities, purifiers are used, equipped with serrated drums operating in combination with grate bars. And the clearance in the light between the bars should exceed the dimensions of large weed impurities that are commensurate with the size of the cotton fly. As a result, through the grate gratings, raw cotton loaves, ulcers, seeds and loose fibers fall in the waste of the saw tooth purifiers, the amount of which depends on the design of the cleaning sections, the mode of their operation and the place of incorporation into the process, and also on the grade, debris and moisture of the cotton-raw.

In accordance with the technological regulations for the processing of raw cotton before the beginning of the data, regenerated from the waste saw tooth purifiers in the regenerators 1PX (PX), the volatiles were mixed with raw cotton supplied to the purification equipment.

As the long-term observations have shown, that with such a technology the quality of the fiber deteriorates, due to an increase in the content of mostly small weeds in the total volume of defects and impurities in the fiber.

The reason for this is a lack of technological process, expressed in the supply of the whole mass of "passive", i.e. isolated from the cleaning sections of cotton from small weeds and the disadvantage of the principle of the regenerator, consisting in the maintenance of small weeds together with the regenerated volatiles fed for mixing with the cotton to be cleaned.

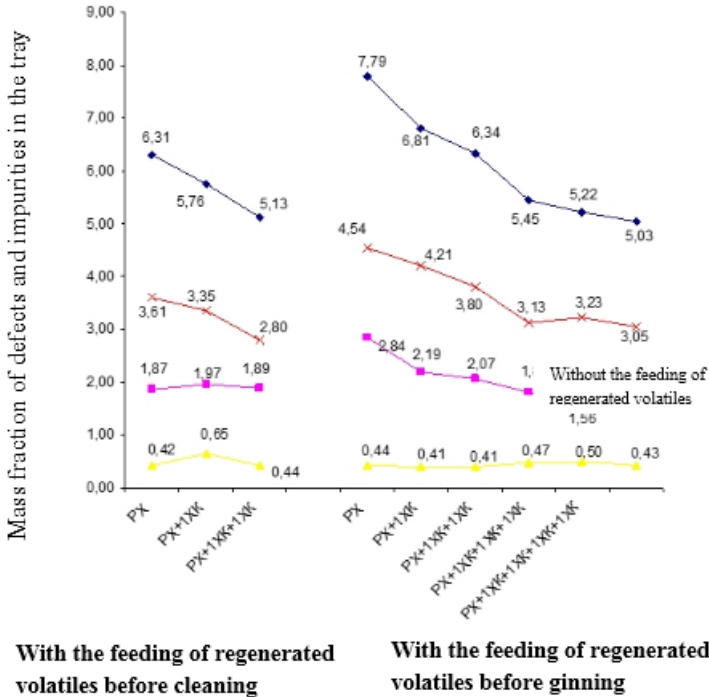
The studies carried out earlier at the Bektemir cotton plant showed that with the said regeneration process, due to the above drawbacks, the content of defects and weed impurities in the fiber of the 2nd grade increases by approximately 0.9%.

As a result of the analysis of the identified shortcomings, it was proposed to use the technological process with additional purification of regenerated volatiles, where it is necessary to determine the optimum place of their supply in the process of cleaning cotton.

To obtain the most complete characterization of such processes with a minimum number of experiments, the experiments were carried out in extreme cases, with the feeding of regenerated volatiles to raw cotton before cleaning and before ginning.

The studies were carried out according to the following procedure. Twelve servings of raw cotton of selection C-6524 engine collection II grade with a moisture content of 9.0 and a weed within 12.54-13, 87% with a weight of 50 kg each were prepared. Then nine portions were separately cleaned on the model of the unit with a capacity of 7000 kg/h (in terms of). The wastes separated during the purification of each portion were collected separately and passed through a regenerator, and the regenerated volatiles were also separately collected. Then, two portions of the regenerated volatiles were separately cleaned on the scale of the cleaner 1XK once, two more portions were similarly purified twice, one portion was cleaned three times, another one four times.

The content of defects and impurities in the fiber, depending on the cleaning plan and the place of supply in the raw cotton regenerated volatiles



Based on the results of the experiments, graphical dependences of the content of defects and impurities in the fiber are plotted, depending on the cleaning plan and the location of the regenerated volatiles in the raw cotton (fig.)

As can be seen from the graph (fig.), When the multiplicity of purification of regenerated volatiles is increased from zero to twofold on a 1XK purifier and fed to raw cotton before cleaning, the content of defects and impurities decreases from 6.13 to 5.13%, respectively, from II-th to I-th at a class of a fiber "usual", and when feeding regenerated volatiles to raw cotton before ginning, when the multiplicity of their cleaning is increased from zero to fourfold, the content of defects and weedy impurities decreases from 7.79 to 5.22%, respectively, the fiber grade rises from III to I in class fibers "normal".

As can be seen, in experiments with twice purification of regenerated volatiles and their feeding into raw cotton, with fourfold purification and feeding into purified raw cotton, and without supplying regenerated volatiles to raw cotton, al-

most identical values of the content of defects and impurities in fiber, respectively, 5.13%, 5.22% and 5.03%.

One of the main indicators of fiber quality is the content of defects and impurities in it. If the content of impurities in the fiber depends on the content of rubbish in raw cotton, the defects (peel with fiber, broken seed, etc.) are formed during the ginning process, resulting in the impact of the saw teeth on the raw roller and negatively affect the quality of the textile industry products.

Reduction of the content of litter in the fiber can be achieved by improving the process of cleaning raw cotton, and in order to reduce the malformation, it is necessary to improve the process of ginning.

The carried out experimental studies have shown that the formation of defects in the fiber is greatly influenced by the ginning regime. In particular, the influence of the rotary roller accelerator on the quality of the fiber was established [1], and also in the course of theoretical studies a mathematical model of the shock interaction of a saw cylinder and a raw roller was made, taking into account the elasticity of a raw roller, which has the form

$$P_{\max} = \left[\frac{2}{3(1-\mu^2)} E \sqrt{\frac{R_1 R_2}{R_1 + R_2}} \right]^{2/5} \left[\frac{5 \frac{m_1 m_2}{(m_1 + m_2)} (V_n - V_c)}{4} \right]^{3/5}$$

where: E – the modulus of elasticity of the material; μ – Poisson’s coefficient; R_1 –radius of saw; R_2 –radius of the raw roller; m_1 –mass of the saw cylinder; m_1 –mass of raw roller; V_n –speed of the saw cylinder; V_c –speed of the raw roller.

The main condition for the rotation of the raw roller is that the adhesion forces between the individual components of the raw roller should exceed the frictional forces between the raw roller and the wall of the working chamber. The adhesion forces between the individual components are directly proportional to the density of the raw roller, i.e. The greater the density of the raw roller, the greater the adhesion strength.

As the volume of the chamber increases, the mass of the raw roller begins to increase and the frictional force between the raw roller and the inner wall of the working chamber, and consequently for the rotation of the raw roller, an increase in the adhesion force between the individual components of the raw roller is required. The increase in the adhesion strength between the individual components, as mentioned above, is achieved with an increase in the density of the raw roller.

Thus, it can be stated that an increase in the volume of the working chamber

increases the mass of the raw roller and, consequently, its density increases automatically, since its rotation requires an increase in the cohesion forces between the individual components of the raw roller. Due to the high density of the raw roller, the number of defects increases.

To reduce the density of the raw roller, it was suggested to reduce the volume of the working chamber by a factor of 1,5-2 and in order to maintain the necessary productivity, change the profile of the front apron, i.e. slightly straighten. The proposed profile was supposed to facilitate a faster exit of the seeds from the working chamber, which would lead to the preservation of productivity with some improvement in the quality of the fiber [2].

In order to verify the correctness of the above proposal, a series of experiments were carried out at the ginning stand of gin saw, on Namangan 77 raw cotton, second grade, second class.

The effect of reducing the volume of the working chamber and the new profile on fiber quality was studied with three different aprons having different radiuses of curvature. Aprons were tested with a radius of curvature of 225 mm, 200 mm and 0 mm (straight apron). As a control we used a 30-saw model of a working chamber of serial gin type ДП-130. The experiments were carried out in triplicate. The time for each replication of the experiments was recorded using a stopwatch. After each replication of the experiment, three samples were taken for laboratory analysis. A qualitative assessment was carried out by means of laboratory analyzes of medium fiber samples. To determine the dependence of the change in the quality of the fiber from the radius of curvature of the apron and to exclude the influence of the fiber cleaner, the quality of the fiber taken immediately after the gin. The average values of the results of experiments carried out on raw cotton of selection Namangan 77, second class, second class are shown in the table. As can be seen from the data presented, the size of the radius of curvature of the apron significantly affects the quality of the fiber.

Table. The results of experiments to determine the change quality indicators of fiber and seeds, depending on the change in the radius of curvature, the front apron of the working chamber

Indicators	Radius of curvature of apron, mm			Working chamber of saw gin ДИИ-130
	0	200	225	
1	2	3	4	5
Mass fraction of defect and impurities in the fiber, total %	4,15	4,32	5,21	4,93
Including:				
impurity	1,92	1,81	2,49	2,17
uluk	0,59	0,65	0,63	0,63
broken seeds and peel with fiber	1,57	1,80	2,08	2,09
other	0,07	0,06	-	0,06

Analyzing the results obtained, it should be noted that as the radius of curvature of the apron decreases, fiber quality is improved [2].

For example, when the radius of curvature of the apron is 225 mm, the mass fraction of defects and impurities in the fiber, after gin was 5.20% (abs.). The same index with a 200 mm radius of curvature was 4.32% (abs.), and with a direct apron (radius of curvature 0) - 4.15% (abs.).

