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国际会议

参与者的英文报告

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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.

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CONTENT

Foreword

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

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

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

Fan Fukuan,
Chairman of the organizing committee of the conference
“Scientific research of the SCO countries: synergy and integration”
Full Professor, Doctor of Economic Sciences,
member of the Chinese Academy of Sciences

前言

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

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

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

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

世界经济空间全球化条件下俄罗斯人员安全的地缘政治风险
GEOPOLITICAL RISKS OF THE PERSONNEL SECURITY OF RUSSIA IN THE CONDITIONS OF GLOBALIZATION OF THE WORLD ECONOMIC SPACE

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注解。 论文得到证实，由于全球化，智力和专业精神处于全球竞争的中心。在全球化的背景下，鉴于专业知识的更新率和相当长的培训时间，参与人员寄生活动比将自己的资源用于建立自己的科学，专业和技术学校更有利可图。。 有人认为，这一过程的后果是竞争国家的人员（知识分子）潜力减弱，经济增长放缓。反过来，这导致国家在世界经济空间中的地缘政治权重下降，对国家安全的威胁增加。

关键词：全球化，人员安全，地缘政治风险，人才潜力，"人才流失"。

Annotation. *The thesis is substantiated that as a result of globalization, intellect and professionalism were in the epicenter of global competition. In the context of globalization, given the high rates of renewal of professional knowledge and the considerable length of training, it has become more profitable to engage in personnel parasitism than to invest its own resources in the creation of its own scientific, professional and technological schools. It is argued that the consequence of this process is the weakening of the personnel (intellectual) potential of the competing countries, the slowdown of their economic growth. In turn, this leads to a decrease in the geopolitical weight of the state in the world economic space, an increase in the threat to its national security.*

Keywords*: globalization, personnel security, geopolitical risks, personnel potential, "brain drain".*

In an environment where attempts to move from the ideological and military confrontation of the leading powers to the geopolitical confrontation become real, the Russian Federation is at the center of significant geopolitical and regional changes of an economic, political and military-strategic nature. All this naturally requires a qualitatively new understanding of the problems encountered, the practical solution of vital issues related to ensuring the national security of the Russian Federation.

In terms of content, the security of a state is revealed through the properties of the constituent elements of its mechanism (legislative, executive and judicial power), its functions (internal and external) and their implementation in all spheres of society, as well as through the properties of processes ensuring the state sovereignty, stability and integrity. The constituent elements of state security are economic, political, public, military, information and environmental security.

The concept of "state security" implies not only identifying, preventing and eliminating threats to security and countering their sources, but mainly, the purposeful activities of the authorities to ensure the sustainable development of the state, strengthen its economic, political, spiritual, defense, scientific and technical potential [5, p. 93].

The problem of national security of the Russian Federation at the moment becomes very relevant due to the unstable economic and political situation of our country on the world stage, which is exacerbated by the ongoing geopolitical changes caused by globalization.

Under globalization in the context of the topic we have declared, we should understand the process of exacerbating the entire complex of global problems and the growth of the planetary interdependence of various countries and regions of the world. Its geopolitical actualization is associated with the period of the 1990s, when the United States and the West as a whole began to lay claim to unconditional domination in world affairs through the implementation of the strategy of "force globalism" in the economic, political and information spheres. Globalization and geopolitics are interconnected, since the very idea of creating a global system that is controlled from one center is essentially a geopolitical idea.

Personnel security (it is sometimes called intellectual security) occupies a leading position in the system of economic security, as it is directly aimed at working with people who are the primary subjects of social activity. In this sense, personnel security and its security is not only one of the main areas of economic activity of the state, but also the most important function of political management.

In essence, ensuring personnel security is a process that prevents a negative impact on the security of a country as a whole, this reduction of risks and threats that are associated with labor resources, their professionalism, intellectual potential and social and labor relations through effective state personnel policy [7, p. 98].

Given the widespread unification of processes and the consequences that are characteristic of the competitive struggle of many countries for the personnel potential of other countries, there is every reason to speak about personnel globalization.

As a result of globalization, intellect and professionalism were in the epicenter of the global competitive struggle. This became noticeable with the recognition in industrialized countries of the indisputable priority of the value of the professional and intellectual qualities of the carrier of the labor factor – a person before any other economic factors.

Globalization has opened up opportunities for attracting specialists from different countries and concentrating unique personnel in the breakthrough areas of the development of science, technology and technology. The substantial reduction in the cost of training professionals and the very rapid increment of the intellectual resource of their own country, as well as the impact on the state of human resources in other countries, both positive and negative, has become real.

Indeed, in the context of globalization, given the high rates of renewal of professional knowledge and the considerable length of training, it has become more profitable to engage in personnel parasitism than to invest its own resources in the education of its scientific and pedagogical staff, scientific, professional and technological schools. Personnel parasitism works on the principle of a vacuum cleaner – o drawing the best professionals from all over the world into its personnel space. The origin and development of this policy is a characteristic feature and an essential component of the globalization process [8, p. 19].

Favorable situation for many developed countries of the West to attract specialists from Russia has developed in the 90s of the last century in connection with the collapse of the USSR. During this period, Russia's intellectual and personnel potential suffered the most significant losses. From 1989 to 2015, according to the Federal State Statistics Service of the Russian Federation, about 4.5 million people left the country [2].

Since the beginning of the 90s, Russia has lost about a third of its scientific potential, and experts estimated the annual loss of our country from brain drain to be 50 billion dollars [9, p. 101]. But the result of this process is not only financial loss. It is also a loss of reputation, the prestige of the country as a place where a professional can and wants to realize his creative potential, which cannot be evaluated financially. At the same time, a wave of migrants from CIS countries rushed to Russia, incomparable with them in terms of their professional level. The consequence of this process was the reduction in the rate of growth of professional experience in specific types of professional activity, or even the loss of this experience. As a result, Russia is forced to borrow technology and advances in various fields of science and technology in other countries.

Despite the fact that since 2010 this trend began to decline, nevertheless, from 2014 to 2016 over 61 thousand Russians left for the European Union for permanent residence. The report of the Civil Initiatives Committee notes that “the emigration flow has high indicators of the quality of human capital – high educational and professional level, young age structure", that is, highly educated specialists leave at the peak of professional productivity. Moreover, this process is far from over, as the masses of other Russians are ready to join the stream of people leaving. "The share of those who have high migration attitudes varies from 8 to 23% according to sociological research, the highest rates among young people and middle-aged people with higher education living in large cities," add the report [4].

Deputy Prime Minister of the Russian Federation Olga Golodets expressed the opinion that the brain drain abroad is due to low wages in Russia. "If we are underpaid for our work and the market is open, we encourage our young people, the most creative and mobile workers, to travel outside of Russia," she said, urging businesses to create high-performance places so that highly qualified specialists can realize themselves. However, experts cite other reasons. In particular, according to the authors of the report of the Civil Initiatives Committee, the main reasons for emigration are dissatisfaction with the prospects for the growth of material well-being, social status, personal and economic security.

Vice President of the Russian Academy of Sciences, Nobel Prize in Physics Zhores Alferov believes that "the main problem of domestic science is not low funding, but the lack of demand for scientific results by the economy and society. And this is the main problem not only of science, but of the whole country" [6].

As Sergey Katyrin, head of the Chamber of Commerce and Industry of the Russian Federation, said in an interview with the "Novye Izvestia" newspaper in early March 2018, business representatives are also leaving, "who have already taken place, have achieved success, but are taking away their experience and entrepreneurial talent" [1].

Most likely, the outflow of experienced and talented business representatives will not stop, because migration attitudes among them are especially strong. A study of the Moscow recruitment agency "Contact" revealed that "every sixth top manager of Russian companies is going to leave the country in the next two years," and "in principle, 42% of top managers have the intention to emigrate [3].

The massive departure of qualified specialists, scientists and businessmen poses serious risks for the development of the Russian Federation, since it is these cadres that the country needs to become a "great economic power."

How to relate to the fact that foreign countries are building such a personnel policy using the personnel potential of Russia and other countries? On the one hand, it is the inevitability that accompanies a society with different intensity practically throughout its history. True, the scale and intensity of today's diffusion of the personnel potential of various states are incomparable with the past, as they are caused by global integration processes. On the one hand, the unification of civilization processes significantly expands the ability of a person to realize his abilities and interests in the field of professional labor. On the other hand, globalization in this sphere is a form of covering up the egoistic interests of the industrialized states of the West who have gone ahead in their development. This is particularly evident in the competition of Western countries for the attraction of foreign personnel potential.

In essence, the sociocultural integration of the personnel policy processes of industrialized countries at the turn of the 20th and 21st centuries proved to be the most effective means of influencing the most important value of society – the individual and the professional and personnel potential of the state. With the help of certain forms and methods, it is possible to achieve not only the economic effect of the concentration of highly qualified personnel in one or another direction of the professional activity of this or that country. But also to have an impact on the slowdown in the professional development of competing countries, the decline in the level of education of their citizens, the thinning of the literate population, and provoke a massive departure from the country of prominent scientists, cultural figures and other categories of highly skilled workers. This dramatically reduces the personnel potential of any society. At that, not only intellectual and professional losses increase, but also the place and role of the state in the geopolitical space of the world decreases, and the threat to its national security increases.

As is known, the migration of the population as a social phenomenon is caused by numerous socio-economic, political, military and other factors. It is more a spontaneous phenomenon. However, the migration of professionals in the context of globalization, as a rule, is less spontaneous and more manageable, since the focus of attention of interested countries are carriers of human capital – holders of professional competencies, scientific discoveries and technological developments. Therefore, from the point of view of the impact on the human resources potential of economically unstable states, and especially of underdeveloped countries, globalization can also be viewed as a form of their depletion and a reduction in the quality of their competitive advantages.

The struggle of states for competitive advantages becomes a powerful factor of competition for highly professional personnel potential of other states. This is a civilized reality. It has for the underdeveloped, developing countries and especially those with the seal of the "resource curse" that have far-reaching negative consequences both for their specialization in the international division of labor, the development of science, education, and for the preservation of their political sovereignty and national-cultural code.

In all likelihood, in the 21st century, mankind has found a new way to redistribute territories (sources of raw materials, markets), pushing forcibly specialization of countries with low personnel potential into assembly and raw materials, processing regions, and controllability of these countries' policies.

In past centuries, states and empires weakened and left the historical scene as a result of wars, conflicts or degradation of elites, useless government. And in the near future this can be done with the help of mechanisms for managing personnel potential, reducing its quality, profiling and specialization, selection, finally, the outflow of the most professional personnel abroad, and absorption of valuable workers in their own country by the personnel space of other countries.

In fact, globalization can be viewed as a geopolitical tool in the struggle of industrialized countries for world professional potential, as a form of fierce competition for world leadership in various fields of science, technology, technology, as a struggle for world domination. And that is why it represents one of the most significant threats to the personnel security of Russia.

