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

Materials of the International Conference

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国际会议

参与者的英文报告

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

Part 3: Participants' reports in English

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Materials of the International Conference
"Scientific research of the SCO countries: synergy and integration" - Reports in English. Part 3

(April 9, 2019. Beijing, PRC)

这些会议文集结合了会议的材料 – 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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These Conference Proceedings combine materials of the conference – research papers and thesis reports of scientific workers. They examines tecnical and sociological issues of research issues. Some articles deal with theoretical and methodological approaches and principles of research questions of personality professionalization.

Authors are responsible for the accuracy of cited publications, facts, figures, quotations, statistics, proper names and other information.

CONTENT

AGRICULTURAL SCIENCES

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"
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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。

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在破产期间非法行为的情况下参与者行为博弈模型的构建和分析（俄罗斯联邦"刑法"第195条第1部分）

CONSTRUCTION AND ANALYSIS OF GAMING MODELS OF PARTICIPANTS' BEHAVIOR IN CASE OF ILLEGAL ACTIONS DURING BANKRUPTCY (PART 1 OF ARTICLE 195 OF THE CRIMINAL CODE OF THE RUSSIAN FEDERATION)

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注解。 提供了应用博弈论要素分析破产期间非法行为参与者行为的可能选择（俄罗斯联邦"刑法"第195条第1部分）
关键词：破产（破产）；腐败行为；腐败；实用功能。

Annotation. *The possible options for the application of game theory elements for analyzing the behavior of participants in the commission of illegal actions during bankruptcy are given (part 1 of article 195 of the Criminal Code of the Russian Federation)*

Keywords: *bankruptcy (insolvency); corrupt behavior; corruption; utility function.*

In the interests of society, it is necessary to identify, and, consequently, create, conditions under which the incorrect behavior of the participants in the process — illegal actions during bankruptcy — would be unprofitable. This requires a qualitative analysis of the motives and patterns of behavior of various participants in the relationship arising from the commission of illegal actions in bankruptcy.

In [2, 3], using the game theory formalism, the behavior models of participants interested in the bankruptcy of enterprises were considered. However, it is extremely important to formulate some qualitative considerations for building advanced models for analyzing behavioral strategies for several participants in the commission of unlawful acts related to bankruptcy, for example, the crime, regulated by Part 1 of Art. 195 of the Criminal Code.

Illegal actions in bankruptcy characterize three separate elements of a crime. For all compositions it is fair that the moment of termination of a crime is connected with the moment of occurrence of consequences in the form of major damage. In the absence of the consequences of the action, under Art. 195 of the Criminal Code, case is considered as an administrative offense.

The subjects of the crime, and therefore, the subjects of the games associated with such criminal acts as illegal actions in bankruptcy, under Art. 195 of the Criminal Code, are the head of the debtor (DC), the founder (CF), the arbitration manager (AM), the head or member of the liquidation commission (H / MLC), the head of the temporary administration (HTA), a citizen, including an individual entrepreneur (IE).

In addition, participants in such games (on the "other side") are creditors (CC), persons in possession of which property (RP) is transferred, responsible employees of the debtor organization (for example, the chief accountant) (EC), and investigative bodies (IA) and the court (JA).

The objective side of this crime, provided for in Part 1 of Art. 195 of the Criminal Code of the Russian Federation includes four different acts:

- concealment of property or property obligations, information about the property, its location, amount, or other information relevant to the creditors about property, property rights or property duties;

- transfer of property to other persons;

- destruction or alienation of the debtor's property;

- concealment, falsification, destruction of accounting or other bookkeeping documents reflecting the economic activities of the organization.

In this case, the crime must be committed in the presence of signs of bankruptcy.

These acts are punished with a fine in the amount of one hundred thousand to five hundred thousand rubles, or in the amount of the salary or other income of the convicted person for a period of one to three years, or restriction of freedom for up to two years, or forced labor for up to three years, or arrest for up to six months, or imprisonment for up to three years with a fine of up to two hundred thousand rubles, or in the amount of wages or other income of the convict for a period of up to eighteen months or without it.

For the game associated with the commission of acts provided for by Part 1 of Art. 195 of the Criminal Code, you can determine the utility functions of the players.

DC utility function (EC):

$$U_{DC(EC)} = (\pi - \overline{P} \ (\pi) \ (\alpha \ p + (1 - \alpha) \ z(\pi)) - I \ (\pi)) \ b + S \ e,$$

where b is a strategy, the choice of which DC (EC) performs illegal actions in bankruptcy; e is a DC (EC) strategy aimed at the lawful conduct of a bankruptcy

procedure, these two strategies mutually exclude each other (b, e, b, e = 0-1); π - the benefit received by DC (EC) when carrying out illegal actions during bankruptcy (the cost of hidden, destroyed or transferred property / property rights or the amount of bribe received for its / their concealment / transfer, concealment of documents) may correspond to the amount of damage from the crime committed (in this case, π≥2.250 million rubles. [1]); *I (π) is a monetary (or other measurable) expression of moral suffering or moral damage, as well as DC (EC) reputational loss from a criminal act; (π) - measure of the possibility of detecting AM (IA) evidence of a crime; α is the probability if the fact of the commission of a crime is revealed by AM (IA), by hiding the DC (EC) of the fact of committing a crime by bribing AM (IA); p is the amount of bribery used to conceal the fact of a crime when it is discovered during a bankruptcy procedure or investigative actions; z (π) - monetary (or other measurable) expression of damage in case of refusal by AM (IA) to take a bribe to conceal the fact of a crime when it is detected during a bankruptcy procedure or investigative actions or when a crime is detected without attempting to transfer a bribe to AM (IA) which is determined by a court sentence (in accordance with the sanction, defined by part 1 of article 195 of the Criminal Code of the Russian Federation); S is the amount of remuneration (salary) to ensure that DC (EC) fulfills its authority in the company (in case of bankruptcy, the transfer is terminated).*

Utility function *CF (IE)*:

$$U_{CF(IE)} = (\pi(A) - \overline{P} \ (\pi(A)) \ (\alpha \, p + (1 - \alpha) \, z(\pi(A))) - I \, (\pi(A))) \, b + (R - C - A) \, e,$$

where b is a strategy, the choice of which CF (IE) performs illegal actions in bankruptcy; e - CF (IE) strategy aimed at lawful bankruptcy proceedings, these two strategies mutually exclude each other (b ≠ e, b, e = 0∨1); A - the market value of the asset, the value of property rights or the monetary expression of the information contained in the documents that are the subject of illegal actions during bankruptcy; π (A) - the benefit received by CF (IE) when carrying out illegal actions during bankruptcy may correspond to the amount of damage from the crime committed (in this case π≥2.250 million rubles); I (π (A)) is the monetary (or other measurable) expression of moral suffering or moral damage CF (IE) from a criminal act; (π (A)) - a measure of the possibility of detecting AM (IA) evidence of a crime; *α is the probability if the fact of the commission of a crime is revealed by AM (IA) of hiding CF (IE) of the fact of committing a crime by bribing AM (IA); p– the amount of bribery used to conceal the fact of a crime when it is discovered during a bankruptcy procedure or investigative actions; z (π (A)) is a monetary (or other measurable) expression of damage when AM (IA) refuses to take a bribe to conceal the fact of a crime when it is detected during a bankruptcy procedure or investigative actions or when a crime is detected without attempting to transfer a bribe AM (IA), which is determined by a court sentence* (in accord-

ance with the sanction, defined by part 1 of article 195 of the Criminal Code of the Russian Federation); R - revenue from the production or sales of the company (in the event of bankruptcy of the organization, income is stopped); C– the sum of the total expenses of the company.

The AM utility function (H / MLC, HTA) has the form:

$$U_{AM(H/MLC,HTA)} = (N - P(\overline{N})\,(\alpha\,p + (1-\alpha)\,z(N)) - J(N))\,b + B\,e,$$

where b is a strategy, the choice of which AM (H / MLC, HTA) performs illegal actions in bankruptcy; e - AM strategy (H / MLC, HTA), aimed at the lawful conduct of a bankruptcy procedure, these two strategies mutually exclude each other (b ≠ e, b, e = 0-1); B - permanent established amounts of financing AM, H / MLC, HTA to ensure that it fulfills its authority (which involves refraining from abusive actions in bankruptcy); N is the amount DC (EC), CF (IE) offers AM (H / MLC, HTA) as a bribe to achieve its goals, or a different income from illegal actions during bankruptcy or the bankruptcy of the organization itself; $P(\overline{N})$ – measure the possibility of detecting IA (JA) evidence of a crime; α - probability if the fact of a crime is revealed by IA (JA), concealment AM (H / MLC, HTA) of committing a crime by bribing IA (JA); p– the amount of bribery used to conceal the fact of a crime when it is discovered during a bankruptcy procedure or investigative actions; z (N) is a monetary (or other measurable) expression of damage in case IA (JA) refuses to take a bribe to conceal the fact of a crime when it is detected during a bankruptcy procedure or investigative actions or when a crime is detected without attempting to transfer the IA (JA) which is determined by a court sentence (in accordance with the sanction, defined by part 1 of article 195 of the Criminal Code of the Russian Federation); J (N) - monetary (or other measurable) expression of moral suffering or moral damage from accepting a bribe and / or criminal acts.

Utility function *CC:*

$$U_{CC} = R - C + A\,q;$$

where R is the proceeds from the production or sales of the lender; C is the sum of the total expenses of the lender; A - the market value of the asset, the value of property rights or the monetary expression of the information contained in the documents that are the subject of illegal actions during bankruptcy, or the part that corresponds to the amount of the debtor's debt to the creditor; q = ± 1 (q = 1 in the case of a lawful bankruptcy procedure; q = - 1 in the case of misconduct in bankruptcy).

Utility function *IA* (*JA*):

$$U_{LA(JA)} = B + N - P(\overline{N})\,\overline{P}(N)(\alpha\,y + (1-\alpha)\,z(N)) - I(N);$$

where B - the established amount of funding IA (JA) to ensure the fulfillment of its powers (which involves refraining from participating in the implementation of corruption schemes) N is the amount DC (EC, CF, IE) offers as a bribe IA (JA) to

prevent criminal prosecution; P (N) - the value of the likelihood of the regulatory bodies in the prescribed manner of control actions - verification of activity IA (JA) and DC (EC, CF, IE); (N) - measure of the possibility of detection by the controlling authorities of the fact of corruption; α - probability, if the fact of receiving a bribe will be revealed by the regulatory authorities, concealment of IA (JA) and DC (EC, CF, IE) by bribing the controlling authorities of the fact of corruption interaction; z (N) is the amount of recovery imposed for payment when corruption is detected when the regulatory authorities refuse to take a bribe to conceal the fact of corruption when it is detected as a result of an audit; I (N) is a monetary (or other measurable) expression of moral suffering or moral damage from receiving (receiving) a bribe, y is the amount that can be offered to the controlling authorities for the purpose of bribing to achieve the goals.

From this general formulation and model, it is easy to get private ones, allowing for a detailed analysis of the relevant situation, analyzing actions and determining the optimal strategies for the participants in committing bankruptcy crimes for different values of utility functions

Further analysis of the resulting game models can help identify opportunities for improving legislation governing liability for illegal actions during bankruptcy.

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国际财务报告准则：俄罗斯现实条件下的实施和适应问题
INTERNATIONAL FINANCIAL REPORTING STANDARDS: PROBLEMS OF IMPLEMENTATION AND ADAPTATION IN THE CONDITIONS OF RUSSIAN REALITY

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抽象。　本文探讨了国际财务报告准则与俄罗斯会计制度的趋同，强调了将国际财务报告准则引入俄罗斯会计实务的问题，证明了向国际财务报告准则过渡的必要性，并将俄罗斯会计准则与国际财务报告准则进行了比较。
关键词：国际财务报告准则，国际财务报告准则，俄罗斯财务报告准则，RAS。

Abstract. *The article examines the convergence of International Financial Reporting Standards with the Russian accounting system, highlights the problems of introducing International Financial Reporting Standards into Russian accounting practice, justifies the need for transition to IFRS, comparing the Russian accounting regulations with International Financial Reporting Standards.*

Keywords: *International Financial Reporting Standards, IFRS, Russian Financial Reporting Standards, RAS.*

The emergence and development of multinational concerns, the growth of international financial markets and changing investor behavior have contributed to the internationalization of economic activity. As a result financial reporting has spread beyond national borders. However, interpretation and understanding of financial information at the international level is hindered by 2 a multitude of factors, including the diversity of the accounting principles and rules governing the preparation of reports in different countries. Thus since the 1970s considerable efforts have been made by various bodies, such as International Accounting Standards Board (IASB), to harmonize accounting and financial reporting standards in different countries in order to improve the usefulness and comparability of financial information in the international context.

Russian Federation is one of the emerging countries that has outlined a plan for gradual 83 IFRS adoption with a number of accounting reforms.

The accounting system of the Russian Federation was reformed in the 90s of the XX century. The Russian accounting and reporting system has always differed from foreign accounting (financial) accounting by the total regulatory system implemented at the state level. At the present stage, the Russian accounting and reporting system is undergoing a period of adaptation. The basis of this adaptation is the convergence of the national accounting system with international financial reporting standards.

The transition of Russian accounting to the principles of IFRS took place in stages. In practice, there are two main stages of the implementation of the Concept adopted in 1997, [1, p 159].

Chronological framework of the 1st stage: 2004–2007. During this period, the consolidated financial statements were transferred to the principles of IFRS. This transition was mandatory for all socially significant enterprises, except for those whose securities are traded on foreign stock markets.

Chronological framework of the 2nd stage: 2008–2010. During that period of time, the consolidated financial statements of enterprises were going over to the principles of IFRS, including socially significant enterprises whose securities are traded on foreign stock markets. However, in the way of reforming the accounting system in Russia, there were certain difficulties that did not allow to complete the process of transition of the accounting system to the principles of IFRS.

Firstly, IFRS are imperfect in many respects, since it doesn't take into account the specifics of certain areas of activity (for example, budget structures, non-profit, charitable and public organizations and foundations). Secondly, financial costs make the transition process more difficult. We are talking not only about the costs of organizations for retraining personnel, the acquisition of upgraded software and the restructuring of documents, but also that small and medium-sized businesses will have to pay a rather high price for preparing a full IFRS report rather than large holdings [2, p. 8].

- One of the main difficulties is the significant difference between the principles of accounting in Russia and the principles of IFRS;

- In the period of reform, there was a shortage of workers with high qualifications and having an idea about the work in the accounting system;

- For many companies it was not profitable to reflect full information about their business activities, as a result they expressed dissatisfaction and resistance during the transition of RAS to IFRS;

- The transition of RAS to the principles of IFRS assumed the implementation of high material and financial costs;

- Another difficulty was the imperfection of Russian legislation and the ambiguity of translating the principles of IFRS into the Russian language.

There are two internal incentives for the transition to IFRS:

1. Informative content, on the basis of which reports are made to analyze the effectiveness of managing an organization and its segments.

2. Improving the discipline and responsibility of the accounting services [4].

In addition, the main economic factors that stimulate Russian organizations to implement IFRS, are:

- access to cheap investments for promotion investment processes. This will allow Russian organizations to enter the international capital markets and, as a result, to obtain the necessary investments in the activities of economic entities from foreign investors. Such output is due to the need to provide high-quality financial statements prepared under IFRS;

- growth of market capitalization. Shares of the majority of Russian organizations are undervalued compared to shares of European companies, as they use different approaches in the application of financial reporting standards [9]

Particularly, the transition to IFRS assumed the appearance of both positive and negative factors for the development of enterprises in Russia.

Let us consider the positive aspects of the transition of the accounting system to the principles of IFRS:

- Information of many organizations has become more accessible and transparent for analysis;

−Informative value of companies' financial statements also increased;

- Due to the application of the principles of IFRS at Russian enterprises, the possibility of direct and unlimited access to foreign capital has appeared.

Along with the positive aspects of the implementation of IFRS, there are negative factors for the transition of the Russian accounting system to IFRS. The reporting by itself does not guarantee the inflow of investments in one or another field of activity. At the same time, in practice, the indicator of the balance sheet profit of enterprises that use IFRS is significantly lower than the indicator reflected according to the rules of RAS. And the company's transition from RAS to IFRS implies the allocation of significant labor, financial and temporary resources, [8].

In this study, there is a need to consider the significant differences between RAS and IFRS. The differences between them are huge, despite the quite similar wording of various provisions.

The main distinguishing feature of documents prepared on the basis of Russian Accounting Standards and International Financial Reporting Standards is that they are intended for various users: documents prepared in accordance with IFRS are used by potential investors of enterprises; documents prepared in accordance with RAS are used by government and statistics authorities. These user groups have different needs for information, therefore, reporting for them is formed on the basis of various accounting principles.

The main distinguishing features of RAS and IFRS are:

- In accordance with IFRS, the reporting date is not tied to the end of the calendar year;

- The RAS' documentation is focused on compliance with the legal form, technical accounting procedure, and to a lesser extent on the economic content of a transaction;

- The whole system of Russian accounting is focused on the application of the chart of accounts for accounting and reporting. In IFRS there is no mention of them, since the reporting involves reflection of the financial results for the services;

- In IFRS, in contrast to RAS, the possibility of recognizing revenues and expenses on a cash basis is not allowed;

There is also some similarity in the basic theoretical approaches to reporting. These include:

1. The accrual principle. The results of operations are recognized on the fact of their implementation, not in a process of receipt of funds.

2. The assumption of continuity of the companies. The company does not intend to discontinue or significantly reduce the scope of its activities.

3. The same set of signs of reliable reporting: clarity, relevance, reliability, comparability.

4. Identical reporting forms [4].

The reporting of Russian companies should include a balance sheet and a report on financial results, as well as appendices to them: a statement of changes in capital; cash flow statement; report on the targeted use of funds received, included in the accounting statements of public organizations that are not engaged in entrepreneurial activities, and other explanations for reporting.

The IFRS reporting package consists of:

• statement of financial position (analogue of the balance sheet);

• the statement of comprehensive income (equivalent to the income statement);

• report on changes in equity;

• cash flow statement;

• notes to the statements.

The filling of reporting forms, both under IFRS and Russian rules, is carried out on the basis of materiality level, that is, companies must independently determine the specification of indicators for reporting items that are most significant for the enterprise [7].

Conclusion. Due to the current circumstances, our country has a number of problems in foreign policy in the form of sanctions and other measures taken against Russia. Our country is experiencing great pressure on the economy and this is acutely felt in small and medium-sized businesses. The urgent need to inject investments from abroad for our entire economy forces us to fulfill all the necessary conditions for this an accelerated pace.

IFRS is one of those conditions under which foreign investors can be assured of the transparency of the report of our organizations and allows them to enter the world market, thereby managing to compete with other foreign organizations. The international accounting community and members of the IFRS board do not have the authority to empower them to require the use of these statements for all, without exception. The benefit of IFRS is that unified financial reporting is recognized by international investors as clear and reliable.

The main purpose of IFRS is to obtain the most reliable information about the state of the company, which is necessary for investors to correctly assess the state of the business and make reliable forecasts.

Considerable progress is being made towards converging RAS with IFRS. However significant differences still remain between the Russian standards and IFRS in recognition, measurement and presentation.

The major obstacle in the adoption of IFRS has been the fundamental differences between national and international standards and accounting practices due to disparate historical, cultural, and legal traditions.

In recent years the number of Russian companies that draw up their reporting on basis of IFRS has been steadily increasing. Thereby it is obvious now that international standards have a significant influence on the forming reporting information in Russian companies. It is being done successfully through the effects on national accounting standards and also due to the fact that some Russian companies form already a direct reporting according to IFRS, including credit institutions which are obligated by Central Bank of Russia.

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国家项目及其在解决国家社会经济发展战略任务中的作用
NATIONAL PROJECTS AND THEIR ROLE IN SOLVING STRATEGIC TASKS OF SOCIAL AND ECONOMIC DEVELOPMENT OF THE STATE

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注解。　　根据俄罗斯总统令V.V.在俄罗斯联邦实施的国家项目　　普京于07.05.2018第204号"关于俄罗斯联邦2024年发展的国家目标和战略目标"确定了国家政策在社会经济生活最重要领域的关键方向。　根据俄罗斯联邦主体的权力，国家项目的目标指标分配到每个区域的水平，这实现了其实施的区域方面，特别是那些旨在提高社会领域质量的方面（卫生，　人口学，文化，教育）。　国家项目框架内的财政支持将使该地区能够解决为他们设定的任务，重点是改善俄罗斯人的生活质量。

关键词：国家项目，地区，项目融资，生活质量，教育。

Annotation. *National projects implemented in the Russian Federation in accordance with the Decree of the President of Russia V.V. Putin of 07.05.2018 No. 204 "On the national goals and strategic objectives of the development of the Russian Federation for the period up to 2024" identified the key directions of state policy in the most important areas of the socio-economic life of society. The target indicators of national projects in terms of the powers of the subjects of the Russian Federation are distributed to the level of each region, which actualizes the regional aspects of their implementation, especially those aimed at improving the quality of the social sphere (Health, Demography, Culture, Education). Financial support within the framework of national projects will allow the regions to solve the tasks set for them, focused on improving the quality of life of Russians.*

Keywords: *national projects, regions, project financing, quality of life, education.*

In order to implement breakthrough scientific, technological and socio-economic development of the Russian Federation, improve the quality of life of citizens, create comfortable conditions for their residence, a Decree of the President of Russia V.V. Putin of 07.05.2018 No. 204 "On the national goals and strategic objectives of the development of the Russian Federation for the period up to 2024" (Figure 1). [1]

According to the strategic directions of development, 12 national projects have been developed.

A project is a way of organizing activities in which the execution of strategic tasks is structured into separate projects and a set of appropriate tools and methods are used to manage them. [2] The advantages of the project management method is to concentrate financial resources on solving the most important tasks.

In accordance with federal projects in the constituent entities of the Russian Federation, to accelerate the socio-economic development of territories and technological breakthroughs, regional components of national projects have been identified, in which target indicators, practical mechanisms for their achievement, funding levels are determined based on the need to solve problems and get results defined by federal projects.

In order to develop project management in the regions of the Russian Federation, regulations have been adopted on the organization of project activities; advisory bodies have been created whose functions include the consideration of issues related to the implementation of national projects in the regions; identified responsible for the implementation of projects, as well as executive authorities, providing issues of overall coordination.

Targets of national projects in terms of the powers of the subjects of the Russian Federation are distributed to the level of each region, with the establishment of their values to the corresponding regional project and are fixed in the agreement on its implementation (in accordance with standard forms).

At the expense of national projects, the regions intend to solve a number of priority tasks in health care, culture, education, etc.

The education system is one of the key vectors of development, both of the country as a whole, and of the subjects of the Russian Federation in particular. [3] In this regard, great attention is paid to the development of regional education through the implementation of federal programs and, starting from 2019, national projects. [4,5]

The main directions and tasks in the framework of the Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On the national goals and strategic objectives of the development of the Russian Federation for the period up to 2024"

Demographics: an increase in healthy life expectancy to 67 years; an increase in the total fertility rate to 1.7; an increase in the proportion of citizens leading a healthy lifestyle, as well as an increase to 55 percent in the proportion of citizens who regularly engage in physical culture and sports.

Safe and high-quality roads: an increase in the share of regional roads; reduction in the share of federal and regional roads operating in transshipment mode, in their total length by 10 percent compared with 2017; decrease in mortality due to road accidents by 3.5 times compared with 2017 - to a level not exceeding four people per 100 thousand population (by 2030 - striving for a zero death rate).

Housing and urban environment: providing affordable housing to middle-income families; an increase in the volume of housing construction to at least 120 million square meters per year; a cardinal increase in the comfort of the urban environment, an increase in the quality index of the urban environment by 30 percent, a reduction in the number of cities with an unfavorable environment in accordance with this index twice.

Labor productivity and employment support: growth of labor productivity in medium and large enterprises of basic non-resource sectors of the economy not less than 5 percent per year; involvement of at least 10 constituent entities of the Russian Federation annually to participate in the implementation of this national program; the involvement in the implementation of this national program of at least 10 thousand medium and large enterprises of the basic non-primary sectors of the economy.

The science: achieving the following goals and targets: ensuring the presence of the Russian Federation among the five leading countries of the world that carry out research and development in areas determined by the priorities of scientific and technological development; ensuring the attractiveness of work in the Russian Federation for Russian and foreign leading scientists and young promising researchers; Anticipating increase in domestic research and development costs from all sources compared with a country's gross domestic product growth.

Health care: decrease in mortality rates of the working-age population (elimination of personnel shortages in medical organizations; an increase in the volume of exports of medical services by at least four times compared with 2017.

Ecology: efficient handling of production and consumption wastes, including the elimination of all unauthorized dumps found on January 1, 2018 within cities; drastic reduction of air pollution in large industrial centers; improving the quality of drinking water for the population.

Education: ensuring the global competitiveness of Russian education, the entry of the Russian Federation among the 10 leading countries of the world for the quality of general education; education of a harmoniously developed and socially responsible person based on the spiritual and moral values of the peoples of the Russian Federation, historical and national-cultural traditions.

Digital economy: an increase in domestic spending on the development of the digital economy from all sources (by share in the gross domestic product of the country) by no less than three times compared with 2017; the creation of a sustainable and secure information and telecommunications infrastructure for high-speed transmission, processing and storage of large amounts of data that is accessible to all organizations and households; the use of primarily domestic software by government agencies, local governments and organizations.

Culture: strengthening Russian civil identity based on the spiritual, moral and cultural values of the peoples of the Russian Federation; providing children's music, art, dance schools, colleges and schools of art with the necessary tools, equipment and materials; promotion of talented youth in the field of musical art, including through the creation of a national youth symphony orchestra.

Small and medium entrepreneurship and support for individual entrepreneurial initiative: an increase in the number of people employed in the field of small and medium enterprises, including individual entrepreneurs, to 25 million people

International cooperation and export: forming in the manufacturing industry, agriculture, and the services sector of global competitive non-primary sectors; the achievement of exports (in value terms) of non-energy non-energy goods in the amount of $ 250 billion a year.

Рисунок 1- *Основные направления и задачи национальных проектов (программ)*
Figure 1- *The main directions and tasks of national projects (programs) under the Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On the national goals and strategic objectives of the development of the Russian Federation for the period until 2024" [1]*

In the regions of the Russian Federation, the implementation of the regional component of the national project in the field of education is planned.:
- Modern school;
- Success of every child;
- Support for families with childre;
- Digital educational environment;
- Teacher of the future;
- Young professionals (Increasing the competitiveness of vocational education);
- New features for everyone;
- Social activity. [6]

Sources of financing regional projects are the federal budget, the budgets of the constituent entities of the Russian Federation, and extrabudgetary sources of funding are provided for individual projects. [6]

■ Modern school   ✕ Success of every child

■ Support for families with children   ↘ Young professionals

■ Social activity
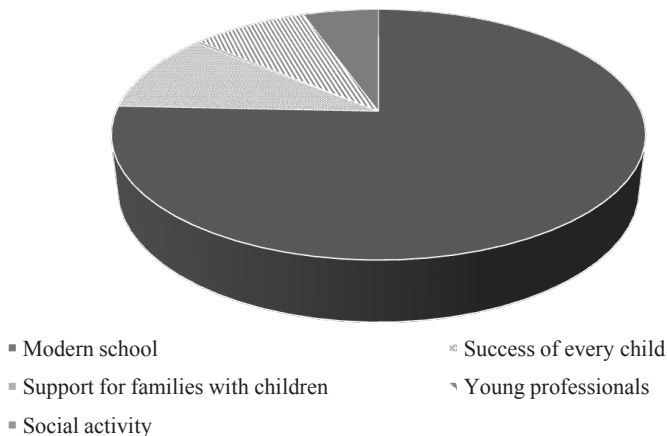
Figure 2 - Structure of financing regional projects in the field of education, %

The main share of expenses envisaged for the implementation of regional projects in the field of education falls on the project "Modern School".

In the framework of the Modern School project, it is planned to: build new general education organizations, which will reduce the shortage of places in schools, increase the proportion of children involved in one shift, update the material and technical base for the implementation of basic and additional general education programs.

National projects in the social sphere in general, and education, in particular, will improve the quality of life of Russian citizens, most fully meet their educational, social, medical and spiritual needs. Despite the fact that the main source of funding for priority national projects is the federal budget funds, the projects themselves are implemented through the direct activities of regions that are interested in their implementation as the most important tool for their development. That is, improving the quality of life of citizens in the country, its effective growth requires an appropriate level of regional project management [7].

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腐败是对俄罗斯主权的威胁：历史分析
CORRUPTION AS A THREAT TO RUSSIAN SOVEREIGNTY: A HISTORICAL ANALYSIS

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Annotation. The article is devoted to the problem of corruption in Russia, and the search for a solution to this problem through the consideration of Russian political and legal thought about the supreme power, and the qualities that the government should possess. The article considers corruption as a dangerous phenomenon for the sovereignty of the Russian Federation.

***Keywords:** corruption, sovereignty, independence, supreme power.*

Corruption is a socially dangerous phenomenon, encroaching on the foundations of government at all levels. Despite the efforts of state bodies, in recent years, the level of corruption crimes continues to threaten the foundations of national security. Corruption in state structures among officials, significantly hinders the development of government, leads to a decrease in the degree of responsibility and independence of the Russian Federation.

Corruption is a threat to the sovereignty of any state, and the Russian Federation can not be an exception.

In Art. 1 of the Federal Law dated December 25, 2008 No. 273-FL "On Countering Corruption" gives an official definition of corruption, namely: abuse of official position, giving a bribe, accepting a bribe, abuse of authority, commercial bribery or any other illegal use by an individual of his official position despite the legitimate interests of society and the state in order to obtain benefits in the form of money, valuables, other property or property services, other property rights for themselves or for third parties or The unlawful provision of such benefits to a specified person by other individuals.

As a phenomenon, corruption is more reflected in the country's legislation, and the idea and theory of sovereignty is found in legal, political science, and philosophical literature.

In modern legal literature, the concept of sovereignty is defined as a political and legal property of state power, which expresses its supremacy within the country and its independence from any other government outside the state.

Ideas containing a characteristic of state power, appeared in ancient times, developed in subsequent periods of domestic and Western European history.

The concept of sovereignty has become a universal reflection of the state of a "full-fledged" state, and at the same time it is a real sign of strong states dictating their will to weak states.

The term "sovereignty" comes from the Latin word superanus, which has become Old French sovereins, i.e. supreme, which in itself implies the existence of a certain independence and autonomy of power. The emergence of this political and legal category was originally due to the need to strengthen state principles, the formation of centralized statehood. That is, the idea of sovereignty was formed as a reaction to the weakening of statehood, feudal fragmentation in the interests of political and legal justification of the absolute power of the monarch (suzerain). This power was considered as supreme, unified and unlimited by any laws and right in general [1, p. 22].

The founder of the theory of state sovereignty, Jean Bodin (1530-1596)., In the opinion of I. P. Trainin, put forward three attributes of sovereignty:

1) the constancy of power, i.e. the indissoluble continuity of inherited power;

2) unlimited and absolute nature of power, not obliged before anyone except god to report on their actions;

3) the unity of power, not redeemable by prescription and not transferable to anyone, its inalienability and indivisibility.

The expression of sovereign power was the law, as a command and coercion of higher power. Only sovereign power could have the right to change the laws. The actions of other authorities were committed at the will of the sovereign and within the rights granted to them as the executors of his will..

The inalienable and unchangeable rights of sovereign power J. Boden attributed the most important issues such as the law of war and peace, the appointment of high dignitaries, the supreme court, the right to pardon, the right to mint coins, the establishment of taxes, measures and weights [2, p. 75].

It is believed that J. Bodin was the first to unite in the state-legal notion of sovereignty all its features: absoluteness, indivisibility, continuity in time, independence, inalienability.

But did Western thinkers reason about the qualities that a supreme ruler should possess? In the domestic political and legal thought there were very valuable ideas about the sovereignty of the state in general, and the supreme power in particular. These ideas came from the ancient Russian period of national history, and evolved as new ideas emerged.

In order to understand the inadmissibility of corruption in our country, it is necessary to analyze the domestic political and legal thought concerning the issues of state sovereignty, the qualities of which the supreme authority must necessarily possess.

In the context of the folding of the Old Russian statehood, the ideas of the unity of the Russian land, of a single, strong, independent power become in-demand, their understanding is developed in relation to the specificity of historical conditions.

However, in ancient Russian political and legal thought, the idea of state sovereignty included not only the ideas of freedom, independence of power, but also the ideas of righteous power, a just and responsible power, for which truth and honesty are the most important characteristics of supreme power. These ideas are found in Hilarion, Vladimir Monomakh.

The power in Russia, unlike the Western understanding of sovereignty, was not just from God, but wore a divine character.

The supreme power, guided by such qualities as truth, justice, verity was endowed with a divine character.

As N.A. Kazakova and Ya.S. Lurie, Joseph Volotsky (1439-1515), distinguishing the idea of power as a divine institution and the power represented by its carrier, a specific person, argued that the power of a particular person might be wrong. The mistakes of the authorities are capable of destroying not only the ruler himself, but also all the people, since God will punish the whole earth for state sins. If a ruler, being put by the king over people, has sins, lies, pride, anger, slyness, avarice, such a king "is not God's servant, but the devil," and he can be resisted, as the apostles and martyrs often did P. 262].

Later, Maxim Grek (1470-1556) will say that the brilliant organization of the worship of faith, religious rites, inactive faith and piety will not make the king true, will not bring him closer to God. Often, those in power who observe all requirements oppress the poor. A true ruler is he who performs just and righteous deeds. God loves most of all truth, generosity, and mercy he wrote [4, p. 211]. It is precisely in the observance of the truth connected with good law that the main duty of the supreme power before the people consists. The presence of faith, but the lack of truth in the implementation of state power is not pleasing to God.

N. M. Zolotukhina notes that in Russia the formula on the interaction of "truth and faith" was the first to be introduced into political literature by Maxim Grek, but it was later widely spread thanks to I. S. Peresvetov, who brightly and vividly described the presence of "truth in everything" in The Ottoman Empire and its absence from the Greek king Constantine [5, p. 128]. The truth and faith of Ivan Peresvetov were tied together; the state, which is not guided by truth and faith, was threatened with the fate of Byzantium.

We see that domestic thinkers connected the future of the state with truth and faith, Joseph Volotsky spoke of "love for money" as a vicious quality of power, Maxim Grek said that God would prefer power to be generous and just, righteous than to observe church rites but offend the poor.

It should be noted that the thinkers of that historical period spoke of those vicious phenomena, by which we mean corruption in the modern sense. Because, in corruption, there can be no truth, justice, not suffering from "love for money", the government will not tolerate corruption. Moreover, since the period of our history was dominated by the theory "Moscow is the third Rome", thinkers of that era cited Byzantium as an example, which had faith, but there was no truth, and therefore Byzantium fell and lost its sovereignty.

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政治 – 完善反跨国犯罪斗争领域国际合作的法律途径
POLITICAL AND LEGAL MODEL OF INTERNATIONAL COOPERATION IN THE FIGHT AGAINST TRANSNATIONAL CRIME ON THE EXAMPLE OF COUNTERING TERRORISM

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注解。 该条致力于改善打击跨国有组织犯罪的国际合作。 由于今天有组织犯罪往往远远超出俄罗斯联邦边界并且具有全球性质，因此提出了在打击跨国犯罪方面制定和实施合作战略的必要性所产生的实际问题。 在这方面，使用了以反对国际恐怖主义为例实施其战略和机制。

关键词：国家的国际合作，有组织犯罪，打击跨国犯罪的战略，政治法律方式，国际法律证书，恐怖主义，对国际恐怖主义的反击等。

Annotation. *The article is devoted to the improvement of international cooperation in the fight against transnational organized crime. Actual problems arising from the fact that today organized crime tends to spread far beyond the borders of the Russian Federation and are global in nature raise the question of the need to develop and implement a cooperation strategy in the fight against transnational crime. In this regard, strategies and mechanisms for its implementation on the example of countering international terrorism are used.*

Keywords: *the international cooperation of the states, the organised crime, strategy of struggle against transnational criminality, a politico-legal way, international legal certificates, terrorism, counteraction to the international terrorism, etc.*

Organized crime in the modern world has a tendency to spread far beyond the Russian Federation and is global in nature. Globalization and transnationalization of crime, as, for example, indicates V.A. Nomokonov, based on patterns that are global in nature, generating the development of systemic measures on the part of the world community and require appropriate methodology and special techniques[1]. [1]

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[1]Nomokonov V.A. Modern criminology: traditional approaches and new directions // Organizational crime, migration, politics. - Moscow, 2002. P. 136.

Experts note that transnational organized crime is a social problem that has a legal dimension. To define the modern concept of organized crime, it is necessary to apply an integrated approach, which, in our opinion, involves the development of a number of areas: "activity approach", "structural approach", "system-functional approach", "sociocultural aspect", "situational aspect", "regional approach".

It seems that the time has come to create a strategy for international cooperation in the fight against transnational crime based on such sciences as political science and law. This position is justified by the fact that law and politics, politics and law are closely interrelated and consist essentially of interpenetrating elements: political and legal norms, etc.

One of the reasons for the growth of transnational organized crime can be considered insufficiently developed political and legal approaches in the field of international cooperation of states. Therefore, for successful work in this direction, *a strategy of international cooperation in the fight against organized crime* is needed. Usually, strategy is defined as the art of leading social and political struggles, as well as the art of planning based on predictions. In this sense, the concept of "strategy" we find in the dictionary of S. I. Ozhegov[2]. [2]

An international cooperation strategy to combat transnational organized crime can be considered as a model. The political and legal *model* of the strategy, in our opinion, represents a system of effective planning for managing the processes of international cooperation in combating organized crime, including a combination of methods and techniques of social and political struggle.

In political science, **the strategy of international cooperation in combating organized crime** *can be represented as a system or complex of ways and means to achieve goals, the implementation of which presupposes the existence of tactics as a level of planning activities and a strategy as a mechanism for accomplishing tasks of opposing international or transnational crime*.

At the same time, it is necessary to agree with the opinion of scientists that tactical planning can be modified and the strategy is unchangeable[3]. [3]

Let us dwell on certain important elements of the mechanism for combating international organized crime, which seems to be dynamic and complex, and also should, in our opinion, include those elements without which the realization of strategic goals in the fight against transnational crime is impossible.

This, in particular, the fight against international terrorism.

The following general policy principles can be used as the basis for combating international terrorism:

the use of force of law;

refusal of concessions to terrorists;

[2]Ozhegov S.I. Explanatory dictionary of the Russian language. - Moscow, 1996. P. 761.

[3]Khizhnyak D.S. The fight against transnational crimes and their investigation: strategic aspects: monograph. - Moscow, 2015. P. 17.

rejection of the policy of double standards in the field of combating terrorism [4]. [4]

impact on states that encourage terrorism and ruthlessness towards the terrorists themselves;

assistance to states in the formation of resources to combat terrorism;

prevent the use of territory and deny safe haven to persons who pursue terrorist goals against other states or their citizens;

consideration of ethnic and religious factors in the development of international terrorism, etc.

In a political and legal sense, the implementation of the above principles implies reliance on the fundamental international acts, namely:

Universal Declaration of Human Rights of December 10, 1948, Convention on the Protection of Human Rights and Fundamental Freedoms of November 4, 1950 (as amended on May 13, 2004), International Covenant on Civil and Political Rights of December 16, 1966, UN Declaration on Measures to Eliminate International Terrorism of December 9, 1994, International Convention for the Suppression of Terrorist Bombings of December 15, 1997, International Convention for the Suppression of the Financing of Terrorism of December 9, 1999, European Convention on the Suppression of Terrorism of 27 January 1977 (with changes from 15 th, 2003), the Council of Europe Convention on the Prevention of Terrorism of 16 May 2005

It is obvious that the generally accepted norms of international law in the fight against terrorism are the basis for bringing together the domestic laws of states and, above all, those that have been affected by international terrorist groups[5]. [5]

At the same time, there are a number of external factors that not only hinder this rapprochement, but also contribute to the emergence and spread of terrorism. The concept of countering terrorism in the Russian Federation (approved by the President of the Russian Federation on 05.10.2009), in particular, includes:

the absence in the international community of a common approach to determining the causes of the emergence and spread of terrorism and its driving forces, the presence of double standards in law enforcement practice in the field of combating terrorism;

the lack of a common anti-terrorism information space at the international and national levels, etc.[6]. [6]

In this regard, the Shanghai Cooperation Organization's Convention against Terrorism, concluded on June 16, 2009 in Yekaterinburg, was a significant step

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[4]See: National Security Strategy of the Russian Federation of December 31, 2015, Art. 18.