The improvement in fiber quality is mainly due to the reduction of litter, broken seed and peel with fiber.

Reduction of the broken seed and peel with the fiber is due to the formation of a “soft” (less dense compared to the raw roller formed in the production chamber), since When the saw enters the “soft” raw roller its teeth less damage seeds.

Based on the results of laboratory studies, a new type of working chamber was developed and manufactured, which is installed on one of the gin at the Chinaz cotton plant. Comparative tests of serial gin ДИИ-130 and modernized gin АЖ-151 on the first and second industrial grades of raw cotton were carried out.

The tests carried out showed the advantages of a new, small-sized camera compared to the serial one. Thus, for example, the reduction in the content of vices and weedy impurities amounted to 1.26% (abs.) On the first grade and 0.82% (abs.) On the second grade. Reduction of the content of defects in the fiber is observed mainly due to reduction of broken seeds and peel with fiber. Reduction of the content of crushed seeds was 1.26% (abs.) In the first grade and 0.61% (abs.) On the second grade. Reduction of the content of peel with fiber was 0.28% (abs.) On the first grade and 0.2% (abs.) On the second grade.

The results of production tests fully confirmed the correctness of the results of

experimental studies conducted in laboratory conditions.

Currently, work is underway to introduce gin with a new type of working chamber in production. As a result, an increase in the competitiveness of cotton fiber produced in the world market is expected due to the improvement of its quality.

Conclusions:

1.Reducing the volume of the working chamber of saw gin allows you to conduct the process of ginning with a “soft” raw roller, which reduces the dynamic loads on the material being processed.

2. Studies have established that with the new sawing ginning process, one can expect an improvement in the quality of fiber for grades 1-2.

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扁豆粉在肉类半成品中的应用

USE OF LENTIL FLOUR IN MEAT SEMI-FINISHED PRODUCTS

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本文介绍了扁豆粉在肉类半成品配方中的应用研究结果，旨在创造出一种具有gerodetic取向的产品。将扁豆粉的化学组成与小麦粉的组成进行比较。小扁豆粉作为肉类和蔬菜半成品的成分的选择得到证实。已经确定了它们的最大可能剂量，允许在保持半成品的可接受的消费者特性的同时增加其营养价值。在肉类中添加植物添加剂（扁豆粉）使得可以制造含肉的半成品，其氨基酸组成比肉更大程度地满足了生物营养的特异性。

关键词：小扁豆粉，生殖营养，肉类半成品，营养价值。

Annotation. *The results of research on the use of lentil flour in the recipes of meat semi-finished products for the purpose of creating a product of the gerodetic orientation are presented. The chemical composition of lentil flour is compared with the composition of wheat flour. The choice of lentil flour as an ingredient of a meat-and-vegetable semi-finished product is substantiated. Their maximum possible dosage has been established, allowing, while maintaining acceptable consumer properties of semi-finished products, to increase their nutritional value. Inclusion of vegetable additive (lentil flour) in meat stuff made it possible to create meat-containing semi-finished products, the amino acid composition of which, to a greater extent than meat, meets the specificity of gerodietic nutrition.*

Keywords: *lentil flour, gerodietic nutrition, meat semi-finished products, nutritional value.*

Introduction.

Nutrition is one of the most important determinants of human health. The conditions of life and work of modern man make new demands on food: the need for fats decreases, and the need for protein increases [1].

The quality of food depends on the presence in it of a complex of biological-

ly active substances: protein, fat, carbohydrates, vitamins, microelements, etc., among which one of the main components is protein. The lack of it causes physiological, functional disorders of the body, a delay in growth and development, rapid physical and mental fatigue. Therefore, the level of welfare of the people in the country is determined by the amount of protein per capita per day [1].

Proteins are very important in human nutrition of any age, and especially their qualitative composition. N.N. Lipatov developed a formalized criterion for the amino acid composition and balance of proteins of the gerodietic products, with the help of which it is possible to design the protein composition of products for gerodietic nutrition [2].

Results and discussion. The nutritional and biological value of all foods, in particular meat semi-finished products, can be increased by introducing non-traditional plant components. Nontraditional plant components are selected taking into account chemical and physical properties, by composition of amino acids, vitamins and microelements. The assortment of meat semi-finished products can be expanded by replacing part of the main raw materials with fruits, berries, vegetables, grains and legumes and other protein-rich plant components [2,3].

Therefore, studies on the use of non-traditional plant components to improve food and biological value, improve organoleptic, technological and functional properties and expand the range of meat semi-finished products is relevant.

The objects of research are: minced meat, lentil flour, chicken eggs, onions, garlic, bread, salt, pepper, fat.

Lentils are a storehouse of vitamins, amino acids and protein, which are easily absorbed by the human body. And in the dry green lentils, they retain most of it - almost 70%, so this is the main product on the vegetarian table. The unique property of the plant - not to absorb the harmful toxic substances in the soil, makes this plant an environmentally friendly product [2,3].

Lentils are useful as a preventive measure against breast cancers, thanks to the content of isoflavones, which suppress their development. Medics note the effect of this plant on blood sugar, so it is useful to people suffering from diabetes. A large number of soluble fibers of lentils help to lower the level of cholesterol in the blood, which leads to a decrease in the risk of developing clinically significant vascular diseases (cerebral infarction and cardiac muscle).

Lentil contains magnesium, a natural blocker of calcium channels. With sufficient Mg content in the body, the vascular walls relax, which reduces resistance and improves blood flow to all organs. Magnesium deficiency is associated not only with a heart attack. The lack of a sufficient amount of a microelement immediately after an attack promotes heart damage by free radicals.

Vitamin B9 reduces the level of homocysteine (an amino acid, which is an intermediate in the methylation cycle). In the presence of folic acid, homocysteine

is converted to cysteine or methionine (useful amino acids). When there is a deficiency of this vitamin, the level of homocysteine in the blood rises, the endothelium of the vascular wall of the arteries is damaged [3,4].

Lentil contains the greatest amount of protein among the remaining plants, which makes it an excellent source of protein for vegetarians. Lentil protein is a rich source of essential amino acids (isoleucine and lysine). Sprouted lentils contain essential amino acids methionine and cysteine (important for the work of muscles), which are not synthesized independently in human cells [5].

To study the formulation and determine the optimum amount of plant supplements, organoleptic and physicochemical indices of the quality of meat semi-finished products were studied. Organoleptic quality indicators of ready-made cutlets with the addition of buckwheat flour are indicated in Table 1.

Table 1. Organoleptic indicators of the quality of ready-made cutlets with the addition of lentil flour

Indicators	Control	10%
Consistency	Normal	Juicy, soft
Structural-mechanical properties	Elastic	Elastic
Colour	Brown	Light brown
Taste	Meat Taste	Significant taste of lentil flour
Smell	Intrinsic	The smell of lentil flour

According to the data in Table 1, the color of the control cutlets is brown. Compared to control cutlets, the color of cutlets with 10% lentil flour was light brown. With an organoleptic evaluation of the taste and smell of meat semi-finished products, the control cutlets had a meat taste and an odor peculiar to them. In cutlets with the addition of 10% lentil flour, the taste of lentil flour was more significant. Structural and mechanical properties remained unchanged. Consistency of control meat semi-finished products was normal, and with the addition of lentil flour was soft and juicy.

We have conducted studies of the effect of adding lentil flour to the vitamin composition of meat semi-finished products.

Table 2. Vitamin composition of finished semi-finished products

Indicators, units of measure	Control variant	With the addition of lentils
	Actual results	
Vitamins		
E	0,561	0,569
B ₁	0,217	0,126
B ₂	0,227	0,229
B ₃	5,672	5,730
B ₄	0,576	0,558
B ₆	0,417	0,420
B ₉	0,0100	0,0101

According to the results of research of functional-technological and organoleptic properties of meat semi-finished products, optimal variants of introducing plant components were revealed. The best option is to apply 10% lentil flour.

Compared to the control sample, the addition of 5% and 10% lentil flour indicates higher and good functional and technological and organoleptic properties of cutlets.

Such indicators will allow using meat - vegetable semi-finished products with high functional and technological properties in production.

Thus, the products of the functional nutrition of the gerodetic orientation open wide opportunities for optimizing the nutrition of older people, increasing their health potential, suspending the development of premature aging in general, and inhibiting the age-dependent pathology.

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建模松弛特性机油

MODELING RELAXATION CHARACTERISTICS MOTOR OILS

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给出了机油介电参数色散依赖性数学模型的实验和理论证据。已经开发了一种用于估算操作过程中碱值变化的方法。

关键词：柴油机油，仪器测量油脂性能，油，石油产品，损耗角正切，介电常数。

Annotation. *The experimental and theoretical substantiation of the mathematical model of dispersion dependences of dielectric parameters of motor oils is presented. A methodology for estimating changes in the alkali number in the process of operation has been developed.*

Keywords: *diesel engine oil, instrument measuring dieelometric properties, oils, petroleum products, loss tangent, permittivity.*

The development and modernization of methods and means for controlling the physicochemical characteristics of motor oils are an important part of the chemothermological studies. Dielectric methods allow, at relatively low cost, to obtain information on the operational properties of lubricants.

1. Justification of the mathematical model

Motor oils are a dispersed system that includes polar (detergent-dispersant additives) and non-polar (base oil, antioxidant and viscosity modifying additives) liquid dielectrics.