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Tyva共和国青年的社会经济状况
SOCIO-ECONOMIC SITUATION OF THE YOUTH OF THE REPUBLIC OF TYVA

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注解。 提高青年人作为一个特殊人口群体的地位，是国家最重要的活动之一，旨在实现青年人的正常生活，教育，道德和社会发展的合法利益。

主要工具是让年轻人参与社会的社会经济，社会政治和文化生活。

本文探讨了教育问题，年轻人在劳动力市场的状况，年轻家庭的社会经济状况以及年轻人的反社会表现。

Annotation. *Improving the position of young people as a special demographic group is one of the most important activities of the state, aimed at realizing the legitimate interests of young people for a full life, education, moral and social development.*

The main tool is to involve young people in the socio-economic, socio-political and cultural life of society.

This article examines the issues of education, the situation of young people on the labor market, the socio-economic situation of a young family and the antisocial manifestations among young people.

Youth is a separate age group of the population. It is the object of national and state interests, is a strategic resource for the development of society.

The system of priorities and measures aimed at creating opportunities and conditions for successful socialization in society and effective self-realization is the responsibility of the state youth policy of the Republic of Tyva.

State youth policy is a systematic direction of the state's activities on creating conditions and opportunities for successful socialization and effective self-realization of young people, developing it potential in the interests of the state [5, p. 242].

Education is the basic element of human potential. For the Republic of Tyva, it can be considered in two aspects: First, the degree to which the level of education of young people in the future will be ready to take a responsible role in the formation and development of the economy, based on their knowledge. Secondly, education as a key element that can help young people to become involved in the labor market and influence social life and economic activity. With regard to education, it can be noted that over the past two years, compared with previous years, the academic performance of pupils in the republic's schools has increased by 5.2%. According to the results of the exam, 72 graduates showed the highest results in different subjects: over 90 points.

Schools No. 2, 15, 1, 5 of Kyzyl, the Agrarian and State Lyceum, distinguished themselves the best. During the 2017-2018 school year, only 932 graduates graduated from the school, of which 55 graduates were awarded the medals "For Special Learning Achievements", and 8 of them are participants in the governor's project "There are at least one child with a higher education in each family"

In the field of vocational education, the main directions of the state policy are implemented for targeted programs "On the development of personnel potential in the sphere of the main directions of socio-economic development of the Republic of Tyva". In order to expand the sought-after specialties on the basis of the Tuva State University, modern specialties "mining", "business informatics", "tourism", etc. have been opened.

Depending on the educational institution, students are paid scholarships with an increased size for sporting and creative achievements, which serves as material support.

The only educational institution of higher education of the Republic of Tyva in the 2017-2018 school year has released 21 graduates of Krasnodar diploma with special academic success. At the moment, all 21 graduates are employed at the decision of the Head of the Republic of Tyva.

As noted in work by V.K. Sevek, R.M. Sevek, Ch.G. Dongak, O.N. Mongush, Ch.S. Manchyk-Sat, "However, in modern society the question of expanding the chances for young people to enroll in higher education, including abroad, is becoming more urgent. The current situation is such that for the innovative development of the country, the key aspect is the harmonious development of the individual (through the development of the level of education of the population), which will subsequently work in the national economy. Therefore, education should ensure the formation of a morally responsible person, without which society cannot develop successfully."[1].

In order to attract young people to creative activities and support talented young people, student festivals "Student Spring", inter-ethnic culture among students and working youth "Eurasia", beauty and intelligence competitions "Miss and Mr. Alma Mater", etc. are held annually.

[1]Севек В.К., Севек Р.М., Донгак Ч.Г., Монгуш О.Н., Манчык-Сат Ч.С. Дополнительные механизмы образовательной деятельности в университете: Инновационные решения// Народное образование. Педагогика, 2017, №4[48] 205-212 с.

In general, it is worth noting that there is a positive trend of young people in the field of science, participation in regional, federal and international grants.

Young people make up a significant part of the Russian labor market, as the main labor resource of the country and the youth work activities play an important role in the development of the country's socio-economic potential [1, p. 110].

With the support of the Council of Young Scientists and Specialists under the Government of the Republic of Tyva, projects are being carried out, the themes of which correspond to modern trends and the innovative development of the Russian and foreign economies.

An important part of any state is a healthy population. What methods and techniques exist to reduce the exposure of young people to various social diseases?

The Republic of Tyva is a constituent entity of the Russian Federation where the traditionally high birth rate prevails. In general, the demographic situation in the Republic of Tyva at the all-Russian level remains favorable, but not without many acute problems.

Based on the main oriented tasks of regional development introduced in the implementation until 2025, the list includes such tasks as:

- reduction of maternal and infant death of not less than 2 times
- strengthening the reproductive health of the population
- reducing the mortality of the working population from external causes, the level of morbidity from social diseases.

The reason for the high birth rate from 2007 to this day is the implementation of the “Generic Certificate” program, where for every second and subsequent children, monetary compensation in the amount of 453,026 rubles is allocated. Naturally, this money should be sent to the accomplishment of good intentions, for example:

- mom's pension;
- child's education;
- housing improvement.

In addition to the tasks of high fertility for the health of the republic, the preservation and strengthening of children's health is important. The Republic provides referrals for treatment and rehabilitation and rehabilitation activities in children's sanatoriums "Tes", "Lake Shira", "Belokurikha", "Tumanny", etc.

As regards social diseases, such socially significant pathologies as syphilis, gonorrhea, and tuberculosis persist in the republic. Social problems include the drug situation in the youth sphere. In total, according to statistics from the republican drug treatment clinic, at the beginning of 2017 more than 3,000 people were registered, most of whom were people from 20 years old. At this time, in all educational institutions the regime of preventive work against adolescent alcoholism has become more frequent. The Republican target program “Comprehensive measures for the prevention of drug abuse and illicit trafficking" conducts various kinds of thematic evenings, seminars, surveys to promote a healthy lifestyle and completely abandon the use of alcohol and drugs.

In order to maintain a healthy lifestyle, in the spring and in the spring All-Russian surrender of the "TRP" standards are held, every year sports fields and swimming pools are built. It is gratifying to see how among young people it has become popular to lead the right way of life and sports. Also on March 22, 2017, with the support of the Head of the Republic of Tyva, a social movement was formulated aimed at promoting a sober and healthy lifestyle in Tuva "Sons of the People".

Practice confirms that only a focus on a healthy lifestyle can completely isolate the spread of alcoholism and drug addiction, because it is under their action that crimes and unintentional acts are committed.

According to Tyvastat in the republic, the main part of the migration trend from villages to cities is youth, due to training in vocational schools, but at the end of training activities, young people who arrived from villages, due to lack of jobs and conditions for career growth in the town.

The main criterion of the socio-economic situation of young people is employment in the labor market, the purpose of which is to provide citizens from 18 to 30 years old from among graduates of educational institutions looking for work in order to acquire the necessary labor skills, increase their competitiveness and adapt to the labor market. Graduates undergo internships at the Ministry of Agriculture and Food of the Republic of Tyva, the Ministry of Labor and Social Policy of the Republic of Tyva, the Office of the Civil Registry Office, the Mayor's Office of Kyzyl, administrative rural settlements, central district hospitals and other organizations. The main professions for which unemployed citizens got jobs were: electric welders, salespeople, accountants, electricians, plumbers, social workers.

In order for young people, including citizens from 14 to 18 years, to properly manage their free time, join the work and acquire certain professional skills, community work is carried out, such as growing vegetables and flowers, redecorating schools and libraries, helping shepherds, cleaning homes for people with disabilities, veterans of the Second World War, collecting materials for schools, museums. It is with such a goal that volunteer activities are developed, for example: volunteer groups "Danko", "Kind Hearts of Tuva", Student groups of Tuva, volunteers-medics, etc.

The most acute problems in the employment of graduates:

- unjustified increase in specialists with higher education, when there is a shortage of qualified specialists;
- the mechanism of communication between employers and personnel policy is that they are focused only on current results, and not in future development;
- low level of involvement of organizations in the process of youth employment;

- unavailability of organizations to change;
- low competitiveness of young people in the labor market due to lack of professional knowledge, combining work with study;
- infantilism.

Youth entrepreneurship is the basis for creating a stable living environment for young people, which is the most active part of the population, which improves the quality of work by implementing their own commercial projects for the level of qualification, reducing unemployment.

The objectives of youth entrepreneurship are:

1. the creation of new business centers;
2. business communities;
3. business incubators.

Small and medium-sized businesses in the Republic of Tyva in the territorial aspect are: 51% of business entities are implemented in Kyzyl, and the remaining 49% in districts, but most of the entrepreneurs are engaged in trade.

The indicator characterizing the level of small business development is the number of small and medium-sized businesses per 1000 people. population. In 2016, in the Republic of Tyva per 1000 people, the population accounted for 21.4 units of small and medium-sized businesses, in 2017 - 22.1 units, an increase of 103.3%.

Today, the state program of the Republic of Tyva “Creating an enabling environment for doing business in the Republic of Tyva for 2017–2020” is in place for entrepreneurs, which includes four subprograms:

1. Improving the investment climate in the Republic of Tyva;
2. Development of small and medium enterprises;
3. Development of international, inter-regional cooperation and foreign economic activity,
4. The development of industry in the Republic of Tyva.

Legislatively providing an independent social status and ensuring the observance of family rights in the social life of society, the state pursues a targeted policy towards young families. In the development and implementation of socio-economic programs in accordance with the activities of authorities and administrations at various levels, is manifested in the process of economic and socio-cultural development of society.

In support of young families, the state policy every year develops comfortable living conditions, introducing into the implementation of the housing support program, such as:

1. "Kyshtag - for a young family";
2. "Cow-nurse";
3. "Young entrepreneur", etc.

Youth marriages are quite an explainable phenomenon of modern society. Many couples, without knowing each other, want to taste family life and understand how it suits them. Accordingly, in parallel with marriages, the number of divorces also increases, often within a few weeks a newly signed couple applies for a divorce and property division — this is the sad statistics of today [2, p. 26].

Experts say that the main cause of divorce is a mistake when choosing a partner. Why does this happen? There are many reasons, including:

1. rash marriage;
2. marriage of convenience;
3. pregnancy;
4. pressure on young people from their relatives.

If you study these statistics causes of divorce are:

- adultery, treason;
- dissatisfaction with each other;
- incompatibility, different views;
- inability to build family relationships and prevent conflict situations;
- disappointment in each other;
- social pathology.

It can be concluded that the basis of any state youth policy should be social partnership, stimulating the activity of young people in various spheres, and developing effective mechanisms for the participation of the state in socialization processes. Young people need an example of how, through legislation, the education system, education and the media, to evoke and maintain interest in family values, traditions, support, learning languages, creativity and improvement in the field of science and knowledge, increasing their professionalism and culture.

Thus, the issue of the socio-economic situation of young people in the Republic of Tyva requires investments in the field of youth policy aimed at effective returns on the terms of the formation of a modern infrastructure. At the same time, it is necessary to make maximum use of the entire material base of educational, health, culture, sports institutions, but the normative base in the field of youth policy cannot be fully formulated, as there is still no federal law that could regulate relations between the state and youth. crucial aspect for the development of the state. The main problem is that the concept of youth policy in the Russian Federation and other legal aspects are not adopted.