[5]Kochoi S.M. Pan-European legislation on combating terrorism and the prospects for reforming the Criminal Code of the Russian Federation // Lex Russica. - 2014. - No. 9. P. 1061.

[6]Rossiyskaya Gazeta, No. 198, 10/20/2009

forward in the formation of international political and legal counter terrorism mechanisms[7]. [7]

In particular, an important step has been taken in terms of unifying the understanding of the essence of terrorism. According to Article 2 of the Convention, "terrorism" is an ideology of violence and the practice of influencing decision-making by authorities or international organizations by committing or threatening to commit violent and (or) other criminal acts related to intimidation of the population and aimed at causing harm to a person, society and to the state.

The Convention (Article 7) defines measures common to the parties in the political and legal sphere, namely: the Parties encourage interreligious and intercultural dialogue involving, where necessary, non-governmental organizations and other civil society institutions, subject to compliance with national legislation in order to prevent situations of tension that can lead to crimes of a terrorist nature.

In addition, each Party, in accordance with the fundamental principles of its legal system, develops and implements measures at the national level to counter terrorism, which may include:

• periodic evaluation of legal instruments governing countering terrorism and practical measures in terms of their effectiveness;

• interaction with relevant international and regional organizations in the development and implementation of counter-terrorism measures;

• legislative definition of restrictions, the introduction of which is permissible in order to prevent terrorist acts;

• enhancement the protection of individuals and objects;

• protection of victims, witnesses and other participants in criminal proceedings, as well as, if necessary, other persons in matters of countering terrorism;

• assisting the participation of non-governmental organizations, individual groups and individuals in countering terrorism and in shaping a rejection of terrorism in society;

• educating the public about the danger of terrorism and its negative consequences, as well as about responsibility for committing crimes covered by this Convention, etc.

An integral part of the political and legal mechanism of international cooperation in the fight against terrorism, in our opinion, is an effective national criminal law policy in the field of countering terrorist crimes, the legal component of which, in the opinion of experts, is a comprehensive mechanism for protecting the state and society by "novelizing the norms criminal and penal legislation, the use of modern legal and other resources for the study of crime determinants ", improvement of the methodological support for the prevention and preclusion of

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[7]The Convention takes force on 14.01.2012. Bulletin of international treaties. 2012. №10. P. 68 - 82.

crime and organizational activities in the field of legislative activity and its implementation[8]. [8]

The result of such work should be the formation of goals and objectives for the effective operation of the international antiterrorist coalition and the development of a comprehensive program of strategy to counter the international terrorism by force, taking into full account its relations with the globalization processes in the world.

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俄罗斯联邦现代大学教育发展趋势
TRENDS IN THE DEVELOPMENT OF MODERN UNIVERSITY EDUCATION IN THE RUSSIAN FEDERATION

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注解。寻求改善俄罗斯联邦高等教育的方法之一是研究国外经验，大学教育发展的主要趋势以及国外大学科学和教育环境发展的前景。从这个角度来看，俄罗斯研究人员对中华人民共和国大学科学和教育环境发展的经验感兴趣，这个国家与俄罗斯联邦目前正在发展的多边关系，包括高等教育。 2016 – 2018年，我们在俄罗斯人道主义科学基金（项目16–06–00083–ОГН）的支持下实施了一个项目“中国和俄罗斯现代大学科学和教育环境的形成和发展”。本文反映了这项研究的结果，该研究描述了现代俄罗斯大学发展的主要趋势。

关键词：大学教育，趋势，科学和教育环境，改革，国际化。

Annotation. One of the ways to find ways to improve higher education in the Russian Federation is to study foreign experience, the main trends in the development of university education and the prospects for the development of the scientific and educational environment of universities abroad. From this point of view, Russian researchers are interested in the experience of the development of the scientific and educational environment in the universities of the People's Republic of China, in a country with which the multilateral ties of the Russian Federation are currently developing, including in higher education. In 2016-2018 we implemented a project with the support of the Russian Humanitarian Scientific Fund (project 16-06-00083-ОГН) "Formation and development of the scientific and educational environment in modern universities of China and Russia". This article reflects the results of this study, which characterize the main trends in the development of modern Russian universities.

In the modern period, major changes are taking place in the system of Russian higher education, which have affected the content, organization, and structure of university education. These changes were reflected in the environment of educational institutions, in their scientific and educational component. The transition of Russian university education to level preparation (undergraduate - graduate - postgraduate) in the context of the development of the Bologna process in European countries has led to the need to improve not only educational activities, but also scientific activities, and also affects their interrelationships. The Bologna Declaration signed in 2003 was focused on the implementation of global trends in the development of higher education as guidelines for reforming the higher education system in our country. The main goal of the Bologna process is to create a single European higher education area. The main reason for its creation is the lag of the countries of the European Union (EU) in terms of the level of education and research training. For example, in EU countries, only 21% of working residents have a higher education, while in the US the same figure is 38%, in Japan - 36%. Also in the EU countries per 1 thousand inhabitants there are 5.5 researchers, in Japan - 9.7, in the USA - 9 [8].

The transition of Russian university education to the level preparation (bachelor's school - magistracy - graduate school) leads to the need to improve educational and scientific activities, the development of their relationship.

In the Russian Federation, such documents as the Federal Law "On Education in the Russian Federation" (2013), Orders and Letters of the Ministry of Education and Science, the Federal State Educational Standards of Bachelor and Master Programs in various areas play an important role in the development of the scientific and educational environment of universities; Federal Target Program "Scientific and Scientific-Pedagogical Personnel of Innovative Russia" for 2014–2020, Resolution of the Government of the Russian Federation and Regulations on State Support for the Development of Innovative Infrastructure, including Support for Small Innovative Entrepreneurship, in Federal Educational Institutions of Higher Professional Education (2010); Development programs of national research universities, etc.

The Federal Law "On Education in the Russian Federation" (2013) [6] allows for several important aspects: features of vocational education (paragraph 5 of Article 11 of the Law); features of scientific and methodological and resource support of the education system (Article 19 of the Law); features of experimental and innovative activities in the field of education. (Article 20 of the Law); categories

of modern universities (Article 24 of the Law); features of forms of integration of educational and research activities in higher education (Article 72 of the Law). The law established a three-tier structure of higher education: bachelor degree; specialty, master; training of highly qualified personnel (postgraduate). In the education system, in accordance with the Law on Education in the Russian Federation, research and design organizations, design bureaus, training and experimental farms, experimental stations and other organizations that carry out scientific and methodological, methodical, resource and information technology provision of educational activities, etc. The law opens up opportunities for experimental and innovative activities in the field of education in order to modernize and develop the education system. Experimental activities are aimed at developing, testing and introducing new educational institutions and mechanisms, educational resources. Innovation activity is focused on improving the scientific and pedagogical, educational and methodical, organizational, legal, financial and economic, personnel, material and technical support of the educational system. This activity is carried out in the form of innovative projects. The law establishes the categories of Russian universities - a federal university providing a high level of educational process, research and technological work, as well as a national research university. The integration of educational and research activities in higher education can be carried out in various forms: research departments, grant activities, joint research activities of universities with different social partners, the creation of scientific laboratories, etc. [7].

Federal state educational standards of higher vocational education [3] regulate and allow assessing the quality of education at the university. GEF bachelor and master programs texts describe the requirements for the conditions for the implementation of educational programs: information support for the educational process; electronic library systems; the minimum required for the implementation of the educational process of bachelor and magistracy list of logistics. These provisions can be viewed as requirements for the organization of the scientific and educational environment of a modern university.

The main federal document regulating the approaches to the design of the scientific and educational environment in higher education of the Russian Federation was the Model Provision on the Educational Institution of Higher Professional Education (Higher Educational Institution), which was approved by Decree of the Government of the Russian Federation of February 14, 2008 No. 71 (expired in 2014 g.). One of the articles of the provision was devoted to the creation of a university complex, which unites educational institutions that implement educational programs of various levels, other institutions and non-profit organizations, etc. The university complex can be considered as a recommended scientific and educational environment [7].

In addition to documents of the federal level, various documents of the local level operate in the Russian Federation as the regulatory and legal framework for the formation of the scientific and educational environment of a modern university. In the Russian Federation, two leading universities have a special status, it is statutory secured by the Federal Law of 10.11.2009 No. 259-ФЗ "On the Lomonosov Moscow State University and St. Petersburg State University "[5].

Thus, the following features of the legislative framework of the scientific and educational environment in universities of the Russian Federation can be identified: trends in the understanding of the scientific and educational environment as a set of intellectual, material and information resources for training specialists and conducting research [1].

The Strategy for Innovative Development of the Russian Federation for the Period until 2020, approved by the Decree of the Government of the Russian Federation on December 8, 2011, states that significant efforts of the state are aimed at encouraging universities to increase the number of Russian universities that are among the 200 leading universities in the world, according to world ranking of universities, up to 4 units (in 2010 - 1).

The main strategic changes are related:

- with the intensification of research work in universities and the integration of science and education;

- with the internationalization of educational programs;

- with individualized learning.

We can briefly describe the main directions of strategic changes in Russian universities.

Individualization of curriculum. Modern Russian High School is focused on building flexible educational trajectories of students. The construction of such trajectories (routes) involves the creation of conditions for the choice by students of the mode of organizing classes. A high degree of individual mobility of the student should be combined simultaneously with a clear planning of the class schedule, a list of responsible teachers - supervisors in the discipline, full accessibility of information on the requirements for the subject and the procedures for its assessment.

In the Russian Federation there is an experience of using nonlinear (asynchronous) construction of working curricula. Let us take as an example the Moscow Higher School of Social and Economic Sciences, in which initially the number of required courses (at the request of British partners - the University of Manchester) was minimized, and all other courses were chosen by students on an elective basis. On average, the proportion of courses chosen by students is 20% of the total number of class hours. All this is quite far from the recommendations developed in the framework of the Bologna process - instead of the ratio of compulsory and elective disciplines at the level of 1: 3, we have their ratio at the level of 4: 1 [4].

The reform of the educational system of the Russian Federation has affected all levels of higher education. If not long ago postgraduate studies were considered postgraduate education, then the Law "On Education" that came into force on January 1, 2013 made postgraduate studies the third level of higher education, which implements a program for training scientific and pedagogical personnel. The term of study in graduate school, as a rule, is 3 years in full-time and 4 years - in absentia. Order No. 2202 of the Ministry of Education and Science of August 12, 2011 approved specialties of technical and natural sciences, the duration of study for which in postgraduate and adjunct studies may be 4 and 5 years, respectively.

Universities independently determine not only the number and list of examinations, but also the grading scale and the passing score when enrolling in graduate school students. Additional points can be obtained for personal achievements: patents, publications, participation in scientific events and competitions. These points are added to the points obtained in the exams, or they can be counted instead. That is, the entrance exam may be replaced by a portfolio competition.

In 2017, for the first time, graduate diplomas were issued, which testify to the "mastering the training program for scientific and pedagogical personnel" in a certain direction and the award of the qualification "Researcher. Teacher Research. As for the doctoral studies, since 2013 it has completely become a form of training scientific personnel.

In the Russian Federation, the scale of the educational services market is growing. Education throughout the world is *the main instrument for ensuring social justice* both through an "equal start" for all citizens and through special support for students with special needs. This, combined with the *educational function of schooling* (which, in particular, ensures the development of the values of solidarity and patriotism), introduces the necessary sustainability in social development and makes economic growth the basis for improving the quality of life of all segments of the population. In President's Message on March 1, 2018, the President of the Russian Federation emphasized: "Equal educational opportunities are a powerful resource for the development of the country and ensuring social justice" [2]. In the further development, it is planned to transfer innovation support infrastructure to the universities (business incubators, business accelerators, innovation parks, technology parks, etc.) and support the effective use of this infrastructure. Online courses at leading universities and mixed courses based on them will have to be at least one-third of educational programs of higher education in universities. It is planned to grant support to cooperation of regional universities, science and business, which involves the allocation of subsidies for a period of 1 to 3 years to finance complex projects aimed at the development of industries and regions carried out jointly by educational, scientific and business organizations. A competitive selection of 100 universities is proposed to support regional economic devel-

opment programs and 25 universities to support industry development programs (transport, medicine, agriculture, industry, etc.), increase the size of scholarships for graduate students to support the development of research for the needs of industries and regional economies.

The experience of many universities shows that without ensuring a close connection between the educational process and research, effective training of highly qualified specialists demanded by modern economics cannot be provided. The following decisions contribute to the integration of the educational process and research in the surveyed universities. Partnership with research organizations to conduct joint research (including through grant support from Russian and international funds); the creation of "basic departments" of universities focused on practical exercises, special courses and experimental work; the creation of educational and scientific laboratories, as a space for the involvement of teachers, students and graduate students in research and development; creation of collective use centers, creating conditions for the effective use of unique equipment.

The revitalization of the research activities of universities implies an increase in the openness of the national high school, the internationalization of its activities. The internationalization of higher education is an objective consequence of the globalization of the modern world and at the same time a major resource for accelerating the integration of social and economic life and the elimination of national isolation. Globalization challenges universities to prepare for activities in the context of integrated labor markets. Today, Russian higher education attaches high priority to the processes of internationalization, within which new strategies, models and mechanisms for the international activities of each Russian university are searched and developed, taking into account university and regional specificities and the place of Russian higher education in the modern international educational space.

In the project "Developing an integrated export strategy for Russian higher education and enhancing its competitiveness in the global education market" (2009), internationalization is represented by the following forms of international cooperation:

- Individual mobility: mobility of students or faculty members for educational purposes;
- Mobility of educational programs and institutional mobility: the formation of new international standards of educational programs;
- Integration into programs of international measurement and educational standards;
- Institutional partnership: creating strategic educational alliances (Developing an integrated strategy, 2009).

The best-known form of the internationalization of higher education is *student*

mobility, that is, training Russian students abroad and foreign students in Russia and the *mobility of teaching staff*. Traditionally, the international mobility of the faculty is due to research and scientific work, but in some regions and certain areas of education there are special schemes for regional and international training for young researchers and specialists.

The academic mobility of students and teachers also conditions the development of conditions for creating double and joint diploma programs with foreign partners, international-standard applications to the diploma. The results of the research of the Higher School of Economics and the Zirkon research group indicate that at present the double degree programs are not developed very much - they exist only in one third of the universities [4]. For the development of academic mobility, the development of courses taught in foreign languages (above all, in English) is of no small importance. In recent years, the number of foreign students from Europe, the USA and other countries has increased.

The geographical advantages and historical ties of China and Russia determine the strategic importance and value of two countries cooperation in the field of higher education. Since the founding of the PRC in 1949, the Soviet Union has become China's leading partner in the development of university education in this country. The Soviet experience of the education system was attractive for professional training of specialists. After the collapse of the Soviet Union, China and Russia signed an "Agreement on the mutual recognition of diplomas and scientific degrees," recognition in two countries of state documents obtained during training. In 2001, the "Chinese-Russian Treaty of Neighborhood, Friendship and Cooperation" was signed. During the "Year of Russia" in China (2006) and the "Year of China" in Russia (2007) various events were organized, including scientific and practical conferences and seminars, the exchange of students' research experience, master classes by experienced researchers, etc.

In modern conditions, Russian and Chinese universities continue to develop academic cooperation.

Thus, the process of continuous modernization of Russian and Chinese universities brings together their strategic direction of development. At the same time, Russian universities are developing in the context of the Bologna process and the formation of the European educational space, changing the structure, content, and educational technologies. The main strategic changes in Russian universities are associated with the intensification of research work, the integration of science and education, with the individualization of education, with the internationalization of educational programs. This can be the basis for the prospects of Russian-Chinese cooperation in higher education.

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在教育过程参与者的社会伙伴关系基础上对社会工作者进行专业培训

PROFESSIONAL TRAINING OF SOCIAL WORKERS ON THE BASIS OF SOCIAL PARTNERSHIPS OF EDUCATIONAL PROCESS ACTORS

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注解。 在论文中，研究了教育过程参与者的社会伙伴关系形式。 定义了从业者参与学习过程的潜力。 提出了新的教育学科。 指定了社会联合项目。 定义了导航船的功能，并讨论了导航船用于社会工作者专业训练的可能性。

关键词：社会工作者的专业培训，社会伙伴关系，从业者参与学习过程，联合项目，导师船，课程调整。

Annotation. In the paper the forms of social partnership of the educational process actors are examined. The potential of practitioners involvement in the learning process is defined. New educational disciplines are proposed. Social joint projects are specified. The functions of the preceptor ship are defined and the possibility of preceptor ship for professional training of the social workers is argued.

Keywords: professional training of the social workers, social partnership, involvement of practitioners in the learning process, joint projects, preceptor ship, adjustment of curriculum.

Practical training of a university graduate, his willingness to perform professional functions is assessed, first of all, by employers who are the final consumer of the product of vocational education. Therefore, one of the leading directions in the training of future specialists, increasing their competitiveness in the labor market is the creation of a system of interaction with employers.

Taking this into account, we, as part of our experiment, developed the content of the social partnership of subjects of the educational process, taking into account the specifics of professional training of the future social work specialist. Social partnership, as part of our experiment, is based on the principle of complexity, i.e. not only with the participation of students and teachers, but also practitioners of social work.

In scientific literature and in practice, social partnership is ambiguous. Some understand it as a specific type of social and labor relations between government bodies, the employer and the workforce. Others - in a broader sense - as a specific type of social relations between professional, social groups, strata, classes, their public associations, authorities and business. Third, as the ideological basis for coordinating and protecting the interests of various social groups, strata, classes, their public associations, business and authorities [1; 2; 5; 6]. In addition, the practice of the so-called non-profit partnership, implemented by non-profit organizations to achieve social, charitable, cultural*, educational*, scientific and management goals in meeting the intangible needs of citizens, their legitimate interests, as well as in the areas of rights protection, resolution of disputes and conflicts, legal aid [4].

In international practice, the concept of social partnership in the field of vocational education has already been formed and is understood as interaction with the subjects of economic life and the world of work in order to increase the effectiveness of vocational education and meet the demand for skills and competencies in the labor market [3]

Summarizing approaches to the definition of *social partnership*, we can say that this is a special type of relationship between professional groups based on the principle of equal cooperation of partners, which ensures the optimal balance and the realization of their main interests in solving significant social problems, increasing the effectiveness of vocational education and meet the demand for skills and competence of the labor force in the labor market.

In most countries, employers' organizations are actively involved in the industrial training system. In addition, practical training — on-the-job training — depends on employers at the enterprise level. In the implementation of industrial training, social partners often act as organizers of independent training centers and institutions of continuing professional education. The success of the practical training of future specialists depends largely on the nature and quality of its organization. We are talking about the relationship between the school and the institution of the system of social protection of the population, which implies a clear coordination of their activities.

As part of our experiment, we offer the following forms of social partnership:

1. Involvement of practical specialists in the training process, which contributes to meeting the requirements of a practice-oriented approach.

2. Conduct joint research and implementation of joint projects.

3. The participation of employers in the adjustment programs of practices and training courses.

4. Training of professional mentors from among practitioners.

Below is the content of each of the forms of partnership we implement.

The first of the proposed forms - the involvement of practitioners in the process of training students.

Conducting practical classes in the institutions of the system of social protection of the population allows students to demonstrate the connection between the theory and the practice of social work, to observe the professional activities of specialists. When studying educational disciplines "Social Gerontology", "Geront-Psychology", "Occupational Therapy", the method of inclusion is used when a client takes part in a practical lesson.

The second form of social partnership is to conduct and implement joint research and projects.

Institutions of the social protection system act as research sites for conducting research for course and degree projects, and are customers for studying various social problems, working their activities and developing programs and recommendations. The implementation of joint research projects, in our opinion, helps students to master the skills and abilities of conducting diagnostic, analytical, predictive and expert work, as well as gaining practical experience in developing social projects, programs and recommendations.

As an illustration of social partnership, social projects can be proposed, in the development and implementation of which, together with students and employees of social protection institutions, the author of this work also took part.

With the assistance of English colleagues in the boarding schools for the elderly and disabled people of the region**, the project "Internal Quality Assurance" (hereinafter referred to as IQA)** was initiated and implemented. The main objective of the project is to improve the quality of life of residents of the orphanage, to achieve improvements in service in general. This goal is realized through communication with each person living or working in a boarding house, or at least with most of them. Such studies are important because they provide a better understanding of the problems of the personal lives of residents.

Social project for the rehabilitation of servicemen who participated in local military conflicts.

Former military personnel who have been in a traumatic war situation for a long time find it difficult to move from an extreme situation of military operations into a peaceful life, rework their negative experience, gain hope for the future without the help of qualified psychologists and social workers.

The key activity of this project was the creation of a service of social and psychological support for servicemen who participated in local military conflicts and the development of a rehabilitation program for this category of citizens, which could provide them with support from society and help to overcome the difficulties of social integration into civilian life.

The main directions of the project were the organization of interaction and the development of a model of cooperation between various institutions and organizations dealing with the problems of former military personnel and their family members in order to ensure their fullest social and psychological support. As a result, it can be stated that the project began to bring concrete assistance: the program for the socio-psychological rehabilitation of combatants and their families "earned", received the necessary support from the city administration, caused the trust of combatants, and they began to turn for help more often.

During the development and implementation of **the social project "World without Borders",** an exchange fund of social rehabilitation equipment was created for elderly people with disabilities and the elderly. We proceeded from the fact that the restriction of vital activity leads to a decrease in the level of social functioning, to a decrease in the possibilities of independent movement and self-service. Therefore, an important area of social work with older people with disabilities and older people with disabilities is the creation of conditions for these people regarding independent living through the provision of technical means of rehabilitation.

The goal of the project **"Development of ethno-tourism in places of compact residence of Teleuts"** is to promote the sustainable development of the territory of compact residence of Teleuts through the introduction of ethnic tourism as a technology for improving inter-ethnic interaction that contributes to the preservation of the original socio-economic and cultural development of the Teleut ethnos. Within the framework of the project, an ethnocultural center was opened on the basis of a comprehensive school, and local entrepreneurs were involved in the project; created new jobs (guides, private hotels).

In the experiment, we proposed this form of social partnership as the training of practicing mentors for student students from among practitioners.

In our opinion, mentoring is a cost-effective way of practical training, it helps to preserve traditional knowledge, while at the same time learning is carried out using real-life situations in the workplace.

We in our experiment rely on the English experience of training specialists in social work. On-the-job training takes place in social institutions, where students are assigned mentors to guide their activities. In most cases, the staff of the institutions themselves are in this role. In our opinion, the English experience in training future specialists in social work - attracting mentors is also applicable in Russia, but it is necessary to take into account our features of vocational training.

The concept of "mentoring" continues to be a rather complex and ambiguous category, having, moreover, a multiple interpretation. There are different approaches to the organization, formulation and evaluation of the forms and methods of work of mentors. The study of literature allows us to consider mentoring as a special form of teacher activity, aimed at interacting to assist the student in

the process of his personal growth, choosing behaviors, making decisions. We have formulated the functions of mentors: orientational; developing; mobilization incentive; professional adaptive; organizational; coordination and correctional; communicative; control and evaluation.

Mentors help students, firstly, to gain additional knowledge, secondly, they teach students to work with a client to take into account their individual characteristics and needs, to organize work, relying on the professional and ethical norms of a social work specialist; thirdly, mentors can help to form important professional skills, professional and personal qualities. They demonstrate professional standards, teach by example, and future social work specialists interact with specialists from other institutions in case they need to be involved in carrying out tasks that require customer assistance.

As we can see, a mentor is a central figure in the process of training future specialists in social work, from the professional competence of which the success of the practice as a whole and the degree of student satisfaction from the internship depend. Therefore, the selection and training of qualified mentors is one of our important tasks, ensuring the high quality of professional training of future specialists in social work. The training of mentors is organized by us in such a way that it contributes to mastering specific techniques for solving specific problems arising in working with students. Our task was to prepare specialists whose duties included the guidance of the internship of students.

The next form of social partnership is the participation of employers in the development and adjustment of programs of training courses and practices, in the analysis and assessment of the quality of specialist training.

Thanks to a joint discussion with employers on the preparation of future specialists in social work, the following disciplines of specialization, the program of disciplines of the variable part have been developed: "The system of personnel training and personnel management in the social sphere"; "Social Services Marketing"; "The activities of non-governmental organizations in social work"; "Experience of organizational and administrative work in the system of social services, institutions and organizations"; "Occupational Therapy"; "Organization of the protection of the rights of children."

Also, with the help of employees of social protection institutions, practical material (case study) was prepared for use at lectures and seminars in the frameworks of the Theory of Social Work and Technology of Social Work disciplines when studying the organization of social work with such categories as unemployed, homeless, migrants , servicemen, poor and needy. Together with the social teacher of the boarding school for orphans and children left without parental care, and a social work specialist, we have prepared the textbooks "Organization of the protection of children's rights" and "Technology of social work at the place of residence".

The difficulties encountered by the managers of the practice base during the practice, the deficiencies in the knowledge and skills of the student interns identified during the preliminary survey allowed us to organize theoretical and practical training of students according to the needs of employers.

Thus, attracting employers to adjust and develop programs of practices and training courses, assess the quality of graduates, allows professional training of future social work professionals to be as close as possible to the professional activities of a social work specialist and appropriate to the employer's requirements.

The development of partnerships between the university and institutions of the social protection system of the population, education, health care, public organizations contributes to an increase of the practical component in the training programs of future specialists in social work. It should be noted that the development of cooperation with vocational education institutions is also relevant for employers, since they need qualified personnel.

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创建一个活跃的环境，提供教师的专业自我发展
CREATING AN ACTIVE ENVIRONMENT THAT PROVIDES PROFESSIONAL SELF-DEVELOPMENT OF THE TEACHER

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注解。 本文概述了教师专业自我发展动态的文章，提出了这一过程的模型，介绍了概念：专业自我发展的速度和强度。 定义了创建活跃环境，提供专业教师自我发展的基本原则和方法。
关键词：专业能力，专业自我发展动态，活跃环境。

Annotation. The article provides an overview of articles on the dynamics of professional self-development of a teacher, presents a model of this process, introduces concepts: the speed and intensity of professional self-development. The basic principles and approaches of creating an active environment, providing professional teacher self-development, are defined.

Keywords: professional abilities, dynamics of professional self-development, active environment.

The dynamics of professional teacher self-development

The professional self-development of the teacher is accompanied by a change in professional abilities. Ability is a complex concept that consists of several components. The components of the abilities are:

- professional competence;
- professional activity;
- professional mobility.

When organizing the conditions of professional development and self-development of the individual, it is necessary to understand that the personality is a

whole nature. Isolation of personality substructures and their components is not a procedure for dividing the personality into separate components independent of each other. This process of personality modeling is necessary to understand a person's professional mental activity in response to certain objective effects.

V.V. Rozanov emphasizes the value of the presence, and therefore the development of individuality, the uniqueness of man through an analysis of the phenomenon of creativity inherent only to man. "A person creates, that is, he brings something new to the world, which is always not common, that he has with other people, but exceptional, that belongs to him alone" [1, P.14]. Real accounting of individual abilities and personal needs of the teacher is required.

In the work of Nikitenko V.N. it is also noted that "a variety of factors, both objective and subjective, influence the professional development." Among the objective are the attitude to the profession of a teacher in the family, the social prestige of the profession, social conditions, the level of development of children, the microclimate in the teaching staff, etc. [2]. The environment acts as a set of conditions and potentials for professional development and defines the most important characteristics of the process of growth of teacher professionalism.

Considering the conditions of professional development of a teacher of physics, it can be noted that the growth of professionalism can be achieved through a change in professional activity (Leontyev A.N. [3], Halperin P.Ya. [4], Nechaev N.N. [5]) and a change in professional the abilities of the teacher's personality (Platonov K.K. [6], Zeer E.F. [7], Nazarov A.S. [8], etc.). The dynamics of change depends on subjective and objective factors, which in turn are interdependent (Nikitenko V.N.). The required quality of a professional, according to N.S. Pryazhnikov. [9, p. 77-78], it becomes the ability to self-development. Esterle A.E. explores modern ideas about the content of the concept of professional self-development of an individual and comes to the conclusion that the professional requires the ability for continuous self-education, personal and professional self-improvement [10].

The analysis of psychological and pedagogical works devoted to the problems of professional self-development of the teacher, and our own observations suggest that, despite individual differences, there are regularities in teachers' mastering the profession and further improving their professional activities. Each teacher goes through three main phases of development, which differ in the levels of professional development and are manifested in professional and personal qualities. In the first phase, a normatively approved way of activity is mastered, professional self-determination takes place. In the second phase, an individual mode of activity is developed, professional self-assertion is carried out. In the third phase, the individual mode of activity is transformed into co-creation with students, and professional self-realization takes place. In addition to the concept of the phase of development, it is possible to identify shades of the inner state of the individual:

readiness and formed skills. They can have two levels of manifestation - actual and potential. The transition from one level to another means changing both operational skills (professional knowledge, mastering different ways of training and education), and teacher's value-semantic orientation (orientation, ideals, motives, professional-personal meanings). If an active environment has been created with a source of driving forces, then professional development will be transferred to the process of professional self-development. The model of this process is presented in table 1.

Table 1. Model of professional self-development by stages and levels

Stages		1		2		3	
Professional and personal qualities of a teacher		Professional self-determination. Professional functioning.		Professional self-expression. Professional activity.		Professional self-regulation. Professional skill.	
Condition		Readiness	Formed skills	Readiness	Formed skills	Readiness	Formed skills
Levels	Actual	To know the surrounding reality	Think rationally	Regulate your behavior and change the environment	Act appropriately	Assess the situation and adjust your behavior accordingly	Act rationally
	Potential	Investigate conditions, know yourself and compare	Regulate their behavior in relation to external conditions	Change conditions	Assimilate	Change yourself	Accommodate

A certain state in the process of self-development of a teacher can be called a phase, then in the profession the teacher lives through three phases of development. The first phase of professional functioning is an activity that takes place in the image and likeness of generally accepted norms and rules of existing ones, a teacher is a performer, it functions. The second phase is professional activity - it happens according to the accepted technologies, mastering which the teacher "tries on them for himself", the teacher acts actively. The third phase of professional mastery is that the teacher's personality changes. It transforms not only the conditions of the educational process, but also changes itself. This change leads to the establishment of new norms and rules, to the implementation of a new round of self-development in the indicated phases and levels, but at a new qualitative level.

The development of teacher professionalism occurs continuously (development horizontally), but the transition from one phase to another occurs discretely (development vertically). The phase transition is a qualitative change in the personality of the teacher and external efforts are required that create the conditions

for the emergence of internal driving forces for a discrete transition to another level of development.

Self-development presupposes a personal development trajectory, depending on the teacher's personal qualities, leads, as a rule, to professional mastery, and sometimes to innovation. Each teacher develops at his own pace (speed), each has its own current level of development. Creating the necessary conditions for the professional growth of a teacher adequate to his needs, abilities and desires is a methodical problem of the system of advanced training, providing a graduate education of a teacher.

To denote the effectiveness of specially created conditions, we introduce the concepts**: the speed** of professional self-development and **the intensity** of this self-development. The speed of professional self-development of an individual means the change in the teacher's professionalism (competences, skills, mobility) over a certain period of time. Under the intensity should be understood the number of individuals (teachers of physics), changing the phase of professionalism for a certain period of time. Absolute intensity is determined by the total number of teachers changing professionalism, and relative intensity by the total number of teachers changing professionalism relative to the total number of physics teachers. Efficiency can be determined if the quantitative and initial criteria are clearly distinguished as a basis for comparing the achieved and planned result and the unit of measurement of the results.

So, the dynamics of a teacher's socio-professional self-development, its speed and intensity depend, on the one hand, on the motivation, the individual's needs, on the internal tension that causes the internal driving forces of self-development, on the other hand, on the external conditions and potentials determined by the active development environment . The task of the education system is to create special conditions for managing the development of the professionalism of a physics teacher.

The basic principles and approaches of creating an active environment that provides professional self-development of a physics teacher

It is possible to make an assumption about the possibility of creating a developing environment in the form of a complex of conditions and potentials that will cause a change in personality, leading to the success of a professional activity. Successful professional activity, causing the satisfaction of self-realization, prompts the individual to change his professional abilities. There will be a professional self-development of the teacher. To create an active environment, it is necessary to formulate the basic principles and approaches of building an active environment that creates the conditions for professional self-development of a teacher.

Principles of creating an active environment that provides teacher self-development

The results of previous studies on the creation of conditions for the development of teacher professionalism, as well as the theoretical concepts outlined in this article, allow us to formulate the following initial positions for creating an active environment that provides teacher self-development:

1. The teacher is a professionally self-developing personality. The essence of the self-development of the individual is the passage through the set of bifurcation points - the "branching" points. From the choice of the direction of motion after bifurcation depends on the subsequent state of the individual (there has been progress or regression).

2. The role of virtual knowledge is growing. Man is less dependent on nature and more dependent on his abilities. The virtual form of causality becomes basic, the probabilistic form is concomitant, and unambiguous causality is only a special case.

Based on these provisions, we highlight the principles of creating an active medium:

1. The correct understanding of professional development is possible only on the basis of the principle of complementarity of intellectual - spiritual - emotional causality and professional orientation.

2. The solution of the problem of the search for communications and understanding between cultures in a multi-ethnic environment is carried out through the formation of a positive ethnic and cultural identity.

3. The principle of regionality in the conditions of postmodernism turns into a paradigm, i.e. in a universal way of thinking. It is used not only in education, but also in economics, politics and other areas of life.

4. Real accounting of individual abilities and personal needs of the teacher becomes a necessary element in creating conditions for the professional development of a teacher of physics.

5. The principle of compliance of the teacher's professional development with the social norms of society.

Approaches to the creation of an active environment that provides teacher self-development

The formulated basic principles for constructing an active environment that provides teacher self-development make it possible to determine the main approaches used in creating a self-developing space:

- value-personal involves conscious self-development: purposeful self-determination, cultivating oneself according to one's own life strategy, the active role of the personality itself in self-development;

- causal consists in the holistic impact on the intellectual, spiritual, emotional

world of the teacher's personality as causality and changes in the professionalism of his pedagogical activity as a result;

- communicative-dialogical consists in establishing the interaction of all subjects of the educational environment who are in open and equal relations to achieve the continuous development of all participants in the process, the manifestation and realization of their creative potential;

- cultural allows you to combine the universal and national foundations of culture in a holistic educational process;

- synergistic involves taking into account the nature-oriented self-organization of the subject, taking into account the virtual form of causality.

So, the principles and main approaches to creating an active environment that provides professional teacher self-development are formulated.

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困难是学生适应大学学习的"钻石"，也是个人特征发展的保证
DIFFICULTIES ARE THE "DIAMONDS" FOR STUDENTS' ADAPTATION TO COLLEGE STUDIES AND A GUARANTEE OF THE PERSONAL CHARACTERISTICS DEVELOPMENT

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抽象。 文章指出，大学生应该自己找到并选择实现教育目标的教育和手段，现代教师应该考虑到学生对此的前瞻性，创造机会。
关键词：青春期，人格，心理学，困难学生，教育原则，父母信仰

Abstract. The article states that a college student should himself find and choose the educational and means of achieving educational goals, and the modern teacher should create opportunities considering the prospectivity of students for this.

***Keywords**: adolescence, personality, psychology, difficult student, principles of education, parental faith*

The beginning of studies at a secondary vocational school, college, accepting a new social role of a student is the most vulnerable period, significantly affects the possibility of personal fulfillment, further professional self-determination and career building.

Former schoolchildren who entered college are only at the beginning of their path to self-determination. Many of them have deliberately chosen a specialty, but there are those whose life plans are not defined. Different students come to our special system of education with its dual form, sometimes not the best.

Often these children are deprived of the teachers attention, since they did not "give the result" and proved to be less capable. Further pedagogical work with students turns out that a success in teaching such children is often associated with poor health and a "tangle" of psychological problems, chief among which are difficulty in communication, lack of confidence in their abilities, and, very importantly, the lack of habit to engage in systematically. These are our students, but we want to work with good results.

One of the reasons for the slow students adaptation is the inconsistency in the pedagogical interaction between the teacher and the student in organizing methods of learning. The difficulties of adaptation are nothing but the difficulties of the joint efforts of the teacher and the student in organizing the learning methods.

Obviously, the teacher is in a situation where the audience of students is active only by 10-15%, and the rest are occupied in their business at best and do not interfere, brings dissatisfaction with work and can lead to the "professional burnout" syndrome.

Self-reflection by the teacher of his own professional activity is refracted by the modern educational environment in two aspects: on the one hand, the teacher wants to see in his students such qualities as education, honesty, independence, decency, and the ability to be proud of their achievements. But at the same time, if to ask any experienced teacher to recall the brightest events or cases from his teaching practice, he, as a rule, does not recall the percentage of excellent students, but something quite different: difficult relationships with a "difficult student"; not a simple process of gaining trust in a "difficult" group; students' stories about their problems and experiences; real help to one of the parents.

Self-reflection by the teacher of his own professional activity is refracted by the modern educational environment in two aspects: on the one hand, the teacher wants to see in his students such qualities as education, honesty, independence, decency, and the ability to be proud of their achievements. But at the same time, if you ask any experienced teacher to recall the brightest events or cases from his teaching practice, he, as a rule, does not recall the percentage of excellent students, but something quite different: difficult relationships with a "difficult student"; not a simple process of gaining trust in a "difficult" group; students' stories about their problems and experiences; real help to one of the parents.

Difficulties in behavior and training are exacerbated during puberty periods, when a person and the system of his relationships with others changes. The most difficult stage for a person to grow up is the transition from childhood to adulthood, namely adolescence, during which the child's psyche is rebuilt, the nature and mechanisms of learning activities and attitudes change, self-awareness is developing rapidly and the basis of the adolescent's personality grows stronger [1].

Consider approaches to the education of "difficult" adolescents. They can be divided and presented in the form of four principles [3]:

• The principle of orientation towards the positive in the behavior and character of the adolescent;

• The principle of social adequacy of education;

• The principle of individualization of education of adolescents with deviant behavior;

• The principle of social hardening "difficult teenagers".

Let us turn to the analysis of the methods of educating "difficult teenagers."

All methods have a cumulative effect on all essential areas of human activity.

In the intellectual sphere, in a teenager with deviant behavior it is necessary, in addition to professional skills, to form the depth and scope of humanistic values: moral ideals, principles, norms of ethical behavior. For the formation of attitudes, concepts, attitudes in the intellectual sphere using the methods of persuasion.

In the motivational sphere, it is advisable to form the concept of the validity and legitimacy of compliance with moral and ethical standards: caring for a person, striving for self-improvement, sincerity, moral efforts. The educational impact on the motivational sphere includes methods of stimulating positive personality traits, which are based on the formation in adolescents of conscious motives for their livelihoods, the ability to correctly analyze life situations, carry out their predictions and develop the most effective and moral behavior tactics.

In the emotional sphere, one should obviously form the character of moral experiences related to norms or deviations from norms and ideals: pity, trust, sympathy, gratitude, responsiveness, ambition, shame, self-love, empathy, etc.

In the volitional sphere, it is important to form moral - volitional aspirations in the implementation of moral actions: courage, bravery, valor, perseverance, principles in the lag of moral ideals.

In the sphere of self-realization, it is important to form the moral legitimacy of the choice of self-esteem, self-criticism, conscientiousness, ability to correlate their behavior with the behavior of other people and its adequacy of the situation, self-control, integrity, reflection, auto-training, etc.

Poor children, or Losers - children with their own educational trajectory, not like their classmates. Performance comes from the word "succeed." Success is speed. The succeeding student has time to master the given teacher and meet the deadline.

Many talented people were poor students. This does not mean that any child who does not succeed - the future A. Einstein or A.D. Sakharov. But those who do not have time to master something at the same time as their class often have a deeper attitude towards the tasks they face.