In an alternating electric field of the capacitor $E = E_0 e^{i\omega t}$ with a cyclic frequency ω when selecting a parallel replacement circuit, the total current density $\vec{j}(t)$ is composed of the current density of the elastic polarization of the electron shells $\vec{j}_1(t)$, the current density of thermal polarization of polar molecules $\vec{j}_2(t)$ and the current density due to the motion of free charges $\vec{j}_3(t)$:

$$\vec{j}(t) = \vec{j}_1(t) + \vec{j}_2(t) + \vec{j}_3(t) \quad (1)$$

The current density of elastic polarization $j_1(t)$ in the low-frequency region has only a reactive component (bias current) [1]:

$$j_1(t) = \varepsilon_1 \varepsilon_0 \frac{\partial E}{\partial t} = i \omega \varepsilon_1 \varepsilon_0 E_0 e^{i \omega t}, \quad (2)$$

where ε_0 - electric constant, ε_1 - dielectric constant of the mechanism of elastic polarization. Thermal polarization of current density $\bar{j}_2(t)$ is caused by a change in the electric moment of polar molecules in the volume of the dielectric by asymmetric distribution of dipoles in the process of establishing thermodynamic equilibrium.

Assuming that the rate of decrease in the polarization P is proportional to the magnitude of the polarization [2]

$$\frac{dP}{dt} + \frac{1}{\tau} P = \frac{n_s \alpha}{\tau} E_0 e^{i \omega t}, \quad (3)$$

where τ - the relaxation time, during which the polarization decreases in e times, n_s is the concentration of polar molecules on the capacitor plates, α - polarizability of dipoles. The solution of equation (3) has the form

$$P(t) = \frac{n_s \alpha}{1 + i \omega \tau} E_0 e^{i \omega t}. \quad (4)$$

Current density $j_2(t)$

$$j_2(t) = \frac{\partial P}{\partial t} = \frac{i n_s \alpha \omega}{1 + i \omega \tau} E_0 e^{i \omega t} = \frac{i + \omega \tau}{1 + \omega^2 \tau^2} n_s \alpha \omega E_0 e^{i \omega t}, \quad (5)$$

includes active

$$j_{2a}(t) = \frac{\omega \tau}{1 + \omega^2 \tau^2} n_s \alpha \omega E_0 e^{i \omega t} \quad (6)$$

and reactive component

$$j_{2r}(t) = \frac{i}{1 + \omega^2 \tau^2} n_s \alpha \omega E_0 e^{i \omega t}. \quad (7)$$

To determine the magnitude of the current density due to the motion of free charges $\bar{j}_3(t)$, using the device ИДС-201 The loss angle tangent for the base oil and oil with various additives was measured [3,4]. In Fig. 1 shows the dependence of the loss angle tangent on the frequency of the base oil and the base oil with different polar additives. For the base oil, the tangent of the loss angle is practically zero, so the active component of the resulting current density is determined only by the mechanisms of thermal polarization of polar additives (6).

A vector diagram of the current densities and the field strength of motor oils is shown in Fig. The angle δ is the angle between the active and reactive components of the current density j .

The tangent of the loss angle is numerically equal to the ratio of the current density of the active component to the current density of the reactive component in the alternating sinusoidal electric field.

$$\operatorname{tg} \delta = \frac{j_{2a}(t)}{j_1(t) + j_{2r}(t)} = \frac{n_s \alpha \omega^2 \tau}{(1 + (\omega \tau)^2) \omega \varepsilon_0 (\varepsilon_1 + \frac{n_s \alpha}{\varepsilon_0 (1 + (\omega \tau)^2)})} \quad (8)$$

For the chosen parallel circuit of replacement of the electric capacitor with losses, the tangent of the loss angle, where ρ is the resistivity. From Ohm's law in differential form and (6):

$$\operatorname{tg} \delta = \frac{1}{\rho \omega \varepsilon_0 \varepsilon}, \quad (9)$$

$$\frac{1}{\rho} = \frac{j_{2a}}{E} = \frac{n_s \alpha \omega^2 \tau}{1 + \omega^2 \tau^2}. \quad (10)$$

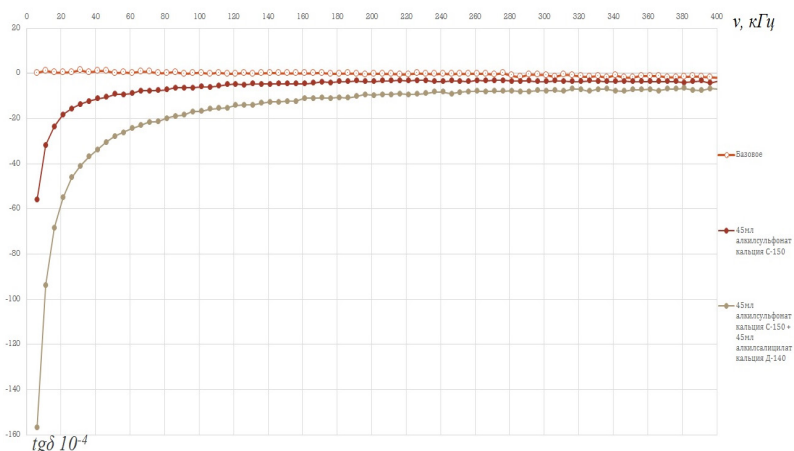


Fig. 1. Frequency dependence of the loss tangent of the base oil and oils with the addition of polar additives: the upper graph - the dependence of the loss angle tangent on the frequency for the base oil; the average graph is the dependence of the loss angle tangent on the frequency for the oil with the addition of an additive of calcium alkylsulfonate C-150; lower graph - the dependence of the loss angle tangent on the frequency for the oil with the addition of an additive calcium alkylsulfonate C-150 and calcium alkylsalic-

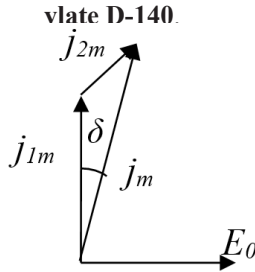


Fig. 2. Vector diagram of current densities and field strengths of a system consisting of polar and nonpolar dielectrics: j_{1m} – amplitude of displacement current density, j_{2m} – amplitude of current density of the mechanism of thermal polarization, E_0 – amplitude of the field strength of the capacitor, δ – loss angle.

Substituting (10) into (8) and comparing with (9) we obtain an expression for the dielectric constant ε

$$\varepsilon = \varepsilon_1 + \frac{n_s \alpha}{\varepsilon_0 (1 + (\omega \tau)^2)}. \quad (11)$$

The change in the permittivity $\Delta \varepsilon$ as a result of the transition from frequency ω_1 to $\omega_2 \rightarrow \infty$.

$$\Delta \varepsilon = \frac{n_s \alpha}{\varepsilon_0 (1 + (\omega_1 \tau)^2)} = \frac{a}{(1 + (\omega_1 \tau)^2)}, \quad (12)$$

where

$$a = \frac{n_s \alpha}{\varepsilon_0} \quad (13)$$

dimensionless parameter, depending on the concentration of polar additives.

The parameter a can serve as a criterion for estimating the concentration of polar additives (alkali number).

Taking into account the substitutions (12), (13), the expression for the frequency dependence of the tangent of the loss angle (8) takes the form:

$$\operatorname{tg} \delta = \frac{a \omega \tau}{(1 + (\omega \tau)^2) \left(\varepsilon_1 + \frac{a}{(1 + (\omega \tau)^2)} \right)}. \quad (14)$$

For a fixed frequency ω_1

$$\operatorname{tg} \delta(\omega_1) = \frac{\Delta \varepsilon \omega_1 \tau}{(\varepsilon_1 + \Delta \varepsilon)}. \quad (15)$$

Expression (15) makes it possible to determine the relaxation time τ from the frequency dependences of the dielectric loss tangent and dielectric permittivity of motor oils

$$\tau = \frac{\text{tg}\delta(\omega_1)(\varepsilon_1 + \Delta\varepsilon)}{\Delta\varepsilon\omega_1} \tag{16}$$

The parameter a , related to the concentration of polar additives at a known relaxation time τ from (12)

$$a = \Delta\varepsilon(1 + (\omega_1\tau)^2) \tag{17}$$

2. Experimental results

The frequency dependences of the dielectric loss tangent and dielectric permittivity of synthetic, semi-synthetic and mineral motor oils were measured in the frequency range from 0.5 to 1000 kHz with capacitive sensors of 70 and 400 pF. The studies were carried out for new oils and oils with a range in the operating temperature range [3,4].

With increasing frequency, the tangent of the dielectric loss angle of motor oils tends to zero (Figure 3), which confirms the correctness of the choice of the parallel substitution scheme (9) and the reliability of the relation (8).

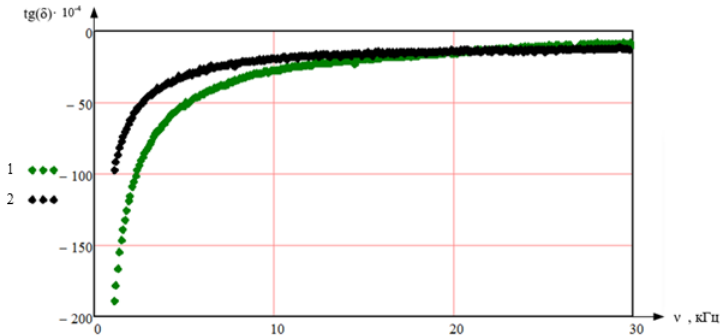


Fig. 3. Dependence of the loss angle tangent on frequency for M8B engine oil at T = 300K: 1 - new oil, 2 - oil with exhausted resource.