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俄罗斯联邦森林资源的定价做法

PRICING PRACTICES FOR FOREST RESOURCES IN THE RUSSIAN FEDERATION

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注解。　本文回顾性分析了俄罗斯联邦森林资源支付的确定和森林收入的分配。 已经确定了低森林率的负面影响。 提出改善森林资源定价的措施。
关键词：定价，林业，林业，森林收费率，森林租金
Annotation. *The article presents a retrospective analysis of the establishment of payments for forest resources in the Russian Federation and the distribution of forest income. The negative effects of low rates for standing forest have been identified. Proposed measures to improve the pricing of forest resources.*
Keywords: *pricing, forestry, forest industry, rates of forest charges, forest rent*

One of the main factors determining the development of the forest industry is the level of rates of forest charges. On the one hand, payments form the income of forest owners, taking into account the fact that they have to include the costs of forest exploitation, which predetermines the competitiveness of forest industry products. The analysis of pricing practices in forest resources, such as forest powers as Russia, in the transition to market-based management methodologies, its achievements and mistakes may be learned by other countries in shaping their own forest policy.

Prior to the adoption in 1993 of the Fundamentals of Forest Law, payment for standing forest was carried out at the established rates, which were called the "standing forest tariffs", according to the state list 07-01, which was formed in the USSR.

Rates were established centrally and differentiated by:

- zones (taking into account the level of forest cover and geographical location of territories),
- categories (distance removal of wood from the place of harvesting to the points of sale of round timber),

- tree species,
- categories of wood size (large, medium, small, firewood).

Using taxes on wood, forestry organizations carried out material and monetary valuation of cut forest.

Privatization of the forest industry and the use of forest leases and forest tenders forced us to adjust the pricing system for standing forest in the direction of its liberalization, abandoning the use of the state price list.

Legally allowed to sell standing timber using bargain prices. As sellers of wood resources were the authorities of administrative districts.

However, at the beginning of the 1990s, this system in practice did not ensure the flow of forest income into the budget system and discredited the idea of market pricing, which was successfully implemented at the same time in the Baltic countries and Eastern Europe.

The lack of success in wood price liberalization was due to the following reasons:

- the economic crisis in which the forest industry was located in the 90s, accompanied by a sharp drop in production volumes and the bankruptcy of a large number of enterprises that worked on the domestic market,

- the lack of local government professional experience, methodological and regulatory framework for setting prices for standing forest,

- high-growth shadow economy and corruption in the use of forests as a result of the implemented decentralization of forest management.

These reasons led to the fact that the size of fees for standing forest in lease agreements often assumed values close to zero, and the collection of accrued payments was stopped. Under these conditions, in 1993 forest income amounted to 29.5 billion rubles, while the forestry costs were more than 7 times more (225.4 billion rubles) [1], which reflected the inefficiency of forest management.

In order to protect financial interests, the state decided to introduce in 1994 into the forest management system such a document as “Guidelines for calculating the minimum rates of forest taxes and rental rates for the transfer of forest areas to rent”. However, due to its recommendatory nature in the context of decentralized forest management, this document was not able to change the situation.

In the 1997 Forest Code, experience was taken into account and centralized setting of rates was introduced at the federal level. The approved rates were taxes and represented the minimum fees for standing timber, while there were opportunities to increase these rates:

a) by decision of regional state authorities through the application of increasing coefficients,

b) when placing wood for tenders, organized and conducted by forestry organizations.

Additional financial resources derived from the use of regional coefficients were transferred to regional budgets, creating incentives at the regional level to attract efficient loggers.

In the second case, additional funds were received by forestry organizations and were part of their own revenues, which predetermined the interest of forest management bodies in this mechanism.

Unfortunately, this practice ceased when the Budget Code, which was enacted in 2001, transferred the fees of forest charges to the state budget (to the federal budget and the budget of a constituent entity of the Russian Federation), regardless of how this fee was formed.

Until 2005, when forest rent were tax, the Federal Budget Act distributed forest income at budget levels, which was often subject to adjustment.

Initially, income in the amount of minimum rates was distributed between the federal budget and the budget of a constituent entity of the Russian Federation in the proportion of 40% and 60%, but then all this income was credited to the federal budget, thereby making the authorities of the constituent entities of the Russian Federation disinterested in collecting these payments.

The auctions for the right to lease forest areas, introduced by the Forest Code of 2006, did not change the above procedure for determining payments for the use of forests.

Article 73 of the Forestry Code [2] establishes the amount of lease payments based on the minimum amount of this payments that:

- when using a forest area with the withdrawal of forest resources, it is defined as the multiplication of the rate of payment per unit of forest resources and the volume of withdrawal of forest resources in the leased forest plot,
- using the forest plot without withdrawing the forest resources is defined as multiplying the charge per unit area of the forest plot and the area of the leased forest plot.

For forest areas that are in federal ownership, the rates of payment per unit of forest resources and the rates of payment per unit area of the forest area are established by the Decree of the Government of the Russian Federation of 22.05.2007 № 310 [3], which is valid until now. It should be noted that these rates for wood, in form and in content, are similar (except for the scale of prices) to forest tariffs in price list No. 07-01, which were used when forest resources were not sold, but were centrally distributed among state-owned timber harvesting enterprises.

Considered rates form the starting price (minimum level) when holding auctions for the right to conclude a lease agreement for forest plots or for sale when buying and selling a forest. Part of the payments exceeding the minimum level is sent to the budget of the constituent entity of the Russian Federation, without having a specific purpose of use. This does not ensure the direct economic interest of the regional forestry authorities in relation to these funds.

Minimum payment rates are annually indexed, however, the forest industry, represented by large vertically integrated companies, has lobbying pressure on making decisions on the level of rates for timber at the root. The basis of this pressure is the desire of the forest business to get preferences to increase competitiveness. its products in the markets, especially export. As a result, there was a significant lag in the growth rate of the average wood charge on inflation (Table).

Table. *Dynamics of inflation, average and average minimum wage for wood in the Russian Federation*

Indicators	2006	2008	2010	2012	2013	2014	2015	2016
The average fee for 1 cu. meter, rub.	52,3	61,2	49,8	47,4	46,2	48,5	52,6	59,1
to the level of 2006,%	100	117	95	91	88	93	101	113
The average minimum fee for 1 cu. meter, rub.	31,7	35,5	34,9	32,3	31,3	32,5	34,6	36,5
to the level of 2006,%	100	112	110	102	99	103	109	115
Annual inflation rate,%		13,3	8,78	6,58	6,45	11,4	12,9	5,4
Inflation index by 2006	100	127	150	170	181	201	227	239

The ruble exchange rate against the dollar was 60.65 rubles / $ as of December 31, 2016

The low level of rates of forest charges in Russia (approximately 20–25 times lower than in European forest industry countries like Sweden and Finland) provides timber producers with additional excess profits due to appropriation of economic rent. However, such a low level forms the following negative phenomena:

- low level of interest of forest enterprises in reducing costs for logging;
- low incomes of the forest owner (state budget revenues), which predetermines insufficient funding for many areas of forest management, including for forest reproduction, research and training,
- the lack of interest of business structures in the development of deep wood processing based on waste-free technologies, in increasing the level of integrated use of raw wood, in optimizing the assortment structure of logging,
- accelerated felling of plantings with the highest consumer characteristics.

On average, the level of rates of forest charges was about 6% of the cost of harvesting. The situation may change in 2018, when the rates per unit volume of timber harvested on lands under federal ownership increased by 43.7% compared to the previous year (for 2018, the indexation rates of fees at the 2006 level were for wood - 2.17, for non-timber resources - 1.57). However, this will not allow to drastically change the situation. Even the use of higher rates for wood in 2018, in the amount of the relevant Governmental Decree No. 310, in the south of the Arkhangelsk region (one of the main forest regions of North-West Russia), allows according to the author to ensure that no more than 25% of the rent is removed.

The problem of Russian forest pricing is not only a low level of rates of forest charges, but also their ratio for assortments with different breed-quality characteristics. The current rates of payment are formed without taking into account the relation of supply and demand for various types of round timber and wood processing products, in the absence of a connection between their changes and the dynamics of price changes in the domestic and export markets for round timber, with the dynamics of changes in production costs.

This creates a situation that the level of rates of forest charges is significantly lower than the level of rent created when working in favorable conditions. Logging companies working in favorable conditions (coniferous species, high average diameter of trunks, short distance of wood hauling, close location of processing industries) receive significant amounts of excess profit, which in turn contributes to the rapid cutting down of all such forest stands.

Further improvement of forest pricing should be based on the use of forest rent as the basis for the formation of market prices for standing forest. Forest rent is a "residual value that arises from the use of forests, after an entrepreneur reimburses material expenses, labor costs, and leaves profit at the disposal with a standard profitability sufficient for reproduction of capital" [4]. The rates of forest charges should be set in such a way that, on the one hand, they do not reduce the reserves of economically accessible forest resources, and on the other hand, they minimize the amount of forest rent left by business structures.

Based on the objectives of the forest policy, to ensure favorable conditions for the development of enterprises engaged in forest exploitation, decisions can be made on using the pricing model for the distribution of forest rent between the state and business. In this case, the rates of fees for wood should be reduced in percentage terms to the target level of the amount of rent left to business structures (for example, 15-20%).

A new system of pricing for forest resources should be built on a rental basis, when the rates of fees for wood will be linked to the prices of products for its mechanical and chemical processing of the first redistribution (lumber, cellulose, plywood, etc.), as well as regulatory costs for processing and timber harvesting and regulatory profit margins of processing industries and forestry. In this case, the level of prices for standing forest will depend on the operating conditions of the forest market and will not take into account either the "transfer" prices for round timber used by vertical integrated forest companies, nor the impact on prices of round timber of the monopolistic structures of the forest complex.

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商业银行与企业客户关系的发展方向
THE DIRECTIONS OF DEVELOPMENT FOR RELATIONSHIP OF COMMERCIAL BANKS AND CORPORATE CLIENTS

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注解。 本文致力于概述商业银行与企业客户互动的主要发展方向，这对于确保俄罗斯经济现代化和技术革命的使用是必要的。 因此，互动发展中的特殊角色被分配给数字银行业务。
关键词：商业银行，企业客户，信贷，创新，数字化，战略，生态系统，小企业，创业。
Annotation. *The article is devoted to an overview of the main directions of development of the interaction of commercial banks with corporate clients, which is necessary to ensure the modernization of the Russian economy and the use of the technological revolution. Therefore, a special role in the development of interaction is assigned to digital banking.*
Keywords*: commercial bank, corporate client, credit, innovation, digitalization, strategy, ecosystem, small business, entrepreneurship.*

The introduction and subsequent expansion of anti-Russian economic sanctions marked the beginning of a new stage in the development of relations between domestic commercial banks and enterprises, which is characterized by a narrowing of the possibilities of profitable borrowing money on foreign markets and the need to establish long-term business relations based on market principles.

The functioning of the banking sector under the conditions of sanctions pressure is characterized by a decrease in growth rates. The maximum growth rate of assets and loans to non-financial organizations over the decade was observed in 2014 (over 30%). In 2015, assets grew by 6.9%, and loans to the non-financial sector by 12.7%. In 2016, the growth rates turned out to be negative, while loans to non-financial organizations declined in relative terms much more than assets (growth rates were - 9.5% and - 3.5%, respectively). In 2017, these figures returned to positive values, but their ratio does not give grounds for optimism: assets increased by 6.4%, while loans to non-financial organizations were only 0.2%. [one].