Let us analyze the situation when this "deep" child enters the classroom with a teacher, for whom academic performance is speed. Such a teacher begins to get nervous because the child does not have time. Because of this, the student is experiencing double stress.

Additional difficulties arise when the parents begin to get nervous because of the child's academic failure [2]. A child is an intonational being, with respect to its parents, a powerful emotional and behavioral mirror. He perceives and enhances all micro-parts that he reads from his parents. And at the same time he does not think in the way that we assume, guided by knowledge of the world around us, which is different from ours. If the parents are nervous because of child failure, the child has a stronger feeling that he is inferior, that he is worse than others. He sees this in the views of adults who can say to him: everything is fine, everything is good, we believe in you. However, the words do not coincide with non-verbal signaling by the parents, and the child sees that this is not true. That in support of adults, in particular, parents, it is impossible to believe.

Infantile children constitute a separate psychological and pedagogical problem. Such a child never undertakes complex tasks. In a situation of heightened responsibility, he seeks to hide, to make it clear that he is not interested. There are also children who, because of all the forces, are not included in the work, demonstrating their pseudo-competence and independence with their whole appearance. It becomes clear that they are afraid to engage in an unexpected ordeal, because they are not internally confident in their abilities. These are those children who are not believed in at home [4].

And again the question is what should parents of Losers do? The answer is obvious - parents themselves need to learn this. No matter how critically we speak of school, college, the problem of a dooser is, in most cases, the problem of his parents. When parents are not confident, they begin to project this uncertainty into their children. As a rule, they say, "We were not successful, but our child must be successful."

 For parents of bad students the biggest feat is to believe in your child. Everything rests on the willingness of the parents themselves from time to time to perform feats. Then a student or a schoolar will have a desire to break through, to take his height. The student must feel the parental faith in everything: in words, intonations, in views of the present and future. The worst thing that can be is to pretend that you believe in a child. Faith must be real. This is the main thing

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该论坛作为上海合作组织成员国小企业区域一体化的机制
THE FORUM AS A MECHANISM OF REGIONAL INTEGRATION OF SMALL BUSINESS OF THE SHANGHAI COOPERATION ORGANIZATION MEMBER STATES

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注解。 文章论述了上海合作组织的发展模式，系统化了重点事件年表的阶段，考察了上海合作组织国家小企业整合的形式。 形成了论坛概念作为上海合作组织国家经济合作政治平台的基本机制。

关键词：上海合作组织，区域一体化，SCO小企业论坛，互动机制，政治平台。

Annotation. *The article discusses the patterns of development of the Shanghai cooperation organization, systematizes the stages in the chronology of key events, examines the forms of integration of small business of the SCO countries. The basic mechanisms of forming the concept of the forum as a political platform for building economic cooperation of the SCO countries are formulated.*

Key words: *Shanghai cooperation organization, regional integration, SCO small business forum, mechanism of interaction, political platform.*

The need to develop cooperation between States has led to the formation of a whole system of intergovernmental and non-governmental organizations of global and regional importance. The Shanghai cooperation organization is an organization that occupies one of the leading places in foreign policy activities, as it covers the most dynamically developing regions of the world. Its activities are aimed at further strengthening and cooperation in the fight against international terrorism, the development of trade, economic and humanitarian cooperation [1] .

The Shanghai cooperation organization was established on the basis of the Shanghai five on 15 June 2001 in Shanghai. Today, the organization represents:

eight member States - Republic of India, Republic of Kazakhstan, people's Republic of China, Kyrgyz Republic, Islamic Republic of Pakistan, Russian Federation, Republic of Tajikistan, Republic of Uzbekistan;

four countries in observer status with SCO-Islamic Republic of Afghanistan, Republic of Belarus, Islamic Republic of Iran, Republic of Mongolia;

six SCO dialogue partner countries - Republic of Azerbaijan, Republic of Armenia, Kingdom of Cambodia, Federal Democratic Republic of Nepal, Republic of Turkey, Democratic socialist Republic of Sri Lanka.

The Charter of the Shanghai cooperation Organization was signed on June 7, 2002 at the summit in St. Petersburg on the basis of the "Declaration on the establishment of the SCO".

The Charter defined the main objectives and strategy of joint development. In General, there are three main areas of regional cooperation: security, economic and cultural cooperation [2].

One of the main goals of the SCO and the most important tasks it is to solve is to promote comprehensive and balanced growth, social and cultural development in the region. An important economic component of the SCO is highlighted.

Building regional cooperation takes place through the conclusion of various kinds of alliances and agreements, within the framework of which mutual coordination of political lines is carried out: for example, in order to jointly resolve conflicts, ensure common security or resolve other issues of common interest to all parties involved. In the process of interaction between two or more States, the use of armed violence should be excluded and the joint search for the realization of common interests should prevail.

As you can see, cooperation within the SCO is gradually and naturally developing from military, anti-terrorist and political to economic.

The development of relations between the SCO countries develops step by step. Within the framework of the annual meetings of the Council of heads of state, agreements are reached and the relevant Declarations are signed, the names of which are included in the names of the host parties.

So, after the adoption of the Declaration on the establishment and the SCO Charter, signed:

June 17, 2004 - Tashkent Declaration of heads of SCO member States;

16 August 2007 in Bishkek; 28 Aug 2008, Dushanbe; June 16, 2009 Yekaterinburg; June 15, 2011 - Astana; June 7, 2012 - Beijing; September 13, 2013 - Bishkek, September 12, 2014 – Dushanbe; 10 July 2015, Ufa; June 24, 2016 - Tashkent; 9 Jun 2017 – Astana June 10, 2018.- Qingdao. On the anniversary dates were signed: Declaration of the SCO fifth anniversary June 15, 2006 – in Shanghai; Declaration of the tenth meeting of the Council of heads of SCO member States-June 11, 2010.

Economic cooperation in the SCO takes place on a full scale, affecting almost all spheres of public life. At present, the SCO is steadily increasing the problems of stimulating the processes of regional economic integration and the creation of single clusters in the field of trade, investment and logistics lines.

However, in General, experts note that economic cooperation within the SCO is unbalanced, due to differences in economic potentials, productive forces, and the share of its participants in the world market.

The SCO has a huge potential to pass through all levels of economic integration from the creation of free trade zones to the formation of a single economic space, especially since there are no insurmountable obstacles of an economic nature in this direction. The most favorable factors for the development of economic integration within the SCO include:

• availability of rich energy resources;

• availability of large natural resources;

• strong scientific,technical and production capacity;

• availability of cheap and sufficiently qualified labor resources.

• complementarity of economies and division of labor between countries, due to the characteristics of each;

Full integration requires a transition to a multilateral format of economic cooperation. The success and effectiveness of integration depends not so much on specific political systems or the political situation, but on the existence of specialized supranational bodies that will promote political interaction and harmonization of relations. The degree of regional integration is determined not so much by economic characteristics as by the intensity of the processes of strengthening political security and economic integration.

Executive Secretary of the SCO Business Council S. V. Kanavsky in the practical activities of the Secretariat of the Business Council builds cooperation, but notes the difficulties due to the varying degree of development of the economies of the members of the organization: "Integration, as a rule, is presented as the ultimate goal of the creation of supranational bodies governing, including some areas of economic development, economy, interaction in this area. It is difficult to imagine the creation of a supranational organization, a structure that could manage the economies of countries with such a big difference — you can imagine what the economy of China means and what the economy of Kyrgyzstan or Uzbekistan means. Even in relation to Russia, China's economy is at an almost unattainable height. Therefore, it was really a very correct cardinal decision to engage in project financing. The project implies a preliminary study, identification of stakeholders and points of contact in the implementation of the project, places where the efforts of several countries could be combined. It must be said that the task initially assigned to the business Council is to assist in the development of multilateral projects — rather a six-party or five-party focus. But for business such a stencil was unacceptable. Business is usually two sides, at best – three" [3] .

As the Chairman of the National part of Business Council from the Russian Federation, the President of the RF CCI S. N. Katyrin, the projects in the frame-

work of the SCO are in need of financial support, and for making appropriate investment decisions might be used credit ratings. "For the development of the SCO economies, it is advisable to talk about the need to form a system of national rating agencies and a single rating platform of the organization's countries. This will take into account the national specifics and improve the objectivity of the evaluation of our projects, to create an alternative to the ratings of leading Western rating agencies" [4].

Noting the high importance of small business in the stabilization of the economy and society as a whole, at the meeting of the BRICS Business Council in Brazil in 2014, the Head of the Republic of Bashkortostan made a proposal to organize a Forum that would contribute to strengthening economic cooperation between business structures, business and regional authorities of the SCO and BRICS member States: "...To date, the capacities of small and medium-sized businesses of the SCO and BRICS COUNTRIES have a huge potential for interregional cooperation and economic interaction, which should be developed and put on a systematic basis" [5].

The basis was laid with the regularity of annual meetings in Ufa, starting from 2015 at the Small business forums of the SCO and BRICS member States (hereinafter the Forum).

A significant part of the forum program is devoted to the prospects of increasing non-resource exports, the development of agriculture and franchising, support for youth entrepreneurship. In addition, participants assess the role of small business in innovative, knowledge-intensive and import-substituting industries, as well as factors affecting the creation of a favorable investment climate in the country and specific regions. The positive effect of bringing discussions of entrepreneurs and representatives of the authorities directed on overcoming of administrative barriers and development of small business. The forum has become a popular platform for building interaction between small and large businesses.

The Forums formulate "General rules", which are necessary in view of the large number of barriers to business interaction between the SCO and BRICS countries. These include various legislation, customs standards, All these contradictions must be overcome in stages at meetings and negotiations.

The business forum is a good opportunity for partners to exchange views on the current economic situation, share experience, and focus public attention on any particularly acute and urgent problems.

For this purpose, the following tasks are performed:

•Association of leading experts in the field of business and Analytics.

•Regular exchange of relevant information, the accuracy of which is confirmed by experts and researchers.

•Exchange of experience, assistance in solving difficult issues and serious problems in the field of entrepreneurship and business.

•Providing an opportunity to adjust, make changes in projects, programs, plans and strategies of business development on the basis of new information, fresh data.

In General, the business program of the business forum includes:

• seminars and workshops for entrepreneurs, business coaches, analysts and economists;

• communication with representatives of business and public authorities, experts in the field of entrepreneurship and Analytics;

• discussion of current and current trends;

• discussion of issues related to the development of large, medium and small businesses;

• presentations by experts and partners;

• presentations and exhibitions of various projects;

• competitions;

• round table, i.e. summing up the results of the business forum;

• informal communication with the participants of the event;

• gala/private evening.

The business forum involves the participation of representatives of state bodies, which ensures their interaction with representatives of the business industry. At the same time, the SCO mechanism does not require the participation of all six member countries in specific projects. Various projects originating in the Forums may have the SCO format, even if they are not carried out with the General participation. And this practice already exists. Many SCO member States have managed to find mutually acceptable solutions to the problems of the economic order on a two - or trilateral basis thanks to their membership in the SCO.

SCO is an open organization, so economic partnership provides for the participation of other countries and associations. And it can be not only observer countries, but also other States .

Economic cooperation in the SCO is already showing results — projects in the fields of energy, transport and information are consistently developing.

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关于在卢克福音第一章希腊文中使用语言时态形式的一些特点与其拉丁语翻译相比较

ON SOME PECULIARITIES OF THE USE OF VERBAL TENSE FORMS IN THE GREEK TEXT OF CHAPTER I OF THE GOSPEL ACCORDING TO LUKE COMPARED TO ITS LATIN TRANSLATION

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注解。 本文试图用卢克福音第一章的文本作为例子，通过希腊语和拉丁语的共轭动词形式来分析传达语法类时态的方法。 使用统计分析数据对所考虑的文本中动词的时态形式进行比较分析。 结论是关于在希腊语和拉丁语圣经文本中使用时态动词形式的一般趋势。

关键词：动词形式，比较分析，圣经翻译，路加福音，希腊语，拉丁语。

Annotation. This article attempts to analyze ways of conveying the grammatical category of tense by means of conjugated verb forms of the Greek and Latin languages using the text of the first chapter of the Gospel of Luke as an example. A comparative analysis of the tense forms of the verb in the considered text is carried out with the use of statistical analysis data. The conclusion is made about the general tendencies in the use of the types of tense verb forms in the Greek and Latin biblical texts.

Keywords: Verb forms, comparative analysis, Bible translation, Luke's Gospel, Greek, Latin.

It is known that the New Testament, including the Four Gospels, was originally written in Greek, and only then translated into Latin. It is not without interest, as far as possible on the material under study, to trace the ways of transmitting the types of tense relations expressed in Greek verb forms by means of the Latin Vulgate.

This paper discusses the first chapter of the Greek Gospel of Luke and the corresponding part of the Latin Vulgate. The choice of material for the study due to several considerations. For various books of the New Testament in general and

the Four Gospels in particular, there is a significant heterogeneity of linguistic and stylistic features. "The Greek New Testament is the language of the Greek school, not native to some of those who write on it, but learned in the process of learning and international communication," writes EB. Smagin in a sketch supplement to the "New Testament Greek Textbook" by J. Gresh Machen. The language in the text under consideration is close to the epistolary or even scientific style, and the gospel of Luke [3, 208–210] possesses the highest literary qualities, according to the researcher. In this case, the selected segment of the text is sufficient for the analysis of the volume and variety of language tools used.

According to the research, in the Greek text of the first chapter of the Gospel of Luke, there are 141 cases of the use of verbal forms of the tenses. The aorist forms comprise more than 50% of all examples of the use of species-specific forms. Imperfect is found in 14% of cases. Futurum makes up about a quarter of the corpus of verb forms used in the text under consideration. 5% of the examples are verbs in the present tense, and another 5% are in single instances of the use of the perfect, the subjunctive and optative forms. We have not found a single example of the pluperfect, In contrast to the text of the same chapter of the Vulgate, where the pluperfect accounts for 2.5% of the conjugated verb forms, the forms of the previous time are not seen in the Greek source.

In general, in the Latin text of which 156 conjugated verb forms are involved, of which the forms of presentation are 17%, the imperfect - 15.5% and the future tense - 12%. Unlike the Greek source, in the Vulgate the most numerous forms of the perfect (53% of the total number of examples).

Given that Greek grammatical terminology is as close as possible to Latin, the systems under consideration are not symmetrical at all, and there are a number of significant differences between them. In Latin, there is no concept of aorist. As for the ancient Greek, according to S.I. Sobolevsky "... the aorist corresponds in large part to the Russian past of a non-durable (perfect) type and the Latin perfectum historicum and partly plusquamperfectum" [4, 84]. The Latin Perfectum praesens roughly corresponds in its meaning to the Greek perfect, denoting the current state of the subject of the action. The aorist denotes a "punctual or preemptive action that took place in the past and does not have a special connection with the moment of speech and is often used in historical narratives". At the same time, this form expresses the most important moments of alternating actions, and the imperfect stops at less significant details [1, 299-301].

In the light of the foregoing, an interesting coincidence in percentage of aorist (52%) and perfect (53%) to the total number of conjugated verbal forms in Greek and Latin texts, respectively, does not cause so much surprise. For comparison, we give the following example:

Verse	Greek	Latin	Russian
1:68	Εὐλογητός κύριος ὁ θεός τού Ισραηλ, ότι <u>ἐπεσκέψατο</u> καί <u>ἐποίησεν</u> λύτρωσιν τω λαω αυτού…	Benedictus Dominus Deus Isra˘el, quia <u>visitavit</u>, et <u>fecit</u> redemptionem plebis suæ…	Благословен Господь Бог Израилев, что <u>посетил</u> народ свой и <u>сотворил</u> избавление ему…

In this case, in the Greek text, two examples of the aorist are really distinguished - in the real and medial voices, in the Latin sample two cases of Perfectum Indicativi Activi are presented, and in the Russian translation - examples of perfect verbs in the past tense. It makes sense to make a reservation that we purposefully summarized all cases of aorist use in a Greek text passage - the medial voice often has a tinge of recurrence, and a number of deponent verbs, such as <u>ἐπεσκέψατο</u> in the above verse, do not have the form of a valid voice and express active meaning medial.

The same can be said about such a form as <u>Ἐγένετο</u> – Aoristus II Indicativi Medii from the verb <u>γίνομαι</u> – « make, become »:

Verse	Greek	Latin	Russian
1: 8	<u>Ἐγένετο</u> δέ έν τω ίερατεύειν αύτόν έν τή ταξει της έφημερίας αύτόύ έναντι τού θεού…	Factum est autem, cum sacerdotio fungeretur in ordine vicis suæ ante Deum…	Однажды, когда он в порядке своей череды служил перед Богом…

J. Gresham Meichen in the construction of <u>Ἐγένετο δέ</u> combination with accusative and present infinitive <u>ίερατεύειν αύτόν</u> sees Semitic roots [2, 196]. However, as indicated in the annex to the same textbook E. B. Smagin, Greek New Testament is closely associated with the Septuagint, the Greek translation of the Old Testament, which was carried out in Alexandria in the III century BC. for internal use, because in the Jewish community of Alexandria of that time, Greek was the language of communication. The researcher explains Semitism in the text of the books of the New Testament by the influence of the traditions of the Septuagint, which, in turn, had an undoubted influence on the Hebrew original [3, 207].

Returning to the example above, it should be noted that «<u>Εγένετο</u>» представляет собой медиальную форму второго (неправильного) is a medial form of the second (irregular) aorist of the verb "to occur", which has a definitely active meaning, despite the suffix "-sya" in the Russian translation of this particular form. In the Latin text, this form corresponds to the construction "factum est", which is nothing mor «<u>factum est</u>», which is nothing more than the analytical form of the Perfectum Indicativi Passivi of the assertive verb, which has an active meaning in the passive voice.

In the synodal translation in this case no verb forms are involved at all. Here the adverb corresponds to the Greek aorist, expressing the idea of one-time certain action – «once». However, in the translation of the same verse into Church Slavonic, there is a somewhat different picture: "By the same I serve him in the cause of his environment before God". "Being" in this case carries a certain correspondence to its Greek analogue, carries with it the same particle "same" and occurs on the considered segment of the text in all cases where the Greek form «Εγένετο» is involved.

In general, the ratio of the number of examples of another historical time - the imperfect - in ancient Greek and Latin languages is also not so different - 14% versus 13% (15.5%, if we take into account all the subjunctive mood of the simple past tense in the Latin translation of the New Testament). Consider this situation with specific examples:

Verse	Greek	Latin	Russian
1:80	Το δέ παιδίον ηὔξανεν καί ἐκραταιούτο πνεύματι, καί ἤν ταίς ἐρήμοις ἔως ἡμέρας ἀναδείξεως αὐτού πρός τόν Ιςραήλ.	Puer autem crescebat, et confortabatur spiritu : et erat in desertis usque in diem ostensionis suæ ad Isra͏̈el.	Младенец же возрастал и укреплялся духом, и был в пустынях до дня явления своего Израилю.

In this case, again, the complete coincidence of temporal forms is obvious - both in ancient Greek and Latin translation, forms of the indicative mood are presented Imperfectum, and the verb in the passive voice in the Latin translation corresponds to the media passive in the Greek original and the return verb translated into Russian.

Quite interestingly, both in ancient Greek and in Latin text, the verbs in the form of Imperfectum are not distinguished by great semantic diversity. A significant proportion of examples with a simple preterite in both Latin and Greek examples of the text are sentences with the verb "to be"; use in the imperfect verbs with other meanings single.

An interesting example is the following, involving various verb forms, including the perfect form, which is not numerous in the Greek text.:

Verse	Greek	Latin	Russian
1:22	Ἐξελτών δέ ούκ ἐδύνατο λαλήσαι αύτοίς, καί ἐπέγνωσαν ότι ὀπτασίαν ἑώρακεν ἐν τῶ ναῶ καί αὐτος ἤν διανεύων αύτοίς…	Egressus autem non poterat loqui ad illos, et cognoverunt quod visionem vidisset in templo. Et ipse erat innuens illis…	Он же, выйдя, не мог говорить, и они поняли, что он видел видение в храме; и он объяснялся с ними знаками …

In this example, the imperfect of the verb "can" ἐδύνατο coincides with the imperfect of the corresponding verb poterat, aorist ἐπέγνωσαν orresponds to the shape of the perfect cognoverunt in the Latin translation, and the Greek Latin perfect vidisset corresponds to the Greek irregular perfect ἑώρακεν. In this case, we disagree with the opinion of the compilers of the textbooks of the ancient Greek language that the ancient Greek perfect has a meaning rather than the present tense and expresses the current state of the subject of the action. In this example, the Greek perfect is fully consistent with the historical perfect in the Latin translation. Finally, the third verb form in verse we are interested in is as close as possible to the analytical forms of modern languages and is formed on the same principle - a combination of the verb "to be" in the imperfect and present participle in both Latin and Greek.

Quite significant is the difference in the relative number of forms of the present and future tenses in the Greek original and Latin translations. However, this phenomenon can be easily explained by considering the following examples:

Verse	Greek	Latin	Russian
1:16	Καί πολλούς των υίων Ιςραήλ ἐπιστρεψει επίκυριον τόν θεός αύτον	et multos filiorum Isra¨el convertet ad Dominum Deum ipsorum	И многих из сынов Израэлевых обратит к Господу Богу их
1:30	Καί εἴπεν ὁ άγγελος αὐτή…	Et ait angelus ei…	И сказал ей Ангел…

It is obvious that the use of present-day forms for the expression of future time is quite characteristic of the Latin language, while in the ancient Greek model of the text no such example was noted. As for verse 1:30, here we are dealing with a quite common historical present not only in Latin, but also in many modern languages, which, as can be judged by the analyzed text sample, is not typical of the ancient Greek language of the New Testament. These two factors explain, in our opinion, the presence of a larger number of future forms and a smaller number of cases of the use of the present tense in the text of the first chapter of the ancient Greek version of the Gospel of Luke.

Based on the foregoing, it can be concluded that, although in ancient Greek and Latin texts there are some differences in the arrangement of species-specific forms, they are quite insignificant, and it seems quite possible to speak of general grammatical tendencies in the considered text samples. This conclusion is explained by the close links between the Greek and Latin cultures of that era and the secondary nature of the Latin text as a translation of the ancient Greek original.

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诗意语法作为表达作者世界图景的方式之一
POETIC SYNTAX AS ONE OF THE WAYS
TO REPRESENT THE AUTHOR'S PICTURE OF THE WORLD

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注解。 本文试图分析现代自由节奏中包含句法结构的用法，以建立现代诗歌文本句法组织特征与世界个人作者图景之间的联系。 基于在分析经验材料过程中揭示的通过分割来描述所描绘的现实碎片的趋势，可以得出结论，当代德语诗人世界图景的特殊性可以在语法上得到反映。 水平。

关键词：世界语言图片，个人作者的世界图景，自由节奏，诗歌文本，句法结构，分类。

Annotation. *The article attempts to analyze the use of parceled syntactic constructions in the free rhythms of modern times in order to establish a connection between the features of the syntactic organization of the modern poetic text and the individual authorial picture of the world. On the basis of the tendency revealed in the course of analysis of the empirical material to detailing the depicted fragments of reality through parcellation, it is concluded that the peculiarities of the picture of the world of contemporary German-speaking poets can be reflected at the syntax level.*

Keywords*: language picture of the world, individually-author's picture of the world, free rhythms, poetic text, syntactic constructions, parcelling.*

The artistic work is a complex whole, the unity of content and form. The substantive aspects of the concepts are connected with content and form: "author's outlook", "ideology", "world view", "point of view", creation of an integral image of the author, expression of the concept of the world, etc.

In modern linguistics, the phenomenon of worldview, expressed in language, has been called the linguistic picture of the world, and in relation to a personal - the individual linguistic picture of the world.

Language is the most important way to form a person's knowledge of the world. Showing in the process of activity the objective world, a person records the results of knowledge in words. The combination of this knowledge, captured in a linguistic form, represents what is commonly called the "linguistic picture world". "If the world is man and the environment in their interaction, then the picture of the world is the result of processing information about the environment and man" [6, p. 111-116].

Through language, we have the opportunity not only to penetrate into the modern mentality of the nation, but also into the views of ancient people on the world and society. The language reflects everything that happens to its carrier, people or a separate linguistic person. According to E. Sapir, language is "the most massive and all-embracing of all known arts, vast, anonymous and unconscious labor of generations" [10, p. 235].

The text can be interpreted as a special model of the construction, execution, functioning and evolution of the linguistic picture of the world. "Being absorbed into the artistic fabric of the text, each language unit of the emotionally-different spectrum reconstructs, structures the unique personal aura of the creator of the text; in conjunction with the entire fund of linguistic resources, a "special picture of the world is "tangled" [2, p. 36].

Poetic text as a source and carrier of verbal information is a complex and multifaceted phenomenon. First, in a poetic text, as in any other, elements of reality are displayed. Secondly, the poetic text belongs to a certain ethnoculture: the information encoded in its linguistic material provides the necessary share of objectivity in the event of a possible author's interpretation. Thirdly, a poetic text always consists of units (separate images, meanings), from which the meaning is formed - the content of the entire work. These units are the means of implementing the corresponding author's ideological and artistic concept, their role in it can be different, their textual significance is also different according to this, so we can talk about the dominance of certain elements in the hierarchy of poetic text [12].

To understand the essential features of a poetic text, it is necessary to first examine its structure, determine its compositional elements and the relationship between them. The poetic text has inherent dominants, which are determined by the special features of the structural construction of the work. The very structure of the poem contributes to their selection, determines their textual and semantic significance.

The dominant modern free rhythms with their focus on the detailed image of the objects of surrounding reality can be considered such syntactic constructions as isolation, parcellation, ellipsis, etc., which are linguistic means of representing the principles of sequential laconicism and content compression that characterize modern poetry.

It should be emphasized that free rhythms, which are a unique feature of German-language poetry, are characterized by the absence of rhyme and a firmly fixed metric scheme. According to the apt expression of H. Domin, the structure of the lines in such verses is determined "not by the meter, but by the poet's breath" [14, p. 165]. Freedom from the established rules in free rhythms is often underlined by an additional lack of punctuation. The appeal of poets to a similar, "open", verse form is due to the most important guidelines of modern poetry, namely, its focus on "fragmentary, momentary, improvisation" [4, p. 333].

Expressing his inner state, the modern poet in his works strives for brevity, lapidarity, the ultimate concentration of content. This is achieved through the principles of the structural organization of the poem, in particular, through the parcels.

The **purpose** of this article is to attempt to analyze parceled constructions as one of the means of poetic syntax, reflecting the peculiarity of the world view of modern artists of the word. Poetic works of modern German-speaking poets, written by free rhythms, namely poems by Walter Tümler (born in 1955), Thomas Kling (born in 1957), Steffen Popp (born in 1978) act as **material** for analysis.).

As you know, on the basis of the picture of the world as a system of generalized images of reality, different forms and levels of the person's worldview potential are built and function: outlook on life, attitude, world perception and understanding, ideology [9, p. 51].

The author's artistic picture of the world is a specific form of world perception, which acts as an alternative to the real world and is the result of the author's inner work, his creative activity [1, p. 67].

The picture of the world, being a kind of connecting link between "objective reality and its "humanized" image in the minds of each speaker of a particular language [8, p. 288], forms and manifests ways of the human / world relationship, the components of which, according to J.M. Dreeva, are such integral parts of the human perception of the world as tonality, emotional coloring, subjective attitudes, goals, as well as regulatory structures and semantic factors [4 , with. 101].

The above components are formed during constant contacts with the outside world through the information received by the subject. However, the perception and processing of the information received will depend directly on the selectivity of human perception. According to A.A. Ukhtomsky, a person is inclined to perceive only what his dominants are prepared for, which stand between man and the world, between the thought process and reality [13, p. 382].

One of the regularities of the contextual interaction of the means of different linguistic levels in a literary text is the syntactic and, as a result, intonational-accent selection of words that constitute the logical or expressive center of the utterance.

As is well known, a poetic text is nothing more than an expression of the author's attitude to the depicted reality and to himself, which can be achieved through various means aimed at establishing communication with the reader. Expressing the author's communicative intentions, syntactic means can have in poetry texts an accent function, an evaluation function, an associative function, a function that violates the recipient's expectations, as well as a structure-forming function [3, p. 20].

The choice of language means at the syntactic level occurs, on the one hand, consciously, when the author of a poetic work takes into account the semantic adequacy, syntactic correctness and pragmatic success of the use of language units. On the other hand, the author uses linguistic means unconsciously, submitting to his speech habits, which reveal his idiostyle features and, as a result, characterize an individual-author's picture of the artist's world [7, p. 122-128.].

Means of highlighting a word or phrases in a sentence are expressive word order (first or last place in a sentence), separation and as a means of enhancing the allocation — parcellation (isolation), and in each case the syntactic emphasis is accompanied by intonational and accent notation of the word or phrase [12]. **Parcellation** is understood to mean the syntactic separation of individual parts or words of a phrase (most often homogeneous members) as independent sentences in order to enhance their semantic weight and emotional load in the text [11].

It should be noted that the increased attention of modern artists of the word to specific objects of reality, meeting the needs of modern poetry in truthfulness, as well as the desire of poets for an explicit manifestation of the internal state caused by a crisis of consciousness of the modern era, could not but find an appropriate reflection at the level of building a modern poem. Therefore, it is not surprising that the conflict between the new content and the old form "traditionally" once again emerged by the mid-twentieth century was decided by the poets in favor of a new form of verse "adequate to the worldview of the epoch" (G. Bar), which was called " free rhythms "(Germ." Freie Rhythmen ").

As the analysis of the empirical material has shown, syntactic structures that violate the smoothness of the flow of the rhythm of the verse are quite common in modern free rhythms. Such syntactic techniques include parcelations that introduce discontinuity in the intonation pattern of the verse and create the impression of "fragmentation" of the verse utterance. As a result, the actions described in the poem are perceived by the reader not as a complete picture, but as constituent parts, individual specific fragments of a single phenomenon or event.

For example:

<div align="center">

XII

Dies Herum-Buch-
stabieren Nicht Worte Nur
der Lüfte Gezirp Weder
Schicksal noch Scham
dort bettelst du
(mit der Haut)
</div>

<div align="right">[18, S. 190].</div>

<div align="center">

XIV

unterbrich die Vögel nicht…
wenn du ver-
weilen könntest An einer
Toreinfahrt Die Hände
geschlossen im grünen
Grund des Mittags
(des schattigen)
</div>

<div align="right">[18, S. 190].</div>

As we see, when using parceled constructions, intonationally-related text is intentionally divided into punctuation-independent segments, i.e. the syntactic structure of the sentence is embodied in the poetic text not in one, but in two (possibly more) intonation-speech units, or:

<div align="center">

das Vor- und Schluß-
blatt Seines Buches ***(Ertragen***
wie?)*zwischen Fingern*
welch Gewicht Tut's weh
dem Aug ***(Und nicht***
nur ihm)
</div>

<div align="right">[18**,** S.188].</div>

Violation of syntactic unity is marked, as a rule, with the help of a dot or another sign of the end of a sentence. However, in a modern poem, as a rule, ignoring punctuation marks, a parcel (part of a sentence that is beyond the scope of the sentence) is usually graphically fixed with brackets, as in the above poems - miniatures of Walter Tümler or in the following fragment from the poem of Steffen Popp "Gibraltar" *(„Gibraltar"):*

<div align="center">

<…>
Geliebter, verzeih, ich wollte nach Golgatha
aber im Wäscheschrank
lag nur ein gelber Revolver ***(so blieb ich).***
[17, S.146].
</div>

In the following excerpt from a poem by Thomas Kling, "The Fashionable Colors of 1914" *(„die modefarben 1914")* the selection of important details of the depicted picture also occurs due to the parcels fixed in brackets:

<…>
ab sommer-, apper herbstsaison:
schwarzer wollkrepe (gekappt)
schwarzer baumwollkrepe, kappen,
schwarzer taft.
<…>
schwarzer velourschiffon, darf ich mal,
für das tiefdekolletierte schwarze abendkleid
das mit der schwarzen spitzn-
(gekappt)

[16, S. 96].

With the help of parcels, the effect of an unexpected pause in the action image can be created, as in the poem by Walter Thümler.:

V
keine Tätowierung
hilft Daß: Hier/ dudeine
Handverstehst Fahren ja (eine
Weile)Doch halten wie?Zwei
Türen quer übereinander-
gelegt Wie Narben

[18, S. 186].

or in an excerpt from a poem by Thomas Kling "Makovnik" *(„mohnkuchen"):*

<…>
die ewig schlafgestörten, schwankenden.
die ungeachteten, abgehängten, die fertigen,
während die oberfertigsten in den seitenstraßen
abhängen (verdrängt); pumpen
und einwerfen: schon <…>

[16, S. 94].

Thus, as evidenced by the study, modern free rhythms are a form of expression of the special attitude of the poets, corresponding to the spirit of the time, determined by their critical attitude to reality and suggesting a true, lapidary reflection of objective realities in poetic art.

Free rhythms of modern times are characterized by a "broken" syntax, reflecting the tendency of authors of poetic works to detail the fragments of depicted objects and phenomena of the external world. The function of the considered syntactic constructions is aimed at specifying the concepts and pictures of extra-linguistic reality. The parcels imitate the fragmentary perception of the modern world, the effect of the sequence, as well as the unexpectedness of the onset of a pause described in the action poem.

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International Conference

Khanty文学中的俄罗斯形象
THE IMAGE OF RUSSIA IN KHANTY LITERATURE

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介绍。本文致力于研究Khanty文学中的俄罗斯形象。讽刺和史诗作品（Khanty国家文学中的戏剧未被开发）用于揭示图像，其最充分地反映了Khanty艺术文学中图像的主要标记，其历史始于20世纪30年代。本文适用于现代Finno-Ugric研究的跨学科研究的复杂性。

目标：作者旨在分析具有俄罗斯形象的汉特文学文本。

研究材料：研究材料是具有特定图像的艺术文本，呈现在各种汉庭诗人和散文作家的作品中。

结果和科学新颖性：俄罗斯是Khanty文学的乌兹别克语代码的主要支配者之一。在它看来，汉特的诗人和散文作家使用既定的符号：国家的历史，家庭价值观，宗教信仰，俄罗斯文学，自然。　Khanty艺术文本中"俄罗斯"的同义词是"祖国"，"地球"。记忆，怀旧和回归Khanty文学的主题也与这个形象有关。

关键词：汉特文学，城市代码，俄罗斯形象，元文字。

Introduction. *The article is devoted to the study of the image of Russia in Khanty literature. Lyrical and epic works (drama in the Khanty national literature is not developed) are used to reveal the image, which most fully reflect the main markers of the image in Khanty art literature, whose history begins in the 30s of the 20th century. The article fits into the complex of interdisciplinary research of modern Finno-Ugric studies.*

Goal: *The author aims to analyze the Khanty literary texts in which there is an image of Russia.*

Research materials: *The materials for the study were artistic texts with a given image, presented in the works of various Khanty poets and prose writers.*

Results and scientific novelty: *Russia is one of the main dominants of the Uzbek code of Khanty literature. In it's view, Khanty poets and prose writers use established symbols: the history of the country, family values, religiosity, Russian literature, nature. The synonym for "Russia" in Khanty artistic texts is "Motherland", "Earth". The motifs of memory, nostalgia, and returns to the Khanty literature are also connected with this image.*

Keywords*: Khanty literature, urban code, image of Russia, metatext.*

Introduction

The image of Russia and the Russian people did not become the subject of independent consideration by researchers of Khanty literature. Scientists in the articles referred to Russia when it came to the topic of the motherland or presented an interpretation of a literary text (in various aspects) and most often on the example of R.P. Rugin and prose E.D. Aipin. The exception is the work of V.L. Syazi [1], who made the first attempt to systematically reveal the author's reception of Russia in the prose of E.D. Aipina.

The image of Russia is one of the brightest in Khanty prose, but the authors have different ways of presenting it. So, E.D. Aipin in stories, novellas and novels presents contradictory judgments about a Russian person and shows Russia in its historical development in the twentieth century; R.P. Rugin speaks of the significant events in the history of the twentieth century, which made changes in the lives of the aboriginal population of the North; Yu.N. Nakov in his works reproduces Russia through the gallery of images of contemporaries and so on. In Khanty poetry, this image is seen in the works of GD. Lazarev, M.I. Shulgina, V.S. Voldina, R.P. Rugin, M.K. Vagatova, M.I. Novyukhov and the first poets, whose works are represented in the publication "Khanty-Mansiysk Poetry".

The article interprets the image of Russia and its main markers in the Khanty literature as an important component of the urban code of the Khanty art literature.

Materials and methods

The material of the study was the artistic texts of Khanty poets and prose writers, in which the image of Russia is presented. Exploring the image of Russia as part of the urban code of the Khanty literature, they relied on modern approaches to text analysis, using a combination of scientific research methods.

Results

It is worth noting that rarely among Khanty poets uses the nomination "Russia", preferring the bulk "Homeland". M.I. Novyukhov in his poem "Motherland" stated: "For me, you are not just a great understanding, / For me, you are not just a solemn toast. / For me, you are myself! And more than once I die / Walked for your happiness in your unbent growth. // Your thoughts, dreams are close and clear to me, / As the voice of rivers and fields is clear and close ... // In every creative takeoff, / in every feat of arms / I recognize you in your proud power" [2, 24].

M.I. Novyukhov is perhaps the only poet in the history of Khanty literature who refers to the direct nomination of Russia. Among his poetic heritage there is an excerpt from the poem "Russia", in which the main markers of the country are marked: "Oh, how can I dislike you, / my motherland, dear! / Here I got the right to live / and drink wine from the thicket of May. / Here I saw the sky / in its wonderful colors. / Here is my mother and my people, / My love and my children. / I was born here and here I will die. / I have grown into Russia, like a birch, / that

pours invisible tears / on the carefree grass" [2, 172]. When a poet writes about Russia, he compares: "as if he entered a fairy tale". The emotional background of the hero is characterized by joy, ease of breathing, "good soul". At the same time, kindness is becoming a key characteristic of Russia. Even the New Year lights in the windows" <...> with a kind look of Russia / smile at me." It is not by chance that the poet at the end of the poem "Happy New Year, Russia!" Uses the appeal "my dear Mother-Russia" (as we see, this is another author's variation of the well-established Mother-Earth appeal).

Russia is a country that, having a long history, carefully preserves the past. Khanty poets and prose writers in their works turn to historical memory. Almost all writers present Russia through important events in the history of the state of the twentieth century; the names of famous figures from different eras are introduced into the text: Peter the Great, Menshikov, Empress Catherine, Emperor Nicholas II, V.I. Lenin, LD Trotsky, A.V. Kolchak, M.N. Tukhachevsky, I.V. Stalin, K.E. Voroshilov, B.N. Yeltsin (here you can call the poems of GD Lazarev, K. Posokhov, D. Tebetev, the novel by R. Rugin "An Unusual Day", the novel by E. Aipin "The Mother of God in Blood Snow" and others.

Along with all-Russian historical persons, regional landmark figures are also recorded in the works: "the exiled Bolshevik" Tikhon Danilovich Senkin, the "legendary" Vauli, who "raised the Northerners against the Tsar" and others. The famous Hungarian scientist Peter Domokos argues: "The history of small nations is part of Russian history. The dates of major historical events both in their life and culture are of a landmark (for example, the capture of Kazan, the Siberian campaigns of Yermak, the uprisings of Razin and Pugachev, the revolutions of 1905 and 1917, the first and second world wars, etc.). But besides them, it is necessary <...> to take into account <...> those specific circumstances, local events, wars, uprisings, the activities of significant personalities, the creation of institutions, the publication of <...> publications that are the property of the people's history, its stages, nodal events "[3, 90-91].

The October Revolution of 1917, the First World War, the Great Patriotic War are presented through the motives of memory and crying in poems and poems: it suffices to recall the poem "Makar Osmarov" by M.I. Shulgin, poem "So Molupsi" VS Voldin, cycle "Memory of War" R.P. Rugin, poems by M.K. Vagatovoy "I went to the military road", "Soldier made of stone" and so on. In prose, these events are reflected through the fate of the hero, the people, through the changes that occur in the established order of life. Here you can name the stories of E.D. Aipin "Oathbreaker", "In the Trenches, or the Catherine the Great Phenomenon", his story "At the Dying Hearthand" and the novel "Khanty, or the Star of the Morning Dawn", stories by R.P. Rugin "Three skins", "The sun over the snow" and others. The events of the early twentieth century are also reflected in the play by E.D. Aipin "Red Narta".