The dielectric constant of motor oils decreases with increasing frequency to the permittivity of the base oil in accordance with (11) and Fig. 4, 5.

3. Modeling the relaxation characteristics of motor oils

The modeling problem consisted in determining the frequency dependences of the relaxation time τ and the parameter a from (16), (17).

In Fig. Figures 6 and 8 show the calculated curves of the frequency dependence of the parameter a , related to the concentration of polar additives, for new oils and oils with a run.

For each frequency of the investigated range at a fixed temperature, the ratio between the parameters a of the oil and the range and the new oil was calculated. The results of the calculations are shown in Fig. The average ratio of parameters was 0.61 with a relative error of 10%. This value is comparable with the ratio of the values of alkaline numbers (0.5) obtained by chemical analysis methods. Similar results (0.84 with an error of 7% and 0.8) are obtained for Shell 5W-30 oil. The results of modeling and calculation of the oil parameters of Shell 5W-30 are shown in Fig. 8, 9.

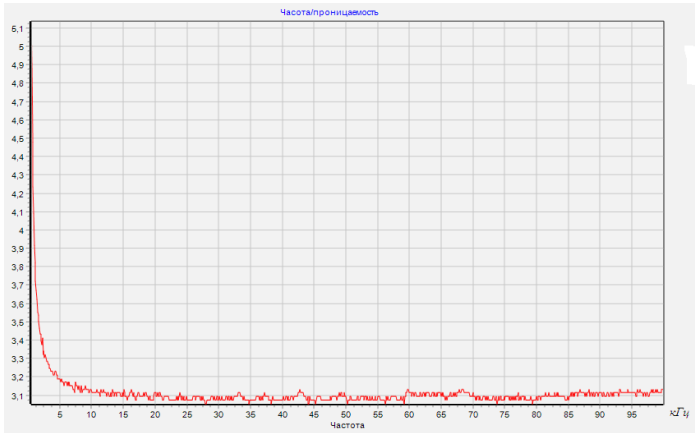


Fig. 4. Dependence of dielectric permittivity on frequency for mineral motor oil Lukoil 5W-40 at $T = 300\text{K}$.

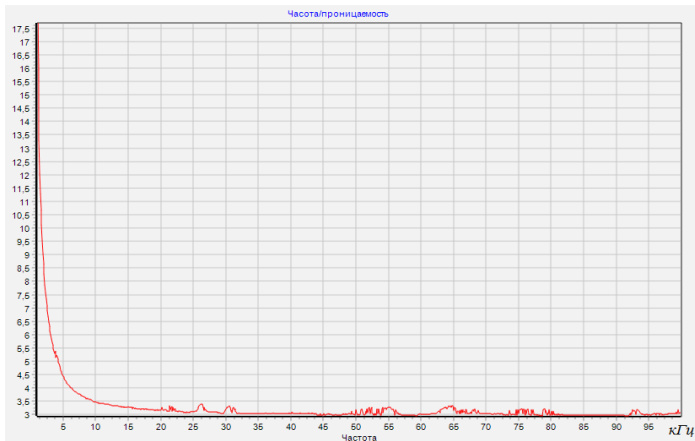


Fig. 5. Dependence of the permittivity on frequency for mineral motor oil Lukoil 5W-40 at $T = 350\text{ K}$.

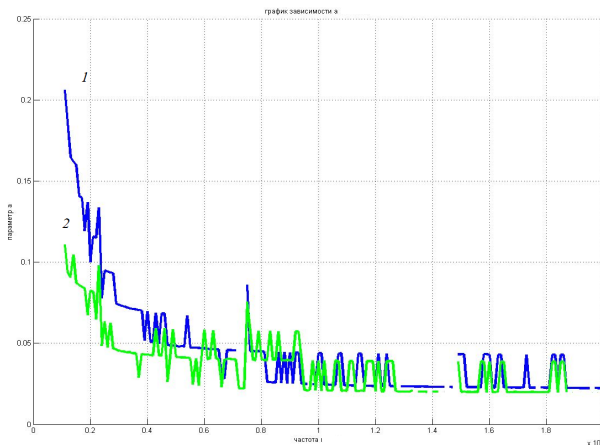


Fig. 6. Frequency dependence of parameter a of motor oil M8B for temperature 300 K. Curve 1-new oil (value of alkali number 6 mgKON / g), curve 2 - oil with mileage (value of alkali number 3 mgKON / g).

Table 1 presents the results of calculations of the dielectric parameters of the investigated oils for the temperature $T = 300\text{ K}$ and the alkali number (TBN) from the passport data for new oils. Values of alkaline number for oils with mileage are obtained by chemical analysis methods.

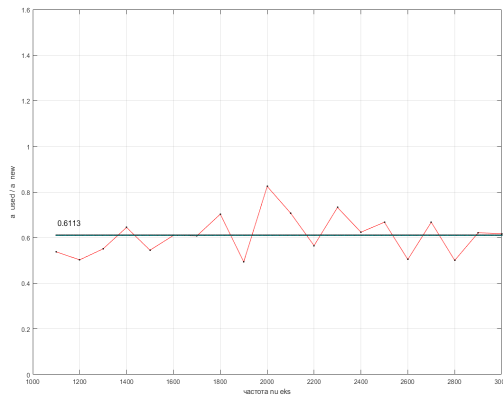


Fig. 7. Graph of the ratio of the parameters a used and new M8B oils, and the value of the mean value.

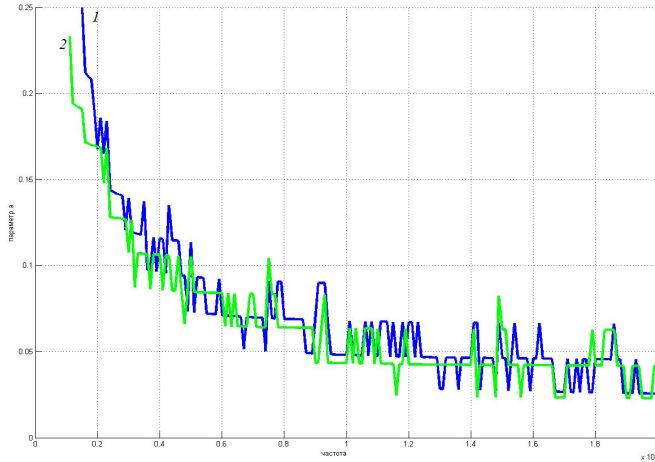


Fig. 8. Frequency dependence of the parameter a of the engine oil Shell 5W-30 for a temperature of 300 K. Curve 1-new oil (value of the alkaline number 7.5 mgKON / g), curve 2 - oil with mileage (value of alkali number 6 mgKON / g).

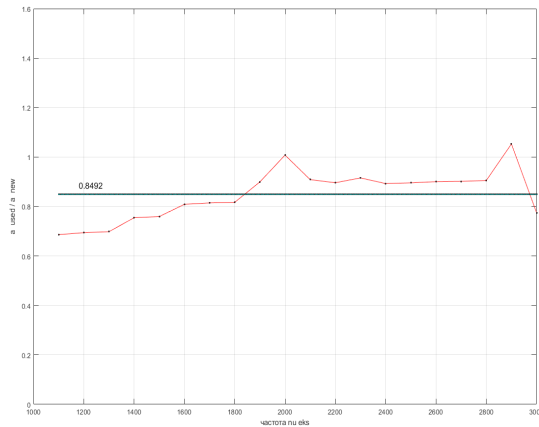


Fig. 9 Graph of the ratio of the parameter a used and new oil Shell 5W-30 and the value of the average value.

Table 1: Results of calculations of dielectric parameters

Oil grade	ϵ_1	$\omega_1 (c^{-1})$ 10^3	$\Delta\epsilon$	$tg\delta$ 10^{-4}	$\tau (c)$ 10^{-4}	a	TBN mgKOH /g
Lukoil 10W-40 semisynthetic	3.00	8.84	1.00	634	0.286	1.100	11.00
Lukoil 5W-40 mineral	3.10	6.28	0.80	572	0.500	0.867	8.57
Total quartz 5W-40 synthetic	2.70	5.65	1.10	740	0.450	1.200	10.00
M8B	3.10	6.91	0.14	190	0.600	0.160	6.00
M8B mileage 20000 km	3.47	6.91	0.08	134	0.840	0.090	3.00
Shell 5W-30	3.00	6.91	0.27	272	0.476	0.300	7.50
Shell 5W-30 mileage 7000 km	3.15	6.91	0.18	144	0.390	0.190	6.00

The numerical value of the parameter a for a fixed temperature depends on the frequency and is significantly different for oils of different manufacturers with the same alkali number. This is due to the difference in the chemical composition of the additives and the physicochemical properties of the base oils that affect the adsorption of polar additives to the measuring electrodes. With a known initial value of the parameter a for a new oil, its change is proportional to a decrease in the alkali number.

Thus, for the analysis of each type of oil, it is necessary to experimentally obtain the standard dispersion characteristics of the loss-angle tangent and the permittivity for different temperatures and calculate the dispersion dependences of the parameter a for the temperature range under study from (16), (17).

The obtained calibration characteristics will allow to evaluate the quality of new oils by comparing their characteristics with the standard and to monitor the dynamics of the change parameter a during operation.