Experts of the Bank of Russia, commenting on the decline in lending to the real sector, note that the real extent of the reduction is lower than nominal, and points to the effect of several objective factors: replacement of loans with corporate bonds, which make it possible to reduce the cost of funding; low quality of loans from banks undergoing financial recovery procedures; the negative impact of currency revaluation; increasing conservatism in credit policy [2].

In 2017, the lowest growth rates for the analyzed period were demonstrated by banks' own funds (0.1%), which, given the increasing conservatism of the regulatory oversight assessments, could potentially complicate relations between banks and large corporate borrowers.

Also, the sanctions period is characterized by a deterioration in the quality of the portfolio of loans issued to corporate borrowers. If in 2010-2014 the share of overdue debt ranged from 4.15% to 5.29%, then starting from 2015 it does not fall below six percent. On the contrary, the indicator has been growing in the last three years, its value was 6.23% at the beginning of 2016, 6.28% at the beginning of 2017, and 6.43% at the beginning of 2018. It should be noted that the highest share of overdue debts is observed in the cluster of rehabilitated banks - more than 30% of the respective loan portfolios [2].

The observed situation in the bank-oriented Russian economy is unlikely to serve as a support for innovative growth, which in the coming years will provide a breakthrough in modernizing the economy and infrastructure and using the tremendous opportunities of the technological revolution that the President spoke about in his message to the Federal Assembly.

Under current conditions, it is necessary to search for new directions of development of the interaction of commercial banks with corporate clients, which should be focused on the implementation of projects that ensure the long-term development of domestic enterprises and their competitiveness in world markets. Among them it is necessary to note the following areas.

1 Preferential focus on digital banking, innovative online development, the introduction of artificial intelligence systems. There are promising mobile applications that allow managing the company's finances by employee access levels (online banking with role-based access); corporate bank cards; services for electronic document management, which provide the exchange of documentation with various counterparties and help banks act as Uber, the flagship of e2e.

For example, Sberbank in Strategy 2020 set a goal to become a conductor of the digital ecosystem. An ecosystem is a network of organizations that are created around a technology platform and use its services to form the best offers and gain access to products and services of their own production and by connecting external providers [3].

Alfa-Bank in the strategic development plan for 2016-2018, one of the strategic goals that contribute to improving the sustainability of the business, puts e-business as an independent business; puts forward the idea of becoming the best bank in the field of mobile banking within the framework of a strategic task related to service, distance channels and convenience [4].

2 Development of cyber fraud prevention systems, ensuring the bank's reliability for the client in the digital economy and the improvement of the monitoring centers, in the development of modern platforms for the search for threats. So, Sberbank recognizes cyber security issues as one of the key elements of the innovation infrastructure. His 2020 Strategy assumes that clients are trained in modern ways to prevent cybercrime. Banks as data-oriented companies are obliged to improve the quality of ensuring the security of corporate customer data.

3 Attracting stakeholders, small and medium-sized businesses through the creation of specialized platforms, incubators, accelerators, cooperation with them (IIDF, Skolkovo) in order to open and develop small businesses, support innovations, conduct hackathons, and finance public-private partnership programs. Non-core areas are becoming increasingly attractive for banks (Roketbank, Plazius, Alfa-Start), and cooperation with start-ups allows you to quickly get services that harmoniously complement the bank's ecosystem and help attract new customer groups.

Over time, as they master the experience of Western European countries and the development of the domestic regulatory framework, banks will be able to additionally attract small and medium-sized businesses through the P2P segment. Today, domestic banks are using smart loans based on an intelligent model for analyzing customer data. The development of Fintech today allows analyzing the creditworthiness of small business borrowers for a wide range of alternative information, sources of which are electronic wallets, online stores and product delivery services, geoservices, statistical web services, mobile operators, government agencies, online accounting, social networks, etc.

4 Expanding the scope of unconventional banking, i.e. sectors of near-banking and non-banking products and services, implemented in order to create an ecosystem, to create new customers and ensure the sustainable development of their business, mainly small and medium. For a long time and traditionally complement traditional banking products with insurance and investment products, credit history information services, and financial analytics of clients. The most extensive and sought-after, while characterized by good growth opportunities, is the range of

goods and services related to business - consulting (especially HR consulting), staff recruitment, online cash registers, accounting services, legal advice, website design, e-commerce, counterparty verification, logistics, contextual advertising, business seminars, electronic document management systems and business intelligence, etc.

Thus, the synergy of banking and non-financial products for small and medium-sized businesses in Alfa-Bank is carried out within the framework of the “Clients Club” project, a distinctive feature of which is the unification of local and regional entrepreneurs and small business companies. In Tinkoff Bank, banking for legal entities has built-in accounting and allows you to do the calculation and pay taxes, check counterparties. The Ural Bank for Reconstruction and Development considers non-financial services for business one of the strategic directions of development.

5 Personalization of offers for large corporate clients. Thus, Alfa-Bank considers development of relations with large corporate clients through the implementation of an individual approach and the provision of additional opportunities for the implementation of credit programs as one of the main areas of work. [4].

VTB Group Development Strategy for 2017-2019 It assumes the development of the Global Business Line “Corporate and Investment Business” while strengthening its leading positions in working with large corporate clients through solving a number of strategic tasks. These include tasks related to improving the quality of service, offering innovative products, modernizing the existing technological platform, developing products and expanding the geography of the business of trade and export financing, efficiently using the Group’s international presence. [five].

Work with large clients cannot be completely entrusted to consulting robots, chat bots and other assistants appearing at banks during digitalization. Thus, the fully digital bank Tinkoff Bank, actively developing since 2015 the activity on servicing legal entities, was released on lending to small and medium-sized businesses only in August 2018 [5]. Therefore, the task of training highly qualified managers working on command principles will remain relevant. Their distinctive qualities include charisma, sensitivity, openness, activity, flexibility, good knowledge of the client’s business, the ability to open new contacts and opportunities. As a result of the work of corporate managers, a unique relationship is built with the client.

6 Packing without imposing additional services, suggesting the presence of a core in the form of innovative loan products focused on the medium and long term, capable of developing to the level of engineering and reengineering of clients' business processes; schemes combining trust management and venture financing; consortium agreements with partner banks, etc. The task of the bank is to design such a set of originally integrated products and services, which convincingly demonstrates the need to transfer business to this particular bank.

Particular attention in the package approach in working with large borrowers should be paid to improving the procedure for assessing creditworthiness, since banking products and services are interdependent, interdependent. The principles of a comprehensive assessment of creditworthiness, flexibility of a methodology for assessing creditworthiness and differentiated labor intensity of assessing creditworthiness are most important. [7].

For the same reason, the tasks of pricing, forecasting the profitability of projects that require the use of modern economic-mathematical methods and models are quite complex. Problems can be associated with ensuring transparency and clarity of pricing for the client, if necessary, to comply with the requirements of information security, to avoid copying banking products and services.

7 Transformation of traditional services, implemented using new technology platforms. The transactional business is actively developing, in a broad sense, including all banking services for settlement services, such as cash management services, cash management, foreign trade services for clients, trade and export financing, currency control. The offer of a complex of products and services in the field of liquidity management is relevant, which allows you to prevent situations of insolvency, effectively use temporarily idle funds, reduce the need for lending by increasing the efficiency of using the internal financial resources of business units (cash pooling, netting, factor payment and more d.) In a simplified format, this complex should be available for growing medium-sized businesses.

Thus, in the strategy of VTB with medium-sized business clients, the strategic objective is to recognize a significant expansion of the client base and the rapid growth of transaction business. Alfa-Bank's development drivers in corporate business - “Reach the leading positions in leasing and factoring operations”, “Grow above the market in the medium and mass segment with a focus on transactional activity”. The payment industry will continue to improve, since it is this that forms the foundation for a cashless economy.

The market of banking products and services for non-financial organizations is constantly being improved, moving in the direction of business development of clients. With the decrease in the number and proportion of captive credit institutions, cleaning the banking sector, fair interbank competition is growing, the quality of banking products and services is improving, and the role of market mechanisms of interaction between banks and corporate clients is increasing. One of the key challenges of the decade - Fintech - turns banks “from monolayer into marketplays”, brings them closer to business hubs and provides corporate clients with more and more opportunities for innovative development.

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通过联合投资项目发展三国（俄罗斯，立陶宛和中国）对外贸易的方法和工具。

METHODS AND TOOLS FOR THE DEVELOPMENT OF FOREIGN TRADE OF THE THREE COUNTRIES (RUSSIA, LITHUANIA AND CHINA) THROUGH A JOINT INVESTMENT PROJECT

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摘要。本文介绍了联合三国经济的国际项目：俄罗斯，立陶宛和中国。文章概述了这些国家的主要经济问题，有希望的合作选择，以及如何吸引项目投资。其主要思想是俄罗斯西部的资源在立陶宛进行再加工，并通过海运送往中国。文章在分析的基础上，介绍了中国消耗最多的商品，服务和原材料的数据，俄罗斯和立陶宛联合生产的可能性是合理的。另外，文章还介绍了提高项目资本化的方法和手段及其实施的经济效果。

关键词：经济生产物流俄罗斯中国立陶宛投资交换银行货物服务港口营业额外贸出口进口

***Annotation**. This article describes the international project that unites the economies of three countries: Russia, Lithuania and China. The article provides an overview of the main economic problems of these countries, promising options for cooperation, ways to attract investment in the project. The main idea is that the resources of the western part of Russia are reprocessed in Lithuania and sent by sea to China. In the article, based on the analysis, data are presented about the most demanded goods, services and raw materials consumed by China, and the possibility of their joint production by Russia and Lithuania is justified. In addition, the article describes the methods and tools for increasing the project's capitalization and the economic effect of its implementation.*

***Keywords**: economy, production, logistics, Russia, China, Lithuania, investments, exchange, bank, goods, services, port, turnover, foreign trade, export, import*

1. General description of the business idea "bear - stork - dragon"

The development of foreign trade is one of the priorities of a successful economy, it is relevant and plays a huge role in the formation and development of entrepreneurship, in the formation of the country's budget, in maintaining the welfare of the people.

Regardless of the international political climate, the growth of trade turnover between countries should contribute to the prosperity of the state.

If the internal and external interests of the countries coincide, the task of the government, economists and business is not to miss the opportunity and bring good to their country through the development of foreign trade.

This article contains a description of a business idea that affects the mutual interests of the three states: Lithuania, China and Russia. We have studied some of the current problems and features of such different economies, identified elements of the coincidence of their interests. A special feature of the study was the introduced condition: the economic factor should simultaneously affect the interests of the three indicated countries: Russia (we set the symbol "bear"), China (the symbol - "dragon") and Lithuania (symbol "stork").

The political and economic events of recent years have only strengthened a number of needs of the three countries, which formed the basis of this article.

All of these aspects contributed to the emergence of the idea of creating an economic chain "bear - stork - dragon" which at the same time would take into account the interests of all participants and fit into the development strategies of these countries.

The innovativeness of this idea is to use "unauthorized" natural resources from the western part of Russia, to carry out their primary processing at Lithuanian enterprises and by sea to the ports of China. At the same time, only those goods and services that simultaneously coincide with the economic needs of the three countries will be involved in the chain.