Regional history is included Khanty writers in the all-Russian historical context. Indicative in this respect, the novel by E.D. Aypin "Mother of God in the bloody snow." In the article Katalin Nad' "The Secular Pagan Pieta, or the Mother of Children in the novel "The Mother of God in the bloody snows"" contains the memoirs of the author: "It seems to me that I began to write my new novel "The Mother of God in the bloody snows" began to remember myself. Because in my childhood I heard a lot of stories about the Kazym uprising, about the Kazym war from my parents and from my grandmother Daria. The times then were strict, tough, one might say cruel. Therefore, talking about the war in a whisper. Those stories, those pictures were so tragic and bright in their tragedy that I remembered them for the rest of my life. But the topic was closed under the Soviet regime. The archives were closed. After perestroika, after the fall of Soviet power, I began writing my novel" [4, 274].

From time immemorial the support of the power and glory of Russia is its army. This is confirmed by the hero of the novel, E.D. Aypin's "Mother of God in the bloody snows" Bely: "<...> there was support from the state, there was support from Russia — the Russian army" [4, 235].

Russia is a multinational country. Khanty poets write about the friendly relations of peoples. So, in the poem G.D. Lazarev "Children of the same family" is woven into the main theme of the motive of friendship between nations. The poet uses the comparison "as one family", likening relations between peoples to family relations. In the same work we see how G.D. Lazarev transforms the folklore formula "Mother Earth" into "Mother Country". A similar model uses the V.S. Voldin in the Khanty poem: "We call all people Khanty, / Khanty - Russian, Nenets and Uzbek, / Because this word is Khanty / Translated means human. <...> / Remember our wise name, / Khanty - all nations on Earth" [5, 26].

Russia is a country in which faith is an important part of the nation's spiritual cluster. How faith helps a person, saves him, showed E.D. Aipin in the novel "The Mother of God in the bloody snows" [6]. On the pages of the novel, the prose writer states: "Everything in this world is from God ...". The novel combines two faiths: pagan and Christian. Christian motifs are realized in the novel through the icon of the Mother of God and the image of the Virgin Mary, they are associated with the images of the White Officer and the Mother of Children, pagan motifs - in customs, rituals, in the cults described in the novel, in the mythological picture of the Khanty world. Through the image of the main heroine of the novel Mother of Children, the author broadcasts the dual faith of the people. Three Orthodox images appear in the novel, familiar to any person: the image of the Mother of God, the image of Christ, the image of Judas. The traits of Herod, the biblical bloody king, were laid by the author of the novel in Chukhnovsky and his circle. A Russian man cannot do without faith, especially in difficult times: "When he awoke, each time he raised his eyes and was baptized on an icon,

and then for a long time and silently looked at her. Every morning he seemed to pass through three worlds: from the world of dreams he moved to the world of the Mother of God, and from there to the world of people. And there was just enough in the world of God to get the necessary strength to continue life on earth..." [7, 90].

Faith is the spiritual core of a person. The hero of the novel, E.D. Aypin "Khanty, or the Star of the Morning Dawn" says: "You believe in the teachings, in the books, in communism. Believe the people who wrote these books, come up with these words and ideas. These are your gods. <...> The main thing - you believe. With their help, look for the Highest Truth of Life..." [8, 132]. Simple faith, according to Demyan, "the faith of those who can not grasp the doctrine <...>. With the help of this faith, they seek the Highest Truth of Life" [8, 133]. The hero is convinced that every person should have this faith. And the Highest truth of Life is in the sense of human life and the quest: "The main thing is that there should be no emptiness..." [8, 133]. This same understanding of faith can be seen in poetry.

Russia is a country in which family values are part of the people's spiritual life. The link of generations is also transmitted through the family. Therefore, the family with its joys and tragedies is in the center of attention of Khanty writers. It is enough to recall the story of R.P. Rugin "Forty Northern Winds", "Waiting for the Son", T.A. Moldanova "In a nest lonely", "Touching Civilization", E.D. Aipin "I listen to the earth", "At the fading hearth" and his novels. It is not by chance that prose writers often use the formula "family = people" in their works. The images of father and mother, imbued with an anxious feeling of love, are proudly found in poems in almost all Khanty poets. Here is how he writes about M.K. Vagatov in the poem "Mother's Heart" (translated into Russian by N. Shamsutdinova): "Mother's Heart! / Tell me, what is its simple secret? - / How much heat is in it! - the sun has no tenth. / Red light is brighter and more beautiful with the blood of red mothers, / There is nothing to compare my mother's heart to light: / Kohl with the road - the road is infinitely wide, / If with force this force is immensely great. / If Kohl with the price, then there is no more expensive than that price on the whole Earth, / If with honor, without self-interest, you cannot find a word for me. / Well, if I compare the mother's heart with the price of life, / I will not drop that heart's merits and honor. / Old age does not enter into it, it is impossible to find reproach in it, / And fatigue is ordered into that heart. There is no way! / In it - we are the first breath, long-awaited, we take, / Opening doors in life unforgettably white day. / Mother's heart! / Worthy, in happiness - it tells to live. / Mother's heart! / You are the conscience, and mine, and of the whole Earth!" [14, 165].

M.I. Shulgin has two poems with the common title "Father." In the first poem we feel the pride of the son by the father-sniper, who survived in the difficult 1942 near Leningrad. The second poem is a reflection of the filial gratitude to the front-line father: "I want to today / Thank you to tell the father / For this simple science - / Always remain in the ranks" [9, 260].

Recognition of Russia and brought Russian literature. The names of A.S. appear on the pages of Khanty writers' works. Pushkin, L.N. Tolstoy, S.A. Yesenin, quoted their lines. So, M.I. Novyukhov in the poem "To the Lyrics of S. Yesenin" confesses: "Sweet understandable, / Sensitive poems. / Tears of grace / They caused <...>" [2, 37], the lines from the poem" Anna Snegina "by S. Esenin are recalled by the hero in the story of E.D. Aipin "Parisian": Esenin's lines about him were remembered to him: "... They drove out the tsar - so / All the misfortunes fell down / On our unintelligent people" "[10, 192], and quotes the words "the sun of Russian poetry": "Two feelings wondrously close to us - The heart acquires food in them - Love for the native ashes, Love for the coffins" [10, 191], and in the story" Autumn in your city "the hero E.D. Aipina again quotes A.S. Pushkin: "Sometimes, distorted Pushkin lines floated around: "... a little leg walked, a golden curl curled ... ". Although Pushkin had all of this, it seemed, in the present tense" [10, 16].

Almost all Khanty poets and writers turned to nature, since nature is one of the important markers of Russia. In R.P. Rugin is a poem "A Prayer of Nature" in which the poet speaks of the need to preserve his father's property: "The water is silent. And the fish in it - are silent. And the sun from a height will not say a word. / Silent foliage, swallowing blue chad. / And together - they pray menacingly and severely: / - We, the man, friends, and not enemies! / You value your progress above all. / But still, take care of us, / After all, we cannot be replaced by anything in the world" [11, 239]. In the perception of the poet, nature is a wondrous fairytale creation. So the forest has become a place of a wonderful, unusual: "Come with me to our quiet forest, / There are blueberries and cloudberries, / There all kinds of miracles / One hundred thousand - and a little more!" [11, 276].

Birch is not only a symbol of the country, but also a symbolic image in the works of Khanty poets. V.S. Voldin is a poem "My friend and I," in which birch stands as a symbol of the Russian people: "On the bank of the river is a pine, / Birch is next to it. / And it seems to me that she / And older and stronger. <...> / There are two trees. / Spring. / And it seems to me: I am a pine, / My Russian friend is a birch" [5, 20]. An almost similar statement is found in the poem by M.K. Vagatovoy "In my heart, all nature ...". Lyrical heroine M.K. Vagatovoy became like a tree, hence the comparison: "Gold is like a birch, / I am lit up on the slope of summer <...>" [12, 16]. The Khanty poetess has a poem "My birch tree", which is built as a dialogue with a tree symbolizing life. N.V. Polyakova, speaking of honoring trees among different nations, writes: "<...> the symbolism of the tree passes through beliefs and traditions <...>. Birch, for example, is distinguished by dazzling whiteness, and the notches on its trunk symbolize the stages of shamanic ascension of gods, spirits and souls, thus making the connection between Heaven and Earth" [13, 95].

This tree symbol appears in the lyrics of V.S. Voldina, M.I. Shulgin, R.P. Rugin, M.K. Vagatovoy, E.E. Seraskhova and other Khanty poets. Most often, a magical image is created using avatars, comparisons and epithets. Sometimes poets use mythological parallels. This is how E.E. presented the birch at different times of the year. Seraskhova in the poem "Birch", translated into Russian by K. Kuksin: "The beauty birch tree looks clean in the water / In a white frog in the spots - stern, sweet, quiet. / In autumn it will be covered with scarves of gold, / Desiccated with a scarlet bead the hem of grass and moss. / In winter, in a frosty, blizzard, he will wear a patterned shawl, / Handmade lace made of silver threads. / And with the first bird chirp it will shake a languid drowsiness - / it's time for a girl to knit a spring in the spring! / In the short summer a silk outfit is thrown over by a northern dress - / With tassels and ruffles, green, painted. / The earrings are ringing with miraculous panicles - / The bride for the marriage came to the forest tent!" [14, 647-648].

Diligence, mercy, following God's commandments from ancient times were in the character of the Russian people. Writers have repeatedly spoken about the breadth of the Russian soul, generosity, dedication, unbending will and patience in the pages of their works. And the whole history of the Russian state confirms this.

R.P. Rugin in poems, when he speaks in pain of ruined rivers, abandoned villages, and homeless dogs. Here the poet understands ecology more widely, not only as a qualitative indicator of space, but also as a state of mind. The poem "Stray dogs" is significant in this respect.

The modern view of society is represented by the poet through the image of the eye. In R.P. Rugin has several poems with this image. Let's stop only on one. The poem "Eyes" is included in the cycle "Rainbow in the Heart" of the book of selected poems of the poet. Translated into Russian by I.Fonyakov. His stanzas from the seventh to the tenth will be a dialogue that leads with the eyes of a lyrical hero who has studied them for many years. To the posed question: "Oh human eyes, / Is it always better to be transparent always, / Why tell me, are these difficulties?" He receives an answer confirming that the eyes are a reflection of the world order, the dualism of the world. The dream of the eyes themselves is to always remain transparent. The value of transparency is enhanced by the semantics of the blue color, which symbolizes calm, spirituality, and tranquility. After all, the dream is embodied under the "pigeons of blue": "And always the answer came: / "You find in us the same as in the world! / There is a blessed light in the world of the sun / And the wind is ice in the autumnal expanse. // There is purity and depth in the world, / But there is both blackness, and fear, and torments, / Rottenness and darkness of the oozy bottom, / Nalimya slippery, greed of a predatory pike. // Freed, like rivers, from ice, / Under the blue skies, / Oh, we would always be transparent! / About this, brother, we ourselves dream" [11, 282]. Narrating about the eyes, R.P.

Rugin often resorts to direct comparisons with the natural world, draws parallels, embracing in the eyes all the facets of the world order and the nature of man. A similar technique is used by the Khanty poet in the poem "I will tell you in plain English ...".

The assessment of modern man gave ED. Aipin on the pages of the book "River-in-January. "Here he also defined the role of Russia in the world community (the story "Night of the Maestro"): "Agree, after all, the role of the confessor is prepared in the life of earthlings of Russia ..." [10, 92]. Deep feelings of patriotism, pain for the country and the people imbued with the lines of the stories "Night of the Maestro", "Parisian".

Discussions and conclusions

As you can see, Russia is an important component of the code of the Khanty literature. In her view, Khanty poets and prose writers use established symbols: the country's history, family values, religiosity, Russian literature, nature (especially birch). Describing the country, the authors often replace the nomination "Russia" with the concepts of "homeland", "land". The motives of memory, nostalgia, and return are also connected in Khanty literature with Russia. It is not by chance that the hero of the story, E.D. Aipin's "Night of the Maestro" says: "Everything, I am returning home <...>. To your North. In Russia. Taken apart, ruined, tormented, but - Russia!" [10, 96]. All authors, regardless of their nationality, regard native land (country) as wealth, which must be preserved from generation to generation, as the basis of reason and strength. R.P. Rugin in the poem "Since when in my native village ...": "Since then, when in my native village / I began to understand the human speech / I stumbled into my memory the instruction: / Take care of our eternal land. <...> / How good she is, generous, beautiful - / Your father's fortune! / And not only muscular strength, / The mind and heart are also from her" [11, 20].

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滨海边疆区过渡生物气候区工业城市弥漫性地方性甲状腺肿的分布
DISTRIBUTION OF DIFFUSE ENDEMIC GOITER
IN INDUSTRIAL CITIES
OF THE TRANSITIONAL BIOCLIMATIC ZONE
OF PRIMORSKY REGION

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注解。碘缺乏病的传播是俄罗斯联邦滨海边疆区的一个紧迫问题。该研究显示了生活在Primorsky Krai过渡生物气候区工业城市的三组不同年龄的弥漫性（地方性）甲状腺肿大的规律：Ussuriysk和Artem;采用描述性统计和生态卫生检验方法对获得的规律进行分析。结果显示，成人群体中弥漫性（地方性）甲状腺肿的总发病率水平显着低于转变生物气候区儿童和青少年的相应水平。调查结果表明，滨海边疆区现有的预防碘缺乏病的措施不足，建议制定预防碘缺乏病的方案，同时考虑到不同性质的环境因素的复杂性。影响碘缺乏病的形成和发展。

关键词：碘缺乏病，弥漫性甲状腺肿，地方性甲状腺肿，滨海边疆区。

Annotation. *The spread of iodine deficiency diseases is an urgent problem for the Primorsky region of the Russian Federation. The study shows the regularities of diffuse (endemic) goiter spread among three groups of different age who live in industrial cities of transition bioclimatic zone of the Primorsky Krai: Ussuriysk and Artem; the obtained regularities were analyzed using the methods of descriptive statistics and ecological and hygienic examination. It was revealed that the levels of total incidence of diffuse (endemic) goiter among the adult population were significantly lower than the corresponding levels among children and adolescents in the transition bioclimatic zone. The findings indicate the insufficiency of existing measures for the prevention of iodine deficiency pathology in the Primorsky region, in connection with that it is recommended to create programs for the prevention of iodine defi-*

ciency diseases taking into account a complex of environmental factors of different nature that can affect the formation and development of iodine deficiency diseases.

Keywords: iodine deficiency diseases, diffuse goiter, endemic goiter, the Primorsky region.

Introduction.

Iodine deficiency diseases (IDD) are one of the most common non-infectious diseases in the world; Among them are conditions developing against the background of iodine deficiency in the human body and have a complex harmful effect on the thyroid system and on the work of the whole body.

The majority of the countries managed to eliminate the deficit of iodine as a national problem following the recommendations of World Health Organization (WHO) (first of all, to introduce programs which mean to fortify salt and other products by iodine). Annual report of Iodine Global Network at the beginning of 2017 says that the iodine deficit problem is still present in 19 countries while in 2011 there were 31 countries [1].

However, the problem of iodine deficiency and the iodine deficiency related pathologies are a national issue in the Russian Federation. In particular, the Primorsky region of the Russian Federation, despite the relative security of the population living in the region with iodine, belongs to the territories endemic for IDD [2].

The thyroid system can be significantly affected by such environmental parameters as temperature, humidity, air mobility, solar radiation [3]. The Primorsky region due to its geographical location is characterized by heterogeneity of these factors [2]. The entire territory of the region can be divided into three bioclimatic zones characterized by different climatic conditions that influence the spread of IDD in the population: coastal zone, transition zone and continental zone [2,4,5]. The focus of this study is the transition bioclimatic zone, located at a distance of 50-70 km from the coastline. In addition to the influence of climatic factors of the environment, studies have previously found that in the geochemical provinces in the transition bioclimatic zone have shortage of elements such as iron, zinc, germanium, selenium, and the increase of content of strontium, tin, arsenic, lead, cadmium [2]. Such an imbalance of elements in the objects of the environment can also contribute to the emergence and development of IDD in the population living in this territory.

Diffuse goiter is one of the indicator diseases, the prevalence of which show the level of IDD safety of the territory (according to WHO criteria, the prevalence of goiter less than 5% among children of primary and secondary school age is one of the indicators of the absence of iodine deficiency in the region) [6,7]. In this regard, the actual direction for the study is to determine the regularities of diffusion of endemic goiter among the population of industrial cities located in the transition bioclimatic zone of the Primorsky region, followed by an analysis of the identified patterns.

The aim of study. The aim of the study is to identify regulations of prevalence of diffuse (endemic) goiter for the period 2005-2013 in two industrial cities of the transition bioclimatic zone of the Primorsky region: Ussuriysk and Artem.

Materials and methods of study.

There is statistics about the levels of total incidence of diffuse (endemic) goiter in three age-groups of population living in Ussuriysk and Artem of the period 2005-2013 which is showed by medical informational and analytical center of the Primorsky Krai.

The division of the territory of the Primorsky region into three bioclimatic zones was performed in previous studies [5]. Ussuriysk and Artem are industrial cities of the Primorsky region, located in the transition bioclimatic zone.

Methods of descriptive statistics and ecological and hygienic examination were used in the process of the study.

Results and discussion.

At the first stage of the study, on the basis of statistical data on the levels of General morbidity of diffuse (endemic) goiter, the picture of the dynamics of the prevalence of this nosology in the children's age group of the population living in the cities of Ussuriysk and Artem was determined (Fig. 1).
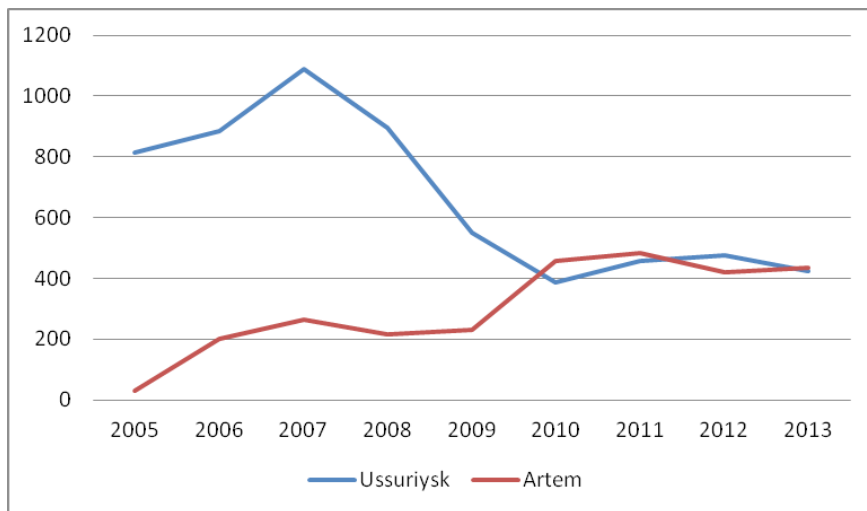

Fig. 1. Levels and dynamics of prevalence of diffuse (endemic) goiter in children of Ussuriysk and Artem (per 100,000 population)

Analyzing the picture of the dynamics of the prevalence of diffuse endemic goiter among the children's population of the studied cities, it is worth noting that the prevalence of diffuse goiter among the children's age group of the population of Ussuriysk in the period under review has decreased significantly: while in 2005 the overall morbidity rate in this age group was 814.52 (per 100,000 population), in 2013 this figure was 425.68. In the dynamics of prevalence of the studied disease in the child population residing in the city of Artem, observed the opposite situation: in 2005, the overall incidence of diffuse (endemic) goiter was 30.33, but by 2013 it had risen to 434.88.

After a short period of increasing prevalence of diffuse endemic goiter in the children's age-group of the Ussuriysk city population (2005-2007), the period 2007-2010 is characterized by a tendency to a sharp decrease in prevalence. In the period of 2010-2012 there is a tendency to a slight increase in the levels of General morbidity.

The prevalence dynamic of the studied nosology among children of Artem it is conditionally possible to allocate the periods of 2005-2007, and also of 2009-2010 characterized by a tendency to considerable increase in levels of the general morbidity.

The period of 2010-2013 in the dynamics of the prevalence of diffuse goiter among the children of both cities can be conditionally characterized as a period with no significant changes in the dynamics. By 2013, the prevalence levels of the studied nosology in both settlements were comparable (425.68 in Ussuriysk; 434.88 in Artem).

Based on the presented dynamics, it can be concluded that, despite the completely different epidemiological situation for diffuse (endemic) goiter at the beginning of the period under review, the levels of prevalence of this nosology in the child population by the end of the period under review were comparable in both studied cities – with no significant changes in the dynamics since 2010.

At the next stage of the study, a similar situation appeared in the dynamics of the prevalence of diffuse (endemic) goiter in the population of the adolescent age group living in Ussuriysk and Artem (Fig. 2).
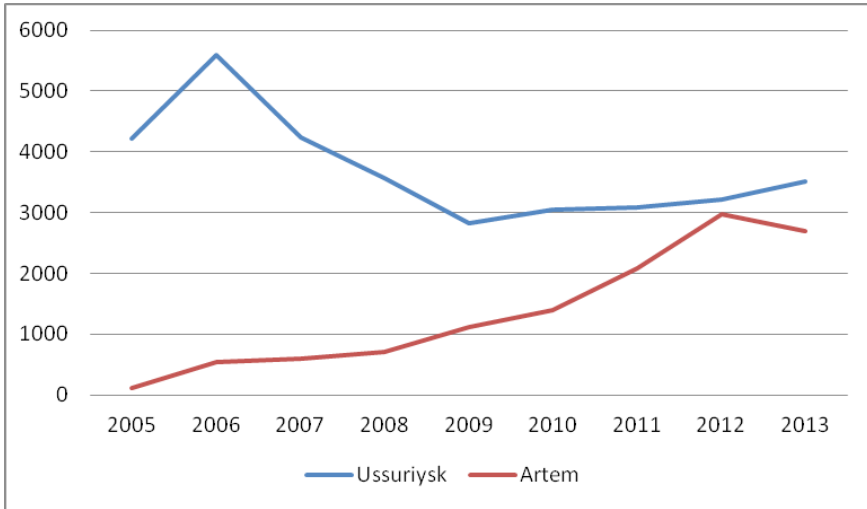
***Fig. 2.** Levels and dynamics of prevalence of diffuse (endemic) goiter
in children of Ussuriysk and Artem (per 100,000 population)*

The dynamics of the prevalence of diffuse (endemic) goiter among the adolescent population of the studied cities shows that the overall incidence of this nosology in the adolescent population of the city of Ussuriysk during the period under review decreased from 4217.45 in 2005 to 3520.14 in 2013. The prevalence of diffuse goiter among the adolescent population of the city of Artem, on the contrary, increased during the period under review: if in 2005 the overall morbidity rate was 114.24, in 2013 it was 2690.88.

The dynamics of the prevalence of the studied nosology among the adolescent population of Ussuriysk shows that after a sharp increase in morbidity in the period 2005-2006, followed by a period with a tendency to reduce the levels of General morbidity (2006-2009), followed by 2009 and up to the end of the study period, there is a tendency to a slight increase in the levels of General morbidity of diffuse (endemic) goiter.

The dynamics of the prevalence of diffuse (endemic) goiter in the population of the adolescent age-group living in Artem show that there is a period of gradual increase in the overall incidence of the studied nosology (2005-2012).

Thus, if at the beginning of the studied period the total incidence of diffuse endemic goiter in the adolescent population of Artem was minimal while there was a significant prevalence of this disease among the adolescent population of Ussuriysk, by the end of the reporting period the gap between the levels of diffuse goiter in the adolescent population in the two cities significantly decreased (in

2012 this gap was minimal: the level of total morbidity of the adolescent population of Ussuriysk was 3212.98, Artem – 2979.92).

At the last stage of the study, based on the statistics of the levels of total morbidity of the adults with diffuse (endemic) goiter, the dynamics of the prevalence of this nosology among the adult age-group of the population living in the cities of Ussuriysk and Artem was determined (Fig. 3).
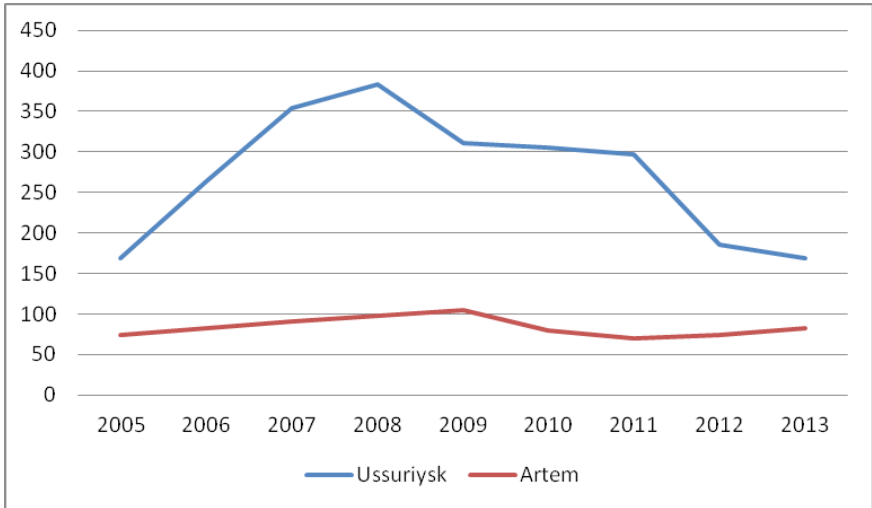

Fig. 3. *Levels and dynamics of prevalence of diffuse (endemic) goiter in the adult population of Ussuriysk and Artem (per 100,000 population)*

Analyzing the dynamics of the prevalence of diffuse (endemic) goiter in the population of the adult age-group living in Ussuriysk and Artem, it should be noted that at the end of the considered period the levels of General morbidity of the studied nosology did not change significantly: thus, in Ussuriysk the studied indicator was 168,86 in 2005 and 169,34 in 2013, and in the city of Artem – 74,61 in 2005 and of 81.79 in 2013.

Nevertheless, it should be noted that in the period 2005-2008 the dynamics of the prevalence of diffuse (endemic) goiter among the adult population of the city of Ussuriysk showed that there was a tendency to an increase in the prevalence (the level of total morbidity was 383.64 in 2008), followed by periods of more pronounced (2008-2009; 2011-2012) and less pronounced (2009-2011; 2012-2013) decrease in the levels of total morbidity of the studied nosology.

The dynamics of the prevalence of diffuse (endemic) goiter in the adult population of Artem was much less pronounced: the periods 2005-2009 and 2011-2013

had a weak tendency to increase the levels of total morbidity, and the period 2009-2011 is characterized by a tendency to a slight decrease in the overall morbidity.

During most of the study, the levels of total incidence of diffuse (endemic) goiter in the adult population of both cities were significantly lower than in the child and adolescent population, which is consistent with the literature showing that more than 50% of diffuse endemic goiter cases occur in people under 20 years of age [6.8].

Summary.

The snslysis showed that the prevalence of diffuse (endemic) goiter in Artem city at the end of the studied period increased in two age-groups of population (children and adolescents). The dynamics of the prevalence of these age-groups show the tend to increase the level of total morbidity studied by nosology.

The dynamics of the prevalence of diffuse (endemic) goiter in adolescents living in the city of Ussuriysk is also of concern, since from 2009 until the end of the period under review there was a trend towards an increase in the total morbidity.

It should be noted that levels of total incidence of diffuse (endemic) goiter among the population of the city of Ussuriysk were higher than the same levels in the population of the city of Artem in all age groups (with the exception of the levels of infant morbidity in 2010, 2011 and 2013).

Thus, the results may indicate a lack of effectiveness of existing measures for the prevention of IDD in high-risk groups. Programs for the prevention of IDD in the Primorsky region (and in particular, in the territories of the transition bioclimatic zone) are recommended to be tailored to the specifics of the emergence and development of IDD in the region, and taken into account because of the possible deficiency of iodine intake in the body with food and a set of environmental factors of different nature that can affect the formation and development of the population of the IDD region, in particular diffuse goiter.

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首次发现由Kuzbass的Borrelia Miyamotoi引起的昼夜蜱传borreliosis病例
FIRST IDENTIFIED CASES OF IXODIC TICK-BORNE BORRELIOSIS CAUSED BY BORRELIA MIYAMOTOI IN KUZBASS

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抽象。　在Miyamotoi　borreliosis存在观察97例急性蜱发生感染和15例蜱虫出生的脑炎和石灰病患者。　在所有情况下通过IFA和PCR方法进行病原学验证。　在13.4%的急性和66.6%的蜱传出感染疾病的慢性病例中检测到Borrelia Miyamotoi。

关键词：Borreliosis，Borrelia Miyamotoi，蜱虫感染，Rtvtrovo。

Abstract. 97 patients with acute tick born infections and 15 tick born encephalitis and Lime disease patients were observed on Miyamotoi borreliosis presence. Etiological verification by IFA and PCR methods in all cases was done. Borrelia Miyamotoi was detected in 13.4% of acute and 66.6% chronic cases of tick born infection diseases.

Keywords: Borreliosis, Borrelia Miyamotoi, Tick born infections, Rtvtrovo.

Introduction The most common transmissible infections which are transfered by ixodic ticks are tick-borne encephalitis (TE) and ixodic tick-borne borreliosis (Lyme Disease) [1,2] .

Ixodic tick-borne borreliosis, the causative agent of which is Borrelia Miyamotoi is a relatively new infectious disease, which is however widespread in the territory of the Russian Federation [2].

The epidemiological situation in the Kemerovo region according to Lyme Disease in 2017 is regarded as not favorable. The incidence of tick-borne borreliosis in the Kemerovo region is 3.0 times higher than in the Russian Federation [3].

Relevance of the study: in recent decades in the Kemerovo region among the refined forms of infectious diseases transmitted by tick bites there were found Lyme borreliosis (V. afzelii,B. garinii,B. burdorferis.l), rickettsiosis, tick-borne encephalitis, ehrlichiosis. At the same time, about 50% of the cases of diseases associated with tick bites remain unverified [1,4,5].In this regard, further verification of pathogens is relevant.

Purpose of research: clarification of the spectrum of borrelioses infection on the territory of Kemerovo region with the help of modern laboratory methods of differential diagnostics, to clarify the role of Borrelia miyamotoi in the structure of the Lyme Disease in the Kemerovo region.

Materials and methods of research.

Two groups of patients were studied: Group 1: 97 patients in the acute period of the disease, group 2 of 15 patients with chronic tick-borne encephalitis jamborees.All patients underwent etiological verification on tick-borne encephalitis, Lyme borreliosis, borreliosis Myamboto(BM).

Group 1 - the study was conducted on the basis of the State Autonomous Health Institution of the Kemerovo region "Kemerovo regional clinical infectious diseases hospital"in the period from 04.2018 to 09.2018. Patients at the age from 18 to 85 years had a history of sucking ticks that preceded the development of

acute febrile illness. The presence in serum of specific antibodies of class M and G against the causative agents of Lyme Disease were detected using kits for ELISA – "LymeBest-IgG", "LymeBestIgG" (AO "Vector-best", Novosibirsk), "VectoVKEIgM", "VektoVKEIgG". Detection of DNA of B. miyamotoi was carried out using a set of "Realbest DNA Borrelia miyamotoi" (AO "Vector-best", Novosibirsk), and detection of DNA of the pathogen Lyme Disease – three genocidally B. afzelii,B. garinii,B. burdorferi were carried out using a set of "Real Best DNA BorreliaBurgdorferis.l./RNA VKE" (AO "Vector-best", Novosibirsk).A set of reagents "Realbest extraction 100"was used to isolate nucleic acids.

Group 2 - 15 patients with persistent residual effects of tick-borne infectious diseases (TID), cured 5-15 years ago (the study of serum samples was carried out by means of an immunochip for serodiagnosis for the differential diagnosis of classic Lyme disease and barrelisation (BM), caused by BorreliaMiyamotoi). – immunochip for detection of antibodies to antigens Borreliamiyamotoi is not yet registered, is the development of the Central research Institute of epidemiology of Rospotrebnadzor, where the study was conducted.

The results of the research and their discussion.

Working with the material of patients with acute forms of tick-borne infections, 17(17.5%) samples (16 blood sera and 1 cerebrospinal fluid) of Borrelia DNA were detected. Including DNA B. Miyamotoi identified in 13 cases (13.4 per cent); the DNA of other genocidaire detected in 4 cases (4.1 percent).Thus, 13(13.4%) cases of acute disease caused by B. Miyamotoi were verified for the first time in Kemerovo region.All patients were enrolled in SBHI KO "KOKEB" with a preliminary diagnosis of tick-borne fever. 4 patients had a General infectious syndrome (fever above 38.5 C was observed in 1-2 days of disease, stopped for 4-5 days against the background of taking antipyretics and antibiotics).All patients also had the syndrome of hepatitis, the level of total bilirubin did not exceed 40 mmol/l, ALT indicators exceeded the norm by 3-4 times and by the time the patients were discharged from the hospital did not reach normal values. 1 patient had subfebrile fever up to 37.5 ° C during the first 5 days of the disease, which was accompanied by severe arthroalgic and myalgic syndromes. Metabolic changes of myocardium were documented by ECG of all BM Patients.

Modern researchers indicate that ixodic tick-borne borreliosis caused by B. Miyamotoi proceeds by the type of generalized inflammatory reaction with high body temperature, increased heart rate, high CRP. In addition, there were violations of the kidneys, liver [6,7,8].

In the 2nd group, 10 (66.6 per cent) of patients identified in blood by ELISA immunoglobulin G. Borrelia Miyamotoi.In the study of these patients with chronic manifestations of TID in the clinic noted: 2 patients with monoinfection caused by B. Miyamotoi, polyneuropathy. At the same time, the 1st patient - polyneuropa-

thy was combined with chronic atrophic acrodermatitis, the 2nd with chronic pain syndrome, fibromyalgia. 5 patients with detected Lyme borreliosis (V. afzelii,B. garinii,B. burdorferis.(l) had the clinical course of the disease manifested as polyneuropathy. 3 patients with mixed infection (Lyme borreliosis, tick-borne encephalitis) were clinically marked poliomyelitisa form of tick-borne encephalitis. The spectrum of clinical manifestations of chronic tick infection (CE,TID, BM) of patients from Kemerovo region coincides with the data of foreign studies [9,10].

Summary: Cases of tick-borne borreliosis caused by B. miyamotoi in acute and chronic periods of the diseasein for the first time were identified, confirmed by PCR, ELISA and immunochip in the Kemerovo region.

Further research is planned to determine the prevalence of the causative agent, vectors and the level of incidence among the population.

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Barnaul居民冠心病急性加重期的季节动态
SEASONAL DYNAMICS OF EXACERBATIONS
OF CORONARY HEART DISEASE IN RESIDENTS OF BARNAUL

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抽象。　本文讨论了温度对Barnaul市冠心病患者急诊护理可及性动态的影响以及冠心病急性加重期的季节动态。　揭示了气温与救护车中诊断为冠心病的患者数量之间的相关性。　上诉季节性明显，冬季达到高峰，夏季出现下降。
关键词: 冠心病，温度，冠心病急性加重期的季节动态。
Abstract. *The article discusses the effect of temperature on the dynamics of appealability to emergency care for patients with coronary heart disease in the city of Barnaul and the seasonal dynamics of exacerbations of coronary heart disease. Correlation between air temperature and the number of patients with a diagnosis of coronary heart disease in an ambulance is revealed. There was a clearly pronounced seasonal nature of appeals with a peak in winter and a decrease in summer.*
Key words: *coronary heart disease, temperature, seasonal dynamics of exacerbations of coronary heart disease.*

Numerous studies have shown the undisputed effect of solar activity, atmospheric pressure, air temperature and other abiotic natural factors on human health.

According to many authors (Grushetskaya, Prokh, 1980; Ragulskaya, Khabarova, 2001; Alyabina et al., 2003; Zyryanova et al., 2004; Smirnova et al., 2012, and others.) the effect of very low or very high temperatures affects on the incidence of cardiovascular diseases. Under the influence of high temperatures, blood viscosity and cholesterol level in blood plasma increase, there is a pronounced inverse relationship between blood pressure level and temperature, etc. (Nuzhdina, 1998; Plesko, 1986; Mironovskaya, etc., 2009; Gamburtsev, Sigachev, 2011).

A sharp increase in the relative humidity of the air affects the frequency of almost all complications of acute myocardial infarction (Nechaev et al., 1998; Yuldashev, Khamitov, 2000; Zyryanova et al., 2004, etc.).

The fall in atmospheric pressure leads to an increase in cases of ventricular fibrillation, paroxysmal tachyarrhythmias and acute left ventricular failure among women and atrioventricular blockade among men. An increase in atmospheric pressure by 2.5 times increases the frequency of atrioventricular blockages in women (Arslanova et al., 2001).

Seasonal periodic weather changes cause a significant change in the physiological processes in the human body. Violation of adaptive reactions, regardless of the causes, provokes a disproportionate response of organs and functional systems to changing environmental conditions, which is accompanied by the development or aggravation of pathological processes (Satpayeva et al., 1993; Warshavsky et al., 2001; Yuldashev, Khamitov, 2000; Smirnova and others, 2012 and others). Currently, more and more attention is paid to the influence of seasonal and climatic factors on morbidity and mortality (Nuzhdina, 1998; Ballester et. Al., 2003; Shettler, Dockery, 2005; Pope, 2006).

Cardiovascular diseases are the leading cause of death in Russia, including in the Altai Territory. The most frequent and dangerous among them are coronary heart disease (CHD) and brain and stenotic lesions of blood vessels. A particular concern is currently causing the growth of these diseases and their "rejuvenation" (Varshavsky et al., 2001).

The purpose of our research was to assess the effect of air temperature on patients with coronary artery disease and to identify the seasonal dynamics of exacerbation of coronary artery disease in residents of Barnaul.