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为PJSC Rostelecom设计和开发会计和订购材料的网络应用程序
**DESIGN AND DEVELOPMENT OF WEB-APPLICATION FOR
ACCOUNTING AND ORDERING MATERIALS FOR PJSC
ROSTELECOM**

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本文致力于设计和实施Rostelecom安装人员所需材料的会计和订购申请。描述了设计信息系统，数据库和应用程序的主要阶段。

关键词：Web应用程序，UML，用例图，类图，数据模型，接口。

Annotation. *The article is devoted to the design and implementation of the application for accounting and ordering of materials required for the group of installers of Rostelecom. The main stages of designing an information system, a database, and applications are described.*

Keywords: *web application, UML, use case diagram, class diagram, data model, interface.*

The company PJSC "Rostelecom" is one of the largest telecommunications companies of local and long-distance telephony, broadband Internet access, interactive television and cellular communications. Despite the fact that the enterprise has existed for a long time, and the work of all departments has been put, the possibility of improving certain processes is not ruled out. Most often, they focus on the work of the primary technical departments, such as the installation group, and specifically the maintenance of the material base in the warehouse. This will reduce the consumption of the material base and the number of errors related to the human factor.

As a means to implement and test the server part of the hosting, the Denwer package was selected. As a database management system (DBMS), MySQL has been selected as one of the most popular and most widely used DBMS on the Internet. To access the database, PhpMyAdmin is used - an application written in PHP and providing full, including remote, work with MySQL databases via a browser. Since phpMyAdmin allows you in many cases to dispense with the direct

input of SQL commands, working with databases becomes quite feasible task [1].

The construction of the object model as the first stage of the beginning of the design makes it possible to represent in more detail all the stages and all elements directly, as well as their interaction among themselves, for a better and more visual perception of the system as a whole and its elements. Designing an object model is an integral step in the implementation of any information systems.

For the design of the object model, the UML language was chosen. UML is a graphical language for visualization, description of parameters, design and documentation of various systems (programs, in particular). Diagrams are created using special CASE tools, for example StarUML. StarUML is an open source project for developing fast, flexible, extensible, functional and, most importantly, distributed free UML / MDA platforms for 32-bit Windows systems. On the basis of UML technology, a unified information model is being built [2].

In Fig. 1 shows a diagram of precedents describing the overall functionality of the system and its actors (actors).



Figure 1. Use Case Diagram

The projected system is represented as a set of entities or actors interacting with the system using precedents. At the same time, any actor interacting with the system from the outside is called an actor or an actor.

The class diagram serves to represent the static structure of the system model in the terminology of the object-oriented programming classes. It reflects the interrelationships between the individual entities of the domain, describes their internal structure and relationships. In Fig. Figure 2 shows the class diagram of the employee interface.

In Fig. 4 shows the diagram of the entity classes of the projected database.

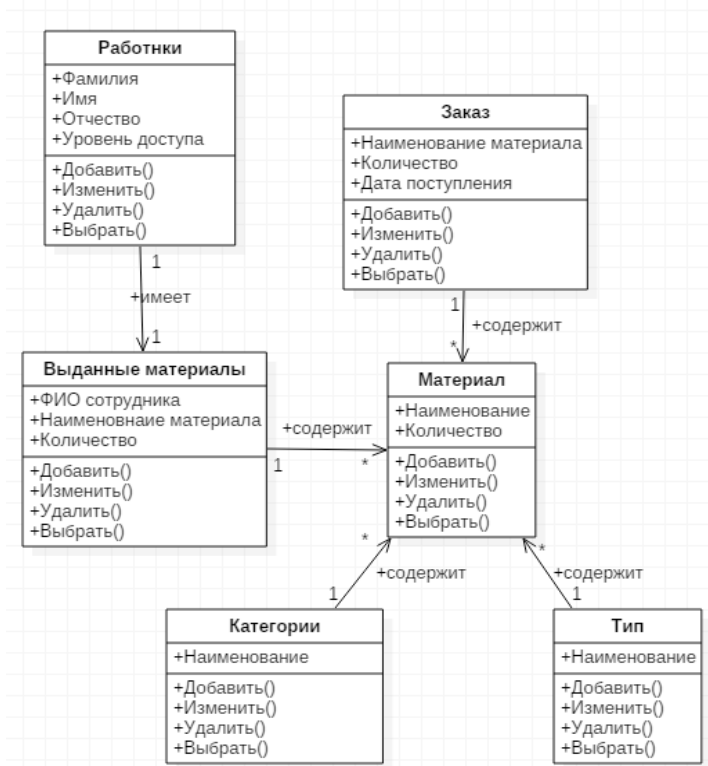


Figure 4 - Database Entity Class Diagram

The physical model of the data, tied to the DBMS, is executed in the CASE-tool ErWin and is shown in Fig. 5.

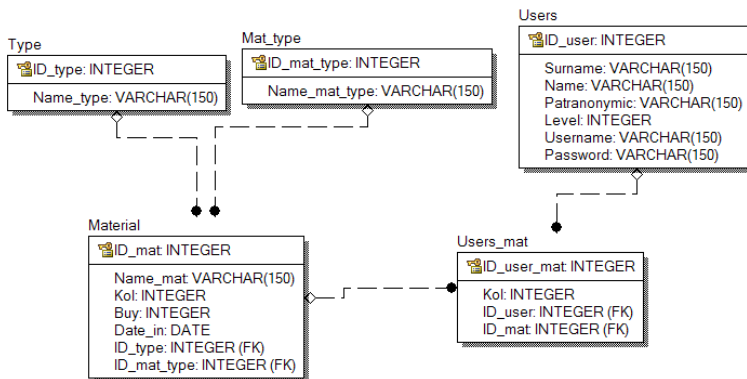


Figure 5. Physical Data Model

The database is designed in the Denwer package. The phpMyAdmin utility included with Denwer was loaded with the received database script from ErWin.

In Fig. 6 shows the downloaded database in phpMyAdmin.

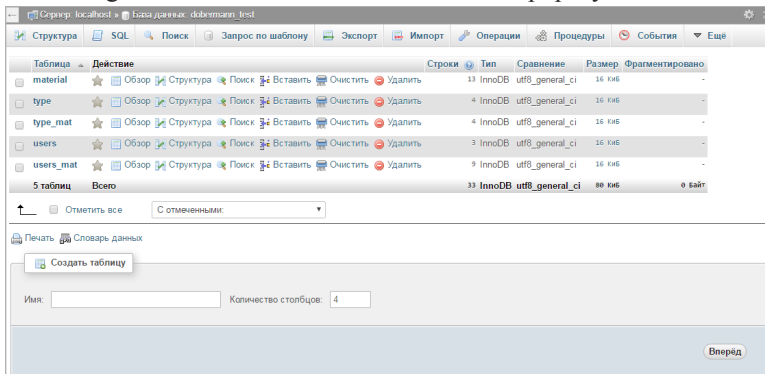


Figure 6. Form phpMyAdmin with the loaded database

To develop the system interface, the Twitter Bootstrap framework was chosen, which allows creating modern, cross-browser and standardized interfaces. A well-thought-out HTML, JavaScript, and CSS code structure gives you the ability to create a wide variety of interface elements and a site grid [3].

Some forms of the created application are shown in Fig. 7-14.