Thus, there is a combination of factors of production of the three countries that can bring an economic effect: the subsoil and natural resources of Russia are processed in Lithuania and consumed by China. Such a model fits into the Chinese concept of "One Belt, One Way," and will also contribute to the improvement of economic relations between Russia and Lithuania.

2. Some problems of the three countries, limiting the development of foreign trade in relation to the bear-stork-dragon model.

Russia. Lithuania's share in the foreign trade turnover of Russia in 2017 decreased to 0.63% of the total turnover: Lithuania is on the 31st place of the countries - partners of Russia in foreign trade. A significant reduction in exports from Russia to Lithuania began in 2016 and affected, primarily, the following products (shown in millions of US dollars): fuel and oil - 500, fertilizers - 56, boilers and equipment - 20, inorganic chemistry - 10, rubber and rubber - 8.

Since 2000, 29 new large enterprises have been built from scratch in Russia, 56 old ones have been modernized to a similar level. Of these new enterprises related to processing, in the western part of Russia there are only the Hygiene-Service plant in the Kaluga Region (built in 2011). .), the plant "Unilever" in Tula (food industry, investment 12.5 billion rubles, 650 jobs), the plant "BTK-group" in Tula (knitwear) and in Kaluga the plant "Galen" (fiberglass, investment 700 million . rub.). Investments in the sector we are interested in in recent years have been minimal, while the share of investments in R & D in Russia is less than 1% of GNP (in the USA - 3%, in the European Union - 2%). At the same time, economic conditions (taxes, labor resources, bureaucracy) created a precedent that the extraction and sale of mineral resources abroad is much more profitable than their processing within the country, despite the fact that in 2017 industrial production fell by 3.6%. Today, Russia is in 48th place in terms of transport infrastructure. The quality of air and water transport - on the 87th and 82nd place, respectively.

Lithuania. For 2017, the volume of trade with Russia amounted to $ 2.5 billion. He fell compared with 2016. by 14.85%, or $ 437 million. The maximum decline in exports from Lithuania to Russia affected (in millions of US dollars): boilers and equipment - 26, salt, sulfur, lime, cement - 11.5, fertilizers - 7, food products - 5.4, products from grain and cereals - 3.6, plastics - 2.8, sugar and confectionery - 2.8, fuel - 2.3, printing - 2.2, furniture - 2.2, flour and cereals - 1.6, e. cars - 1.5, railway cars and devices -1.4.

Among the sanctions products prohibited from supplying to Russia are: meat, fish, seafood, dairy products, vegetables, root vegetables, sausages, cheeses, cottage cheese, etc. Following the idea of the article, it is established that Lithuania has the maximum export of goods to the following countries: Latvia, Poland, Russia, Germany, the United Kingdom and the Netherlands. Nevertheless, shipping lines are also laid, except for the countries of Western Europe, to the countries of Southeast Asia, Eastern Asia and the Americas, but they are not used so intensively. The total trade deficit of Lithuania is in the range of 1.7-2 billion euros per year

After 2015, a wave of bankruptcies of enterprises, usually in the retail sector, swept the country: over 400 companies left the market. Cities included large shopping centers, which contributed to damage for small and medium businesses. According to the World Bank, Lithuania is on the list of the world's fastest-disappearing countries. The loss of population - 28 366 (1%) was encouraged by the rapid emigration of residents, increased mortality, decreasing fertility. According to various data, about a million people left Lithuania since independence and accession to the EU in 2004, and now the population is 2.87 million.

China. The country is in a state of trade war with the United States. The advantage of low export value is declining. China's debt rose to 250% of GDP, and corporate debt increased in 2017 by 60%, to 165% of GDP. Most of China’s investments are made by large banks. Some indicators characterize the economic decline in 2017: the stock market fell by $ 3 billion, foreign exchange reserves fell by $ 300 billion, to $ 3 trillion. USD

The poverty level was 6.1%, the unemployment rate was 5.1% of the population. However, only 10% of the population is economically developed, the rest is backward.

China reduces the share of its foreign investments by 40%, since about 1/3 of them turned out to be ineffective. Thus, in 2016, US $ 78 billion was invested in 5159 enterprises in 154 countries of the world in manufacturing, wholesale and retail trade, commercial services and IT, which was 42% lower than a year earlier. In connection with this, a limit was set on the export of capital: investments in real estate, hotel business, casino, sports and entertainment are prohibited.

The ways to solve these problems do not contradict the development of China's trade relations with the Russia-Lithuania tandem.

3. Coincidence in development strategies and economic interests of the three countries.

The global plans for the development of the Russian economy, of course, include an increase in foreign trade, and in the framework of this study it is also an increase in sales volumes on the foreign market. In addition, a positive achievement would be the development of trade and economic relations between the western part of Russia and China against the background of the restoration of at least the previous volume of trade between Russia and Lithuania. This fits into the Russian "Strategy 2020": the use of geo-economic and transit potential, facilitating the coordination of activities in key commodity markets.

Russia. The export of goods and raw materials from Russia to Lithuania in 2016 amounted to 2.5 billion euros, which included: mineral products - 56%, chemical products - 11%, metals and products from them - 5.92%, food products-5, 77%, machinery, equipment and transport - 4.19%, wood and pulp and paper products - 3.51%. At the same time, the maximum increase in exports in 2017. from Russia to Lithuania amounted (in millions of US dollars): ferrous metals - 45, plastics - 15, fats and oils - 11, residues and waste of the food industry - 8.

No less interesting are the data on the most demanded goods imported in 2017 from Russia to China: fuel oil, coal, bitumen, wood, flour, salvage, mineral water, sunflower oil, chemical fertilizers, alcohol, kozinaki, halva, chicken legs, cookies chocolate

Over the past 5 years, the supply of some goods from Russia to China increased in the following proportions: cereals (+ 447%), sugar (+ 395%), meat and seafood (+ 278%), clothes (+ 205%), animals (+209 %), coffee and spices (+ 199%), cereals (+ 447%), precious metals and coins (+ 183%), cotton (+ 179%), medicines (+ 151%), cocoa (+ 173%), leather (+ 169%), grain grinding (+ 166%), custom-made clothing (+ 163%), vehicles (+ 161%), natural and artificial furs (+ 159%), wood (+ 158%), dairy m grain semi-finished products (+ 155%).

According to other data, the following products from Russia were most successfully delivered to China in 2017: lumber and wood (26.6 million cubic meters), non-ferrous metals (nickel, zinc, copper), buckwheat husks (for food additives, anti-allergic pillows, production furniture, use in agricultural purposes - the price in China exceeds the Russian one by 4-5 times), scrap from stainless steel (in the industrial complexes of the cities of Wuxi and Jiangsu), bitumen (for the chemical industry, roofing and roads), grain crops (wheat and barley) , alcoholic beverages (In China, own alcohol is not high quality, and the growth of wine consumption in China increased by a factor of 1.5 over 4 years, mineral water (the price of mineral water is 7–8 times more bottled, since China has almost no sources left), sweets and chocolate (for 2016, purchases of chocolate in Russia increased 4 times, and cookies - 10 times), pine nuts.

Exports of natural gas, billion cubic meters m. (per year, 2016): Germany - 1.7, Turkey - 0.9, Italy - 0.7, Belarus - 0.7, Great Britain - 0.6, France - 0.4, Japan - 0.3 , Poland, Austria, Czech Republic, Hungary - 0.2 each. Coal exports, in% of annual volume: South Korea - 13%, Germany - 10%, China - 10%, Japan - 10%, Netherlands - 7%, Ukraine - 5%, Poland - 3%.

Thus, Russia still remains the world's most important source of fuel supply to the global economy. This also applies to other types of raw materials.

Lithuania. The country has certain advantages for business, for example, a favorable geographic location, state loyalty to foreign companies, and a program to promote business talent.

Among the goals of Lithuania in the sphere of foreign trade are: an increase in fallen commodity turnover, the development of production and technology, a reduction in product overstock, the restoration of trade relations with Russian business, an increase in the degree of independence from the conditions dictated by the EU economy, the development of the port.

In October 2017, a new concept of development of economic clusters was adopted in the country, 4 types of them were adopted: emerging, formed, developing and mature. This concept, approved by the Ministry of Economy, is one of the reasons for funding Lithuania by the European Union. It should be noted that, unlike other Baltic republics, Lithuania largely took care of preserving its enterprises established during the USSR, making every effort to modernize them: their basis is made up of 580 enterprises mainly from the energy, engineering, metalworking and chemical industries. The country produces the whole range of building materials: cement, slate, gravel, brick, woodworking is well developed.

In the field of mechanical engineering and metalworking, 130 enterprises operate: machines are manufactured (Zalgiris plant, etc.), equipment (Vilnius plant has tested, etc.), instruments, electrical engineering, electronics and radio electronics, medium and low power motors. Supported as a machine and shipbuilding. The chemical industry produces mineral fertilizers for agriculture, man-made fibers, plastics, superphosphates, ammophos, sulfuric and phosphoric acid, injections for the pharmaceutical industry.

The food industry is represented by 120 enterprises, including 8 meat processing plants, 5 in the dairy industry. There are fish processing in Klaipeda: canned food, salted and smoked products, culinary products are produced.

Of the 61% of the country's territory used for agricultural purposes, half of it is developed for grain crops: barley (most), winter wheat, oats, legumes, flax, sugar beets, potatoes, and fodder crops. Gardens (apples, cherries and plums) occupy an area of 50 thousand hectares. Dairy cattle breeding and bacon pig breeding are developed in animal husbandry, 5 large poultry farms operate.

It should be noted that Lithuania, as a country with a rich history, has good national traditions in the production of certain food products. For example, Shakotis cake, Pergale confectionery products, and high-quality alcohol products are unique: Midus (the drink is mentioned in Rigveda, its history is more than 7 thousand years), Bochiu (the base is juniper and hop) Trakai "(15º, honey, hops, acorns)," Staklishkes "(12º)," 999 ". In total, in 2017, Lithuania produced vodka and liqueurs 1.24 million deciliters, sparkling wines - 0.3 million deciliters, and beer 22 million deciliters.

For 2016, the increase in imports to Russia from Lithuania amounted to (million US dollars): alcohol and non-alcoholic beverages - 14, tools, optics - 8, transport and spare parts - 7.4, cardboard and paper - 5.2, detergents - 3, vessels and boats - 2.7, pharmaceuticals - 1.6, textiles - 1.5.

Here is a list of products most actively imported by Lithuania: alcohol and non-alcohol products, salt, sulfur, fuel and oil products, inorganic chemistry, pharmaceuticals, fertilizers, dyes, soap and detergents, glue and starch, plastics, rubber and rubber, cardboard and paper, printed products, wadding and yarn, textiles, clothing and knitting, stone and plaster products, glass, ferrous metals, aluminum products, tools, boilers and equipment, means of transport and parts, ships and boats, furniture, toys and works of art . This list supports the idea embodied in the article: Lithuania, Without having significant minerals and other resources, it makes every effort to develop entrepreneurship.