Temperature. Analysis of the dynamics of appealability to emergency medical care (EMC) of patients with coronary artery disease showed that the maximum number of exacerbations occurs in the winter period of time: for men - for January and February, for women - for December and January (Fig. 1).
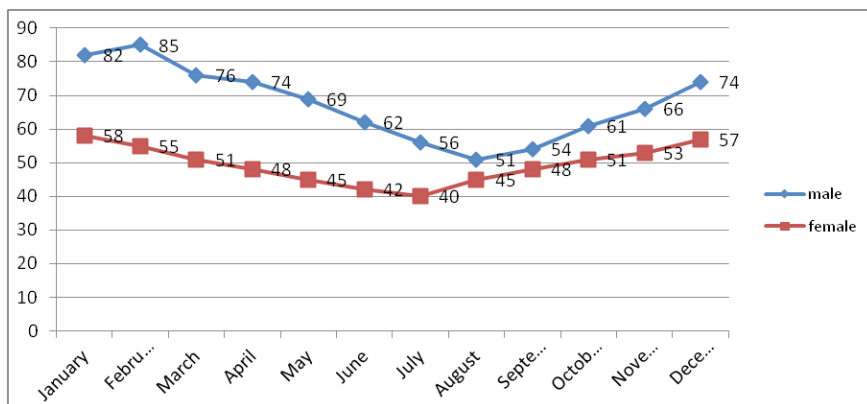

Fig.1. *The dynamics of appealability to the EMC of patients with CHD during the year*

High appealability to the EMC of patients with coronary artery disease was observed at low temperatures (from -20 to -30 ° C and below), low appealability- at high temperatures (from + 20 ° C and above) (Fig. 2).
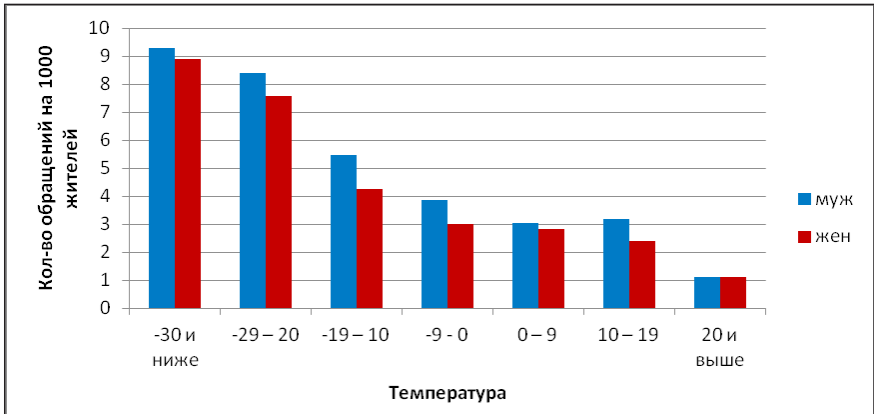

Fig.2. *The dynamics of appealability to the EMC of patients with coronary artery disease, depending on temperature conditions*
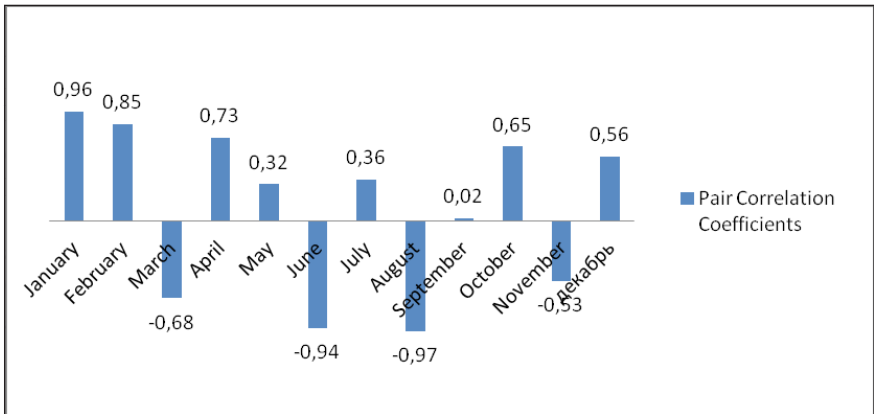
Fig. 3. *Pair correlation coefficients between air temperature and the number of EMC calls to patients with CHD*

Seasonal dynamics of CHD exacerbations. Analysis of the number of calls to the SMP showed that the largest number of calls to the SMP of patients with coronary artery disease in the period from 2007 to 2013. was observed in the winter period of time, and the lowest negotiability was observed in the summer period of time (Fig. 4). Thus, it was revealed that the manifestation of attacks of the disease

depends on the seasons of the year with the peak of increasing in winter and decreasing in summer, which is confirmed by the literature data (Yuldashev, Khamitov, 2000; Alyabina et al., 2003; Smirnova, 2012; Sokolova, Shirokova, 2017).
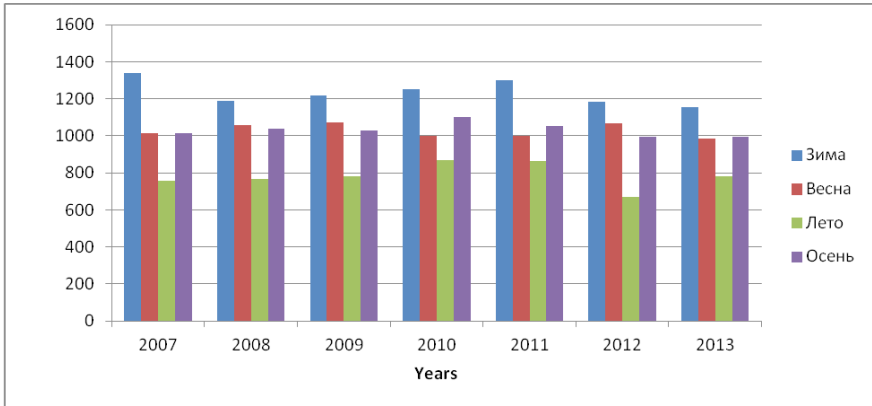
Fig. 4. *Seasonal dynamics of appealability to the EMC of patients*
with coronary artery disease during 2007–2013

Seasonal analysis of appealability to the EMC of males and females showed that the attendance of men is significantly higher than that among females (Fig. 5).

Fig. 5. *Seasonal appealability of men and women with CHD to the EMC*

Thus, winter weather conditions, including low temperatures, cause a number of physiological changes in the body, which lead to an increase in appealability to the EMC of CHD patients.

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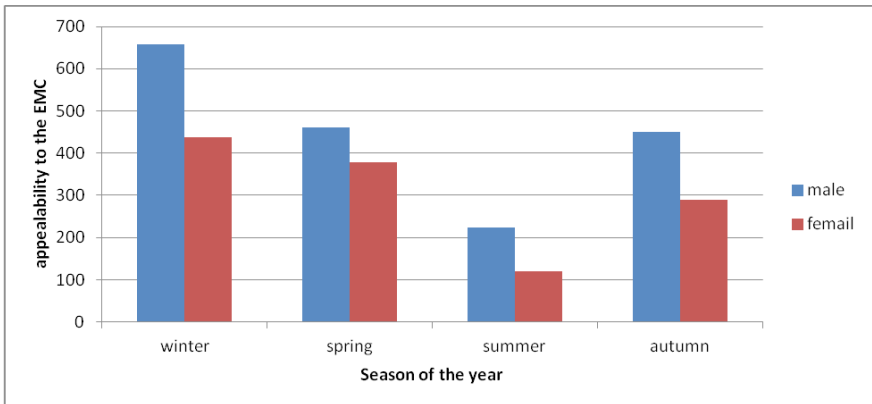*2. Arslanova P.M., Ganelina I.E., Manoilov V.E., Sapozhkov L.K., Churina S.K. Influence of complex environmental parameters on the human body // Space Biology and Aerospace Medicine. - 2001. - №5. - P.53–55.*

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纳米二氧化钛增强上颌聚酰胺假体的生物力学分析

BIOMECHANICAL ANALYSIS OF MAXILLARY POLYAMIDE PROSTHESIS REINFORCED WITH NANOSCALE TITANIUM DIOXIDE

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抽象。提出了一种由聚酰胺制成的切除后上颌假体闭孔器。作者提出增强聚酰胺VertexThermoSens纳米二氧化钛的量可达1 wt。使用Instron 5965机电系统研究所得材料的机械性能。测定了增强聚酰胺的杨氏模量和最大应力。将改性材料的性能与丙烯酸塑料进行比较。假体 – 闭孔器的线性弹性理论的任务是在小变形的框架内。问题通过有限元方法解决。为了构建假体的3D模型，使用Artec Eva扫描仪。结果表明，该假体具有必要的机械性能并且能够承受功能负荷。基于该研究，可以推荐将改性材料用于临床实践，用于制造复杂的上颌假体和具有改善的上颌骨缺损患者的整形外科治疗质量的装置。

关键词：生物力学分析，假体闭孔器，纳米结构二氧化钛，聚酰胺。

Abstract. *A post-resection upper-jaw prosthesis obturator made of polyamide is presented. The authors proposed the reinforcement of polyamide VertexThermoSens nanoscale titanium dioxide in an amount of up to 1 wt. % The mechanical properties of the material obtained were studied using an Instron 5965 electromechanical system. A Young's modulus and maximum stresses of reinforced polyamide were determined. The properties of the modified material are compared with acrylic plastic. The task of the linear theory of elasticity for the prosthesis-obturator is in the framework of small deformations. The problem is solved by the finite element method. To build a 3D model of the prosthesis, the Artec Eva scanner is used. As a result, it is shown that this prosthesis has the necessary mechanical properties and is able to withstand functional loads. Based on the research, the modified material can be recommended for use in clinical practice for the manufacture of complex maxillary prostheses and devices with improved quality of orthopedic treatment of patients with acquired maxillary defects.*

Keywords: *biomechanical analysis, prosthetic obturator, nanostructured tita-nium dioxide, polyamide.*

Introduction. Treatment of patients with defects in the maxillofacial area does not lose its relevance despite significant progress in the field of reconstructive surgery. Acquired defects of the maxillofacial area lead to aesthetic and functional disorders and require further dental orthopedic rehabilitation of patients in 55% of cases [4].

The greatest difficulty in the orthopedic stage of treatment is postoperative defects of the upper jaw with the presence of an oro-nasal communication, which most often occurs as a result of operations for neoplasms (Fig. 1, a) [5], requiring further manufacture of prosthetic obturators (Fig. 1, b) with extended boundaries and, as a result, an increase in the weight of the finished prosthesis, worsening the fixation and stabilization, leading to an overload of the remaining teeth.

a)   b)

Figure 1. *a) upper jaw defect b) prosthetic obturator*

Despite the growing interest in dental materials science of basic polymers, 98% of removable orthopedic structures are still made of acrylic plastic [3], which has disadvantages such as residual monomer, shrinkage, low strength characteris-tics, structure disintegration [7].

Due to the combination of physicomechanical characteristics, our attention was attracted by Vertex ThermoSens thermoplastic polyamide (Vertex-Dental B.V., the Netherlands; ISO-Certificate 9001: 2008), used for the manufacture of bases of removable structures. The absence of residual monomer, the possibility of labo-

ratory correction of prostheses, minimal shrinkage, high density in combination with a low specific weight (1.04 g / cm^3), the absence of metal structural elements, suggest a number of advantages in the manufacture of difficult-jaw prostheses from this polyamide to patients with defects jaw bones. In addition, the possibility of using dento-alveolar clasps allows you to reduce the load on the teeth of a healthy half of the jaw, to ease the weight of complex jaw prosthesis.

It should be noted that the available data from scientific sources indicate an increase by 30% of the tensile strength of a polymeric material in the case of introducing titanium dioxide nanostructures into its composition [6]. In this regard, at the stage of thermopressing the structures of prosthetic obturators, the basic material was reinforced by introducing nano-sized titanium dioxide powder in it in an amount up to 1 wt.% (RF Patent No. 2631050 of September 15, 2017).

Objective: biomechanical analysis and justification of the model of post-resection prosthesis-obturator on the upper jaw, made of polyamide structural material, reinforced with nano-sized titanium dioxide.

Formulation of the problem: In this paper, we calculated the problem of the strength of the elements of the prosthesis. A fragment of a prosthetic obturator is taken as the study area (Fig. 2). At the boundaries of the area set the boundaries of displacements and loads.

The biomechanical model was built under the following assumptions:

1) prosthesis materials are homogeneous and isotropic;

2) the medium is continuous, there are no initial voltages;

3) the palatine part is rigidly fixed on the side of the upper jaw;

4) a distributed load is applied to the tooth;

We used the classical formulation of the problem of mechanics of an elastic isotropic body, consisting of equilibrium equations, Cauchy geometric relations, Hooke's law, and boundary conditions:

$$\nabla \cdot \sigma = 0,\, r \in V; \tag{1}$$

$$\varepsilon = \frac{1}{2}\left(\nabla u + \Delta u^{\mathrm{T}}\right),\, r \in \overline{V}; \tag{2}$$

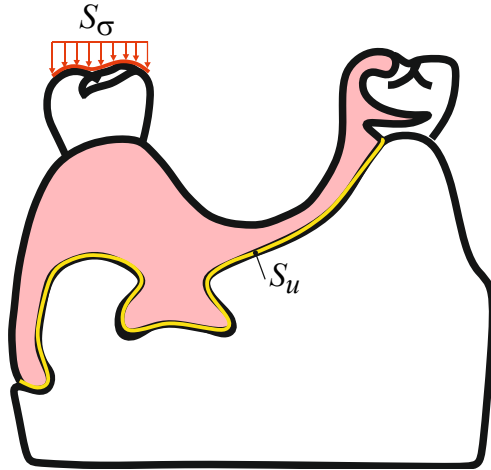$$\sigma = C \cdot\cdot\, \varepsilon,\, r \in \overline{V}; \tag{3}$$

Fig. 2. *Diagram of prosthetic obturator*

where V – area of space occupied by the body, $\overline{V} = V \cup S$ (S – body boundary);
σ – symmetric stress tensor; r – point radius vector; ε – small strain tensor;
u – displacement vector; c – fourth rank tensor of elastic moduls.

$$n \cdot \sigma = p, r \in S_\sigma; \qquad (4)$$

$$u = 0, \; r \in S_u \qquad (5)$$

The border S_σ is subjected to uniform chewing pressure acting along the vertical axis, , the border S_u is rigidly fixed.

To study the biomechanics of the prosthesis-obturator used the method of mathematical modeling. The construction of the calculated finite element model included the following steps:

1) determination of the mechanical properties of materials;

2) the construction of a geometric model;

3) the creation of a finite element mesh;

4) setting the boundary conditions: the conditions of consolidation, power effects.

The model includes the design of the prosthesis, divided into 2 parts: dental and palatine.

To study the mechanical properties of samples of polyamide material modified with nanoscale titanium dioxide, three-point bend tests were carried out on an Instron 5965 electromechanical system with a maximum developed force of 5 kN.

As a result of the tests, the force-deflection dependences were obtained, and later a transition to the stress-strain dependences was made. Young's modulus and maximum stresses are determined. Analyzing the data obtained, it should be noted that the introduction of nano-sized titanium dioxide into the polyamide composition leads to an increase in the maximum stresses and Young's modulus by 8.4% and by 7.2%, respectively.

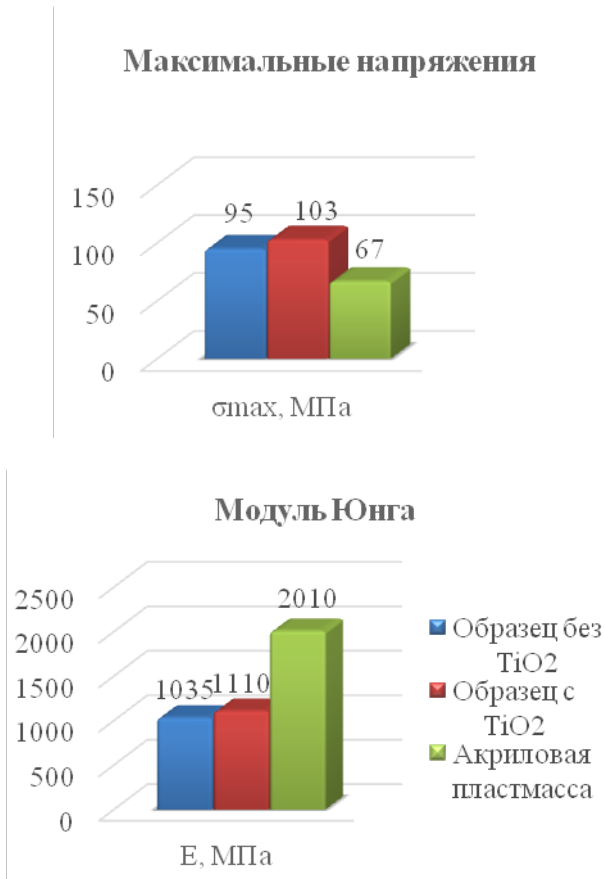The mechanical properties of acrylic plastics in a comparative aspect were taken from reference books. [2]

Fig. 3. *Comparison of mechanical properties of materials used in biomechanical calculations*

To create a three-dimensional (3D) model of a solid using a Artec Eva 3D scanner, a series of prosthesis images processed for calculations was obtained (Fig. 4, a). The construction of the finite-element three-dimensional model based on the CAD-model and its analysis were performed using the specialized software package *ANSYS Workbench* (Ansys, USA). The number of elements and nodes was 342 873 and 202 893, respectively (Fig. 4, b).
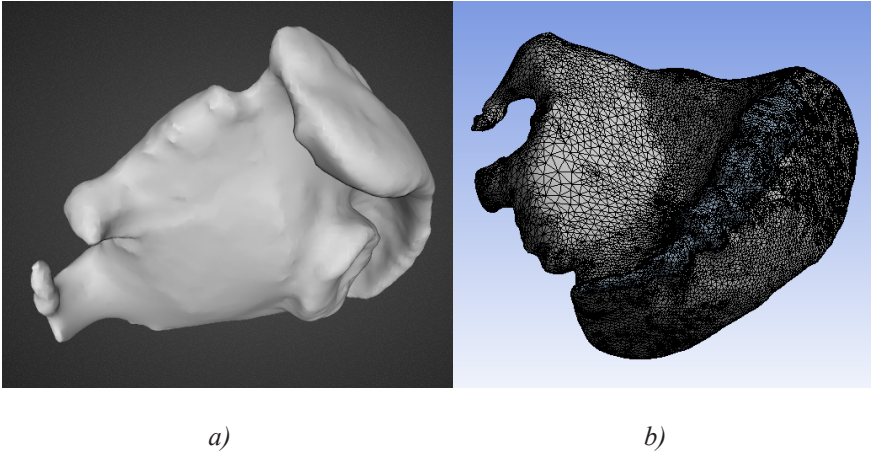

a)   *b)*

Fig. 4 *Calculated three-dimensional models: a) from a scanner, b) finite element*

Results: The calculations are made by the finite element method with the above described prosthesis structure, loads and properties. The compressive and tensile stresses and shear stresses were combined and analyzed as the uniaxial composite Mizes stress equivalent.

An analysis of the maximum displacement of the prosthesis showed sufficient stability, the displacements amounted to 0.37 mm (Fig. 7, a). When analyzing effective stresses, the following patterns can be noted. The most dangerous area occurs on the arc, replacing the bone tissue of the upper jaw (Fig. 7, b). The maximum stress was 80 MPa. The level of maximum stresses obtained in this work was within the limits of strength conditions. In general, the deformations and stresses correspond to the physically supposed representation of the stress-strain state of the prosthesis.
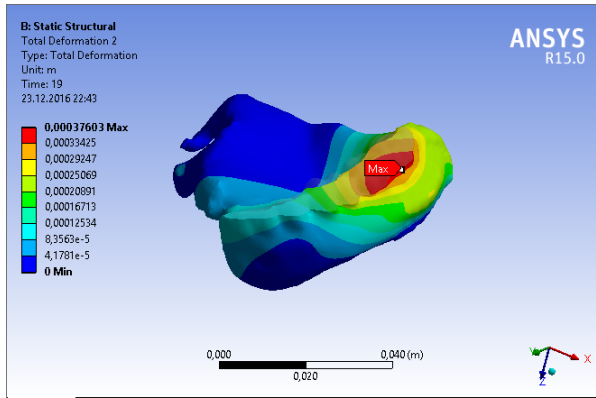
a)
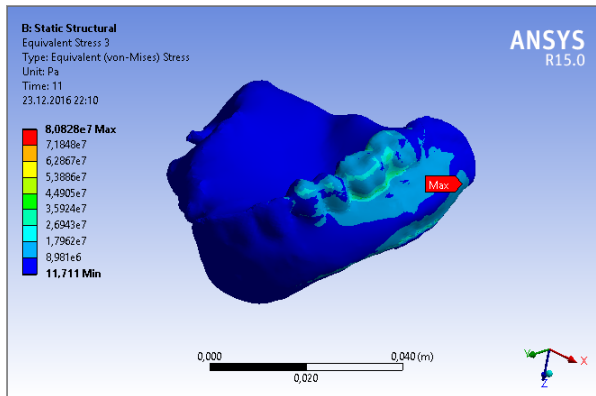
b)

Fig. 5. *Results: a) displacement field, b) equivalent stress field*

Conclusion: Biomechanical calculations of the model of the upper jaw prosthesis-obturator, made of thermoplastic material Vertex ThermoSens, with the introduced nanostructured titanium dioxide showed strength characteristics that meet the requirements of GOST 31572-2012 "Polymer materials for basic dentures. Technical requirements. Test methods "and the international standard ISO 1567: 1999 Dentistry - Denture base polymers (Dentistry. Polymers for denture bases).

Hypoallergenicity, low specific weight, sufficient strength, absence of residual monomer and metal structural elements of the prosthesis make it possible to recommend this material for the manufacture of complex maxillary prostheses and devices.

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幽门螺杆菌相关的慢性胃十二指肠炎和儿童神经元特异性烯醇化酶
HELICOBACTER PYLORI – ASSOCIATED CHRONIC GASTRODUODENITIS AND NEURONSPECIFIC ENOLASE IN CHILDREN

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抽象。根据幽门螺杆菌（HP）感染的存在，炎症过程的严重程度和性别，研究了慢性胃十二指肠炎（CGD）患儿血清中神经元特异性烯醇化酶（NSE）的水平。研究组包括73名患有CGD的儿童。对照组（CG）由28名I-II健康组的儿童组成。内镜和形态学方法用于诊断疾病;用于验证幽门螺杆菌的脲酶，细菌学，分子生物学和血清学。对所得结果的分析显示，与HP相关的CGD（CGD HP（+） – I组）和与HP无关的CGD（CGD HP（－） – II组）的儿童血清NSE水平均增加。 ）与CG相比。 NSE变化的多向性质取决于组I和II中胃十二指肠区的粘膜损伤（ML）的特征。在CGD HP（+）和CGD HP（－）中男孩都发现NSE水平较高，在I组和II组男孩和女孩中，NSE水平超过对照值。

关键词: 神经元特异性烯醇化酶，慢性胃十二指肠炎，幽门螺杆菌感染，女孩，男孩。

Abstract. *The level of neuron-specific enolase (NSE) in the blood serum was studied in children with chronic gastroduodenitis (CGD) depending on the presence of Hélicobacter pylori (HP) infection, the severity of the inflammatory process and gender. The study group included 73 children with CGD. The control group (CG) consisted of 28 children of I-II health groups. Endoscopic and morphological methods were used in the diagnosis of the disease; urease, bacterioscopic, molecular biological and serological for verification of Helicobacter pylori. Analysis of the obtained results revealed an increase in the NSE level in the blood serum in children with both CGD associated with HP (CGD HP (+) - I group) and with CGD not associated with HP (CGD HP (-) - II group) in compared with CG. The*

multidirectional nature of NSE changes was determined depending on the characteristics of the mucosal lesion (ML) of the gastroduodenal zone in groups I and II. Higher levels of NSE were found in boys both in CGD HP (+) and CGD HP (-), in boys and girls of groups I and II, the level of NSE exceeded control values.

Key words: *neuron-specific enolase, chronic gastroduodenitis, Helicobacter pylori - infection, girls, boys.*

Introduction: Currently, diseases of the digestive system occupy the second place in the structure of chronic diseases in children and adolescents. The main problem, as before, is chronic gastroduodenitis, which accounts for 70-75% of diseases of the upper digestive tract (UDT) [1].

The formation of a chronic inflammatory process in the mucous membrane (CO) of UDT is associated with a variety of etiological factors and pathogenetic mechanisms. As one of the main triggers initiating the development of chronic gastroduodenal pathology, there is Helicobacter pylori (HP) infection, the effect of which is "carcinogenic to humans" (group I carcinogen). In 80-83% of cases, chronic gastroduodenitis (CGD) in children has an infectious etiology [2, 3]. The pathogenetic role of dysfunction of neuro-hormonal regulation in the pathogenesis of CGD has also been established [3, 4].

Recently, research has paid attention to laboratory diagnostics, including the definition of a neuron-specific enolase (NSE) as the main intracellular enzyme of the central nervous system [5]. In fundamental works, it is noted that NSE is found in all human tissues and organs, including tissues of the gastrointestinal tract, and significant enzyme activity is determined in blood serum [6, 7].

Thus, it seems appropriate to study the characteristics of changes in the level of NSE in the blood serum in children suffering from CGD associated with HP infection.

Objective: to optimize the diagnosis of the severity of inflammatory changes in the mucous membrane of the stomach and duodenum by studying the changes in the level of neuron-specific enolase in children with chronic gastroduodenitis depending on the sex of the child and the presence of Helicobacter pylori.

Materials and research methods

The study group included 73 children aged 8–15 years with CGD, of whom 34 (46.6%) were girls and 39 (53.4%) were boys. The first group consisted of 30 (41.1%) children with CGD associated with HP (CGD HP +) (I group). The second group included 43 (58.9%) children with CGD that are not associated with HP (CGD HP -) (Group II).

Group I included 14 (46.7%) children with superficial gastroduodenitis (SGD) and 16 (53.3%) with erosive gastroduodenitis (EGD). Group II consisted of 27 (62.8%) children with SGD and 16 (37.2%) children with EGD.

Group I included: 18 (60%) boys and 12 (40%) girls, group II - 21 (48.8%) boys and 22 (51.2%) girls.

The control group (CG) consisted of 28 children of I-II health groups aged 8–15 years, of which 17 (60.7%) were boys and 11 (39.3%) were girls.

Considering the response of the immune system to Helicobacter pylori infection, 2 subgroups were identified. Subgroup 1 (HP-seropositive) included 11 (36.7%) children, and 2 (HP-seronegative) - 19 (63.3%). 1 subgroup included 8 (72.7%) children with EGD and 3 (27.3%) children with SGD. Subgroup 2 included 7 (36.8%) children with EGD and 12 (63.2%) children with SGD.

Patients were included in the study on the basis of the informed consent of the parents, whose children participated in the scientific study.

The diagnosis of chronic inflammatory pathology of the UDT was established on the basis of complaints, anamnesis, and results of general clinical and instrumental examination. All children underwent endoscopic examination, including NBI-technology, histological examination.

The study of NSE in the serum of patients was determined by enzyme immunoassay using Can Ag Diagnostics (Sweden) kits under standardized conditions, in the morning on an empty stomach. The ELISA results were recorded and evaluated using a SUNRISE photometer manufactured by TECAN (Austria).

For the diagnosis of HP infection in all patients, three methods were used: the bacterioscopic method in preparations of biopsy specimens of the antrum and fundus of the stomach; polymerase chain reaction for the detection of Helicobacter pylori DNA in biopsy specimens of the ML antrum of the stomach with "Litex" test systems (Russia); urease method - determination of urease activity in the biopsy specimen of gastric colus by placing it in a liquid medium containing the standard RU-Test Helicobacter pylori (Russia); enzyme immunoassay for the presence of class A immunoglobulins and total immunoglobulins for Helicobacter pylori using "DRG" test systems (Germany).

Statistical processing of the research results was performed using Statistica for Windows (version 6.1) software packages using non-parametric statistics methods (Mann-Whitney test), taking into account that the distribution of NSE values did not comply with the law of normal distribution. The data are presented as medians (Me), as well as 25 and 75 quartile [25% -75%]. Considered significant level of significance p≤0,05.

Research results and discussion

The study showed that the level of NSE in children I and II groups exceeded the values of NSE in the control group: 10.87 (9.9-12.3) µg / l; 11.24 (9.95-12.23) µg / l and 9.79 (8.49-10.9) µg / l (p≤0.01, p≤0.01). At the same time, there were no significant differences in the indicator in children of group I in comparison with II (p ≥ 0.05) (Table 1). That is, the data obtained suggest that there is no correlation between changes in neuron-specific enolase with HP infection in the pathogenesis of CGD.

Table 1.

The level of neuron-specific enolase in the blood serum in children
with chronic gastroduodenitis in groups I and II

Indicators	CG n=28	I group n= 30	II group n=43
NSE (μg / l) Me Quartiles[25-75]	9,79 [8,49-10,9]	11,24 [9,95-12,23] *	10,87 [9,65-12,34] **

Note:* – the differences are statistically significant when comparing children of group I and CG (p≤0.01);

** – the differences are statistically significant when comparing children of group II and CG (p≤0.01).

It was established that in group I the level of the studied enzyme in EGD HP (+) exceeds the values of NSE in children with SGD HP (+) and in CG: 12.14 (11.24-12.27) μg / l; 10.07 (9.95-11.42) μg / l and 9.79 (8.49-10.9) μg, respectively (p≤0.01, p≤0.01). The obtained result indicates the formation of the marker effect of NSE with the worsening of the inflammatory process in the gastroduodenal region. With regard to the dynamics of NSE in group II, it should be noted that there is a different direction of changes in the level of the enzyme in SGD HP (-): 11.10 (10.5-12.34) μg / l compared with EGD HP (-): 10.49 (9.47-10.605) μg / l, p≤0.01. Moreover, the NSE values in these children, as well as in group I, exceeded the control indicators (Table 2).

The NSE level in the blood serum of patients with EGD HP (+) significantly exceeded the values of the index with EGD HP (-): 12.14 (11.24-12.27) μg / l and 10.49 (9.47-10, 61) μg / l, respectively, p≤0,01. An alternative pattern of changes in the NSE level was found in patients with SGD, that is, higher NSE values were found in children with SGD PH (-) compared to SGD HP (+): 11.10 (10.5-12.34) μg / l and 10.07 (9.95-11.42) μg / l, respectively, p≤0.05. The obtained data do not exclude the possibility of selective participation of NSE in complex mechanisms of the formation of varying degrees of severity of the inflammatory process in ML UDT, taking into account the effects of HP (Table 2).

Table 2.

Indicators of serum neuron-specific enolase in children with chronic gastroduo-denitis in groups I and II, taking into account the severity of the inflammatory process

Indi cators	CG n=28	I group, CGD HP (+) n=30		II group, CGD HP (-) n=43	
		SGD HP (+) n=14	EGD HP (+) n=16	SGD HP (-) n=27	EGD HP(-) n=16
NSE (µg / l) Me Quartiles [25-75]	9,79 [8,49-10,9] *,**, ***	10,07 [9,95-11,42]	12,14 [11,24-12,27]	11,10 [10,5-12,34]	10,49 [9,47-10,61]

Note: * – differences are statistically significant when comparing children with CG and children with EGD HP (+) (p≤0,01);

** – differences are statistically significant when comparing children with CG and children with SGD HP (+) (p≤0,05);

*** – differences are statistically significant when comparing children with CG and children with SGD HP (-) (p≤0,01).

Analysis of the results, depending on gender, showed that in boys of group I, the level of NSE in serum significantly exceeded the value of the indicator in girls of group I: 12.04 (10.23-12.27) µg / l and 10.07 (9, 86-10,64) µg / l, respectively, p≤0,01. Similar changes were also found in patients with CGD HP (-): 12.17 (10.87-12.87) µg / l and 10.35 (9.3-10.8) µg / l, respectively, for boys and girls, p≤0,01. This circumstance does not exclude the connection of neuron-specific enolase with the function of sex hormones (Table 3). Moreover, the level of NSE in both boys and girls significantly exceeded the control values of the indicator in both groups, which does not contradict the assumption that the changes in NSE are related to the pathogenetic mechanisms of CGD (Table 3). Also, the obtained data did not reveal differences in the indicator in boys and girls of group I compared to group II (p ≥ 0.05), which indicates a low degree of association of HP infection with NSE in the genesis of CGD (Table 3).

Table 3.

Indicators of serum neuron-specific enolase in children with chronic gastroduodenitis, taking sex into account

Indicators	Girls (n=34)			Boys (n=39)		
	CG n=11	I group CGD HP (+) n=12	II group CGD HP (-) n=22	CG n=17	I group CGD HP (+) n=18	II group CGD HP (-) n=21
NSE (µg / l) Me Quartiles [25-75]	9,0 [7,8-10,0]	10,07 [9,86-10,64] *	10,35 [9,3-10,8] **	9,65 [8,96-11,2]	12,04 [10,23-12,27] ***	12,17 [10,87-12,87] ****

Note: * – the differences are statistically significant when comparing girls of CG and girls of group I (p≤0,05);

**– the differences are statistically significant when comparing girls of GK and girls of group II (p≤0,05);

*** – the differences are statistically significant when comparing boys of CG and boys of group I (p≤0,01);

**** – the differences are statistically significant when comparing boys of CG and boys of group II (p≤0,01).

Analysis of the results of the study of the level of neuron-specific enolase in the group of children with CGD HP (+) revealed comparable values that do not have significant differences in both 1 and 2 subgroups: 12.05 (10.23-12.23) µg / l and 10.74 (9.95-12.12) µg / l (p≥0.05). At the same time, the NSE level in both subgroups significantly exceeded the control values (p≤0.01, p≤0.05) (Table 4).

Table 4.

Indicators of serum neuron-specific enolase in children with chronic gastroduodenitis associated with Helicobacter pylori

Groups Indicators	ГК n=28	Group H.pylori-positive children					
		CGD		EGD		SGD	
		(+) n=11	(-) n=19	(+) n=8	(-) n=7	(+) n=3	(-) n=12
NSE (µg / l) Me Quartiles [25-75]	9,79 [8,49-10,9]	12,05** [10,23-12,23]	10,74*** [9,95-12,12]	12,225 [10,78-12,37]	12,12*, **** [11,93-12,32]	10,07 ***** [9,95-10,82]	11,02 [11,02-11,42]

Note: * – the differences are statistically significant when comparing EGD (-) and SGD (-) (p≤0,01);

** – the differences are statistically significant when comparing CG and CGD (+) (p≤0,01);

*** – the differences are statistically significant when comparing CG and CGD (-) (p≤0,05);

**** – the differences are statistically significant when comparing CG and EGD (+) (p≤0,01); ***** – the differences are statistically significant when comparing CG and EGD (-) (p≤0,01).

No significant differences were found in the content of NSE in the serum in both 1 and 2 subgroups of children with EGD: 12.23 (10.78-12.37) μg / l and 12.12 (11.93-12.32) μg / l (respectively 1 and 2 subgroups, p≥0.05). However, these figures were significantly different from the control values, exceeding them: 9.79 (8.49-10.9) μg / l (p≤0.01, p≤0.01). A similar picture was found in patients with SGD in 1 and 2 subgroups, without having differences with CG (p≥0.05) (Table 3). Changes in the NSE level in children of subgroup 1 do not depend on the severity of the mucosal lesion of the gastroduodenal region (Table 4). At the same time, in subgroup 2 the level of NSE in EGD dominates over the values of the indicator in SGD: 12.12 (11.93-12.32) μg / l and 11.02 (11.02-11.42) μg / l, respectively (p≤0,01).

Conclusion

1. The increase in the NSE level in the blood serum in children with both CGD HP (+) and CGD HP (-), in comparison with the control, indicates the possible participation of NSE in the complex mechanisms of inflammatory development in the mucous membrane of the UDT outside the continuum with pathogenic effects of Helicobacter pylori.

2. The multidirectional nature of NSE changes in blood serum, depending on the nature of the lesion of the UDT mucosa in groups I and II, does not exclude the probability of the involvement of the enzyme under study in the mechanisms determining the formation of varying severity of the disease.

3. The higher serum levels of neuron-specific enolase in boys compared to girls with CGD HP (+) and CGD HP (-) may indicate a possible association of changes in the NSE level with certain effects of sex hormones.

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更年期妇女患2型糖尿病的患病率和风险
PREVALENCE AND RISK OF DEVELOPING TYPE 2 DIABETES IN MENOPAUSAL WOMEN

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Menopause - a natural biological process of transition from the reproductive period of women's lives in his old age, which is characterized by a gradual fading away of ovarian function, estrogen levels decline, cessation of menstrual and reproductive function. In the condition of estrogen deficiency, women live almost one third of his life [4, 9]. According to World Health Organization, more than a billion people worldwide are overweight or obese. In the countries of Western Europe from 20-25% of women are obese. A feature of obesity is that it is often associated with severe disease, leading to a reduction in life expectancy of patients: with type 2 diabetes, hypertension, dyslipidemia, atherosclerosis, coronary heart disease, sleep apnea syndrome, certain types of cancers, reproductive disorders, diseases of the musculoskeletal system. But the most important aspect of the problem of obesity is its relationship with type 2 diabetes.The risk of developing type 2 diabetes (T2DM) is greatly increased in direct proportion to body mass index and severity of dyslipidemia. Currently, the number of patients with diabetes is 177 million, with 90% of patients - patients with type 2 diabetes. Almost for the last 20 years the number of patients with diabetes in the world increased by 6 times. By 2020, the projected increase in the number of patients to 300 million people. It should be noted that women over 45 suffer from diabetes in 2 times more often than men [2, 3, 12]

In addition, each "extra" pounds of body weight above normal increases the risk of diabetes, regardless of gender, age and race: an increase in body weight by 5 kg populational risk of developing diabetes is 27%. Adults with a body mass index (BMI) $\geq$ 40 kg / m ^{2} have more than seven-fold increased risk of disorders of carbohydrate metabolism. [10, 13, 14].

Epidemiological studies have shown that menopause increases the incidence of diabetes in the female population. In women older than 45 years, the risk of diabetes, cardiovascular disease is increased by several times. The Consensus of the European and Russian cardiologists and Gynecologists (2007, 2008), based on data from the Framingham study and the large observational Nurses' Health Study

(Nurses Health Study), the grave fact is that women with diabetes, the risk of developing cardiovascular disease during the peri - and post-menopause increases in 3 - 7 times compared with healthy women of similar age.[11].

Unfortunately, the onset of menopause in women is often accompanied by an increase in body weight and / or indicators of waist ratio and waist / hip. It is a mistake that is associated with the use of hormone replacement therapy (HRT) in the period, referring to some studies, where the women using HRT was found higher body mass than women, do not use this type of therapy.

Women with diabetes, as well as the general population of women have the same indications for HRT. However, the percentage of use of HRT in women with and without diabetes are different and are 17% and 39%, respectively.[16].

In menopausal women with diabetes increases the risk of endometrial pathology. Diabetes, overweight / obesity, hypertension (AH) - triad, which increases the risk of endometrial cancer by 50%. [7, 8, 12, 14].

It is known that female sex hormones control the metabolism of fats and carbohydrates in the body, accelerating the breakdown of fats and inhibiting the synthesis of lipid fractions contributing to the development of atherosclerosis. It is proved that not only hyperlipidemia, but also a violation of the relation between the individual lipid fractions (dislipoproteinemia) play an important role in the pathogenesis of coronary heart disease and the development of systemic ateroleroza. , The following critical indicators of the level of serum lipids, which increase the risk of coronary heart disease (CHD): total cholesterol (TC) of 240 mg / dL, high-density lipoprotein (HDL) cholesterol less than 35 mg / dL, low-density lipoprotein (LDL) cholesterol more than 160 mg / dL, triglycerides (TG) 500 mg / dl. Mechanism of the effect of sex steroids on the blood lipid complex. It is believed that the hormones act on the catabolism of HDL primarily through changes in the activity of hepatic lipoprotein lipase. The gradual decline in estrogen levels at menopause leads to disruption of lipid metabolism and the formation of insulin resistance, which results in a tendency to weight gain in this age period. In adipose tissue is an active synthesis of female sex hormones (estrogen synthesis vnegonadny): estrone from androstenedione and estradiol from testosterone. With an excess of adipose tissue, this coordinated process can be broken, and during the end of the menstrual function worse. It is also important that obesity is characterized by a predominance of large amounts of adipose tissue over the muscle, and most often occurs in women between 30 and 70 years.The prevalence of muscle tissue over fat indirectly confirms the presence of hyperandrogenism in women during menopause and, of course not independent of body mass index: that is, can occur in women with normal body weight and obesity. At the same time as visceral obesity is directly linked to the state of insulin resistance. Visceral adipose tissue has a direct effect on the liver and is metabolically more active than subcutaneous fat. Increasing the amount of visceral fat with age due to both physiological changes in a woman's body, and with lifestyle changes. However, not excluded, and genetic predisposition in an autosomal recessive manner [4, 5, 11, 13].

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个体类胡萝卜素稳定性的比较研究
A COMPARATIVE STUDY OF THE STABILITY
OF INDIVIDUAL CAROTENOIDS

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注解。可用于预防和治疗目的的一类生物活性物质是类胡萝卜素。他们有一整套药理学特性，主要是抗氧化，光保护，抗癌，维生素原和其他类型的活动。在临床实践中存在妨碍大规模使用类胡萝卜素的若干问题，并且应该强调的问题之一是单个类胡萝卜素的物质的极端不稳定性。

该研究的目的是对个体类胡萝卜素的稳定性进行比较研究。

作者使用了早期作者获得的单个类胡萝卜素β-胡萝卜素，番茄红素，叶黄素，虾青素的物质。在实验室中通过分散在不混溶液体中的方法设计类胡萝卜素微胶囊。提出了一种在自然条件下储存类胡萝卜素的专有算法。用分光光度法监测类胡萝卜素的稳定性。实验证实，微胶囊化可用作稳定单个类胡萝卜素的方法。

关键词：类胡萝卜素，β-胡萝卜素，番茄红素，叶黄素，虾青素，微胶囊，稳定性，分光光度法。

Annotation. One of the classes of biologically active substances that can be used for both prophylactic and therapeutic purposes is carotenoids. They have a whole list of pharmacological properties, the main of which are antioxidantive, photoprotective, anticarcinogenic, provitamin and other types of activity. There are several problems that impede the large-scale use of carotenoids in clinical practice, and one of the problem which should be emphasized is the extreme instability of the substances of individual carotenoids.