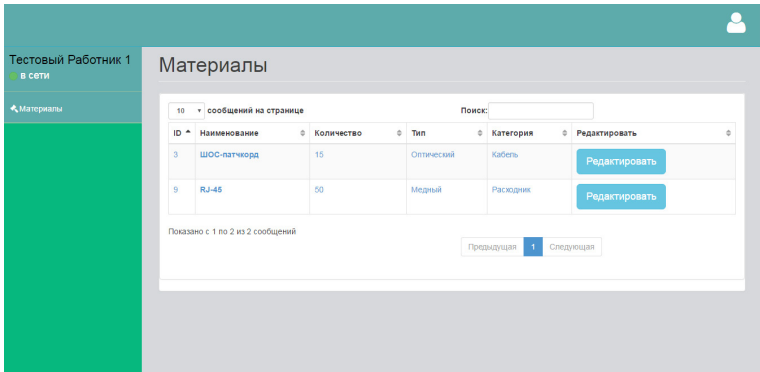


Figure 7. Main window of the employee interface

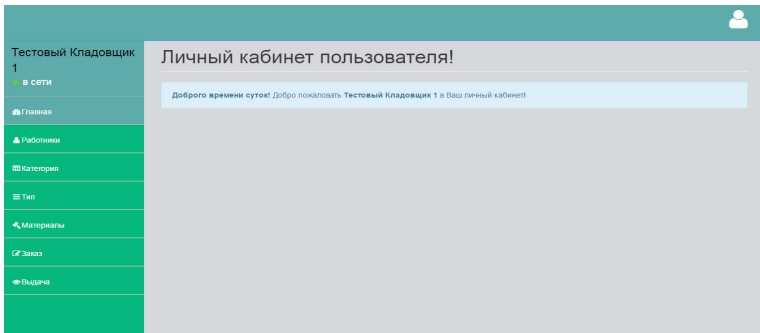


Figure 8. The main window of the storekeeper interface

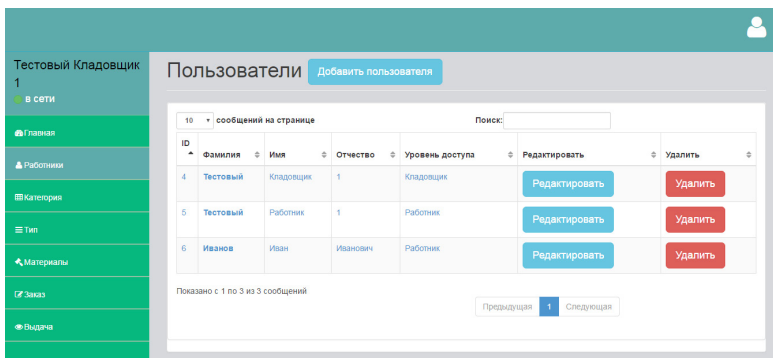


Figure 9. Information on employees

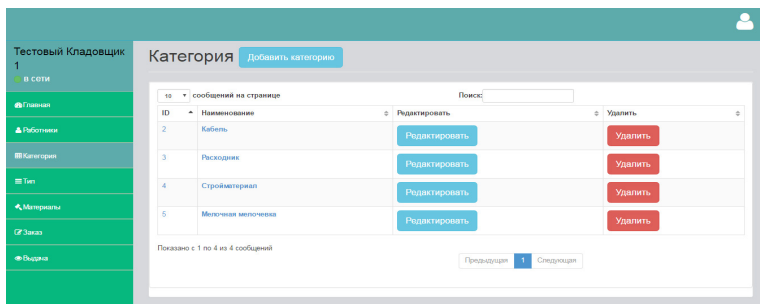


Figure 10. Information on material categories

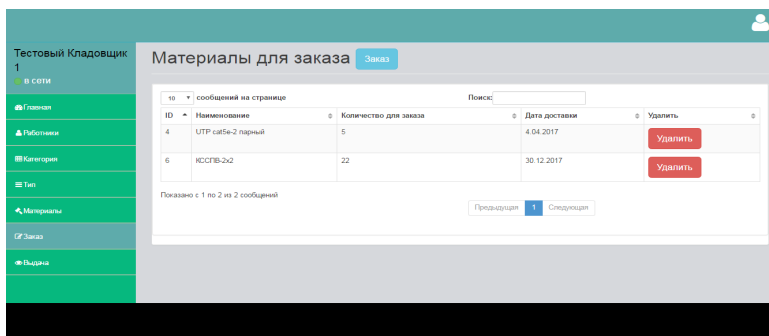


Figure 11. Material Information

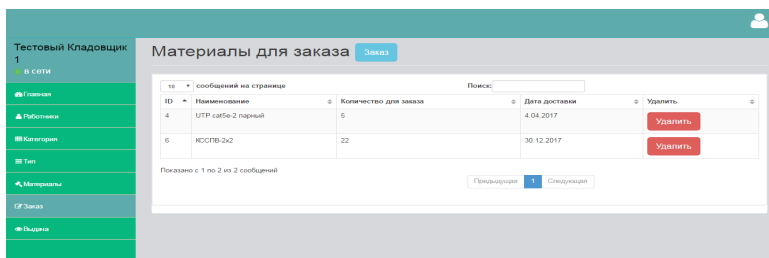


Figure 12. Information on ordered materials

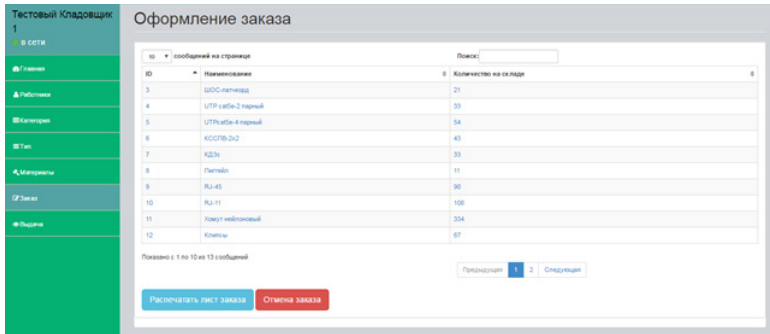


Figure 13. Ordering the material

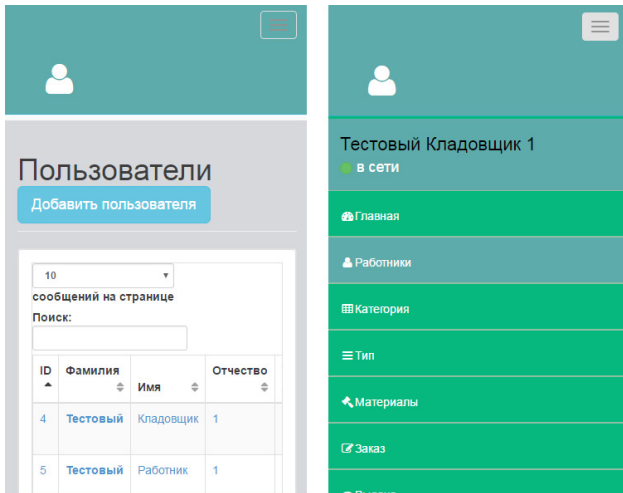


Figure 14. Interface on the mobile device

Developed web-application for PJSC "Rostelecom" for a group of installers for warehouse management and material consumption control.

In the course of the analysis of the subject area of the department's work, it was revealed the need to automate the information activity of the unit's work, setting and achieving the following tasks: eliminating routine manual operations that are unavoidable in the processing of information; significant acceleration of processing and data transformation; increase the accuracy of accounting and reporting data, quick access to information for both installers and dispatchers with engineers.

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关于改善棉花清洁厂轧花车间工作条件的问题
**TO THE QUESTION OF IMPROVING WORKING CONDITIONS
IN THE WORKSHOP OF GINNING OF THE COTTON-CLEANING
FACTORY**

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文章反映了轧花车间员工工作条件的负面影响。 简要概述了美国和俄罗斯在保护工人劳动方面开展的工作。 提供了两种改善轧花车间工作条件的措施。

关键词：杜松子酒，纤维清洁剂，纤维冷凝器，棉绒，纤维水龙头，空气纤维去除，空气消耗，工作条件，原棉加工设备。

Annotation. *The article reflects the negative aspects of working conditions of the employees of the workshop of ginning. The work carried out in the USA and Russia on the protection of workers' labor is briefly outlined. Two variants of measures to improve working conditions in the workshop of ginning are given.*

Keywords: *gin, fiber cleaner, fiber condenser, linter, fiber-tap, air fiber removal, air consumption, working conditions, device for processing raw cotton.*

The Law of the Republic of Uzbekistan of September 22, 2016 No. LRU-410 establishes a unified procedure for the organization of labor protection regardless of the methods of production, forms of ownership and it is aimed at ensuring the protection of health and work of citizens.

At present, as in the leading countries of the world, a great deal of work is being done in our republic on labor protection, which is directly related to the creation of favorable working conditions.

As an example of labor protection abroad, there are well-known studies in the USA and Russia:

American health and safety researcher received a three-year grant and further testing of a special fatigue measurement sensor designed to help employees monitor their work status and, in general, to facilitate the work of labor safety specialists. [1]

According to the American scientist, "The problem of fatigue is not widely ex-

plored, according to the American Society of Occupational Safety Engineers, which financed an unusual study. At work, a tired employee can make a mistake as critical as a drunk, and after all people often cannot estimate how big their workload is."

It is expected that the invention of American engineers will be based on the same technologies that take into account the number of steps and hours of sleep passed by an employee. At the right time, the sensor will send a special signal to the employee, and the device will give the necessary recommendations to him on the necessary rest to restore the body.

In the future, the fatigue measurement sensor is planned to be introduced into the daily workflow, and it is possible to assess the working conditions for employees in a completely new mode.

In the Russian Federation, a similar device is used on trains by Russian Railways to monitor the wakefulness of the driver for about 15 years: a sensor attached to the wrist measures the pulse, measuring the psychophysiological state of the worker and sending warning signals if within 8 minutes the driver Press the special button on the device. Otherwise, the system of emergency braking of the train will be started. The introduction of this practice in other professional spheres, experts believe, can bring significant improvements to the work process [2].

Unlike the above American and Russian studies, our follow-up is aimed at improving working conditions by changing the working environment in the ginning shop.

As is known, in accordance with the approved technological regulations for the primary processing of raw cotton, a battery of saw gin (consisting of four or three gins depending on the type of gin) is installed in the ginning workshop with an air stripper, fiber wipers connected to the gins by a fiber outlet, up to the fiber condenser installed in the press workshop and then from the condenser of the fiber to extend the air duct to the cyclone installed outdoors. In the same workshop, there are two linter batteries with six linters in each battery.

Air extractors of gin and linter use air supplied from inside the workshop. The air consumption of the air pullers of gins is 2-2.4 cubic meters per second, and the liners are up to 6.

The entire volume of air used in the process of removing fibers through the fiber outlet enters the fiber cleaner, then, together with the air sucked from under the wiper, enters the fiber condenser and is then piped through the pneumatic line to the outside to the cyclones. The same picture is observed from the use of air pullers of linter batteries.

As can be seen from the above, there is a constant pumping of air up to 8 m³ per second, which leads to the formation of "large drafts" in the premises of the workshop and, therefore, adversely affects the working conditions of workshop workers, especially, in winter conditions. The presence of "large drafts" prevents the creation

of local suction of dusty air from the service area of gins and linters, heating the room in the winter.

To exclude the above negative working conditions, two options for eliminating "large drafts" are proposed:

1-variant - air supply to the ventilator of the air puller from the outside of the room.

2-variant - replacement of equipment with air removal for equipment with mechanical removal.

In the first variant, air to the fan is fed through a pipeline for air intake outside the workshop.

The second option uses a device for processing raw cotton under the patent RUz FAP 00495.

The task of the device for processing raw cotton is to reduce the amount of equipment of the production process, reduce the consumption of electric energy, metal consumption, increase productivity, reduce losses of the spun fiber along with waste, regulate the frequency of fiber cleaning, depending on the initial quality parameters of the fiber, eliminating the need for adjusting the aerodynamic mode of operation, improving the environment by reducing dust emissions and working conditions by creating conditions for heating inside the main body.