The country ranks 17th in the world in terms of investment attractiveness; a program is being implemented in Lithuania to attract business talent to the country. The country has created comfortable conditions for the work of foreign companies, as well as for the registration of companies for opening a new business: the minimum capital requirements are set at about 3,000 euros. When drawing up a minimum set of documents (charter, extract from the register, list of founders, purchase agreement, seal), the company registers from 7 to 14 working days, after which it is registered for tax purposes (4-5 working days), the lease agreement is concluded , for the provision of accounting services, bank accounts - and you can start an activity. Russia and Lithuania have concluded an agreement on the avoidance of double taxation. Profit tax is calculated from the rate of 5%. All these factors indicate a comfortable business environment in Lithuania.

China. The country is implementing a new economic model aimed at developing domestic consumption while preserving exports, developing the services sector, and government support for national exporters. In China, the healthcare, engineering, IT, automotive, and e-commerce markets are growing particularly fast. At the same time, the media, the mining industry and partly the financial services market are closed to foreign investors. The public procurement market is available, but priority is given to national companies.

Since 2012, China is rapidly taking the lead in 2017. its export volume amounts to 2057 billion dollars, which is almost three times more than in 2005. China's share in world exports is 11.2%. The world's largest exporter, China excel in exporting over 100 types of products.

To date, China has founded 18 thousand enterprises abroad to attract foreign direct investment, they are located in 177 countries (areas), the net amount of foreign direct investment is 424 billion 780 million dollars. It is especially worth noting that Chinese investments abroad make a huge contribution to the economic prosperity of recipient countries. Only in 2011, the total amount of taxes paid by Chinese companies abroad exceeded $ 22 billion, by the end of last year the number of workers in Chinese enterprises abroad reached 1 million 220 thousand, among them 888 thousand - foreign specialists, workers from developed countries - 100 thousand, these data clearly indicate the effectiveness of foreign investment.

Sectors promoted in China: Chinese medicine, development of oil and gas fields, production of automotive components, aircraft and automobile engines, their components, production of air-conditioning control systems, accounting and auditing services, real estate market, production of 1q1qqq-based and water-based air-mobile systems, car design, design and production of civilian satellites, construction and operation of railways, international maritime transport. In 2013, PRC Chairman Xi Jinping announced the “One Belt, One Road” project. The essence of Zthis Chinese initiative lies in the search, formation and promotion of a new model of international cooperation and development by strengthening existing regional bilateral and multilateral mechanisms and interaction structures with the participation of China. His measures:

1) to strengthen the political interaction of countries in order to promote regional economic integration;

2) to develop a single transport highway from the Pacific to the Baltic;

3) to strengthen trade relations and economic cooperation, to develop schemes for the elimination of various barriers that hinder the growth of the speed and quality of economic relations;

4) in order to reduce costs, expand the use of national currencies;

5) strengthening humanitarian cooperation in order to increase mutual understanding between nations.

In the Chinese industry, 35% is occupied by the engineering and manufacturing industries, a significant amount is occupied by the textile industry and equipment manufacturing. The leading industry is heavy mechanical engineering, machine-tool and transport mechanical engineering. In the production of cars, the country ranks 6th in the world, 60% of this industry is located in the seaside zone.

The idea of the article fully coincides with the development strategy of the PRC; it assumes to attract the most demanded goods and services in China, to enter a new segment of the external market.

Lithuania has trade relations with China. Since the spring of 2016, fifteen Lithuanian companies have already passed the procedures for coordination with the Chinese authorities on the export of mineral water and similar products, another seventeen companies have been allowed to import dairy products to the Chinese market.

From the point of view of available investments, China still does not play a significant role for the Lithuanian economy. At the end of 2014, the good news was that Lithuania attracted three-quarters of all Chinese investment in the Baltic countries. The bad thing is that the total amount was only $ 12.5 million. This is not very significant, although it significantly exceeds the money of Chinese investors invested in Latvia ($ 0.5 million) and Estonia ($ 3.5 million).

4. Estimated ways to implement the project "bear - stork - dragon".

Processing of Russian resources at Lithuanian enterprises and sending products to China is impossible without logistic support. The farther away the resource base in Russia is from the borders of China and the closer it is to Lithuanian enterprises, the more attractive the model becomes. If we compare the cost of shipping goods from the territory in the Baltic region to the Far East by different types of transport, then, despite the time frame, the profitability of sea transportation is obvious. So, delivery of a standard 20-foot container will cost the following price:

1) St. Petersburg - Vladivostok (railway): 11-13 days, USD 2120;

2) St. Petersburg - Shanghai (sea freight): 37-49 days, USD 1690;

3) St. Petersburg - Vladivostok (road transport): 17-20 days, USD 3,500;

4) St. Petersburg - Shanghai (air transportation): 1 day, USD 2030;

The comparison gives an idea of the cost and timing of transportation of products. One of the advantages of working with Lithuania is the presence in the country of an ice-free port in Klaipeda, the Baltic leader in container handling. The port of Klaipeda was founded in 1991, has a depth of 14 meters, an area of 415 hectares, a water area of 623 hectares. It occupies 319 place in the world, has shipping lines with Western Europe, Southeast Asia, East Asia, America. A member of 5 international organizations, KIPIS and GIS, provides 58 thousand jobs. Statistics of the port for 2017: cargo turnover - 45 million tons; Po-po transportation (rolling cargo) - 251 thousand units; container handling - 440 thousand TEU; cruise shipping - 64285/52 persons / ships; the number of ship calls at the port is 7000.

In China, there are 8 of the 17 largest ports in the world, another 2 - in Hong Kong and Taiwan. For comparison, we give some indicators of the leading ports of China. Shanghai: the world's busiest port, container handling - 35 million TEU. Shenzhen: consists of 4 large ports. Nilbo: a large port 150 km south of Shanghai. Guangzhou: has connection with 300 ports of the world in 80 countries, 4,600 berths, accepts ships up to 100 thousand tons, cargo turnover - 341 million tons. Hong Kong: container handling - 22 million TEU, cargo turnover - 276 million tons.

Supply of raw materials and finished products

According to the analysis, the most recently requested raw materials and materials are most in demand for delivery to China: fertilizers for agricultural needs; flour, cereal products, grinding of grain and cereal semi-finished products; mineral water; wood and wood materials; bitumen; scrap from stainless steel and non-ferrous metals; buckwheat and husk. In addition, China’s industry is in need of metals such as aluminum, zinc, copper, and lead.

Among finished products recently actively imported: alcohol (wine and spirits); pharmaceutical products (medications, infusions); cardboard and paper; confectionery products (cookies, chocolate); chicken legs; air conditioning and purification of air and water.

A separate instrument, of course, is amber.

Over the past five years, the price of a gram of amber, valued in China, has soared over 800% to the price of gold, but recent market trends are alarming in the industry as a whole: the governor of the Kaliningrad region explained that the annual turnover of the global amber industry reaches 1 billion euros , but his region earns less than 20 million euros per year. Lithuania is also a major supplier of amber, which can not be ignored in the concept of the article.

Intellectual IT export.

According to the principles of the formation of the new policy of the PRC, the sectors of the rapidly growing market are IT and e-commerce. Their development is impossible without maintaining a high level of IT-specialists. This level is quite high in Russia: Akademgorodok (Novosibirsk), Innovation Center (Skolkovo), etc. At the same time, the average level of remuneration of a programmer in Russia is USD 700-1000, in China - USD 2-2.5 thousand, in the USA - from USD 4 thousand. Although the payment of specialists varies depending on the area: web applications, windows-applications, applications for mobile systems, databases, etc. As well as from product development stages, such as domain analytics and setting technical specifications, system architecture and project management, development and coding, documentation, testing, website development, promotion and marketing, technical user support, etc.

The departments of regional and metropolitan Russian universities that train specialists in this field form groups that work on orders from large international corporations (Siemens, BMW, etc.) already from 3-4 courses. Similar business models can be implemented within the framework of this project: the parent company from Lithuania could search for orders in China, form technical assignments and send them to Russian universities, being a communicator company, besides carrying out labor remuneration for both university departments and personally.

Export Accounting Services

Similarly, according to the new economic model of the People's Republic of China, the sphere of accounting and auditing services belongs to the industries promoted. The difference in pay for an accounting specialist (bookkeeper level) in countries is obvious: Russia - USD 500-1000, China - USD 2000, US - from USD 4000. The principles of accounting in the world are the same. By analogy with the IT-model, the parent company from Lithuania could, through cooperation with the departments of accounting and auditing of Russian universities, offer accounting services for Chinese companies based on IFRS or PRC standards. If in terms of audit services, international outsourcing is quite expensive and complicated, in the field of primary accounting services of foreign companies may be attractive.

6. Methods of attracting investment in the project "bear - stork - dragon".

Attracting financial resources for the development of the international project "bear - stork - dragon" is possible in several ways, in this article only one of them is given. It is modeled on the basis of the optimal use of the opportunities available in each of the three countries, taking into account some features of their financial systems:

1) Financing of projects in China is carried out with the involvement of large banks in the country;

2) Lithuania is a country with a favorable investment climate (17th in the world), with comfortable conditions for the creation of new enterprises, their taxation (corporate income tax in China is 25%, income tax in Russia is 20%, in Lithuania from 5 %).

3) The Russian NP RTS Group has a number of advantages in providing ser-

vices for issuers (a more rapid transfer of securities to the organized market compared to the Hong Kong Stock Exchange, independence from the global market, unlike the Baltic Exchange, which is part of NASDAQ). In the RTS system (Exchange St. Petersburg) about 450 instruments of foreign issuers are drawn.

Based on the principle of equality and equal interest of the parties of the bear-stork-dragon project, it is proposed to fund an enterprise established in Lithuania, brought onto the Russian stock exchange through debt securities, guaranteed by Chinese banks operating in Russia.

One of the possible sources of project funding may be trust funds. In China, for example, there is a significant amount of this kind of institutions. According to the Investment Funds Act, approved by the All-China Assembly of People's Representatives, funds can be of four types: private funds (up to 200 qualified investors), public open funds, fund committees (managed by a group of investors), funds with unlimited liability. Regulation is carried out by the Stock Industry Association. The project may include, among others, funds created for the development of Russian-Chinese relations, for example:

Russian - China Regional Development Investment Fund (founded in 2017). Investors are large public and private corporations of China, companies in the free economic zone. In the management of the Fund - 100 billion yuan. The purpose of the Fund is to invest in objects in Russia and abroad for the development of projects from Russia. Among the directors of the Fund: Rustam Temirgaliev, Wang Feng. The Fund’s strategy: investments in nuclear power facilities, infrastructure and logistics, the enterprises of the One Belt, One Road and Volga - Yangtze projects. The rate is from 9% in RMB, the term is 3-10 years.

7. The expected economic effect of the project

In 2017, the trade turnover between the Russian Federation and the PRC in annual terms increased by 25.5% and exceeded $ 80 billion, the Central Customs Administration of the People’s Republic of China reported.

The volume of shipments from China to the Russian Federation over the same period increased by 21.8%, in value terms it amounted to 46 billion dollars. The volume of deliveries of Russian goods to the PRC over the same time increased by 29.5% to 34 billion dollars.

Already by 2020, this figure could grow to $ 200 billion, n

gives a forecast of the Ministry of Economic Development of China.

At the end of 2016, the trade turnover between the PRC and Russia grew by only 2.2% in annual terms and reached 69.52 billion dollars. Chinese exports to Russia grew by 7.3% to 37.297 billion dollars, and imports from Russia to China fell 3.1% to $ 32.228 billion.