The purpose of the study is a comparative study of the stability of individual carotenoids.

The authors used the substances of individual carotenoids β-carotene, lycopene, lutein, astaxanthin, obtained by the authors earlier. Carotenoid microcapsules were designed in the laboratory by the method of dispersion in immiscible liquids. A proprietary algorithm for storage of carotenoids in natural conditions

is proposed. Monitoring the stability of carotenoids was carried out spectrophotometrically. It was experimentally confirmed that microencapsulation can be used as a method for stabilizing individual carotenoids.

***Key words:** carotenoids, β-carotene, lycopene, lutein, astaxanthin, microcapsules, stability, spectrophotometry.*

Introduction. Currently, there is deterioration in the physical condition of people who consider they to be completely healthy and who have not identified any pathology. Many scientists associate such a change in the health status of the adult working-age population, people of older and retirement age, as well as children with rapidly deteriorating environmental conditions. A rather unfavorable ecological situation in both industrialized and developing countries predetermined the development of research related to the development of medicines that would increase the body's adaptation reserves and enhance the human immune system in the current modern environmental conditions.

It should be noted that the creation of prophylactic drugs containing such biologically active substances (BAS) as vitamins and vitamin-like compounds will allow healthcare practitioners to implement one of the basic principles of preventive medicine: "it is easier to prevent the disease than to cure it". To implement the prophylactic direction of medicine, drugs that have restorative, immunotherapeutic and antioxidant activities are needed.

One of the classes of biologically active substances that can be used for both prophylactic and therapeutic purposes is carotenoids. They have a whole list of pharmacological properties, the main of which are antioxidant, photoprotective, anticarcinogenic, provitamin and other types of activity [1 - 5].

There are several of the most serious problems that impede the large-scale use of carotenoids in clinical practice, of which the extreme instability of the substances of individual carotenoids should be emphasized.

The purpose of the study is a comparative study of the stability of individual carotenoids.

Materials and Methods. The substances, materials and reagents used in the experiment are β-carotene, lycopene, lutein, astaxanthin substances were obtained by the method described in [6, 7]; purified water; isobutyl alcohol; medical gelatin; glycerin brand PC-94; titanium oxide (IV) (titanium dioxide, E171); sunflower oil; n-hexane.

The equipment used in the experiment is laboratory sieves C30 / 50; Laboratory electronic scales LV 210-A; laboratory scales VL-210 Accuracy class 1 (special); mixing device LAB-PU-0; spectrophotometer SF-2000 (spectral range from 200 to 750 nm).

Microcapsules of carotenoids were obtained in the laboratory by the method of dispersion in immiscible liquids: for the production of microcapsules, a mixing device made of stainless steel was used, equipped with an anchor type stirrer and steam jacket. Preliminarily carotenoid had been dispersed in a 30% solution of gelatin with a 3% content in it of a plasticizer glycerin. Through the hatch for supplying solutions to sunflower oil, a polymer solution was introduced (the ratio of oil to polymer is 3: 1) and stirred for 10 minutes at the speed of rotation of the mixer blades - 29-30 rpm. Dispersing was carried out before the formation of soft microcapsules, and then the temperature was sharply reduced to 15 ° C, feeding cold water into the jacket of the reactor. After receiving the microcapsules, they were discharged into the collection, separated from the oil by decantation, washed with isobutyl alcohol and dried at room temperature for 8 hours.

The control during storage of microcapsules of β-carotene, lycopene, lutein, astaxanthin was carried out spectrophotometrically, for this weighed amount of preliminarily triturated microcapsules about 0.2 g (exact weight), transferred to a separatory funnel, added 25 ml of n-hexane, shaken for 5 minutes, added 10 ml of 10% solution of sodium bicarbonate and 75 ml of n-hexane. The mixture was extracted for 30 minutes, and then the hexane layer was separated and filtered.

1 ml of hexane filtrate was transferred to a 25 ml volumetric flask and the volume was adjusted to the mark with hexane and stirred.

The optical density of the obtained solution was measured at the following analytical wavelengths: β-carotene - 450 nm, lycopene - 470 nm, lutein - 445 nm, and astaxanthin - 468 nm.

In parallel, the optical density of a 0.0002% solution of CO of the corresponding carotenoid (β-carotene (7235-40-7 Sigma-Aldrich), lycopene (L9879 Sigma), lutein (127-40-2 Sigma-Aldrich), astaxanthin (A3236 Sigma) was measured).

The calculation of the quantitative content of carotenoids was carried out according to the formula:

$$X_\% = \frac{A_x \cdot N \cdot C \cdot P}{A_0 \cdot a_x}$$

where A_x is the optical density of the test solution;
A_0 is the optical density of the carotenoid CO solution;
a_x is the sample of microcapsules, g;
N is coefficient taking into account dilutions, 2500;
C is the concentration of the standard solution; g / ml;
P is the carotenoid content in the standard sample,%;

Results and its discussion. Since the main goal, in accordance with which the production of microcapsules with carotenoids was carried out, is their stabilization, after their construction a comparative study of the stability of microencapsulated carotenoid and carotenoid substances without inclusion in the microcapsules should be carried out.

To control the content of carotenoids during storage, we used the spectrophotometric method for the analysis of carotenoids [8, 9], adapted for the analysis of microcapsules with all four of the studied substances.

The technique was certified in accordance with the requirements and approaches set forth in the State Pharmacopoeia of the Russian Federation XIV [10]. Validation characteristics of the method of analysis of carotenoids in microcapsules are presented in table 1.

Table 1 - *The results of the certification methods for the analysis of carotenoids in microcapsules*

Validation Characteristics	Microcapsules			
	With β-carotene	With lycopene	With lutein	with astaxanthin
The regression equation	y =1,992x+0,021	y=1,989x+0,013	y=1,996x+0,005	y=1,976x+0,029
Linearity $r \geq 0,98$	r =0,999	r =0,999	r =0,999	r =0,999
Trueness $RSD \leq 3,0\%$ $R_{avg.}$ 98,0-02,0 % $T_{design.} < t_{table}$ (2,57)	RSD = 0,99% $R_{avg.}$ =99,7 % T_{design} = 0,48	RSD = 0,84% $R_{avg.}$ = 99,8% T_{design} = 0,33	RSD = 0,65% $R_{avg..}$ =99,9 % T_{design} = 0,27	RSD = 1,24% $R_{avg.}$ =99,7 % T_{design} = 0,77
Precision (convergence) $RSD \leq 3,0\%$	RSD =0,85%	RSD = 0,75%	RSD = 0,54%	RSD = 1,42%

Values of the certification parameters of the method confirm its validity, on the basis of which it was used in the analysis of the stability of individual carotenoids.

Due to the fact that carotenoids are thermolabile compounds, a comparative study of stability was performed under conditions of natural storage. To obtain more detailed experimental data, an experiment according to the scheme developed by us was planned and carried out (Table 2).

In developing the experimental design, factors affecting the stability of carotenoids were taken into account. The storage temperature was 25 ˚C, the effect of light on the objects under study assumed storage without access of light and storage in the light. As the primary packaging used dark glass bottles and bottles of colorless glass.

According to the plan of the experiment, it was intended to store the carotenoid substance enclosed in microcapsules and without microencapsulation for all experimental conditions. Depending on the storage characteristics, each group of objects was assigned a code: 1A, 1B, 1B, 1G (storage of objects without light), 2A, 2B, 2B, 2G (storage of objects in the light) (Table 2).

Table 2 - *Comparative Matrix*
for Studying the Stability of Individual Carotenoids

Storage temperature – 25 C							
No light exposure				light storage			
Micro-capsulated carotenoid substances		Carotenoid substances without microcapsules		Micro-capsulated carotenoid substances		Carotenoid substances without microcapsules	
Flacons of dark glass	Flacons of transparent glass	Flacons of dark glass	Flacons of transparent glass	Flacons of dark glass	Flacons of transparent glass	Flacons of dark glass	Flacons of transparent glass
1 A	1 B	1 C	1 G	2 A	2 B	2 C	2 G

Sampling for analysis was carried out with a frequency regulated for natural storage conditions, i.e. every three months. The control points were 3 months, 6 months, 12 months, 18 months, 24 months, and 30 months. In order to be mathematically able to compare the results of determining the stability of carotenoids in substances and the microencapsulated product, for microencapsulated carotenoids, the percentage of carotenoid from the microcapsule was calculated.

The results of the experiment are presented in Figure 1. Data for objects stored in the absence of light exposure - diagram A, stored in the light - diagram B.
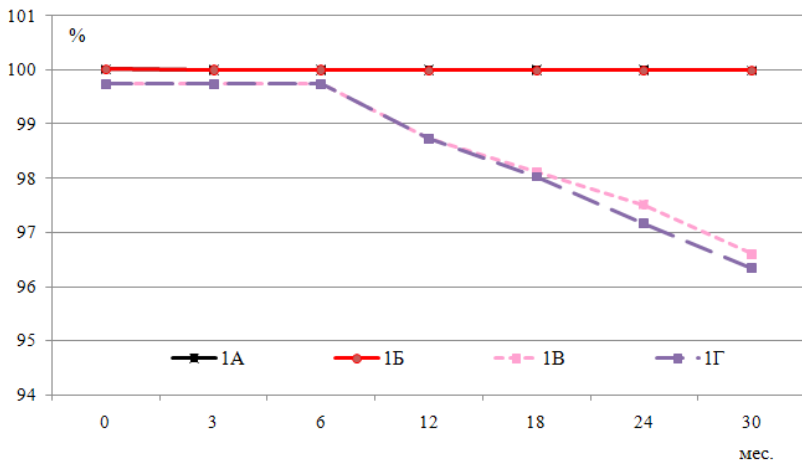

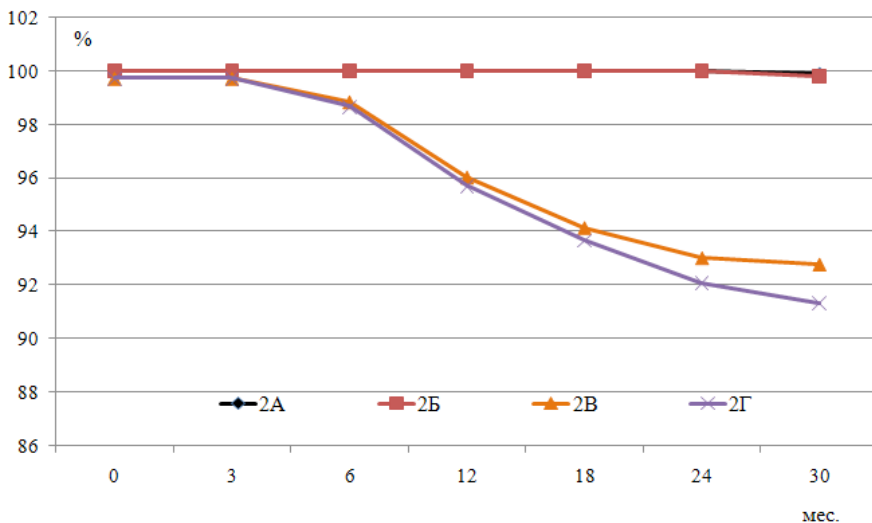***Diagram A -*** *objects stored without light*

Diagram B - objects stored in the light
Figure 1 - *The results of determining the stability of carotenoids during storage*

The results of the experiment conducted on the proposed storage matrix (Table 2) confirmed the theoretical assumptions that microencapsulated carotenoids, when they stored without access to light, will remain stable in dark glass flacons. For all four studied carotenoids of group 1A (β-carotene - 99.99%, lycopene - 100.00%, lutein - 100.00%, astaxanthin - 99.99%) and 1B (β-carotene - 99.99%, Lycopene - 99.99%, Lutein - 99.99%, Astaxanthin - 99.99%) showed a content of the active substance at the level of 100% during the two years of the study. It should be noted that this is the result for a group of microencapsulated carotenoids stored in dark glass flacons (1B) and in transparent flacons (1G), and their comparison confirms the protective stabilization function of the microencapsulation.

When objects stored without access to light of all four native carotenoids, the content of the active substance during the first year of storage corresponded to the initial value: for group 1B: β-carotene - 99.58%, lycopene - 99.70%, lutein - 99.65%, astaxanthin - 99 , 69%), for Group 1G: β-carotene - 99.57%, lycopene - 99.69%, lutein - 99.65%, astaxanthin - 99.69%. However, the control after 12 months showed a decrease in the content of carotenoids, on the basis of which we can state their stability for 6 months.

During storage of microencapsulated carotenoids in the light (groups 2A and 2B), their stability was recorded for two years (the content of active components is about 99.99%), which can be considered a positive result. Thus, the method of

technological protection, namely microencapsulation, ensured the safety of substances during storage under conditions that are extreme for carotenoids at the level of data in groups 1A and 1B.

Special attention is given to the result in groups 2B and 2G, in which the native substances β-carotene, lycopene, lutein and astaxanthin were tested. As expected, storage on light for carotenoids cannot be acceptable. Samples of groups 2B and 2G showed stability only for three months. The least stability was shown by samples of group 2G, i.e. native substances in clear glass flacons stored in the light.

Conclusion. The experiment confirmed our assumption that microencapsulation will increase the stability of the substances of individual carotenoids and can be considered a technological way to protect these compounds. The results of the experiment performed allow us to recommend storage conditions for microencapsulated carotenoids, namely, in a dark glass container or a non-transparent container without access of light.

The stability of microcapsules with β-carotene, lycopene, lutein and astaxanthin allows us to propose a technology for producing microcapsules for its autonomous implementation. In addition, a positive result on the stabilization of carotenoid substances allows us to consider the microcapsules we obtained as an intermediate technological product, which can later be used to produce finished drugs forms containing carotenoids, for example, capsules.

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杯[4]间苯二酚和铑配合物浓度对油脂生物降解过程影响的研究
THE STUDY OF THE EFFECT OF CONCENTRATIONS OF CALIX [4] RESORCINES AND OF RHODIUM COMPLEXES BASED ON THEM ON THE PROCESSES OF OIL BIODEGRADATION

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注解。 研究了含氨基和磷酰基的杯[4] resorcins以及基于它们的铑配合物对硫酸硫酸盐还原菌降解油过程的浓度和结构特征的影响：微生物生长动力学和动力学 研究了在存在和不存在添加剂的情况下微生物对油的消耗。 还鉴定了所研究化合物的浓度添加剂的区域，其中它们表现为油的生物降解的抑制剂或引发剂。 已经确定所研究的化合物的杀菌活性取决于它们的浓度和它们中包含的官能团的类型。
关键词: 含胺杯[4]间苯二酚, 含磷酰基杯[4]间苯二酚, 铑配合物, 油脂生物降解, 硫酸盐还原菌脱硫菌, 杀菌活性, 抗氧化活性, 生物量增长, 油残留浓度

Annotation. *The influence of concentrations and structural features of amino- and phosphoryl-containing calix [4] resorcins, as well as rhodium complexes based on them on the processes of oil degradation by Desulfobacter sulfate reducing bacteria, was studied: the kinetics of microbial growth and kinetics of oil consumption by microorganisms in the presence and absence of additives were studied. Also identified areas of concentration additives of the studied compounds, in which they behave as inhibitors or initiators of biodegradation of oil. It was established that bactericidal activity for the studied compounds depends on their concentration and the type of functional groups contained in them.*

Keywords: *amine-containing calix [4] resorcinol, phosphoryl-containing calix [4] resorcinol, rhodium complexes, oil biodegradation, sulphate-reducing bacteria Desulfobacter, bactericidal activity, antioxidant activity, biomass growth, residual concentration of oil*

From the second half of the 20th century, close attention has been paid to chemistry and the study of the properties of spatially organized three-dimensional systems of the cyclophane series and, in particular, to calix [4] resorcin (**К[4] P**), representing resorcinol-aldehyde tetramers (Fig. 1) [1]. Functionalization **К[4] P**, both on the lower and upper rims of the molecule, it is possible to produce compounds with a number of interesting properties [2-5], due to which these substances can find their application in industry. In particular, the functionalization with amine-containing or phosphorus-containing groups allows to obtain compounds with amphiphilic properties, which form micelles or bilayers depending on the solvent of various types [5-8]. At the same time, amino- and phosphorus-containing surfactants possess biological activity [9]. In connection with the above amphiphilic properties of **К[4]P** can be used in the management of oil biodegradation.

The observed increase in oil production, the volume of its processing and transportation is accompanied by an increase in the amount of oil waste in the form of oil sludge, which is about 500 thousand tons annually, and the resources of these wastes in earthen barns are estimated at 4.5 million tons. Technical means are not able to fully ensure the cleaning of contaminated objects. Currently, the most promising are biotechnological methods based on the ability of microorganisms to use petroleum hydrocarbons as the only source of energy, but the process requires a lot of time, since the natural rate of microbial destruction of oil in water and soil is quite low. Therefore, using various stimulating substances. Amino- and phosphorus-containing **К[4]P**, as well as complexes based on them, are promising in this respect. The biological activity of compounds with phosphoryl and amino groups is different. At the same time, the inclusion of amino- and phosphoryl-containing **К[4]P** metal ions changes the properties of supramolecules. Therefore, we carried out a comparative study of the effect of concentrations of phosphoryl and amine-containing **К[4]P** (respectively, compounds **I, II** - Fig. 1) and rhodium complexes based on them- (respectively, compounds **III** {**I'**•4(RhCl$_4$)•**I'**}; **IV** - {**II**•4[Rh^{III}(O$_2^-$)2(Cl$^-$)]} – Fig. 1) [10, 11, 4, 5, 12] on the processes of oil biodegradation by the culture of sulfate-reducing bacteria (SRB) Desulfobacter..
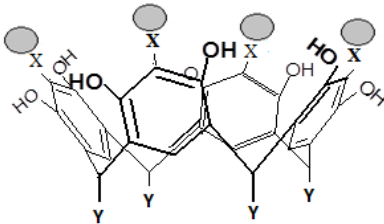
соединение I: X = H, Y = Ar-P(O)(OEt)₂

соединение II: X = CH₂ - N(Me)₂, Y = Ar

соединение III
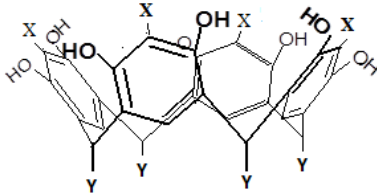
соединение IV

- {Rh(O₂)·(2Cl)}

X = CH₂ - N(Me)₂, Y = Ar
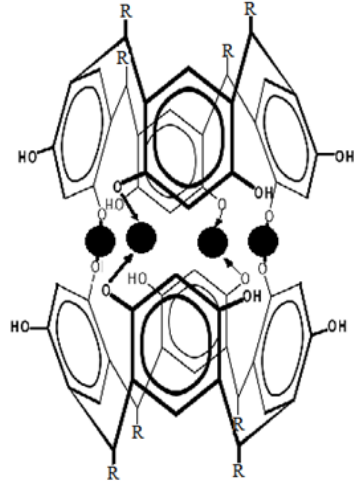
R = Ar - P(O)(OH)(OEt)

- RhCl₄ или

Figure 1 - *Structural formulas of compounds I-IV*
(compounds are cone-shaped, rccc-isomer)

In the process of studying the biodegradation of oil, use was made of the sulfate reducing bacteria of the genus Desulfobacter isolated from the Romashkinskoye field of the Republic of Tatarstan. To study the kinetics of biodegradation of oil, a settled water-oil emulsion was taken in an amount of 250 ml, selected there. After settling, the oil-water emulsion was divided into 125 ml of oil in the upper layer and 125 ml of water in the lower layer (the percentage of oil water cut was ~ 50%). Water-oil emulsion contained 7 g/l NaCl, 1 g/l $MgCl_2 \cdot 6H_2O$, 4 g/l Fe^{2+}. Optimal culture growth range: pH 6,5 – 7,4, temperature 20-33⁰C.

For each of **I-IV** compounds, a series of concentrations were studied in the range of C = 0,01 g/l - 0,3 g/l. Bactericidal activity was estimated by observing the kinetics of the growth of Desulfobacter sabs. For these purposes, the concentration of biomass in the medium was determined according to optical density with a recalculation to the weight of absolutely dry biomass (ADB) according to the calibration graph [13]. Conducted two parallel experiments: control - in the absence of the studied compounds and experi-

ments in the presence of the studied compounds. A 10% Desulfobacter culture was also added. Observations were conducted for 12 days or 12 months. Cells for observation were selected in the exponential growth phase. In the case of observations within 12 days, sampling for analyzes was carried out for ten days. We conductedsix independent experiments, which was repeated twice. Bactericidal activity was assessed by the degree of growth inhibition of SRB Desulfobacter, according to the formula: $S = [C_{1к} - C_{2к} / C_{1к}] \cdot 100\%$, where $C_{1к}$ – is the concentration of biomass in the controlled sample, g/l; $C_{2к}$ – is the concentration of biomass in the test sample, g/l. Negative value (%) indicates an increase in growth, and positive value (%) indicates growth inhibition. The destructive ability of microorganisms (the degree of biodegradation of oil) was judged by the residual volume of oil in the medium by the gravimetric method. Studies were carried out on a water-oil emulsion in the presence of **I-IV** with an initial minimum concentration of substances - 0.06 g / l under the following conditions: C_{NaCl} = 15%, pH environment 6.8-7.8, 10% active culture environment with SRB Desulfobacter, pure oil — C= 125 g/l, oil field wastewater. In parallel, control studies were carried out under the same conditions. Observations were made for 12 days or 12 months.

Data on the kinetics of growth and the degree of biodegradation of SRB Desulfobacter oil for compounds **II** and **IV** are presented in Figures 2-3. Compounds **II** and **IV** inhibit the growth of *Desulfobacter* SRB in the low concentration zone (C = 0.01-0.16 g/l) to C = 0.17 g/l: the degree of biodegradation compared with the control is greater by 88% and 100%, respectively. Further increase in concentration leads to increased growth of the culture. The degree of intensification in the zone C = 0,2-0,3g/l for compounds **II** and **IV** respectively, is 44-68% and 57-83 %. The critical micelle concentration for compounds **II** and **IV** is 0.1g/l. At this concentration, the structure of the solutions changes.

Рост биомассы, г/л (а) и остаточная концентрация нефти, мл (б) при различной концентрации соединения II （ККМ = 0.1г/л)
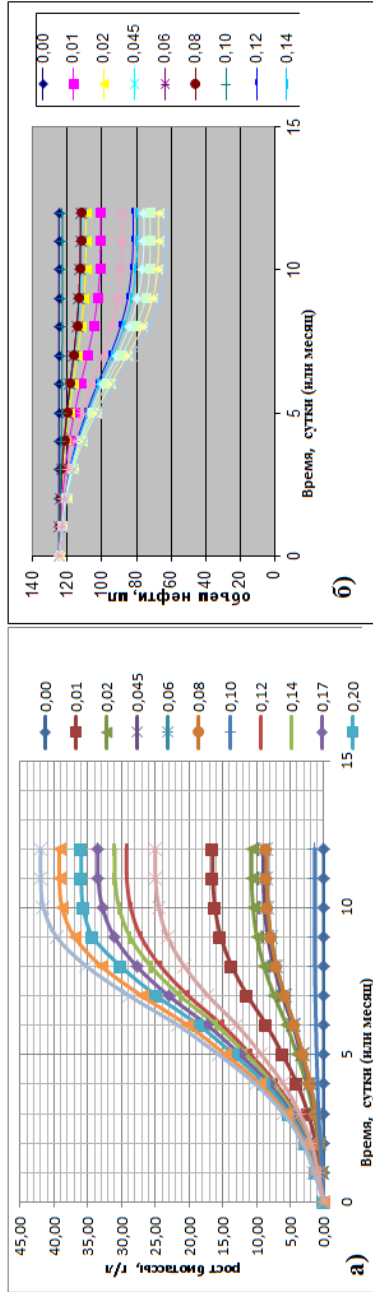
Figure 2 – Study of the bactericidal and antioxidant activity of the compound II

Рост биомассы, г/л (а) и остаточная концентрация нефти, мл (б) при различной концентрации соединения IV (ККМ = 0.1г/л)
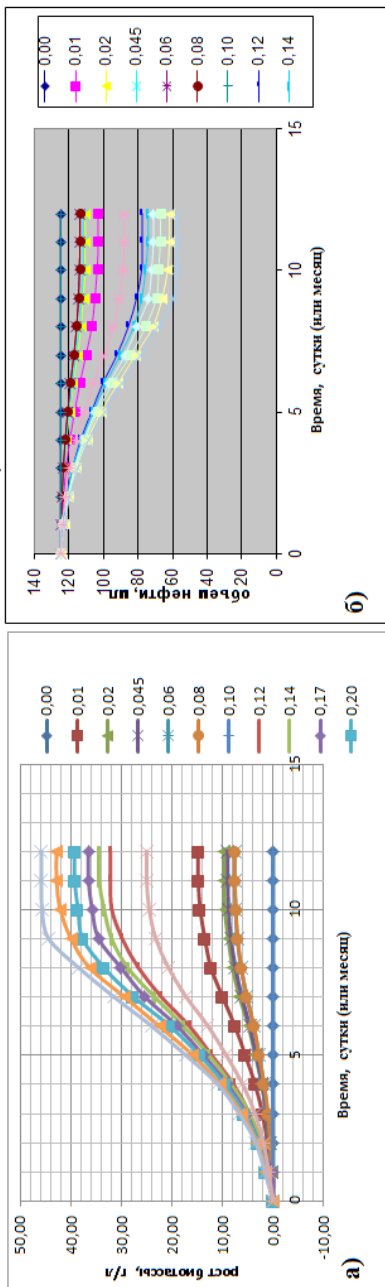
Figure 3 - Study of the bactericidal and antioxidant activity of the compound IV

The most maximally providing interaction of the substance with SRB Desulfo-bacter cells is the mycelial form, in which the outer sphere is formed by resorcinol fragments of the upper rim of the molecules that carry nitrogen-containing groups **II** or **IV** - rhodium-containing fragments with peroxide and chloride ions. This part of the molecule acts as inhibitory and ensures their death. It should be noted that the bactericidal activity of **II** or rhodium complexes with it is confirmed by studies on pathogenic forms of bacteria and fungi [14]. Data on the kinetics of biodegradation of oil SRB *Desulfobacter* supplement the information on the kinetics of growth: compound **IV** ensures complete degradation of oil in the range of concentrations equal to C = 0.10 g / l; Compound **II** at these concentrations also exhibits signifi-cant bactericidal properties and provides almost complete biodegradation of oil. This concentration is designated as the critical micellization concentration of CMC.

Compounds **I** and **III** compared with **II** and **IV** significantly inhibit the growth of culture in the zone of low (0.02-0.1-g/l) and high (0.12-0.24 g/l) concentrations (up to 97%). The degree of inhibition is the same for **I** and **III** when adding the same concentrations. At concentrations C <0.02 g/l, a sharp decrease in bactericidal activity occurs; at concentrations of C> 0.25 g/l - antioxidant properties are mani-fested. Therefore, compounds **I** and **III** compared with **II** and **IV** have bactericidal properties in a wide range of concentrations.

Thus, it was shown for the first time in model processes of oil biodegradation that amino- and phosphoryl derivatives of **K[4]P**, as well as rhodium complexes based on them, show bactericidal activity against Desulfobacter SRB cells, which makes it possible to use these compounds in these processes. Moreover, bacteri-cidal activity for complexes **K[4]P**, as well as for the ligands themselves, depends on their concentration and the type of functional groups contained in them.

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考虑MS Excel中几何非线性的弹性直杆空间变形的实现
IMPLEMENTATION OF SPATIAL DEFORMATION OF ELASTIC STRAIGHT RODS TAKING INTO ACCOUNT GEOMETRIC NONLINEARITY IN MS EXCEL

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注解。建立了12个应力 – 应变状态微分方程组，描述了弹性杆在几何非线性公式中的拉伸 – 压缩和扭转模式下的空间行为。所开发的数学模型使得可以分析在超过欧拉的临界载荷下杆的性能，其中总体纵向稳定性的损失和弯曲期间平面外的稳定性损失。获得的方程组的有限差分形式使得可以在开源MS Excel电子表格中开发和实现该系统的数值积分算法，并使用内置程序"搜索"自动确定初始参数。寻求解决方案"。本文介绍了弹性杆空间载荷的两个特殊问题的数值和实验测试结果，其中平稳形式的减小和后临界变形的分析。对于超过欧拉临界值25％的载荷，杆的截面的最大挠度和旋转角的计算值与实验值的差异不超过8％。
关键词：空间载荷，杆的总纵向稳定性，平面外的稳定性损失，临界载荷，后临界行为，几何非线性。

Annotation. *A system of twelve stress-strain state differential equations was developed, describing the spatial behavior of an elastic rod in the mode of oblique bending with tension-compression and torsion in a geometrically non-linear formulation. The developed mathematical model makes it possible to analyze the behavior of the rod under loads exceeding the critical according to Euler, both with the loss of the overall longitudinal stability and with the loss of stability out of the plane during bending. The finite-difference form of the obtained system of equations made it possible to develop and implement an algorithm for the numerical integration of this system in an open-source MS Excel spreadsheet with automated determination of the initial parameters using the built-in procedure "Search for a solution". The results of numerical and experimental testing of two particular*

problems of spatial loading of elastic rods with the reduction of the flat form of stability and the analysis of postcritical deformation are presented. For loads exceeding the Euler critical values by 25%, the calculated values of the maximum deflections and rotation angles of the sections of the rods differed from the experimental values by no more than 8%.

*   ***Keywords:*** *spatial loading, total longitudinal stability of the rod, loss of stability out of the plane, critical load, postcritical behavior, geometric nonlinearity.*

Introduction

Consider the problem of static equilibrium of a direct elastic rod with oblique bending with tension and torsion. Such loading can lead to loss of longitudinal stability, as well as loss of stability from the plane of action of the bending moment, which is accompanied by spatial bending with torsion.

In numerous studies, including fundamental ones [1–10], mathematical models were constructed and analytical solutions were found for particular cases of loading in an approximate formulation (in all the models under consideration, the assumption of small angles of rotation of sections was introduced). In such a formulation, it is possible to analyze the stress-strain state in the rods under subcritical loads, determine directly the critical loads, bearing in mind the Eulerian buckling under longitudinal loading or buckling out of plane during bending. But with all this, the models have a significant drawback. With their help, it is not mathematically possible to re-step the critical loads line, since, in view of linearity, all design parameters at the same time rush to infinity. At the same time, modern design standards dictate the need to take into account nonlinearity, both geometrical and physical [4].

In real non-ideal systems, the achievement and even excess of critical loads is accompanied by finite deformations, displacements and stresses. In this paper, we propose a mathematical model and an algorithm for the numerical solution (using the non-ideal method) of the problem of the stress-strain state of elastic straight rods, taking into account geometric nonlinearity. The proposed approach allows analyzing the state of elastic rods under any loads, including those exceeding the critical values according to Euler [15-17].

Mathematical model

We construct a model of oblique bending with tension and torsion of a direct elastic rod based on the technical theory of rods in a geometrically nonlinear formulation, adopting, in the first approximation, the hypothesis of flat sections.

Let us take as the internal force parameters the forces N, Q_x, Q_y and the moments M_x, M_y, M_z in the fixed right coordinate system. We represent external forces brought to the axis of the non-deformed rod with q_x, q_y, q_z, m_z.

The displacement parameters in the fixed coordinate system are denoted by u, v, w, and the projections of the rotation angles of the sections to the coordinate planes, respectively, are φ_x, φ_y, φ_z. Diagram of forces, moments, displacements and angles of rotation of an infinitely small rod element dz before and after deformation is presented in Fig.1.
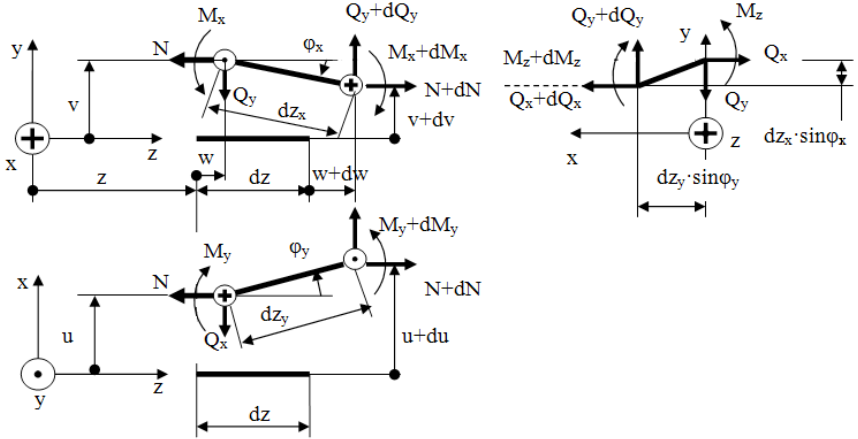
Fig. 1. The spatial equilibrium scheme of the rod element

Using the main provisions of [12-14], we write down six equilibrium equations in the following form:

$$\frac{dN}{dz} = -q_z, \qquad \frac{dQ_y}{dz} = -q_y, \qquad \frac{dQ_x}{dz} = -q_x, \qquad (1)$$

$$\frac{dM_x}{dz_x} = Q_y \cdot \cos\varphi_x + N \cdot \sin\varphi_x, \qquad \frac{dM_y}{dz_y} = -Q_x \cdot \cos\varphi_y + N \cdot \sin\varphi_y, \quad (2,3)$$

$$\frac{dM_x}{dz_x} = Q_y \cdot \cos\varphi_x + N \cdot \sin\varphi_x, \qquad \frac{dM_y}{dz_y} = -Q_x \cdot \cos\varphi_y + N \cdot \sin\varphi_y, \quad (4)$$

Next, the geometric relationships:

$$\frac{dv}{dz_x} = -\sin\varphi_x, \qquad \frac{du}{dz_y} = \sin\varphi_y, \qquad \frac{dw}{dz} = \frac{dz_x}{dz} \cdot \cos\varphi_x - 1. \quad (5)$$

To obtain physical equations and additional resolving geometrical relations, we consider the scheme of transition to moving axes by analogy with [12].

Let the transition be performed by successive rotations of the axes to positive angles v_z, v_y, v_x. In this case, the direction cosines of the moving axes will be:

$$l_x = \cos v_z \cdot \cos v_y, \; m_x = \sin v_z, \; n_x = -\sin v_y;$$

$$l_y = \sin v_x \cdot \sin v_y \cdot \cos v_z - \cos v_x \cdot \sin v_z,$$

$$m_y = -\sin v_x \cdot \sin v_y \cdot \sin v_z + \cos v_x \cdot \cos v_z,$$

$$n_y = \sin v_x \cdot \cos v_y; \; l_z = \cos v_x \cdot \sin v_y \cdot \cos v_z + \sin v_x \cdot \sin v_z, \; (6)$$

$$m_z = cox v_x \cdot \sin v_y \cdot \sin v_z - \cos v_y \cdot \sin v_x, \; n_z = \cos v_x \cdot \cos v_y.$$

Let's express φ_x, φ_y и φ_z through Unknown Rotation Angles

$$tg\varphi_x = -\frac{m_z}{n_z}, \text{ т.е. } \varphi_x = -arctq\frac{m_z}{n_z};$$

$$tg\varphi_y = \frac{l_z}{n_z}, \text{ т.е. } \varphi_y = arctq\frac{l_z}{n_z}; \quad (7)$$

$$tg\varphi_z = -\frac{l_y}{m_y} \text{ т.е. } \varphi_z = -arctq\frac{l_y}{m_y}.$$

Vector length $\overline{dz}$ after loading (turning and stretching)

$$[dz] = (1 + \frac{Q_x \cdot l_z + Q_y \cdot m_z + N \cdot n_z}{EF}) \cdot dz,$$

its projection on the axis oz $-[dz] \cdot n_z$,

on the plane yoz $- dz_x = \frac{[dz] \cdot n_z}{\cos \varphi_x}$,

on the plane xoz $- dz_y = \frac{[dz] \cdot n_z}{\cos \varphi_y}$.

After the substitution of the last expressions into the equilibrium equations and geometric relations, they contain 12 parameters, i.e. three more equations are required. Let's get them.

Fiber elongation $\varepsilon(x, y)$ equals to the relative elongation of the projection of the segment of the axis on the coordinate plane. Consequently

$$\varepsilon(x, y) = y \cdot \frac{dv_x}{dz_x} - x \cdot \frac{dv_y}{dz_y} \quad .$$

Taking into account Hooke's law after loading, bending moments in section

$$M_x \cdot l_x + M_y \cdot m_x + M_z \cdot n_x = E \cdot \iint\limits_F y \cdot \varepsilon(x, y) \cdot dx \cdot dy = E \cdot J_x \cdot \frac{dv_x}{dz_x},$$

$$M_x \cdot l_y + M_y \cdot m_y + M_z \cdot n_y = -E \cdot \iint\limits_F x \cdot \varepsilon(x, y) \cdot dx \cdot dy = E \cdot J_y \cdot \frac{dv}{dz}.$$

After algebraic transformations

$$\frac{dv_x}{dz_x} = \frac{M_x \cdot l_x + M_y \cdot m_x + M_z \cdot n_x}{E \cdot J_x}, \tag{8}$$

$$\frac{dv_y}{dz_y} = \frac{M_x \cdot l_y + M_y \cdot m_y + M_z \cdot n_y}{E \cdot J_x}. \tag{9}$$

In accordance with the known approximate dependences for torsion of non-circular rods

$$\frac{dv_z}{dz} \approx \frac{M_x \cdot l_z + M_y \cdot m_z + M_z \cdot n_z}{k_\rho \cdot G \cdot (J_X + J_Y)}, \tag{10}$$

Where k_ρ - coefficient of calculation of the polar moment of inertia for different sections, calculated experimentally or based on the method of membrane analogy.

The system of 12 nonlinear differential equations (1-6, 8-10) is applicable for estimating critical loads and studying the behavior of straight elastic rods after losing longitudinal stability or a flat shape during bending.

Numerical and experimental model testing

Below are the results of the numerical solution of two test problems on the behavior of a thin-walled elastic straight steel rod with dimensions of 360x19.6x1 mm in the supercritical region with the output of sections of the element from the plane:

- under torque loading (fig. 2, $M_{\kappa p} = \pi \cdot \sqrt{EJ_y GJ_d} / L$ = 3628 nm [3]);

- when loading according to the console scheme (fig. 3, $P_{\kappa p} = 4{,}01 \cdot \sqrt{EJ_y GJ_d} / L^2$ = 12,86 nm [1]).
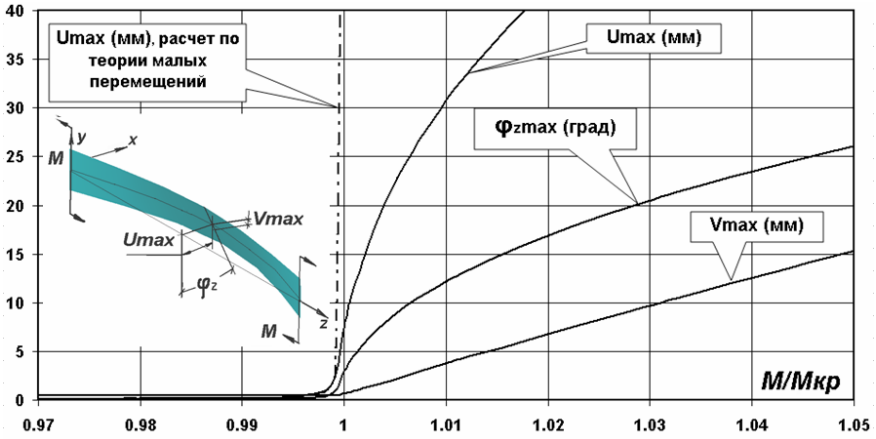
Fig. 2. *Moment loading of the rod*
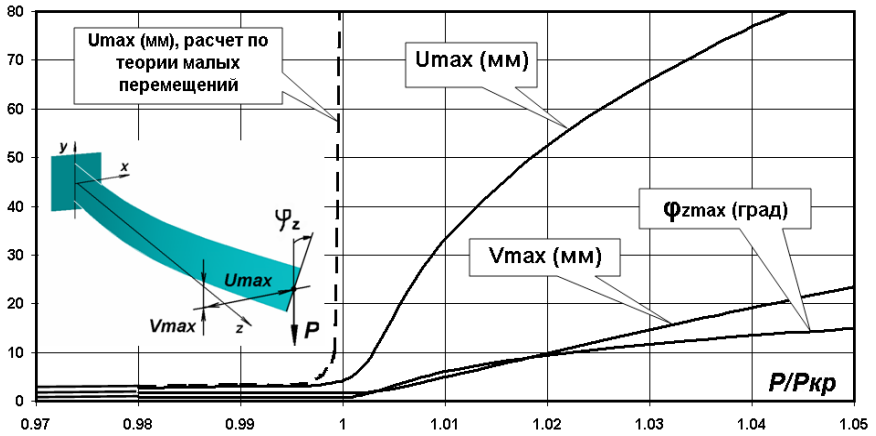
Fig. 3. *Loading the rod according to the cantilever scheme*

The system of differential equations was integrated by the Euler method in the public access spreadsheet MS Excel with a sequential increase in load. After passing through the critical loads, a nonlinear final increase in the calculated parameters is observed, which corresponds to our understanding of the behavior of real rods. The boundary conditions were satisfied using the MS Excel built-in procedure "Search for a solution".