The objective is achieved by the fact that one of the cleaners is inclined, the horizontal axis of the drum mounted below is located below the horizontal axis of the removable gin drum, the outlet mouth of the gin being connected to the supply shaft of the inclined fiber cleaner, the inclined and vertical fiber wipers being interconnected by means of a tee having one inlet and two outlet throats, with the inlet mouth of the tee docked with the unloading window of the inclined fiber cleaner, and one and one of the output openings of a tee with a vertical supply shaft voloknoochistitelya, while the other output is located above the neck tee mechanical conveyor, wherein in a tee mounted rotary flap, which is situated at the junction of the output openings of a tee shaft.

As can be seen from the above paragraph, the proposed technical solution has significant differences from the prototype and, thanks to these differences, the following technical results are achieved:

- The mutual arrangement of working organs of gin and fiber cleaner and their connection makes it possible to exclude from the composition of the process equipment a condenser, pipelines for air removal from the condenser to the fan and then to cyclones, a fan, cyclones, which leads to a reduction in the composition of equipment;

- due to the lack of a fan in the equipment, a reduction in the power consumption of 75 kW per hour is achieved;

- there is no need to install the aerodynamic operation mode of the saw gin itself,

as the air flow is not used during the removal and this ensures the stability of the fiber removal process, the decrease in the probability of slaughtering the inter-conglomerate space in the gins. With the decrease in slaughter in the upper zone of the grate, the number of gin downtime and, consequently, the time spent on slaughtering are reduced, which leads to a simplification of the conditions of exploitation of gin and an increase in its productivity;

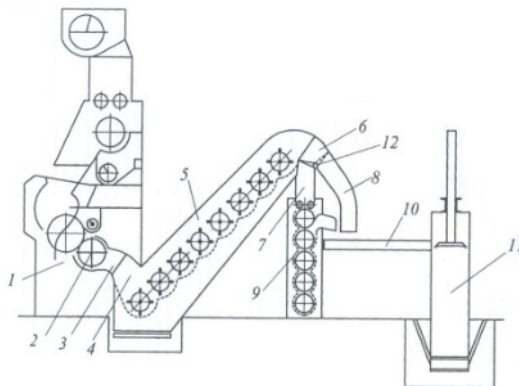
- elimination of losses of the spinnable fiber, since the proposed device does not take care of the fibers through the holes in the condenser grid together with the air flow;

- Increase the cleaning effect of the fiber wipers, since a more loose fiber enters the fiber-purifiers, due to the lack of fiber compaction resulting from the air flow of the pulp onto the condenser mesh occurring during the condensation process;

- reduction of the volume of air consumption due to the absence of fiber used for transportation from gin to fiber cleaner leads to a reduction in the emission of dust into the atmosphere. This leads to improved ecology, as well as a sharp decrease in air exchange in the production room, which allows heating of the production premises in the cold season and thus improve working conditions in the production room;

- the implementation of a multi-stage fiber cleaning creates the conditions for ensuring the necessary fiber cleaning plans, depending on the initial share of the defects and weed impurities in the fiber or other production of the required fiber quality with minimal mechanical impact.

In figure 1 the scheme of the proposed device for processing medium-fiber cotton.



1- sawing gin, 2-detachable brush drum, 3-outlet neck, 4 feeding shaft,
5- inclined fiber cleaner, 6-tee with inlet mouth, 7,8-output throats,
9-fiber cleaner, 10-belt conveyor, 11-press, 12-swivel shield.

Figure 1. Devices for the processing of medium-fiber cotton

The device for processing medium-fiber cotton consists of:

From the saw gin 1 equipped with a detachable brush drum 2, the outlet mouth for the fiber 3 outlet, the inclined fiber cleaner 5, coupled to it, the inclined fiber cleaner 5, whose horizontal axis of the first drum is located below the axis of the detachable drum 2, the tee with the inlet mouth 6 docked with the fiber cleaner 5, outlet mouths 7 and 8 docked with a fiber cleaner 9 and located above the belt conveyor 10, a press 11, a turntable 12, whose axis is located at the junction of the outlet mouths 7 and 8.

The device works as follows.

Purified raw cotton with the help of an inclined conveyor and a distribution screw (not shown in the diagram) is fed into the shaft and from there it enters the working chamber of gin 1, where it is gin. Separated from the seed fiber by the detachable brush drum 2, it is removed from the saw teeth and through the neck for the fiber outlet 3, the feeding shaft 4 of the inclined fiber cleaner 5 is thrown. In the fiber cleaner 5, it is cleaned of impurities and enters the inlet neck 6 of the tee. Depending on the position of the turntable 12, the fiber passes through the exit neck 7 into the shaft of the wiper 9 (the position of the shield is shown in the stroke on the diagram) or to the belt conveyor 10 (with the shield shown as a solid line). When the fiber is fed into the fiber cleaner 9, it is again cleaned there from foreign impurities and fed to the belt conveyor 10, where it is moistened and then fed into the press 11 and pressed into a bale.

As the above description of the operation of the device shows, it is industrially applicable.

Currently, studies are underway to determine the effectiveness of the two proposed options for improving working conditions in the workshop of ginning.

Conclusions:

1. It has been established that research conducted by USA and Russian scientists on occupational safety and health is aimed at determining the fatigue of workers and preventing accidents due to fatigue of workers.
2. The main causes of poor working conditions in the gin plant of cotton factories were determined.
3. Two variants of measures to improve the working conditions of the employees of the gin shop of the cotton plant were developed.

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使用卷积神经网络的轮式机器人控制系统
**THE CONTROL SYSTEM OF THE WHEELED ROBOT USING A
CONVOLUTIONAL NEURAL NETWORK**

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本文讨论了使用在运输网络模型上移动的轮式机器人的示例来操纵汽车方向盘的方法。该算法基于卷积神经网络，在训练和处理的帧上训练。本文给出了用于训练神经网络的数据收集的示例，其使用计算机视觉算法进行后续处理，其允许通过其配置的演示来改进算法和神经网络训练算法的结果。本文的最后部分给出了将接收到的控制系统引入车轮机器人运动算法的示例。

关键词：运动算法，卷积神经网络，计算机视觉，Tensorflow，Keras，轮式机器人。

Annotation. *The article deals with the approach to steering the car's steering wheel, using the example of a wheeled robot moving on a transport network model. The algorithm is based on a convolutional neural network, trained on trained and processed frames. The article gives an example of data collection for training a neural network, their subsequent processing using computer vision algorithms, which allows to improve the results of the algorithm and the neural network training algorithm with a demonstration of its configuration. The final part of the article gives an example of introducing the received control system into the wheel robot motion algorithm.*

Keywords: *motion algorithm, convolutional neural network, computer vision, Tensorflow, Keras, wheeled robot.*

Introduction

The task of driving unmanned vehicles can be solved using different approaches. One such approach is to bring the control task to the task of classifying the state on the road section and, depending on it, to rotate the steering wheel. For these purposes, it was decided to use a neural network. To improve accuracy, it was decided to use algorithms of computer vision, which allow to allocate the objects necessary for decision making: a roadbed and a car.

To implement the algorithm, a 1:18 scale road transport network model was used and a wheeled robot controlled by a Raspberry Pi microcomputer. The mechanism for making turns is realized with the help of a servo. Thus, in order to make a maneuver, it is necessary to determine the angle transmitted to the servo. This mechanism is similar to turning the steering wheel to a certain angle.

The work consisted in creating a training sample using the existing model of the transport network, selecting filters for input images, training the neural network and integrating it into the process of controlling the wheeled robot. As a result, a neural network was received that accepts the filtered image at the input and returns one of the following values: full right turn, partial right turn, full left turn, partial left turn and ride straight.

Personnel training for training

The program for writing data for training a neural network was written in Python 2.7 (Figure 1). It consists of two parallel streams: the first thread is responsible for controlling the car [1] and changing the variable that stores the current state of the robot wheels, the second stream writes the frame from the camera and adds the correct position of the wheels to the array. As a result, each saved frame corresponds to the correct position of the wheels stored in the array. The position of the wheels is stored as a vector consisting of five elements, where the correct position is denoted by 1, and the remaining 0. This array is saved to disk in the format *.npz when the program terminates.



Fig. 1. Block diagram of the program for recording training data

Application of filters

To obtain a more unambiguous and universal image with a smaller number of objects distracting the neural network, a complex of functions for image processing is applied. For this, the OpenCV library is used. In Fig. 2 shows the initial image from the camera. The initial resolution of the image is 320x240.



Fig. 2. The initial image

In the first turn, the image is trimmed to a size of 320x160 due to the peculiarities of camera placement on the vehicle. This excludes all that goes beyond the horizon.

Then the image is converted into a black and white format to reduce computational costs and passes the median filtering: a window is applied to each pixel, among the colors of pixels that fall into the window, the average is selected, the pixel in the center of the window gets the average color (3). In this case, the window size is 5 pixels.



Fig. 3. Using Median Blur

After that, the Canny operator, the image boundary detection operator, is used. Consists of smoothing by applying a Gaussian filter with a 5 by 5 pixel window, looking for gradients (1), where G_x and G_y are the two matrices in which each point corresponds to the approximate derivative with respect to x and y respectively, G is the gradient value, and Θ - The direction of the gradient [4]. Then, suppression of non-maxima, double threshold filtering, and tracing of the ambiguity region (1) is used.

$$G = \sqrt{G_x^2 + G_y^2} \quad (1)$$

$$\theta = \arctg\left(\frac{G_y}{G_x}\right)$$



Fig. 4. Application of the Canny operator

The next step is to apply the Hough transform to find the lines in the image. Thanks to this, it is possible to isolate the marking of the road along which the wheeled robot moves. After that, you need to transfer all found lines to the image (Figure 5).