In 2017, Russia's trade with Lithuania amounted to $ 2.9 billion. The United States, an increase of 12.58% compared to the same period of 2016

Russia's imports from Lithuania in 2017 amounted to $ 372 million, an increase of 12.84% compared to the same period of 2016.

In 2017, Lithuania exported goods worth 123 million euros from China to China, while imports from China amounted to a decent amount of 702 million euros. In the province of the People's Republic of China Hong Kong, the trade in which is accounted for separately, the situation is better - almost 34 million euros were exported, and 11 million euros were imported.

Provided that a bear-stork-dragon is attracted to the development project, about $ 30 million will help develop an investment idea and help increase foreign trade. In order to make more accurate calculations, it is necessary to analyze the production capacities of mining, processing and consuming enterprises of the three countries.

According to approximate calculations, if the conditions for attracting the estimated volume of investments are met, it is likely that the trade turnover between Russia and Lithuania will increase from 2.55 billion US dollars to 3.03, due to this factor and the presence of a stable sales market for these goods and services in China, The increase in turnover due to exports between Lithuania and China will amount to $ 0.29 billion. That is, the increase in exports from Russia to Lithuania will amount to an additional 9.4%, and from Lithuania to China - 28%. The indicated dynamics will give an increase in the income tax in Russia by 4.8 million US dollars, in Lithuania the income tax by 1.45 million US dollars, in China the corporate income tax is about 7.25 million US dollars.

In addition, the project will create about 100-150 new jobs in Lithuania, to conclude (or expand) at least 200 permanent contracts in the real sector of the economy and in the financial market between enterprises of Russia and Lithuania. Between Lithuania and China, at least 100 permanent contracts in the field of trade and logistics are expected, between Russia and China, respectively, 20-30 contracts mainly in the financial sphere.

The economic project "bear - stork - dragon" will not only increase the volume of foreign trade between the countries, but also allow Russia to optimize the costs of supplying its products and services with the largest trading partner - China, Lithuania will increase its independence from other partners of the European Union, increase its competitiveness , to establish trade and economic relations with Russia; According to the approved strategy, China will enter a new market and expand the channel of supplying high-quality goods, services and raw materials to the country.

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体育和体育领域的监管的行政和法律方面
ADMINISTRATIVE AND LEGAL ASPECTS OF REGULATION IN THE SPHERE OF PHYSICAL CULTURE AND SPORTS

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注解。 文章论述了现代俄罗斯体育文化和体育领域的国家监管问题。 描述了体育文化和体育，体育联合会及其相互作用领域的公共机构结构。 在分析斯维尔德洛夫斯克地区的群众体育工作状况的基础上，确定了国家当局和地方政府在体育和体育领域的效率。
关键词：体育文化，国家规制，体育联合会，体育工作。
Annotation. *The article deals with the issues of state regulation in the sphere of physical culture and sports in modern Russia. The structure of public authorities in the sphere of physical culture and sports, sports federations and their interaction are described. The degree of efficiency of the state authorities and local governments in the field of physical culture and sports is determined on the basis of the analysis of the state of mass sports work in the Sverdlovsk Region.*
Keywords*: physical culture, state regulation, sports federations, sport work.*

The development of physical culture and sports is one of the priorities of the social policy of the state, implemented in the educational, cultural, health, youth, national, international spheres. Physical culture and sports have a high legal potential and are able to perform diverse functions of the state. Topical issues are the assessment of the level of development of physical culture and sports in the country, analysis of the legislation of the Russian Federation in the field of physical culture and sports at the federal, regional and municipal levels.

The right to physical education and sports is guaranteed by art. 41, paragraph 2 of the Constitution of the Russian Federation, which states that in the Russian Federation activities that promote the development of physical culture and sports are encouraged. Thus, physical culture and sport is one of the types of human activity aimed at physical improvement of the population as a whole and of each individual person, an activity that has a health, educational, political and socio-economic impact on the social development of mankind.

Legislation governing physical culture and sports relations consists of the Constitution of the Russian Federation, federal constitutional laws, other federal laws, decrees and orders of the President of the Russian Federation, resolutions and orders of the Government of the Russian Federation, normative legal acts of federal executive bodies, laws and other legal acts of higher authorities state authorities of the constituent entities of the Russian Federation and regulatory legal acts of the executive authorities of the constituent entities of the Russian Federation, regulatory legal acts of local governments, A locally regulations, as well as generally recognized principles and norms of international law and international treaties of the Russian Federation.

The Federal Law on Physical Culture and Sport in the Russian Federation entered into force on March 30, 2008. The law establishes the principles of interaction between the three main subjects that make up the system of organizational support for physical culture and sports in the Russian Federation:

• the state through the Minsportturizm of Russia, as well as through the executive authorities of the constituent entities of the Russian Federation, determines the basis of state policy in the field of sports;

• sports federations by sports are responsible for the highest achievements of sports and for the participation of Russian athletes in national and international competitions.

By-laws also include decisions of sectoral ministries and departments concerning sports and recreational activities; first of all, these are federal bodies of education, health care, etc.

The immediate basis of the bylaws is the normative documents of the federal body of physical culture and sports management (until April 2008 it was the Federal Agency for Physical Culture and Sports (Rossport)), adopted in accordance with the Regulations on this body approved by the Government of the Russian Federation.

At the municipal level, programs of additional education of physical culture and sports orientation are mainly implemented at the sports and recreation stage, the stage of initial training and the training stage, and at the regional level, programs of additional education of physical education and sports orientation at the stages of sports improvement and higher sports skills.

With the active participation of specialists from the Main Directorate for Physical Culture, Sports and Tourism of the Administration of the Sverdlovsk Region, scientists and interested organizations, the Regional Law "On Physical Culture and Sports" was prepared and adopted by the Legislative Assembly. This allowed to transfer all relationships in the field of physical culture and sports on a solid legal basis.

Practical measures are being taken in the Sverdlovsk Region to create conditions conducive to the development of physical culture and sports and the formation of a healthy lifestyle for the population.

Recently, in the Sverdlovsk region, a lot of work has been done on the organization of mass sports and physical training and health promotion activities, promoting a healthy lifestyle among citizens.

Services to ensure access to sports facilities can be detailed by type of sports facilities (open / closed or stadiums / sports complexes / swimming pools / etc.) or by categories of consumers (if access is granted to certain (preferential) categories).

Also, the details included in the list of state (municipal) services (works) may be detailed. For example, work on the preparation of sports teams of subjects of the Russian Federation may be detailed by the composition of sports teams (athletes with disabilities and without limitation thereof) or by the types of sports in which teams compete.

The process of managing physical culture and sports at the local level is based on the norms and rules adopted in the regulatory legal acts at the level of the Russian Federation, the Sverdlovsk region and the local level (Table 1).

Table 1. *The main regulatory and legal acts that ensure the activities of local governments of Yekaterinburg in the field of physical culture and sports*

№	Name of the regulatory legal act	Content
1	Constitution of the Russian Federation	Defines guarantees and foundations of local self-government as an independent institution of power in the Russian Federation, as well as the right of citizens to exercise local self-government. (Chapter 8, vv. 130-133)
2	Federal Law "On the General Principles of the Organization of Local Self-Government in the Russian Federation" of October 6, 2003 No. 131-ФЗ	Identifies the local issues of a city
3	Federal Law "On Municipal Service in the Russian Federation" dated March 2, 2007 No. 25-ФЗ	Establishes the general principles of the organization of municipal service and the basis of the legal status of municipal employees in the Russian Federation
4	Federal Law "On Physical Culture and Sport in the Russian Federation" dated December 4, 2007 No. 329-ФЗ	Establishes the legal, organizational, economic and social bases of activity in the field of physical culture and sports; determines the powers of local governments in the field of physical culture and sports
5	The law of the Sverdlovsk region "On physical culture and sports in the Sverdlovsk region" (as amended on June 27, 2018)	Determines the main tasks and priorities for the development of physical culture and sports in the Sverdlovsk region
6	Charter of Yekaterinburg	Determines the powers of the local authorities of Yekaterinburg in the field of physical culture and sports
7	Regulations "On the Department of physical culture and sports of the Administration of Yekaterinburg"	Regulates the activities, powers and responsibilities of the Department of Physical Culture and Sports of the City Hall of Yekaterinburg

The Strategy of Social and Economic Development of the Sverdlovsk Region until 2020 defines the role of physical culture and sports in the development of the human potential of society, its spiritual and physical health.

The Ministry of Physical Culture, Sports and Tourism of the Sverdlovsk Region, carrying out the assigned functions, together with the executive authorities of the region and municipalities, organizations and public associations in 2018 provided further development of the sphere of physical culture, sports and tourism.

Based on the priority directions of socio-economic development of the Sverdlovsk region, the objectives of the activities of the Ministry of Physical Culture, Sports and Tourism of the Sverdlovsk Region are:

- involvement of the population of the Sverdlovsk region in systematic physical culture and sports;
- ensuring the competitiveness of Central Ural sports in the Russian and international sports movement.

To achieve these goals, you need a comprehensive solution of the following tasks:

- ensuring the development of mass sports and a sports and fitness movement among various groups and categories of the population;
- modernization of the system of physical education and the formation of a healthy lifestyle;
- creation of conditions for high-quality training of athletes from the Middle Urals and their participation in Russian and international competitions;
- ensuring the development of a network of children's and youth sports schools, children's sports clubs, improving the system of training sports reserves;
- development of infrastructure in the sphere of physical culture and sports.

A positive trend in 2018 is an increase in the total number of people engaged in physical culture and sports, which will amount to 758 thousand people or 21.8 percent of the population (in Russia - 18.8). The number of people involved in sports schools will increase to 76.3 thousand people and up to 63.7 thousand in sports clubs at the place of residence, with which 3.2 thousand trainers-teachers and other specialists conduct classes.

Improving the efficiency and quality of the educational process, introducing new forms of organizing extracurricular activities in physical culture and active leisure of adolescents in the community contributes to the annual allocation of funds from the regional and local budgets for the additional rates of heads of sports sections for educational institutions, children's clubs and sports schools. The problem of employment and the organization of leisure of children and adolescents is also solved by involving them in classes in sections of physical culture and sports clubs in the community, the number of which is 269 units. Total enrollment of students in physical education and sports is 43.5 percent of the total number of students; the goal is to increase this figure to 60 percent by 2020.

Currently, a multi-level system of sports events has been formed in the region among various groups and categories of the population. The unified regional calendar plan for physical culture and sports events includes more than 3 thousand events in 105 kinds of sports and, taking into account competitions in municipalities, there are over 7 thousand.

Gradually, physical culture and sports work is revived with the workers of enterprises and organizations, as well as persons with disabilities. The number of students in sections and groups reached up to 197.8 thousand people, full-time sports specialists up to 552 people. Every year the number of enterprises grows, which have included in the collective agreements issues of the development of physical culture and sports.

About 9 thousand of disabled people are engaged in adaptive physical culture and sports, which is 5.3% of the total. Competitions and various tournaments are held in municipalities, regional festivals among children and adults are held. Athletes with disabilities at national and international competitions during the year won more than 200 medals.