When integrating the system near critical loads, the method of nonidealities was applied (small perturbation in the form of insignificant linear load in the direction of the supposed loss of stability) and a small step increment of the main load. In the case of a bifurcation of the solution, the magnitude of the step increment of the main load decreased.

To check the adequacy of the proposed model, an experiment was carried out on the console loading of a steel rod with dimensions 600x51x1.18 mm according to the scheme in Fig. 4. At the same time, the loss of flat forms at a load of 19.6 n ($P_{кр} = 4,01 \cdot \sqrt{EJ_y GJ_d} / L^2 = 19,8$ н [1]) with subsequent measurements of deflections and angles of rotation of the end section at various transverse forces P.

Fig. 4. *View of the loaded experimental sample*

The experimental data and the corresponding sample data of the numerical integration with loads exceeding the critical force are given in Table 1..

Table 1. *Comparison of experimental and calculated data*
for a cantilever rod (600x51x1.18 mm)

P,n	Vmax, mm			Umax, mm			φzmax, degree		
	Exp	Est	%	Exp	Est	%	Exp	Est	%
20,3	-23	-21,3	7,4	98	95,6	2,4	-12	-11,3	5,8
25,0	-139	-132.7	4,5	263	252,3	4,1	-29	-28	6,9

Conclusion

Comparison of experimental data with calculated ones showed sufficient accuracy for engineering calculations of deflections.

In the future, to determine the range of adequacy, it is supposed to conduct a comprehensive experimental study of the developed model. The proposed approach has all the prerequisites for taking into account the deplanation of the cross section and the physical nonlinearity of the material with a way to simulate the survivability of both flat and spatial bar structures taking into account real defects - local and common axes of rods, defects and damage to the shelves and walls components, cuts and holes with the account of the real outlines and locations.

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蓝莓浆果的化学成分
THE CHEMICAL COMPOSITION OF BLUEBERRY BERRIES

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抽象。　本文介绍了在摩尔曼斯克地区生长的野生蓝莓浆果的化学成分研究结果。　已确定蓝莓浆果含有许多有价值的生物活性化合物。　蛋白质含量为1.27%，脂质含量为0.2%，总糖含量为7.1%，其中还原糖含量为3.5%，灰分含量为0.2%。　通过高效气液色谱法，建立了蓝莓中所含脂肪酸的单独组成。　已经在脂肪酸组合物中鉴定出亚油酸，油酸和棕榈酸。　研究了蓝莓浆果矿物质的个体成分。
关键词：蓝莓，化学成分，脂肪酸，提取，HPLC，矿物元素。

Abstract. *The article presents the results of studies of the chemical composition of wild blueberry berries growing on the territory of the Murmansk region. It is established that blueberry berries contain a number of valuable biologically active compounds. The protein content is 1.27%, lipids - 0.2%, total sugar - 7.1%, including 3.5% of reducing sugars, ash - 0.2%. By the method of high-performance gas-liquid chromatography, the individual composition of fatty acids contained in blueberries has been established. Linoleic, oleic and palmitic acids have been identified in the fatty acid composition. Studied the individual composition of the minerals of blueberry berries.*

Keywords: *blueberry, chemical composition, fatty acids, extraction, HPLC, mineral elements.*

Introduction
With the development of the food industry and the expansion of the range of processed foods, people began to consume much more high-calorie foods containing significant amounts of fats and carbohydrates and the minimum amount of essential minerals and vitamins. Against an unbalanced diet, the body is deficient in nutrients that are necessary for normal development and functioning.

According to FAO WHO, there has been a rapid increase in the development of diseases associated with metabolic disorders, diabetes and obesity, there is also a risk of developing cardiovascular diseases, etc.According to the research of FGBUN "FITS nutrition, biotechnology and food safety" in 85% of the population there is insufficient intake of vitamin C, lack of vitamins of group B, in particular B1, B2, B6 and B9 experience from 40 to 60%. There is also a shortage of minerals, largely iodine, calcium and selenium [8].

Scientists recommend to compensate for the lack of vitamins, macro-and micronutrients and dietary fiber through the use of natural products that have functional properties and meet safety standards.

Eating wild berries can solve the problem of nutrient deficiency. Growing in their usual climatic zone, they are able to accumulate biologically active compounds, allowing them to adapt to environmental conditions [7].

According to experts, the stock of wild berries in Russia is 9.5 million tons, more than 60% of the total stocks of berries fall in the North and North-West regions [2]. However, today this raw material is underutilized in the food industry, despite their useful properties.

Based on the foregoing, the purpose of this work is to determine the chemical composition of environmentally friendly plant materials (blueberries) obtained without the use of mineral fertilizers, pesticides and in the absence of anthropogenic impacts, to further substantiate the usefulness and relevance to the consumer.

1. Objects and research methods

The object of study - berries of wild blueberry shrubs *(Vaccinium uliginosum)*.

The mass fraction of moisture and dry matter of berries was determined by the method of drying the sample to constant weight [3].

The mass fraction of lipids in berries determined in the machine SELECTA DET/GRAS.

The method is based on multiple extraction of lipids with an organic solvent, its stripping and subsequent weighing of the lipid residue[3].

The presence of fatty acids contained in blueberries was carried out by high performance liquid chromatography with derivatization on an «Agilent 1100» chromatograph with a diode array detector. The HPLC method is based on introducing the sample into the solvent current and passing its components through a chromatographic column filled with a stationary phase. [3]

The mass fraction of total nitrogen was determined by the Kjeldahl method. According to GOST 26889-86, the essence of the method consists in decomposing the organic matter of the sample with boiling concentrated sulfuric acid to form ammonium salts in ammonia, distilling it into an acid solution, quantitatively accounting for ammonia using the titrometric method and calculating the nitrogen content in the material under study [3].

The amount of reducing sugars was carried out by iodometric method, then sucrose was hydrolyzed and the total sugar content was determined. [3].

The content of pectic substances in the berries was determined by the gravimetric method. The method is based on the conversion of protopectin to the dissolved state, saponification of soluble pectins, precipitation of polygalacturonic acid with calcium and gravimetric determination of sediment [3].

The amount of ascorbic acid was determined by the method of direct iodometry. The method is based on the reaction of ascorbic acid with iodine [3].

Mass fraction of mineral substances was determined by removing organic matter from the sample by burning and subsequent weighing [3].

Sampling and preparation of samples to determine the presence of metals in the berries were carried out in accordance with GOST 26929-94 [5].

The content of iron, manganese, copper and zinc in blueberry berries was determined by the atomic absorption method according to GOST 30178-96 [4]. The content of iodine – by the titrimetric method.

2. Results and discussion

As a result of the study on chemical composition of blueberries the moisture content, nitrogenous substances, lipids, total sugar, pectic substances and ash were determined. The results are presented in Figure 1.
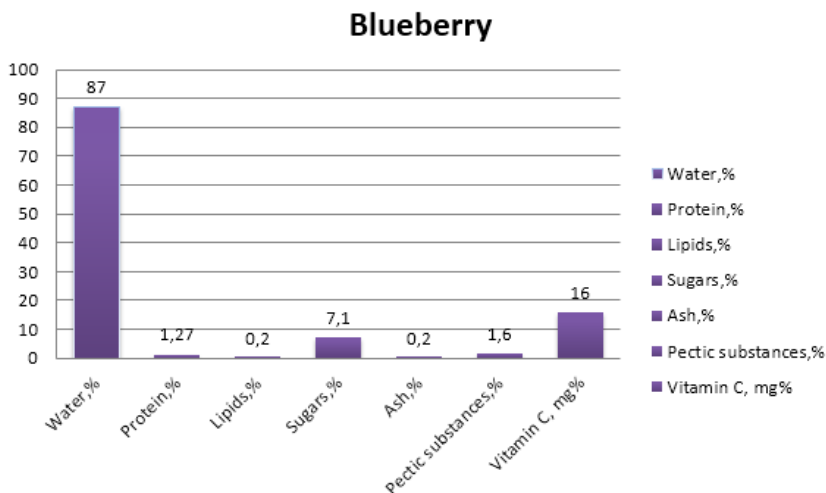

Figure 1 - *Indicators of the chemical composition of blueberry berries*

The data obtained indicate a significant content of pectic substances in blueberries (1.6%), which is two times more than in other local berries. As you know, pectic substances regulate the process of digestion, are capable of removing heavy metals and radionuclides, acting as an absorbent.

Ascorbic acid content is 16 mg%. Ascorbic acid is an active participant in metabolic processes occurring in the human body, plays an important role in the formation of antibodies, increasing resistance to infections and strengthening the immune system. The presence of vitamin C indicates the presence of antioxidant properties of blueberry berries.

Mass fraction of ash in the composition of blueberry berries was 0.2%. Figure 2 shows the mineral composition of berries, the amount of iodine, zinc, iron, manganese and copper.
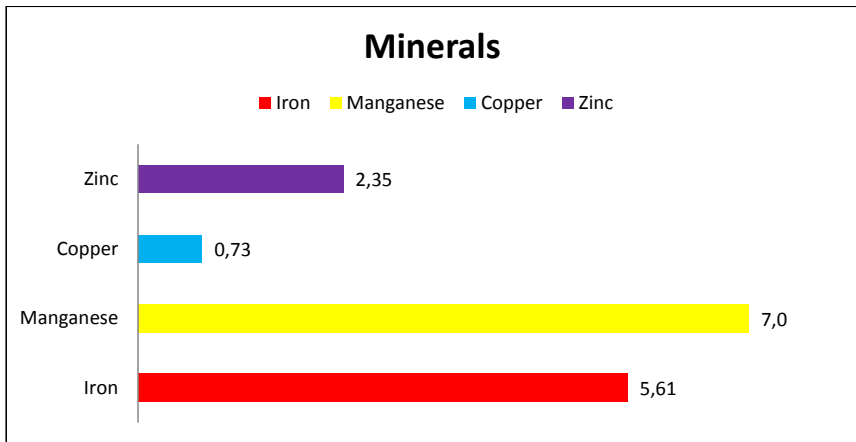
Figure 2 - *Quantitative content of mineral substances in blueberry berries, mg / kg*

As you know, zinc helps to increase immunity, cell regeneration, normalizes liver function, participates in metabolic processes. The lack of this trace element can cause gastrointestinal tract pathology, nervousness, insomnia, destabilization of the immune system.

Zinc deficiency can lead to the development of diabetes mellitus, due to a decrease in insulin levels. The daily need ranges from 2 to 3 grams [6].

Manganese is a stimulator of the activity of enzymes involved in the formation of bone and connective tissue, promotes the absorption of nutrients, has antioxidant activity, binding free radicals. Actively affects the metabolism, enhances the action of insulin [7]. The recommended level of manganese consumption is 5 mg / day, the minimum need is from 2 to 3 mg [6].

Iron plays an extremely important role in blood formation. This trace element also affects the function of the thyroid gland. [7]. Low iron content in the blood causes oxygen starvation of tissues and organs. The recommended daily adult need for iron is 14 mg / day [6].23

Copper is part of certain enzymes, is involved in the functioning of the central nervous system, promotes the absorption of iron and the synthesis of hemoglobin. Copper deficiency can lead to anemia. The recommended daily requirement for copper is 2-3 mg / day [6].

Iodine is involved in the formation of thyroid hormone - thyroxin. It is known that iodine deficiency leads to disruption of the functioning of the thyroid gland, which can cause the development of endemic goiter. [7]. Iodine is a stimulator of brain activity, as it participates in oxidative processes.

Based on the results obtained, the percentage of satisfaction in macro- and microelements from the daily consumption rate is calculated, which is shown in Table 1.

Table 1. - Indicators of satisfaction in minerals

Element	Content in 100 g of blueberry, mg	Minimum daily requirement, mg / day	The percentage of satisfaction of the daily rate,%
Iron	0,561	14	4
Zinc	0,235	2	11,8
Copper	0,073	2	3,6
Manganese	0,7	2	35
Iodine	0,0169	0,2	0,8

Analysis of the experimental data showed that 100 g of blueberry berries contain a significant amount of zinc (it is 11.8% of the daily intake rate) and manganese (35% of the minimum daily intake rate). Fresh use of blueberry, combination with other products, as well as an additive to various dishes, will reduce the deficit of macro-and micronutrients in the body.

Mass fraction of lipids was 0.2%. Lipids are part of cell membranes and cell structures. In fruits and berries, lipids are represented by fats, waxes, cutin, steroids and other compounds. Waxes, kutin, ursolic acid form a waxy coating, characteristic, for example, of blueberries and cranberries. Fats of fruits and berries are characterized by a favorable fatty acid composition with a predominance of unsaturated fatty acids. The concentration of fatty acid was determined by the peak area, the results are presented in the form of a diagram in figure 3.
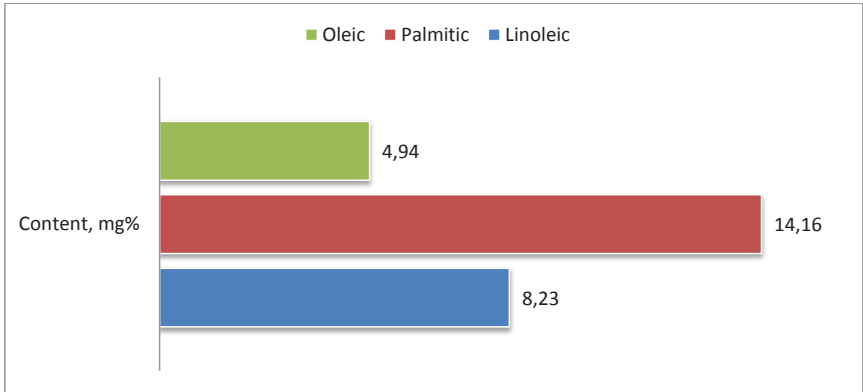
Figure 3 - *Composition of individual fatty acids in wild blueberry berries*

The data obtained indicate that blueberries have a favorable fatty acid composition. A significant amount of palmitic acid (14.16 mg%) was detected in the test sample, which refers to saturated acids. The main role of these compounds is to provide the body with energy. They are involved in the construction of cells. Saturated fatty acids should be about 7-8% of the daily caloric intake [7].

Also identified are oleic (4.94 mg%) and linoleic acid, (8.23 mg%). It is known that unsaturated fatty acids, such as oleic and linoleic, are indispensable and can only come from food. The optimal body's need for linoleic acid is 10 grams per day, the minimum is from 2 to 6 grams [6]. Oleic acid lowers total cholesterol, while increasing high-density lipoprotein levels and lowering low-density lipoprotein levels in the blood [7].

Conclusion

Thus, the results of a study of the chemical composition of blueberry berries indicate their high biological value and useful healing properties. Fresh use of blueberry, combination with other products, as well as use as a food additive to various dishes, will strengthen the immune system, reduce the deficiency of minerals and vitamins in the body and reduce the risk of cardiovascular diseases.

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International Conference

计算和物理实验复杂化方法在飞机空气动力学特性识别中的发展
THE DEVELOPMENT OF METHODOLOGY FOR COMPLEXATION OF COMPUTATIONAL AND PHYSICAL EXPERIMENTS IN IDENTIFICATION OF AIRCRAFT AERODYNAMIC PROPERTIES

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抽象。　将计算和物理实验技术复合到一个综合数据处理系统中的新方法已经开发出一种综合数据处理系统，该系统以一种非常规的模式提供数据流，并且数学模型组件之间的数据连接作为基本系统的决策。　开发了围绕对称轮廓的模拟流动模型。

关键词：AT质量，计算和物理实验的集成，建模技术的算法化。

Abstract. *New methodology for complexation of computational and physica1 experiment technologies into an integrated data processing system that provides ordering of data flows in the form of an array pattern, and data connections among mathematical model components as elementary systems f'or rnaking decisions, has been developed An imitation model of the flow around a symmetrical profile was developed.*

Keywords: *quality of AT, integration of computational and physical experiment, algorithmization of modeling techniques.*

Ensuring the high quality of aviation technology is a decisive condition for saturating the domestic market with it, reducing the costs of its creation and operation, and ensuring competitiveness on the world market.

To the quality indicators assessment at all stages of the product life cycle and their compliance with the requirements confirm, a whole range of various tests are carried out, ranging from mathematical modeling at the early stages of development to the most complex and expensive field tests. The complexity and diversity of the problems of creating the promising aviation technology models, the dynamics of their improvement based on advanced technologies, including information, leads to the need for joint analysis of a huge set of data different in their physical nature, production methods and processing methods.

The meaning of physical and computational experiments in aircraft quality assurance tasks.

The aim of the study is to develop a simulation model of the flow around a symmetrical profile based on a methodological approach to the integration of computational and physical experiments technologies into an integrated test system based on block-modular organization of information and technological procedures. At the same time, information is linked to various models (mathematical, physical, informational), hardware and software, which ensures compatibility of heterogeneous data obtained in the process of creating a product.

Modular approach in attaining a wide range of tests are based on the information flows structuring on the stages of the life cycle and of the states of the aircraft, automated data processing and the multidimensional use of the once entered information. The structuring of information allows a set of draft and technological procedures to be described in the format of a so-called "electronic" matrix of the product in systems of management the projects and quality of aircraft (LA).

The authors developed a conceptual model of the problem of forming a unified information base of the LA test technology in the form of a hierarchically organized matrix structure of decision-making models (Fig. 1)
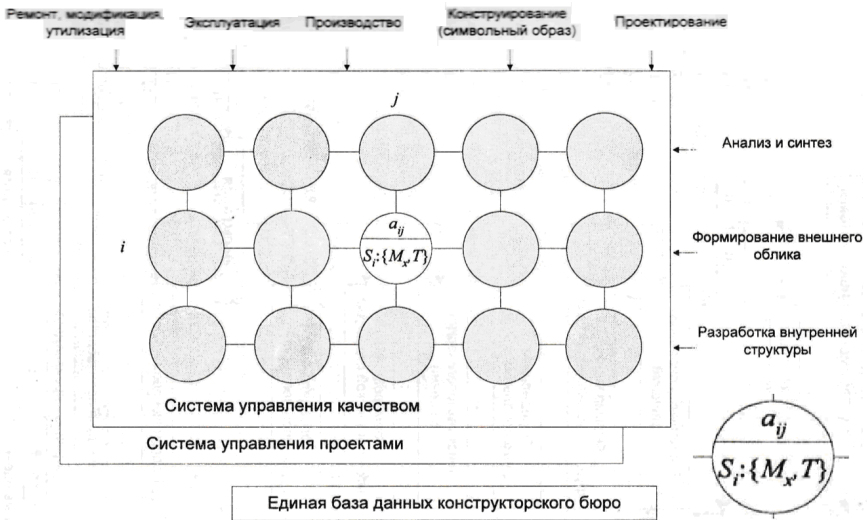

Fig. 1. *Structure of information processing*

Mx – functional operator, T – decision rule (algorithm).

«анализ и синтез» - «analysis and synthesis»; «формирование внешнего облика» – «shaping appearance» «разработка внутренней структуры» - «internal structure development».

The structuring of informational links between the elements of the matrix model in the nodes of the matrix we describe as the decision-making system

$$S \subseteq XY$$

on a set of input X and output Y system characteristics.

The main attention is paid to the formation of the M_X family of tasks in the nodes of the matrix and the methods of integrating them into an integrated data processing system, different in nature, production methods and processing methods. We propose to use the method of integrating technologies of computational and physical experiments into an integrated functional system.

The calculation of the boundary layer in the continuation problem on straight lines $y = const$. Development of a simulation model of a flow around a symmetric profile.

From the hydrodynamics point of view, the main task of the wing theory is to determine the force interaction of the flow and the streamlined wing [1, 3, 5]. Modern fluid mechanics has no common methods for solving this problem. The article proposes, within the framework of integrating the technology of computational and physical experiments, to define the task of mathematical modeling of medium flow near the wing profile surface in the sense of:

• setting the initial velocity profile in the boundary layer, based on the flow topology near the profile nose, which is the result of a quantitative physical experiment;

• • the use of physical knowledge of the flow topology allows the continuation task to be determined on a real profile (for example, the symmetrical profile of the B-12 series).

The direction of the integration of physical and mathematical methods for studying the force interaction of the medium and the body allows us to expand the "coverage area" of the mathematical model for a symmetric profile up to $\bar{x} \geq 0{,}6$.

The continuation problem is considered for the mathematical model of the kind [4]:

$$u \frac{\partial u}{\partial x} + v \frac{\partial u}{\partial y} = u_\infty \frac{du_\infty}{dx} + \frac{\partial^2 u}{\partial y^2}, \tag{1}$$

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0, \tag{2}$$

where u and v - components of speed, respectively, along the x and y axes: the x axis is directed along the surface of the streamlined body, the y axis along the outer normal to it;

u_∞ - is the velocity of the external potential flow; boundary conditions are specified:

$$u = v = 0 \text{ при } y = 0,$$
$$u \to u_\infty \text{ при } y \to \infty. \tag{3}$$

The equation at $y = 0$ (condition on the wall) corresponds to the conditions of fluid adhesion to the surface and the latter's impermeability;

The term at $y \to \infty$ (asymptotic condition) determines the smoothness of the transition of the boundary layer to the external potential flow

Equations (1) and (2) are L. Prandtl's equations in dimensionless form, obtained under the usual assumptions of the boundary layer theory from the Navier-Stokes equations.

As is known, the main link of the computational finite-difference scheme for solving equations of the theory of the boundary layer refers to their dynamic part, i.e. to the method of jointly solving the equations of motion and continuity.

The paper developed a method for calculating the boundary layer on straight lines $y = const$, as the most universal in terms of the use of computers.

Let us show the similarity of equations (1) and (2) to the original L. Prandtl equations.

These equations, obtained by L. Prandtl in 1904, have a generally known form:

$$\rho u \frac{\partial u}{\partial x} + \rho v \frac{\partial u}{\partial y} + \frac{\partial p}{\partial x} = \mu \frac{\partial^2 u}{\partial y^2},$$
$$\frac{\partial p}{\partial y} = 0, \tag{4}$$
$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0;$$

where: ρ – density,

p – static pressure,

μ – dynamic viscosity coefficient,

u и v – components of speed, respectively, along the x and y axes.

The x axis is directed along the surface of the streamlined body, the y axis along the outer normal to it [4].

Introducing the kinematic viscosity coefficient:

$$v = \frac{\mu}{\rho}$$

and using the Bernoulli integral:

$$p + \rho \frac{u_\infty^2}{2} = const,$$

we can rewrite equation (4) in the form:

$$u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} = u_\infty \frac{\partial u_\infty}{\partial x} + v\frac{\partial^2 u}{\partial y^2}, \tag{5}$$

where : $u_\infty = u_\infty(x)$ means the speed of the external potential flow.

The equations (4) solution with given boundary conditions in the field $x \geq x_0$, $0 \leq y < \infty$ determines the velocity field $u(x, y), v(x, y)$.

In addition, the calculation of the boundary layer is accompanied by the calculation of such quantities as:

- the thickness of the boundary layer δ; conditionally determined by the equation
$$u(x, \delta) = 0{,}99\, u_\infty;$$

- extrusion thickness:

$$\delta^* = \int_0^\infty (1 - \frac{u}{u_\infty})dy\,,$$

- - impulse loss thickness:

$$\delta^{**} = \int_0^\infty \frac{u}{u_\infty}(1 - \frac{u}{u_\infty})dy,$$

- local shear stress on the surface of the body et al.:

$$\tau_0 = \mu \frac{\partial u}{\partial y}\bigg|_{y=0} \quad 1$$

To develop a numerical method for solving the continuation problem, a transition is made to dimensionless quantities determined by the following relations:

$$\bar{x} = \frac{x}{L},\ \ \bar{y} = \frac{y}{L}\sqrt{Re}\ ,\bar{u} = \frac{u}{U},\ \ \bar{v} = \frac{v}{U}\sqrt{Re},\ \ \bar{u}_\infty = \frac{u_\infty}{U} \tag{6}$$

Here L and U are some characteristic values of length and velocity, respectively,, Re - is the Reynolds number, equal to $\dfrac{UL}{v}$. Using relations (6), we arrive at the equations in the universal dimensionless form:

$$u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} = u_\infty\frac{du_\infty}{dx} + \frac{\partial^2 u}{\partial y^2},$$

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0.$$

Dashes above the dimensionless quantities in these equations (or equations (1), (2)) are omitted for convenience.

In the case of commonly specified boundary conditions with $y = 0$, $u = v = 0$, and with $y \to \infty$, $u \to u_\infty(x)$, whose appearance does not change with the chosen form of dimensioning (6), after solving the continuation problem for a given initial profile $u=u°(y)$ for some $x = x_0$ by going back to dimensional values, you can easily get a family of solutions for various options for setting values $L., U$ и Re. We note here that the universality of the equations for the calculation of the boundary layer with the selected law of change $u_\infty(x)$ preserved, since the appearance of the boundary conditions is such that the number Re does not affect them. The dependence on the number Re would have occurred in the case of permeability of the profile wall, when $v = v_0(x)$ at $y = 0$ (blowing, boundary layer suction).

Let, besides the boundary conditions (3), in some initial section $x=x_0$ the profile of the velocity component is formed $(x_0, y) = u°(y)$ on $(0; \infty)$, specified as a result of a physical experiment (the interfacing operator 1, Fig. 2), it is required to find the velocity profiles $u (x, y)$ for $x>x_0$.

Conclusions.

A simulation model of viscous flow around a profile has been developed and a computational experiment has been performed, the initial conditions in which have been determined by a physical experiment.

In Fig. 2 shows the "interaction" of machine and physical modeling technologies; interfacing/conjunctional operators define the mathematical model of the problem with initial and boundary conditions obtained as a result of a physical experiment and form a data converter for a geometric modeling system (SGM). In Fig. 3 shows the results of modeling the flow on a symmetric profile of the B-12 series at an angle of attack $a = 5°$. The epures are shown in sections for $x> x_0$.

The adequacy of the flow profile model of a wing profile is confirmed by a physical experiment in a gravity flow tube. Integration of computational and physical methods for studying the force interaction of the environment and the body made it possible to expand the "coverage area" of the simulation model for the selected profile to $\bar{x} \geq 0{,}6$.
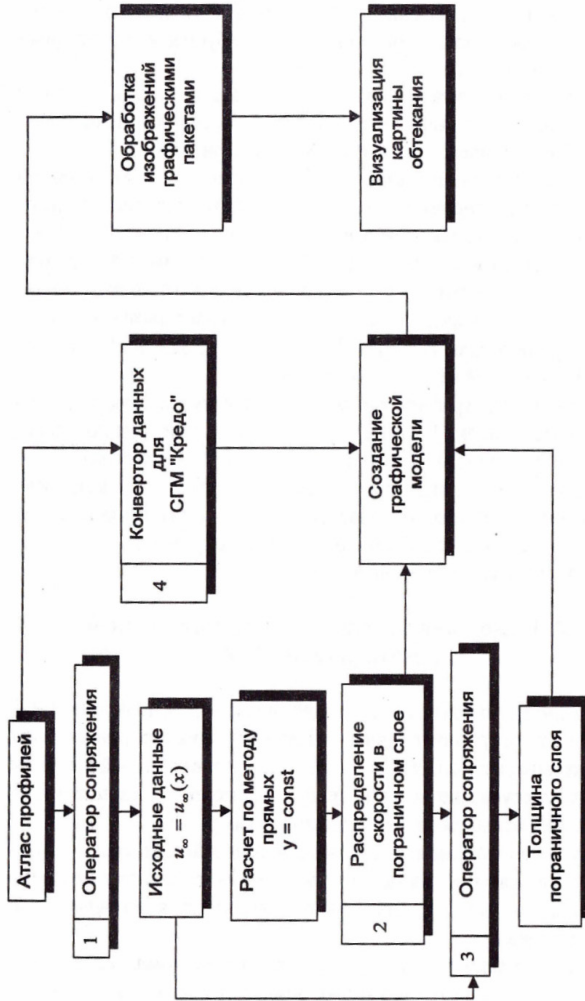
Fig. 2. - *A block diagram of the technology of physical and computational experiments integration in the continuation problem*

атлас профилей - *profile atlas*; оператор сопряжения – *coupling/conjunction/interfacing operators*; исходные данные - *initial data*; расчет по методу прямых – *calculation by straight lines y=const*, распределение скорости в пограничном слое - *velocity distribution in the boundary layer*; толщина пограничного слоя - *boundary layer thickness*; конвертор данных для «Кредо» - *data converter for "Credo"*; создание графической модели - *creating a graphic model*; обработка изображений графическими пакетами - *image processing by graphic packages*; визуализация картины обтекания – *visualization of the flow pattern.*
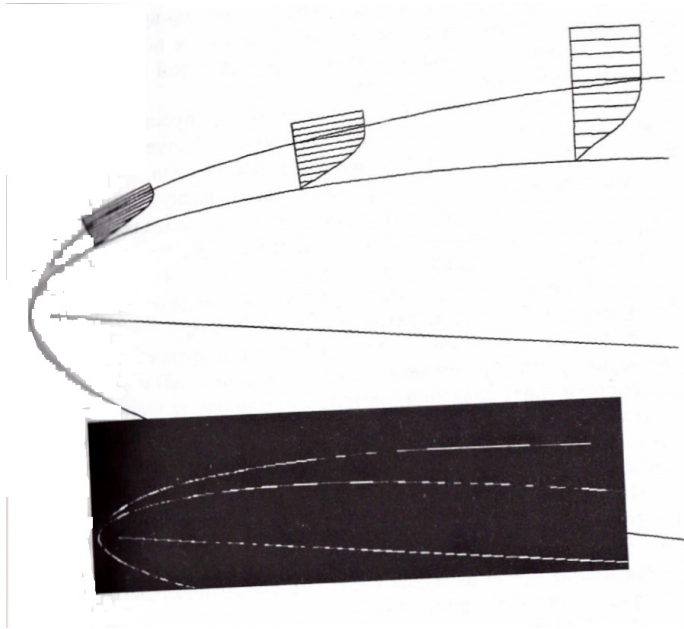
*Fig. 3. - The result of modeling the flow symmetrical profile
of B-12 at an angle of attack α = 5°*

The discussed flow model completely corresponds to equations (1), (2) in a di-mensionless form. To obtain numerical results, it is necessary, according to (6), to return to dimensional values and recalculate. In this case, the visualization of the flow pattern is complemented by numerical values. The software implementation of the conjugation operators performing the functions of technology integration has been developed.

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选择年轻股票的理论和实践选择
THEORETICAL AND PRACTICAL OPTIONS FOR THE SELECTION OF YOUNG STOCK

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注解。任何动物，牛群，品种的繁殖价值取决于产品的数量和质量，特别是奶牛的牛奶的数量和质量，从牛到年，哺乳期，生命等，它是由两个相互关联和相互依赖的因素的综合影响决定：遗传和环境。

动物开发的集约化工业技术的引入显着改变了基于其个体特征的经典育种方法。在这些条件下，首先不是提高生产力，而是在每个单独动物的适应程度，以显示在松散的住房和同一类型的全年喂养条件下的高生产率和肥力。技术的变化显着地改变了动物的质量，并且必须逐渐形成大的复合物，优选地以实际生长的幼小动物或在相同条件下生长的小母牛为代价。与原产地一起，牛群替代的主要要求是具有相同的饲养技术，内容和成年奶牛群的形成。

关键词：奶牛育种，育种，奶牛 – 母牛，牛群替代，生长，发育，行为学，挤奶水平，产奶量。

Annotation. The breeding value of any animal, herd, breed is determined by the volume and quality of products, in particular in dairy cattle is the amount and quality of milk obtained from the cow for the year, lactation, life, etc., and it is determined by the combined influence of two interrelated and interdependent factors: heredity and environment.

The introduction of intensive industrial technologies of animal exploitation significantly changes the classical approaches of breeding based on their individual characteristics. In these conditions, firstly does not go the productivity but the degree of fitness of each individual animal to show high productivity and fer-

tility in the conditions of loose housing and year-round feeding of the same type. The change in technology significantly makes difference in animal quality and it is necessary to form of large complexes gradually, preferably at the expense of the actually grown young animals or heifers grown in identical conditions. Together with the origin, the main requirement for the herd replacements is to have identical feeding technology, content and forming of groups of grown-up cows.

Keywords: *dairy cattle breeding, breeding, cows-mothers, herd replacements, growth, development, ethology, the level of milking, milk yield.*

Improvement of dairy herds is carried out in the direction of increasing milk yield, the mass fraction of fat and protein, improving the morphological and functional properties of the udder, reproduction indicators. The selection and breeding work is done together with feeding improvements and improvements of conditions of the animals that positively influences the productivity of the offsprings [1].

The genetic analysis of signs which have practical, economic importance, their variability, repeatability and heritability are the main parameters indicating the possibility of controlling the breeding processes occurring in populations during purebred breeding and crossing [2].

Acceleration of genetic progress in animal breeding with the use of large-scale selection is changing the requirements of animals to feeding and housing. The effect will be seen only if each new generation of animals is not only superior to the original livestock genetic data, but also grown in conditions that contribute to the full realization of their genotype. Therefore, the growing of herd replacements is a powerful factor in improving the herds and breeds [3].

Development of selection methods of cows in the creation of breeding herds in dairy cattle on a set of features, taking into account milk productivity and fertility is of particular interest in the theory and practice of breeding dairy cattle. Modern breeding of dairy cattle is based on the account of many features of selection: the level of productivity, product quality, fertility indicators, evaluation of the exterior and type of animals, resistance to disease, etc. [4].

The quality of herd replacements influence both reproductivity and milk productivity of cows for 1 and futher lactations. Selection of heifers from mothers combining high milk yield and milk fat content will contribute to breeding progress in the herd on these characteristics of productivity [5].

V. Volgin, O. Vasilyeva (2011) note that live weight is one of the most important indicators characterizing the growth and development of young cattle. Change of the environment, the type and method of feeding, competition for food, water, recreation, the manifestation of the rank division of the herd and various kinds of stress — are the reasons for the decrease in growth rate and, as a consequence, live weight. Calves with high nutritional activity are more likely to show their potential productive potential even in stressful situations [6].

According to A. A. Nekrasov and other's studies (2013) the highest percentage of culling of heifers during the first lactation was observed among the slowest and fastest growing animals, moderately growing animals in the future have a longer period of economic use [7].

The work was carried out on the basis of OOO "REAL-Agro" which is one of the largest complexes for the production of milk in Kabardino-Balkaria, it currently contains 960 cows and in the next year or two the complex will reach the design capacity of 1200 cows with loose box content, year-round feeding of the same type, double milking on the milking machine "Parallel – 32" with software.

There were 3 groups of heifers formed, 12 heads in each to observe them on the analogues pronciles. The basis for the formation of groups with the same average live weight of heifers (M±m = 84,3 ± 1,97 kg, σ = 6,85 kg) was the value of the standard deviation of the sign. The first group included heifers with live weight M ± σ, the second - M +2σ and the third group M–2σ and more. Feeding and keeping heifers in all growing periods were the same and were designed for at least 360 kg of live weight to 16 months.

Time observations were carried out during the day every ten days from 3 to 16 months of age. The daily rhythm of the main elements of the behavior of experimental animals was established by the method of timing and visual observations. The elements of behavior were recorded using a specially designed laboratory for behavior genetics VNIIRGJ *Azbuke* behavior [8]. The duration of the different periods was recorded in minutes in accordance with the accepted time scale.

Dairy cattle breeding is the leading segment of animal husbandry and it is the most complex because of the volume and importance of the products produced. The demand for milk and dairy products is increasing because of the population growth and the state of the industry largely determines food security.

Selection of herd replacements begins actually with making the selection plan and is specified after the birth and, first of all, is defined by efficiency of selection. Distinguishing of breeding (selection) nucleus and recruitment of a manufacturer for the studied group determines the inclusion of the offspring in the group of herd replacements, which is specified by the breeder.

The attempt of geneticists to identify or establish the level of the influence of heredity in *pure form* on quantitative traits is not yet possible, because they are determined by many genes. Basically there is no quantitative trait which could not be caused by 100% either by heredity or by the influence of the environment.

At this stage, the origin, appearance (exterior) and health status are taken into account. Breeding effect of selection of herd replacements is determined by the intensity of repair of the main herd. The output of calves per 100 cows of the breeding nucleus and the natural departure from birth to the inclusion of the animal in the main herd have a significant impact on the intensity of selection. Therefore, the lack of cows pregnancy and the reduction of the influence of natural selection in the process of bringing of herd replacements can increase the effectiveness of breeding.

An important element of bringing of herd replacements is the formation of groups of animals. During the period of growing of the first and third groups one head dropped in each. By the end of the period the live weight of heifers of the first group was 368.0±2.71 kg, the second – 362.1±3.44 kg, the third - 347±5.41 kg. The difference between the first and second groups was 5.9 kg (P 0.95), between the first and third 20.7 kg (P≥0.999) and between the second and third 14.8 kg (P≥0.99).

On average, for the entire period, the duration of rest in heifers of the first and second groups was more than the third group, respectively, by 15 and 13 %, while the duration of feed intake was 7-9 % more in heifers of the third group.

The data showed that heifers that are lagging behind in the same conditions in their growth and development by more than 2 σ from the average in the herd are not capable of calculated productivity and can not be used effectively.

Despite the fact that the breeding value of a young cow is mainly determined by the quality of the parents, it is very important to systematically monitor the growth and development, the health of young animals. The intensity of growth and development of young animals as well as the productivity of adult animals determines the degree of possible implementation of its genotype in specific environmental conditions and should be the basis for selection.

Quite a controversial issue is still the comparative effectiveness of the formation of replacements heifers from mothers of different ages.

Some researchers think [9] *netel - is a young animal which is not formed completely and hence can not provide normal development for its fetus. Hence, in this case genotype and also phenotype, namely - conditions of embryonic development of the fetus* influence formation of offspring productivity.

Long-term studies which we led show that due to the sharp decrease in the duration of productive use of cows and low yield of calves, these disputes have lost their importance. Furthermore, as first-calf cows are derived purposeful selection of mothers in the formation of core breeding and selection to them the most valuable sires, the offspring of the heifers already has a preferential right to be included in the group repair. In this regard, we have analyzed the effectiveness of the selection of first-calf cows offsprings. The mother cows of first-calf cows were distributed by milk yield for 305 days of the first lactation into 7 groups with a class interval of 500 kg and their daughters were ranked according to their milk yield also for 305 days of lactation (table 1).