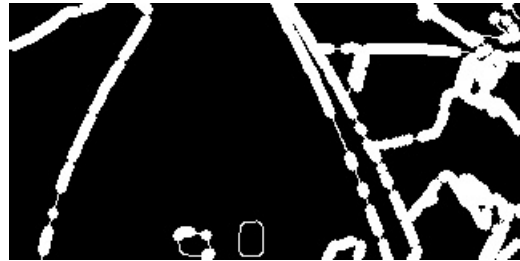


Fig. 5. Applying the Huff transform

The next step will be the application of a morphological operation. Its essence lies in the fact that each pixel of the image is viewed with some neighborhood. In our case, a closing operation is used to join the road marking lines (Figure 6). The closure of A with respect to the set B (2).

$$A \bullet B = (A \oplus B) \ominus B, \quad (2)$$

where A is the image, B is the structural primitive.

The closing operation is the successive execution of the contraction and expansion operations. As a result, we get a smoothing of the contours of the object, the elimination of breaks, depressions, holes, filling the gaps of the contour (Fig. 6).

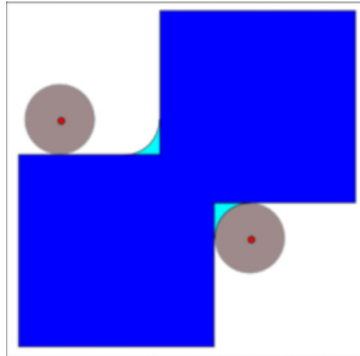


Fig. 6. Application of the closing operation

The last step is to fill the area of the road and darken all white pixels (Figure 7). Pouring occurs on the coordinates, it is understood that the robot is on the road surface, which can be identified due to previous operations with the image.



Fig. 7. The final image

As a result, we get an image on which the roadway is maximally properly allocated and there are no other objects, which makes the algorithm more universal. The disadvantages are the complexity of the algorithm and the need to manually assign coordinates for the area to be filled. Because of this, there may be situations when an incorrect area is filled. However, in general, such situations arise only in the event of a significant deviation of the car from the correct course. In addition, the image shows bowsprits, which help correctly interpret the positions of the wheeled robot relative to the road.

Neural network training

The first step for learning the neural network is to load the training sample, then the matrix of each image is reduced to a sequence of zeros and ones by dividing by the color intensity that the road was painted over. Then the neural network

is created. The project uses a convolutional neural network. For its creation, the freely distributed TensorFlow and Keras machine learning libraries are used to solve the configuration and learning problems of the neural network.

The basic idea of convolutional networks is that pixels that are close to each other depend on each other more than those that are in different parts of the image [2]. In addition, in the event that a certain part of the image is important, its location will not matter.

For a better understanding of the principles of this technology, we introduce the notion of a convolution operator. Let there be an image \mathbf{I} and a matrix \mathbf{K} of size $\mathbf{h} \times \omega$ (the convolution kernel). The minimized image of $\mathbf{I} * \mathbf{K}$ is calculated by superimposing the kernel on the image and writing down the sum of the products of the original image and the core (3).

$$(I * K)_{xy} = \sum_{i=1}^n \sum_{j=1}^n K_{ij} \times I_{x+i-1,y+j-1} \quad (3)$$

Fig. 8 shows the described idea:

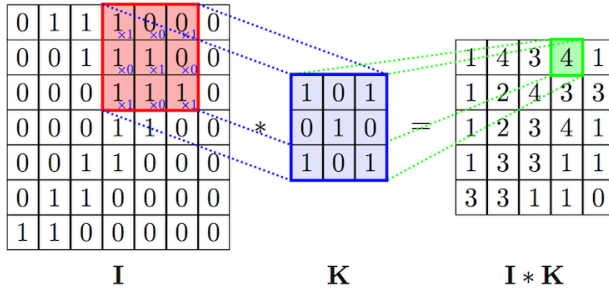


Fig. 8. The convolution operator

The first layer of the neural network is a two-dimensional convolutional layer with a convolution core of 5×5 pixels. The activation function is Rectified Linear Units (ReLU) (4). Fig. 9 shows a graph of this function [3].

$$f(x) = \max(0, x)$$

$$f(x) = \ln(1 + e^x) \quad (4)$$

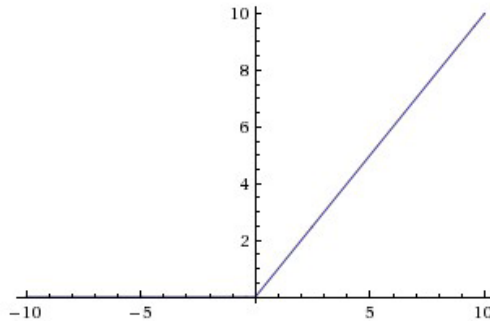


Fig. 9. Graph of the function ReLU

The activation function calculates the output of an artificial neuron.

Next, a layer of the sub-sample (pooling layer) is used, which receives separate fragments of the image, in our case 2×2 pixels, and combines the fragments into one value (Figure 10).

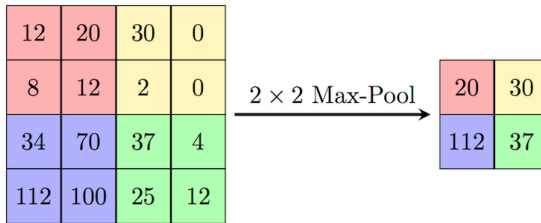


Fig. 10. Sub-sample layer

This sequence of layers is repeated twice. Then a layer is used that converts the network from a 2D image to a flat one. The last two layers are the fully connected layers (Dense). These layers take each pixel as an independent value. One contains 50 neurons and uses the ReLU activation function, the other 5 neurons and the Softmax activation function (the normalized exponential function) (Figure 11) (5).

$$h_{\theta}(x) = \frac{1}{1 + \exp(-\theta^T x)} \quad (5)$$

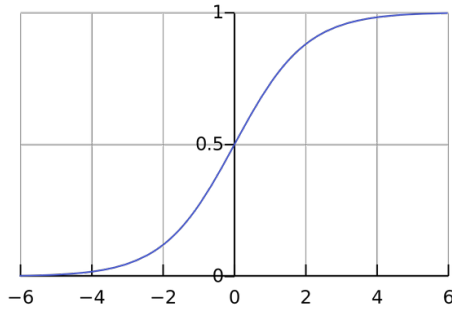


Fig. 11. Softmax function

To prevent retraining of the neural network, the technology of Dropout is used, the essence of it is that in one iteration the specified percentage of the training sample is eliminated. Thus, the search sample has differences at each iteration.

Fig. 12 shows the final structure of the neural network.

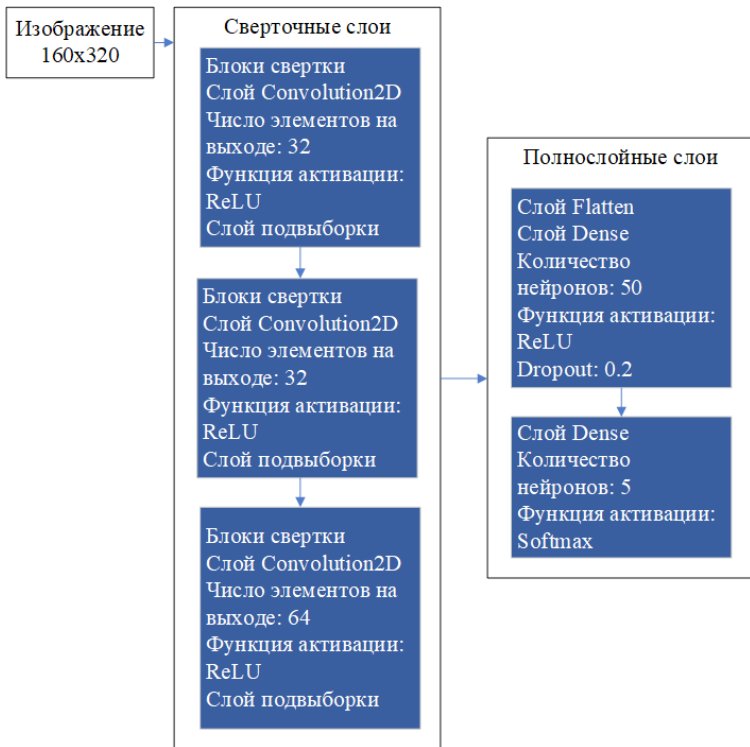


Fig. 12. Scheme of the neural network

Using a Neural Network

Trained neural network is used in the general project ROS [1] to control the wheeled robot. The image is taken from the camera, passes the filtering, similar to the one described above and fed to the input of the neural network. The neural network returns a vector (one-dimensional array) with nonzero values. Each element of the vector represents one of the positions of the robot wheels. The largest of them is the most correct option, according to the neural network. This element is replaced by one, while the others are replaced by 0. As a result, we get one of the previously known variants of turning the wheels. The result is sequentially compared with the possible options, and in the case of the right condition, a turn is made to a predetermined angle.

Conclusion

As a result of this work, a set of algorithms for steering of the wheeled robot steering system was obtained. Among the advantages can be noted the relative universality of the algorithm due to image filtering. It must be said that the accuracy of the neural network obtained is of the order of 85-90%. However, most network errors are related to the fact that a turn in the right direction occurs, but at the wrong angle. This problem is less critical in real trials.

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