*Table 1 – Efficiency of selection of replacement heifers from cows-mothers
on milk yield for 305 days of the first lactation*

Indicator	Classes of cows-mothers and their daughters on milk yield for 305 days of I lactation, kg						
	Up to 3500	3501-4000	4001-4500	4501-5000	5001-5500	5501-6000	6001 and more
Number of "mother-daughter" couples	25	26	27	26	26	13	7
The average milk yield of mothers, kg	2966.7	3778.8	4248.8	4737.9	5198.5	5705.5	6455.3
Daughters average yield of milk, kg	4826.7	4439.1	4920.1	4971.9	4956.4	3468.3	4842.7
± to mothers	+1860.0	+660.2	+671.3	+234.0	-242.1	-2237.2	-1612.6
Number of "mother-daughter" couples	37	14	18	19	14	18	30
Daughters average yield of milk, kg	2490.5	3681.9	4280.9	4743.9	5227.4	5764.8	6699.5
The average milk yield of mothers, kg	4630.0	4251.1	4647.0	4695.3	4120.9	4291.0	4410.5
± to mothers	-2139.5	-569.2	-366.1	+48.6	+1106.5	+1473.8	+2289.0

The first part of the table shows ranking into classes caaording to the milk yield of mothers and the indicators of their daughters, the second shows ranking of the daughters and which cows were their mothers.

Analysis of the first part of the table shows that from cows-mothers of the first four classes with an average yield of up to 5000 kg, daughters significantly exceeded the yield of mothers. With an average yield of 104 cows-mothers 3945.4 kg, milk yield of their daughters was 4790.4 kg or 845.0 kg higher than mothers. However, with the increase in milk yield of mothers by more than 5001 kg, their daughters became significantly inferior to their mothers. There were 46 heads of such cows with average milk yield 5533,0 kg, whereas the milk yield of their daughters – 4518,5 kg, which is lower than the milk yield of mothers at 1014,5 kg.

The results show that in the specific conditions of this economy, the first-calf heifers of more than 5000 kg have a negative impact on the productivity of the offspring. We believe that it can be explained by the fact that growing body of a first-calf cow can not bear the pressure of yield together with the pressure of embryo development. The reduction of their yield proves in dependence of increase of their mother's yield.

To confirm this conclusion, we have ranked daughters in the same productivity classes (the second part of table 1).

The analysis shows that the first three classes of the 69 low-yielding daughters with an average milk yield 3199,3 kg occur from mothers with milk yield 4557,6 kg, which is significantly higher milk yield of daughters on 1358,3 kg, whereas 62 best heifers with average milk yield 6095,7 kg obtained from mothers with average milk yield 4310,4 kg. The difference was 1785.3 kg.

Data show that the best daughters obtained from mothers on 247,2 kg was inferior to the yield of milk the group of mothers which received the low-yielding daughters.

The increase in the average yield of milk in the herd by more than one σ (Sigma) changes the hereditary boundaries of the genotype reaction in the changed environmental conditions, which necessitates the ranking of animals through the phenotypic manifestation of the trait. On the one hand, changes can be caused by the genetic ability of the organism to increase the degree of severity of the sign depending on the action of the environment, on the other, the change in the environment can contribute to the identification of genotypes, the potential of which begins to manifest itself in the appropriate conditions.

The results allow us to conclude that the intensity of growth and development of heifers is no less important indicator in the selection for reproduction and the intensity of the first heifers should be at the level of the average milk yield in the herd and (or) no more than 1000 kg per 100 kg of live weight at 2-3 months of lactation.

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决定俄罗斯南部红色草原牛选择效果的因素
FACTORS DETERMINING THE EFFECTIVENESS OF THE SELECTION OF RED STEPPE CATTLE IN SOUTHERN RUSSIA

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注解。 本文论述了俄罗斯南部条件下国内红色草原品种专业乳品生产的育种和进一步发展问题。

关键词：奶牛育种，红色草原，荷斯坦，选择，评价，选择，匹配，效率。

Annotation. *The article deals with the issues of breeding and further development of cattle of the domestic red steppe breed of specialized dairy productivity in the conditions of the South of Russia.*

Key words: *dairy cattle breeding, red steppe, Holstein, selection, evaluation, selection, matching, efficiency.*

Red steppe cattle in the zone of the North Caucasus have been bred since the middle of 19th century. It is the most adapted and accounts for more than half of the total number of livestock. The breed received wide distribution due to its high adaptability to the hot, arid climate of the steppe zone, high resistance to invasive and infectious diseases, increased viability, unpretentiousness to forage and relatively satisfactory productivity [1].

The problems of establishing (identifying) the breeding value of an animal has been and remains the most important task of animal breeding [2].

Modern genetics cannot yet answer many questions related to the laws of variability and inheritance of qualitative characteristics of selection, does not allow

to find out what the relative role of individual genotypes and environment in the formation of phenotypic diversity according to the main features of selection [3].

According to our data, the cross craze has led to the fact that over the past 20 years, virtually no region in the North Caucasus has been conducting targeted selection, assessment and rational use of purebred bull-breeding black-and-white, red steppe and Schwyz breeds that are most adapted to the zonal natural and climatic conditions, but also by aggregate indicators not inferior to imported breeds. Under these conditions, it is difficult and often impossible to prove the presence of genotypes in a breed, which can not only compete with producers of improving breeds, but also surpass them in a number of selection criteria [4].

Due assessment is not given to the reproductive qualities of the animals being rated. As a result, it is possible that cows with low reproductive qualities will be enrolled in the group of highly productive, and cows with an optimal duration of the service period, not inferior to them in breeding qualities, and sometimes superior to them in a less productive group [5].

In recent years, many regions of the Russian Federation, has achieved notable success in increasing the average yield, respectively, in milk production. The current trend is explained by the fact that in a market economy, the determining element of profitability of production in dairy cattle breeding was the value of milk yield and the direction of selection in all farms of different forms of ownership, regardless of the status and breeding value of the livestock, mainly due to the selection of the milk yield. The intensive use of Holstein cattle, mainly American and Canadian selection, played a significant role in choosing the direction of selection. It took more than a dozen years to actually analyze and evaluate all the pros and cons of this technique and develop an appropriate attitude to this problem.

Apparently there is no special need to prove that the Holstein breed has long and convincingly proved its superiority in terms of yield and at this stage it has no equal in this indicator. Paying tribute to the breeders for the creation of this breed, attempts to focus on the mono-breed in all regions, we consider this fact economically and logically unreasoned.

The enormous diversity of climatic, fodder, technological, financial and economic and, elementary, human factors of our country does not allow the effective use of this breed everywhere and even weak improvements in domestic breeds, not giving proper returns, will only lead to the complete elimination of the latter.

We do not aim to revise the effectiveness of the use of the Holstein breed, but we do not consider it expedient for the North Caucasus regions to breed in cleanliness, first of all, black-and-white, as well as red-and-white Holstein.

A characteristic feature of this zone is the fact that natural and climatic conditions allow prolonged (up to 280-300 days) use of pastures. This is especially important because, on average, up to 70% of the territory of all the republics of

the North Caucasus belongs to the mountainous area, which limits the use of field feed production. These conditions, at the present stage, determine the direction of breeding and, naturally, the choice of breeds to meet the needs of the population with livestock products. In this regard, we consider the breeding in the given area to be Schwyz, and the rest (steppe) is reasonably improved, including using the gene pool of red-motley Holstein, domestic red steppe breed.

Largely the effectiveness of breeding is reduced due to simplification in the selection and matching issues, primarily in breeding farms. The breed composition of manufacturing bulls, the sperm production of which is used for reproduction, is actually one hundred percent represented by Holsteins.

The elimination of large farms led to the elimination of zootechnic and zootechnic-breeder posts, but it is time to understand that animal husbandry is doomed without a specialist. At this stage, the herd reproduction is organized quite simply. Because of the limited breeding stock, as a rule, one farm uses sperm of one, less often two stud bulls for a year and a half, in order to only exclude inbreeding, and then the bulls are changed. Since the results of the breeding value of the used bull will be known only after 2.5-3 years, even if it turns out to be an improved, the opportunity to get his sperm becomes problematic, and in the absence of a specialist, almost no one deals with these issues.

The current trend is explained by the fact that in recent years, in both breeding and commercial herds, the direction of breeding is mainly due to the selection of milk yields.

A quality indicator of milk is determined by the content of fat and protein. In principle, accounting and selection for protein milk content in Russia are not involved, and the available material is of a purely statistical, scientific nature.

Despite the assertion of a number of authors about the overwhelming influence of stud bulls on the genotype of the population, without proper selection and selection among the breeding stock for breeding milk content is ineffective. Even in breeding plants, where greater attention is paid to the issues of selection of milk fat content, the strength and direction of the link between milk yield and fat content is about the same as in other categories of farms.

Largely the efficiency of selection is reduced due to the lack of work with lines, families, and also with some simplification in the selection issues in breeding farms. As a rule, no more than one or two producing bulls of a certain line are assigned to the farm. This eliminates the possibility of targeted use of brood stock. In breeding farms, both as a whole throughout the herd, and within the line, groups of cows should be distinguished according to the type of milk yield, taking into account the selection plan.

An important element of improving the breed is the use of quality-rated offspring bulls. Due to the low repeatability of the evaluating results of bulls, as a

rule, their breeding value is very rarely confirmed. Consequently, in our conditions, it is more expedient to have a differentiated assessment within certain limits of the average level of productivity of the breeding stock, within which a positive compatibility is obtained. There is the need, along with the assessment by progeny, to establish the boundaries of the productivity of cows within which it is advisable to use each positively estimated sire.

The great practical importance has the ability of breeders to manage and take into account the relationship and interaction of the main signs of selection. At present, for any breeder's practice, it has become an axiom that the efficiency of selection is inversely proportional to the number of traits selected. But even with breeding, it is permissible only for milk yield; the practical effect is usually much lower than the theoretically expected. This situation is explained by the fact that the mathematically calculated parameters of a selected trait do not always reflect the influence of various factors on the resultant trait.

Classical selection involves the systematic culling (breeding) of low-yielding and not suitable for industrial technology cows, regardless of age of use. In practice, it ends, as a rule, with the first, less often with the second calving. In the subsequent reasons are changed by completely different parameters. Starting from the third lactation, for various reasons, mainly due to a decrease in reproductive ability, cows drop out of the herd, which in terms of productivity significantly exceeds not only first-calves, but also the average indicators of the herd.

The transition to a market economy makes a completely different assessment of the importance of each attribute and selection, each element of production technology.

We have attempted to determine the connection between milk yield and factors, the exclusion of which in practice is impossible. Only a list of factors that directly determine the amount of milk yield of cows indicates the complexity of managing the selection.

Table - 1 *Factors determining the amount of milk yield and the degree of their influence (weighted average)*

№ o/n	Factor	Influence Power (correlation)		
		average	Fluctuations (limit)	
1	Heredity	0,27	-0,07	+0,63
2	Feeding, %	56	48	82
3	Operator qualifications, %	5,6	3,5	15,5
4	Frequency of milking, %	5,0	3,0	12,1
5	Housing technology, %	4,3	2,0	8,5
6	Mass fraction of fat, %	-0,17	-0,11	-0,27
7	Mass fraction of protein, %	-0,16	-0,13	-0,24
8	Live weight of an adult animal	0,16	-0,11	+0,47
9	Age of I calving	0,08	0,0	0,22
10	Live weight with I calving	0,18	0,14	0,43
11	Live weight of offspring	0,05	0,0	0,10
12	Form and development of the udder	0,22	0,18	0,41
13	Lactation duration	0,11	0,05	0,23
14	Lactation curve	0,09	0,04	0,17
15	Service period duration	0,07	0,01	0,11
16	Dry period duration	0,09	0,05	0,19
17	Calving season	0,07	0,03	0,12
18	Fertility	0,09	0,07	0,11
19	Fecundity	0,08	0,05	0,11
20	Sex of litter	0,07	0,05	0,15
21	Body type	0,11	0,05	0,27
22	Linear belonging	0,07	0,03	0,09
23	Belonging to the family	0,12	0,08	0,21
24	Mastitis disease	0,14	0,09	0,31
25	Lifespan	0,15	0,09	0,31

All of these factors directly or indirectly determine the amount of milk yield.

Radical changes in technological processes of production due to the intensification of the dairy cattle breeding industry (high concentration, the use of high-performance milking machines, large-group maintenance, year-round feeding of the same type, etc.) are largely reflected in the productive qualities of animals.

For a number of generations, the selection of animals that are used on modern high-tech complexes has been improved in terms of the usual technology of individual care and maintenance. A sharp change in technology during the life of one generation significantly affects the rank distribution of animals according to the degree of manifestation of the selected traits. Under these conditions, the preliminary selection of young stock for repair on the basis of the phenotypic data

of parents, manifested in conventional technology, becomes even less accurate. In terms of industrial technology, new requirements for the biological and economic characteristics of animals arise. A number of features of animals that have been selected for several generations, in one way or another, contribute to the transfer to the industrial base, others may not have an impact, and still others, on the contrary, may become a brake on the new technology.

According to the results of our research, for the recruitment of large complexes with animals, preference should be given to calves grown under the conditions of this economy, passing through the first calving of all suitable for reproduction, regardless of origin, and selection should be carried out according to phenotypic indicators for the first three months of lactation. If the yield of heifers during this period is 40% or more of the average yield of heifers in the herd, they can be left, if it is necessary to select or discard them below. In any case, this technique is more effective than the purchase from the third side.

In any case, the effectiveness of breeding is manifested with an appropriate level of feeding and qualification of machine milking operators.

The rigid parameters of the technology themselves play the role of a * merciless * breeder who standardizes animals in size and position of the nipples, the simultaneity and duration of the issuance of various udder fragments, almost regardless of the main feature - the amount of milk yield, the right of the strong, they limit the access of the weaker, and this, as a rule, is more highly productive not only to feed, but even to drinking-bowl. Grouping cows by age and daily milk yield mitigates these costs to a certain extent, but does not exclude them.

The above determines the need to take into account the ethological (behavioral) characteristics of animals when recruiting large complexes, which also complicates the selection.

According to the results of our research, the total costs associated with the formation of the herd, the level of culling, reproduction, treatment, the duration of animal use, the cost of servicing the milking equipment, etc., the savings in labor costs for loose housing does not cover the costs of technology and does not create advantages compared with tethered.

It should be borne in mind that excessive concentration of animals, reducing the efficiency of breeding, creates serious environmental problems that also need to be taken into account.

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Miscanthus Andress属植物在水培系统托盘制造中的应用
THE USE OF PLANTS ON THE EXAMPLE OF GENUS MISCANTHUS ANDRESS IN THE MANUFACTURE OF TRAYS FOR HYDROPONIC SYSTEMS

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注解。 关于使用芒草作为水培系统中托盘（盒）生产的替代来源的信息。

在水培条件下增加的湿度和持续照明导致绿藻的强烈生长，包括小球藻，其对作物的生长和设备和消耗品的美观产生不利影响。

该研究发现，由于其对病虫害的高抗性，使用芒草茎来制造托盘（盒子）不允许小球藻繁殖和传播。

使用由泡沫和芒草制成的托盘（盒）的比较分析的结果证实了芒草对水培条件下的疾病和高湿度的抗性。

关键词：水培，托盘，沿海水生植物，芒草，小球藻。

Annotation. *Information on the use of miscanthus as an alternative source for the production of trays (cassettes) in hydroponic systems.*

Increased humidity and constant illumination in hydroponic conditions leads to intensive growth of green algae, including Chlorella, which adversely affects the growth of crops and aesthetics of equipment and consumables.

The study found that the use of miscanthus stems in the manufacture of trays (cassettes) does not allow chlorella to reproduce and spread, due to its high resistance to pests and diseases.

The results of a comparative analysis of the use of trays (cassettes) made of foam and miscanthus confirm the resistance of the miscanthus to diseases and high humidity in hydroponic conditions.

Keywords: *hydroponics, tray, coastal aquatic plants, miscanthus, chlorella.*

At the present stage of development of the crop industry an important task is the cultivation of environmentally friendly, economically profitable crops, competitive in market conditions, that are in demand [6].

Today, modern technologies for the production of agricultural products are directly related to the need to use methods for studying soil, plants and fertilizers, as well as their interaction.

The land resources of the Russian Federation, according to statistics, are colossal: almost a hectare (0.87 hectares) of arable land and 0.53 hectares of natural forage land per one person. And, despite the fact that, in general, the climate of our country for agriculture is not the best (even in agricultural areas two thirds of the territory is under conditions of either a shortage of heat or moisture deficit), with a skilled selection of crops you can feed not only today's population country, but also another 30-40 million people [1].

However, there are a number of objective problems that make it very difficult, and in some cases do not allow to increase food production in Russia at all. In this regard, there is a need to introduce high agricultural technologies, which are characterized by the efficiency of production and ecologization of agriculture (organic farming).

Such technologies include hydroponic method of cultivation of agricultural crops. This is one of the most advanced and progressive ways of growing vegetables, flowers, fruit and berry crops in greenhouses and at home.

Today, hydroponics is incredibly successful in the densely populated countries of the world (Belgium, Holland, Japan). Being still quite an exotic type of agriculture, hydroponics is gaining popularity in China and South Asian countries. Hydroponic crop farming is also popular in countries where conventional agriculture is possible only during certain favorable periods of the year (Canada, Scandinavia). Such interest in hydroponics has not bypassed the expanses of the CIS, where large and small farms try their hand in this area.

Historically, the method of hydroponics was based on the study of root nutrition of plants. Already in the nineteenth century, the German botanist F. Knop, and in Russia, K.A. Timiryazev and D.N. Pryanishnikov developed for scientific purposes a method of plant culture in aqueous solutions of inorganic compounds. In 1936, in the USA, Gericke have tested growing vegetables in solutions, calling this method hydroponic. The first successful experiments of growing vegetables in solutions without soil in Russia were set up in 1938-1939, and the first hydroponic greenhouse in our country was built in 1958 at the Teplichny state farm (Moscow) according to a project developed by the Research Institute of Hydrometeorology and Hydrodynamics [3].

Initially, plants in hydroponics were grown exclusively in the aquatic environment. But under aquatic culture, the supply of oxygen to the roots was unsatisfactory, the solution reaction was unstable, and individual roots and whole plants quickly died.

Today, when using the hydroponic method of cultivation, inert substitutes are used for the land: gravel, vermiculite, perlite, expanded clay, coarse sand, moss,

peat. By the name of the substrates used in pure form or mixture, the name of the method of cultivation is given: gravel culture, sand culture, peat culture, etc. Inert substrates are easy to disinfect, do not enter into chemical reactions with mineral salts dissolved in water, and provide good access of air to the roots.

The substrate must have the following properties:

- it should easily pass air and solution, must be well wetted by it;
- do not enter into a chemical compound with solutes;
- have a weak acid or neutral reaction;
- do not hinder the development of the root system and keep the plant in an upright position.

When used properly, substrates of granite and quartz are used for up to 10 years, of expanded clay and perlite for 6-10 years, and of vermiculite for only 2-3 years. The use of additional consumables in the hydroponic system requires compliance with SanPiN standards and norms [3].

In November 2017, within the framework of international cooperation between Chiba University (Japan) and Primorsk State Agricultural Academy (hereinafter - the Academy), a group of students and teachers of the Academy was on probation in Japan at the Institute of Horticulture and Agriculture.

The joint project "Future Agriculture with Russia" is a long-term project between universities and is carried out under the guidance and funding of the Ministry of Agriculture, Forestry and Fisheries of Japan.

The goal of the project is to introduce and improve the technology of cultivation of agricultural crops in hydroponic conditions.

Chiba University – is a public institution of higher education in Japan, which began its academic activities in 1949. Chiba University is a university that is firmly included in the top twenty of the best educational institutions in Japan. The strongest and most popular area is considered "Life Sciences and Medicine", which, according to international ratings, is in the top 390 in this field [11].

The University's infrastructure is represented by 13 schools, among which the Institute of Horticulture and Agriculture (Kashiwanocha Campus) stands out, in which (area - 2430 m2) there are greenhouses with production facilities and greenhouses in which the educational process is carried out. The greenhouse complex was organized in 2011. Tomatoes, cucumbers, green crops, flowers are grown in the production greenhouses. In the Japanese greenhouse, the use of Dutch greenhouses and technologies prevails, incl. hydroponics.

Research conducted by the staff of the University is connected with the influence of various factors (temperature, light, humidity, CO_2 concentration, etc.) on growth, yield and quality of cultivated products. Also, the scientific directions of the greenhouse industry are connected with the issues of increasing the sugar content of tomatoes and the influence of the spectral composition of light on the quality of finished products.

Lecture courses and practical exercises conducted as part of the internship allowed the group of students and teachers not only to gain valuable knowledge and experience in the direction of hydroponics, but also to offer their solution to the problems associated with the operation of hydroponic systems, especially in experimental greenhouses.

The essence of the problem of the state of the elements of the hydroponic system, which works in conditions of artificial illumination, is that the constant humidity and illumination allow the green alga of the genus Chlorella sp to actively reproduce.

Chlorella is characterized by a high content of protein, vitamins, microelements, pigments, including chlorophyll, antioxidants, plays the role of biostimulant, has antibacterial properties [1].

As a result of the active physiological activity of the algae, trays and (or) cassettes are in an unaesthetic form (Fig. 1), the smell of its presence increases sharply. A problem of this kind is characteristic not only of hydroponic systems that are used in Japan, wherever foam is used as a tray or cassette, while artificial light is used in a greenhouse, the reproduction process of Chlorella sp. very active.

Figure 1 - Chlorella sp. affecting cassettes of hydroponic systems

One of the proposals for replacing foam trays and cassettes is the use of material made from plants of the genus Miscantus sp., Which is ubiquitous in Japan.

Miscanthus sp. is a genus of perennial herbaceous plants of the family of cereals (Poaceae). About 40 species of the genus Miscantus are distributed in the tropical and temperate regions of Asia, Australia and Africa. In Russia, on the territory of the Russian Far East only 2 East Asian species grow, characteristic of meadows and shrubs: Miscantus sinensis Andress. and M. sacchariflorus (Maxim.) Honda. These species are common on the Japanese islands [1].

A study of the literature on the economic use of species of the genus Miascantus showed that the species are widely used not only as biofuels (chips, briquettes, pellets), but also in the production of cellulose, biogas, compost material, fodder bioadditive, ecological building material - bio-concrete. Miscanthus is also effectively used as an additive in the production of biological plastics [4].

Miscanthus mulch is very effective in preventing and protecting weed growth. Extremely resistant to wind and water erosion, it also has a very high level of water retention, limiting evaporation in hot weather. Miscanthus is extremely unpretentious and does not require special care [7].

Currently, the world community considers species of the genus Miascantus Andress., Due to the good dry biomass yield, drought resistance and winter hardiness, as one of the most promising sources of renewable cellulose-containing raw materials [9].

Abroad, research is actively conducted on the processing of various types of miscanthus, mainly: Chinese miscanthus (Miscanthus sinensis Andress.), Giant miscanthus (Miscanthus giganteus JMGreef, Deuter ex Hodk., Renvoize) and miscanthus of sugar beetle (Miscanthus sacchariflorus) (Maxim.) [ten].

According to researches of Budaeva V.V., Sakovich G.V. [2], cellulose (from 40 to 60%) with its unique structure of repetition of β-D-glucopyranose molecules forming the skeleton is the main resource for the majority of biomaterials and biofuels production; hemicelluloses (from 20 to 40%) are a matrix substance consisting of various polysaccharides; lignin (from 10 to 30%) ensures the rigidity and integrity of the structure. In Russia, Miscantus sp. considered as a promising cellulose-containing raw material for the production of cellulose and products of its chemical modification.

Miscanthus stems contain cellulose (48.10-56.58% versus 35.95- 43.57%) and pentosans (20.92-27.91% versus 19.78-20.83%) are concentrated in the stem [4].

Cellulose fibers are the main component of plant cells, they swell well in water, they are able to fibrillate into smaller fibers (fibrils and microfibrils), have high strength and resistance to the effects of temperature and chemicals, are easily dispersed in water and form a strong interfiber connection between by itself in a paper sheet. Cellulose fiber has the ability to be well moistened with water [5].

By their nature and physical structure (presence of capillaries) cellulose fibers are highly hygroscopic. The absorption of moisture by fiber depends on the degree of humidity of the air and on the nature of the fiber itself. The ratio of cellulose to water is determined by the structure of its molecules, which in the form of chains of glucose residues carry a large number of hydroxyls on their surface. The clutches of cellulose molecules form micelles, and groups of micelles make up the elementary fibrils of plant fibers visible in a microscope.

The only drawback of cellulosic fibers is their ability to be destroyed by mold fungi and bacteria. The places affected by fungi are externally manifested in the form of spots of various colors, the defeat by bacteria most often does not affect the appearance of the textile material even with its strong destruction [8].

Cellulose content of the stem of species of the genus Miscantus Andress. allow us to conclude that, regardless of the place of growth and age of the plant, the stem of the studied species is characterized by a higher content of cellulose and a lower content of non-cellulose components. The exceptions are pentosans (non-cellulose component), which predominate in the stem.

The obtained results of chemical studies of the stem of species of the genus Miscantus Andress., Features of the morphological organization, are upright bare, smooth stems, its physiological features, allow representatives of the studied genus to be used in the production of cassettes or trays in hydroponic systems.

Scientific research related to the manufacture of trays or cassettes for hydroponic plants from plants of the genus Miscantus Andress held as part of the final qualifying work and tested during the regular internship of students of Primorskaya State Agricultural Academy at Chiba University in the summer of 2018.

The use of miscanthus cassettes on the example of the hydroponic system of the biotechnology laboratory of Primorsky State Agricultural Academy during the growing season of tomatoes showed a positive result in comparison with foam cassettes on which Chlorella actively developed. High resistance to pests and diseases, incl. the spread of chlorella on the stems under conditions of high humidity and intense insolation, allow the manufacture and use of cassettes in hydroponic installations. Further studies will be carried out as part of an internship for students of the Academy at Chiba University in May-November 2019.

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决定奶牛繁殖效率的因素
FACTORS DETERMINING THE EFFICIENCY OF REPRODUCTION OF DAIRY CATTLE

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注解。 研究旨在研究限制畜群繁殖率的各种因素的影响。 实际结果表明，从羊群生产力水平7–7.5千克以上开始，繁殖率降低，幼畜产量无法有针对性地选择再生小母牛。 在平均牛奶产量高于每头奶牛每年8.0万公斤的农场中，在淘汰的奶牛结构中，超过40%的牛奶被与繁殖相关的原因所占据。

考虑到奶牛繁殖能力相对较低的遗传力（h2 = 0.09–0.11），必须仔细考虑限制动物繁殖能力的亚型和生理因素。 这个系列的主要地方是人类因素，工作投入到这个因素。

关键词: 奶牛育种，繁殖，强度，授精年龄，服务期，人为因素，效率。

Annotation. *Researches are aimed at studying the influence of various factors that limit the rate of reproduction of the herd. Practical results show that starting from the herd productivity level above 7-7.5 thousand kg, the reproduction rates are reduced and the yield of young stock does not provide the possibility of targeted selection of remount heifers. In farms with average milk yield higher than 8.0 thousand kg per cow per year, in the structure of culled cows over 40% are occupied by reasons related to reproduction.*

Taking into account the relatively low heritability of the reproductive ability of cows ($h^2 = 0.09-0.11$), careful consideration of the paratypical and physiological factors limiting the reproductive ability of animals is necessary. The leading place in this series is occupied by the human factor, to which the work is devoted.

Key words: dairy cattle breeding, reproduction, intensity, age of insemination, service period, human factor, efficiency.

In dairy cattle breeding, there are two ways of housing cows; there are tethered housing and loose housing. The traditional tethered method of housing is more widely distributed. It allows you organizing normalized feeding, facilitates the control of the physiological and clinical condition of animals. [1].

From the economic point of view, the most promising and profitable way of housing cows on dairy complexes is loose method [2, 3].

A number of authors consider that, there is an increase in milk production with loose-boxed contents with year-round feeding of the same type, both in gross volume and per cow, and the duration of the service period is reduced and the insemination index decreases [4,5].

The opinion of other authors is "The integral elements of industrial technology are large-group loose housing and mechanization of all labor-intensive animal-servicing processes — while being organizationally and economically viable, at the same time do not sufficiently take into account the biological characteristics of animals and are often far from sparing operating conditions of the main herd leads to a reduction in the productive use of cows. » [6].

As experience shows, this is due to a metabolic disorder, a decrease in reproductive ability, unsuitability for machine milking, all sorts of diseases that do not allow animals to adapt to modern technology and fully realize their bioresources potential. [7]

The existing loose-housing technology with milking on group milking machines with year-round feeding of the same type, even in farms with an average annual yield of 8000 kg and more per cow per year, does not ensure the profitability of milk production above 10-12%, which reduces the attractiveness of investing in this industry. In this regard, the overwhelming number of economic entities of various forms of ownership cannot provide for the construction and acquisition of the corresponding population of modern complexes due to the lack of financial resources, which determines the need to choose the optimal indicators for milk yield and maintenance technology available to economic entities.

In market conditions, the main purpose of breeding any dairy breed is to increase the profitability of milk production by increasing the productivity of animals in use. At the same time, an increase in the level of productivity should occur without a decrease in fertility, health and longevity.

The studies were carried out in "RIAL-Agro" LLC of the Prokhladnensky district of Kabardino Balkariya. Red steppe cattle and its hybrids with the Angler and red-and-white Holstein breeds are bred in the farm.

According to the technology adopted in the household, cows and heifers are transferred to the maternity barn 10-15 days before the expected calving and are

housed there 20 days after calving. The housing is loose, calving pass in the box stalls. Cows are housed no more than 2-4 hours with calves. Fresh cows are examined, if necessary, preventive and curative measures are carried out, and afterwards, with the permission of the veterinary service, in 15-20 days they are transferred to group I of the lactation phase, where they are kept for up to 100 days.

The studies are based on the logistic principle based on the accounting and analysis of the existing technology, the efficiency of herd reproduction and milk production, and the method of comparing causes and effects.

The data of primary zootechnical and pedigree accounting are analyzed, as well as proprietary materials obtained through the use of various algorithms for assessing the reproductive ability of the offspring of producing bulls of different genotypes. The intensity of the use of heifers-daughters of the estimated manufacturing bulls was carried out on a 10-point scale, while the maximum 10 points were determined for heifers fruitfully inseminated before the age of 450 days (15 months), allowing calving at the age of 24 months. Class interval which is 1 point was 45 days.

The calculations were made according to the following formulas:

$$N_{max} = \frac{\text{the age of calve X } n}{730}, \text{ where}$$

N_{max} - maximum calf yield;

n – quantity of daughters;

730 - optimal age of I calve, days

$$Y_{ip} = \frac{84}{DSP}, \text{ where}$$

Y_{ip} – daughters use intensity index;

84 - optimal duration of service-period, days;

DSP - the actual duration of the service period, days.

The success of breeding is determined by the total tribal value of the mother and father, i.e. progeny genotype. Considering that the possible influence of the mother is limited in this particular case to the number of daughters left to reproduce the herd (these are 1-2, etc.), and the stud bull is significantly more, we have carried out a comparative assessment of the stud bulls by daughters indicators.

The analysis of the growth intensity of remount heifers in the household ensures the achievement of body weight of 350-370 kg by the age of 14 months, which at this stage is quite enough to start insemination. According to the results of our observations in heifers of the red steppe breed, puberty begins at 9-10 months of age and body weight of 250-270 kg. Therefore, we consider the optimal start of insemination from 14 months of age, so as to get the first calving at the age of no more than 24 months.

Logic - if the intensity of growing repair heifers ensures a body weight of more than 350 kg and the possibility of insemination at the age of 14 months, therefore, the influence of the level of feeding and maintenance technology can be excluded. In this case, the age of productive insemination will be determined by two factors: the genotype and the effectiveness of insemination. To establish the influence of the genotype on reproductive ability, we carried out the grouping of daughters of bulls by the age of fruitful insemination (table 1).

Table 1 - Comparative assessment of manufacturing bulls by intensity of daughters use (in points)

Name and № of a bull	Quantity of daughters, n	Age of productive insemination, days.	Duration of pregnancy, days.	The age of calve, days.	Intensity of daughter use, points.
Angar 3372	188	739,6±20,1	278,3±1,1	1017,9±20,6	3,6
Sonny 321	62	589,7±16,6	280,2±0,8	869,8±17,2	6,9
Madan 7101	52	546,5±20,4	281,7±1,3	828,2±20,6	7,9
Carmen 76299385	44	574,7±22,1	279,5±1,1	853,7±22,5	7,2
Kizil 9118	37	555,2±19,8	280,1±1,4	835,3±20,1	7,7
Dumpy 2125	20	559,0±24,3	282,8±1,4	841,8±23,9	7,6
Mostik 5392	11	581,1±17,2	279,3±0,9	860,4±16,8	7,1
Pan 2037	9	591,7±18,8	282,0±1,5	873, ±19,0	6,9

For a more objective assessment of the reproductive qualities of the daughters of stud bulls, we determined the total rank of 3 algorithms: the intensity index of use; the maximum amount of offspring that can be obtained at the optimal age of calving and the proportion of offspring obtained during the calendar year.

The data in Table 1 show that the age of productive insemination of daughters, estimated stud bulls exceeds the optimal age from 96.5 (daughters of Madan 7101) to 289.6 days (daughters of the bull Angar 3372). Accordingly, the maximum rating of 8 bulls was 7.9 points of Madan 7101, the minimum of Angar 3372.

The highest index of intensity of use of daughters had Madan 7101 and Kizil 9138. The lowest indicator was obtained for the group of daughters of the bull Angar 3372. These stud bulls received a similar assessment on the maximum number of litters. According to the index of reproductive capacity, the highest indicator was recorded in the group of daughters of the bull Sonny 321, the worst in the group of daughters of the bull Carmen 76299385. According to a total assessment, the Madan bull 7101 received the 1st place in daughters' reproductive capacity, and Pan 2037 was the last.

At this stage of development of dairy cattle breeding in Russia, the main methods for housing cows are: tethering (stall-grazing) and loose housing with year-round feeding of the same type. In the practical conditions of modern complexes, the problems of reproduction begin after calving (difficult calving, retention of the afterbirth, stillborn fetus, metritis, endometritis, etc.). During the period of keeping in group I of the phase, the cows should be inseminated, however, a definite one, while a significant part of the cows for various reasons do not have time to productively inseminate and have to be overexposed. The latter leads to the accumulation of cows in this group, and the constructive layout of the room does not allow grouping them, taking into account both the milk yield and age, respectively, to organize normalized feeding.

Numerous studies of the behavior of cows in loose housing conditions are reduced to attempts to prove that this method does not limit the freedom of the animal. However, a more detailed analysis shows that, to a certain extent, the option of active exercise cows receive only * on the way * to the milking parlor and back.

We have analyzed the possible impact of the main factors on animals in modern dairy complexes with various feeding and feeding technologies in order to find out the reasons that have had and continue to influence the decline in reproduction (Table 2).

Table 2 - Conditions that promote or limit the reproduction of cattle

№ o/n	Factor	Housing Technology	
		Stall-pasture, yield up to 5500 kg	Loose h. with year-round feeding of the same type, yield up to 7000 kg and above
1	Season of the year	Promotes	Has no effect
2	Climatic conditions	Promotes	Has no effect
3	Feeding level	Does not limiting	Reduces
4	Milk yield	Does not limiting	Reduces
5	Physiological state	Normal	Constant stress
6	Fecundity	Does not limiting	Reduces
7	Hierarchy	Low limiting	Limits
8	Lifespan	Low limiting	Reduces
9	Reasons for rejection	Within normal limits	Increases
10	Active Exercise	Relatively sufficient	Limited
11	Reproductive ability	Not less than 90%	Not more than 75%

A comparative analysis of 11 different factors that have a different impact on the health of animals, and, naturally, on their reproduction, depending on the method of maintenance and the size of milk yield, suggests that loose housing does not provide a normal physiological state, and the yield per year is more than 8000 kg reduces the duration of productive use of cows to 2-2.2 of lactation.

The duration of the service period is one of the main indicators characterizing the level of herd reproduction. The grouping of daughters of bulls according to the duration of the service period suggests that, under the same feeding and housing conditions, according to this indicator, first-heifer cows differ significantly depending on the origin of the father. At the same time, the average duration of the service period ranged from 100-115 (daughters of bulls Sonny 321, Mostik 5392, Dumpy 2125 and Angar 3372) to 172 days (daughters of bull Carmen 76299385). Only 6-10 days shorter than the service period for the daughters of the Kizil bulls 9138 and Madan 7101.

With the largest number of daughters - 188 heads (52% of the entire sample), relatively high rates in the Angar bull, 3372, the duration of the service period was 115.1 days, which is on 21 days shorter than the average herd rates.

Losses of offspring per year due to yeldness on average for the entire sample amounted to more than 81 calves. Most of the calves in a calendar year are underpaid from the daughters of the bulls Carmen 7699385, Kizil 9138 and Madan 7101.

The final result of any production activity in market conditions is the profitability of products. In dairy cattle breeding, it consists of the cost of two types of products - milk and super-remount young stock.

In this regard, we calculated the losses of offspring that the farm bears on two indicators: the first is due to the overexposure of the age of the heifers and the second is due to the duration of the service period of more than 84 days, which does not allow the calf to be received from the cow during the calendar year (table 3). At this stage, the average prevailing market value of dairy breeds at the age of 10-15 days in the region ranges from 11-13 thousand roubles, the cost of bulls is 14-16 thousand roubles.

Table 3 - *Hidden losses of offspring due to the irrational use in the reproduction of cow daughters of bulls of different genotypes*

Name and № of a bull	Quantity of daughters, n	Losses due to overexposure of heifers by age. insem., head.	Losses due to increased service period, head.	Total losses due to under-received offspring, thousands, roubles
Angar 3372	188	74	20,9	1281150
Sonny 321	62	12	3,6	210600
Madan 7101	52	7	14,6	291600
Carmen 76299385	44	7	25,7	441450
Kizil 9118	37	5	10,9	214650
Dumpy 2125	20	3	2,2	70200
Mostik 5392	11	2	1,1	41850
Pan 2037	9	2	2,0	54000

The data in table 3 show that with an increase in the intensity of the use of heifers for reproduction and the optimal duration of the service period, the farm could receive an additional 2.6 million roubles of income. On average, the hidden losses due to the inefficient use of the reproductive ability of animals per 1 head amounted to 6.2 thousand roubles.

It is believed that cow's yeldness is a consequence of the influence of various factors, but studies have shown that in practical conditions it is largely due to the influence of the human factor. Analysis of the duration of the service period and the multiplicity of insemination of the daughters of different bulls showed that the multiplicity of insemination does not always coincide with the number of cycles during the duration of the service period (Table 4).

Analysis of table 4 shows that on average up to 70% of cycles insemination of cows was not performed, which significantly increases barley.

Table 4 - *Share of the human factor influence on the efficiency*
of reproduction of daughters of bulls

| Name and № of a bull | Total hunting cycles | Of which | | | | Total duration of service period of all daughters, days |
| | | Insemination is done | | Missed cycles | | |
		number	%	number	%	
Angar 3372	739	304	41,1	435	58,9	15519
Madan 7101	385	106	27,5	279	72,5	8085
Sonny321	365	85	23,3	280	76,7	5303
Kizil 9118	256	59	23,1	197	76,9	5376
Carmen76299385	355	86	24,2	269	75,8	7455
Mostik 5392	18	8	44,2	10	65,5	378
Pan 2037	46	10	21,7	36	78,3	966
Dumpy 2125	121	34	21,8	87	71,9	2541
Total	2285	692	27,9	1593	72,1	45623

Despite the fact that the yield of calves decreases with an increase in the duration of the service period, in practice, to increase the classiness of the cows, taking into account the fact that with an increase in the duration of lactation, the milk yield in the first 305 days increases, this technique is often used. In this regard, we have studied how much the milk yield increases in the first 305 days, depending on the duration of the service period of the daughters of the estimated bulls.

Studies have shown that a clear pattern of dependence, with an average yield per herd of 1 per heifer within 3500-4500 kg of milk for the first 305 days of the duration of the service period, was not observed for any group of daughters of bulls, but the output of calves is proportionally reduced. The additional amount of milk that can be obtained due to the increase in the duration of the service period does not cover the loss from the lost production.

To a certain extent, due to technical reasons, the program may not always distinguish cows in a hunt, but with so many missed cycles, additional control is necessary.

According to the research results, it is recommended to inseminate with one bull's sperm no more than 3 times and if a single insemination with sperm of another bull did not give a positive result, the animal must be prepared for culling.

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