Attention has increased to the youth sport, which made it possible to expand the network of sports schools and the number of pupils to 76.3 thousand, and to increase the skills of young athletes. National teams of the Sverdlovsk region regularly take prizes at the Games of students and young people of Russia, in all-Russian and international competitions.

The systematic work of the Ministry of Sports of the Sverdlovsk Region together with the executive authorities of the region and municipalities, public associations on the implementation of the Strategy for the Development of Physical Culture and Sports in the Russian Federation for the Period up to 2020, approved by the decree of the Government of the Russian Federation of 07.08.2009. №1101-p allowed to ensure the dynamic development of the industry in the Sverdlovsk region.

On the territory of the city of Yekaterinburg, activities in the development of physical culture and sports are carried out by the Department of Physical Culture, Sports and Tourism of the Administration of the City of Yekaterinburg.

The Department of Physical Culture, Sports and Tourism of the Administration of the City of Yekaterinburg (hereinafter referred to as the Administration) is a branch body of the Administration of the City, established on the basis of the decision of the Sverdlovsk City Duma of 11.03.1997, N 4/1 “On the structure of local governments of the city of Yekaterinburg”, and acts on the basis of the decision of the Sverdlovsk City Duma of 24/05/2005, No. 3/5 “On approval of the structure of the Administration of the City of Yekaterinburg”.

The following tasks are assigned to the Office:

1) the creation of conditions for the development of mass physical culture, sports and tourism in the city of Yekaterinburg;

2) the involvement of various groups of the population in regular occupations of various forms of physical culture, sports and tourism in order to increase the level of physical fitness, reduce morbidity, increase efficiency and improve the social situation in society;

3) ensuring the development of material, technical and sports facilities for practicing physical culture, sports and tourism;

4) promotion of a healthy lifestyle among the population.

11. In the framework of solving basic tasks, the Office performs the following functions:

1) renders:

- financial, methodological and medical assistance to high-class athletes, teams of the highest league for the purpose of high-quality training and successful performance at the Olympic Games, World Championships, Europe, Russian and international competitions;

- practical assistance in conducting regional, regional, Russian and international competitions in the city of Yekaterinburg;

- methodological and practical assistance to sports-related institutions subordinate to the Department;

- organizational and financial assistance to the city council of sports veterans;

2) takes measures:

on the development of a network of municipal sports institutions;

- on the development of affordable sports for the population, various forms of organization of classes in physical culture, sports and tourism;

3) coordinates:

- activities of physical education teams, sports clubs, sports schools and other sports organizations, institutions and public associations of the city of Yekaterinburg for the development of physical culture, sports and tourism, regardless of ownership;

- the activities of the departments of physical culture, sport and tourism of administrations of districts in the city of Yekaterinburg, provides them with methodological, practical and financial assistance;

4) organizes:

- holding urban sports events, competitions in sports, sports and athletics, match meetings, festivals, etc .;

5) provides:

- control over the activities of subordinate sports institutions;

- financial accounting and reporting of activities of subordinated municipal institutions in the prescribed manner;

6) carries out:

- together with interested organizations, the preparation of city teams, teams of the highest league, individual athletes, students of municipal sports institutions, educational institutions and other organizations to regional, Russian and international competitions, conducts training camps for them, provides equipment and equipment to them medicines, provides funding for secondment;

- maintenance, repair, reconstruction, construction of municipal sports facilities and premises;

- current and long-term planning of the main indicators of the development of physical culture, sports and tourism, provides monitoring of their implementation;

- control of effective spending of budget and attracted funds by municipal sports institutions;

- preparation and implementation of targeted and sectoral urban programs for the development of physical culture, sports and tourism in the city;

- promotion of physical culture, sports and tourism among the population;

7) conducts:

- work with appeals of citizens and organizations;

- The work of improving the skills of physical culture;

comprehensive planned and unscheduled inspections of the activities of subordinate municipal sports institutions;

8) confers grades, petitions for conferring state and departmental honorary titles and awards, awards and incentives to the City Administration, Yekaterinburg City Duma, the Government of the Sverdlovsk Region and the Legislative Assembly of the Sverdlovsk Region to athletes and physical culture and sports workers, sports veterans

9) publishes and publishes various printed materials on physical culture, sport and tourism, provides interaction with the media, creating an information base of physical culture, sports and tourism in the city;

10) organizes and conducts contests for sports mass and recreational work;

11) manufactures and awards sports attributes (letters, cups, badges, pennants, medals, etc.), prizes, cash awards to winners and medalists of city competitions and sports days, best coaches, athletes, physical culture workers, social activists, sports veterans sports organizations;

12) interacts with teams of the highest league and super leagues on the basis of contracts or agreements;

13) participates in the implementation of regional and Russian target programs for the development of physical culture, sports and tourism;

14) carries out other functions assigned to the Office.

The Department for the implementation of the tasks and functions assigned to it interacts with all structural divisions of the apparatus and organs of the City Administration, deputies of the Ekaterinburg City Duma, the apparatus of the Ekaterinburg City Duma, the General Directorate for Physical Culture, Sport and Tourism of the Sverdlovsk Region and other organizations carrying out their development activities physical culture, sports and tourism.

Thus, today it is necessary to develop a single mechanism for interaction between various ministries and departments, public organizations, scientists and specialists. Such a policy should be aimed at creating the most favorable conditions for the recovery of people in labor collectives, in educational institutions, at the place of residence, in places of recreation. Consolidation of efforts will allow to harmonize the system and strengthen the regulatory legal framework for the implementation of state policy in the field of physical culture and sports.

学费心算的特点

FEATURES OF TUITION MENTAL ARITHMETIC

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注解。 最近，使用创新的口头计数技术，特别是“心算”的可能性具有很大的科学意义。

本文分析了在KFU的Elabuga研究所的基础上，以6-13岁的儿童为基础，以额外的教育形式引入心算的经验。

根据孩子的年龄，考虑三个级别的学习。 尽管心算中有各种各样的程序，但它们通过构建心算教学系统的主线统一起来。

关键词：口头计数，心算，算盘，soroban，额外的教育

***Annotation**. Recently, the possibility of using innovative oral counting techniques, especially "Mental arithmetic", is of great scientific interest.*

The article analyzes the experience of introducing mental arithmetic for children 6-13 years old in the form of additional education on the basis of the Elabuga Institute of KFU.

Three levels of study are considered, depending on the age of the children. Despite the variety of programs in mental arithmetic, they are united by the main lines of building a system for teaching mental arithmetic.

***Keywords:** oral counting, mental arithmetic, abacus, soroban, additional education*

Mental arithmetic is a rather young and at the same time very ancient method. The beginning of its existence can be considered the invention of the counting board (suanpan) in China more than 5 thousand years ago. This invention is also called the first wooden computer. Those ancient abacus consisted of a plate with special symbols and sand, divided into lines. They were used for addition, subtraction, multiplication, division, calculation of fractions and even square roots. A little later in Egypt, Ancient Greece and Ancient Rome, similar devices for arithmetic calculations appeared. They were more like modern abacus, because the counting was done on a board, not with the help of sand, but with the use of stones or stones. Despite the fact that the abacus was invented in China, they received the greatest use in Japan. There they were modernized and received the name Abacus (Soroban), which in translation Chinese means a computer board. Soroban was not popular in Japan until the 17th century, but there is no doubt that he was familiar to merchants 2 centuries earlier. When this convenient computing tool became widely known, it was thoroughly and thoroughly studied by many mathematicians. As a result of research, the forms and methods of practical calculations on the abacus were getting more and more improvement [1, p. 13-14]. It is also worth noting that training in the Abacus in Japan is still mandatory for 3 - 4 classes.

The word "Abacus" comes from the Latin word "abacus" (board) - a counting board into which special indentations were made in the form of lines, and stones or stones were moved in these cavities [3, p.3-4].

The oral account training system, based on the use of the Abacus account, has been around for more than one millennium, so it has been tested by the time and practice of many generations. The modern Abacus is a rectangular wooden abacus, in which there are 13 (or more, but always an odd number) of vertical knitting needles, divided across the longitudinal plank. On each row of spokes are stitched bones, which allow the child to visualize the basic decimal system. By manipulating these bones, the child produces complex arithmetic operations. Despite the proliferation of practical and affordable pocket calculators, it is believed that, compared to learning to counting on paper and, especially, on a calculator, training in the Abacus has a number of undeniable pedagogical advantages [1, p. 10-11]. On each spoke there are five stones in one row: four (“earthly”) of them mean one by one, and the fifth (“heavenly”) corresponds to the number “five”. Such an arrangement (4 + 5 = 9) makes it possible to represent on the ruler all the numbers from 0 to 9. Significant are the bones, moved to the middle bar. Rulers are not arranged horizontally, as in Russian accounts, but vertically. For a decimal positional system, this is important, since it corresponds to the form of writing numbers from left to right, and calculations on the Abacus are also conducted from left to right, starting with the higher digits. Abacus eliminates confusion in the calculations, as it gives a unique representation of the numbers. No number can be put on the accounts in two ways, which makes arithmetic operations easy to understand. Abacus are the most accessible accounts for human visual perception [4]. The program of mental arithmetic is considered an ancient Chinese technique for brain coordination and body development using the Abacus. It is also positioned as a highly effective program for the development of children's mental abilities.

It is advisable to start learning oral counting according to the method of mental arithmetic no earlier than from 4 to 6 years. By this time, the children already know the numbers from 1 to 10 at least, which will allow them to get acquainted with their location on the accounts and to perform basic operations. In the period from 4 to 12 years, the most active development of the brain occurs in humans. Therefore, the acquisition of basic skills should be carried out during this period. Therefore, experts recommend at the specified age to learn children foreign languages, to master the playing of musical instruments and other activities. Mental arithmetic also fits harmoniously into this list. Stimulation of the work of the brain of this kind contributes to easier and more productive further learning.

On the basis of the Elabuga Institute of the Kazan Federal University, from November 11, 2017, the additional educational program “Mental Arithmetic” began its implementation. Three age categories of children are studied: 5-6 years, 7-9 years and 10-12 years [5].

The method of mental arithmetic harmoniously develops both hemispheres of the brain. Training takes into account the age characteristics of the child and helps to prepare for school, make decisions with lightning speed, memorize any information, successfully pass exams. There is a development of such intellectual abilities of children as speed of thinking, abstract thinking, quick oral counting, attentiveness, creative thinking. With the continuous development of oral counting with the help of a new method, imagination, hearing, observation, logic, memory develops [2, p.24].

The training program for mental arithmetic conditionally consists of two stages. On the first stage, children master the calculation technique on the Abacus accounts, and two hands are involved at the same time. Abacus or soroban is an analogue of Russian accounts, but it is much older, and is based on a five-fold number system. The second stage of the program involves moving to a mental account - the children represent the abacus in the mind and move the imaginary bones. This technique, which appeared in China more than 5 thousand years ago, is now conquering various countries of the world. In Japan, mental mathematics has become a compulsory subject of the school curriculum. The fact is that it contributes not only to the ability to quickly count in the mind, but also develops mental abilities, the creative potential of the child. Inclusion in the process of counting both hemispheres of the brain ensures quick execution and memorization of actions. The left hemisphere perceives numbers, the right - the picture of the bones of the bones. So, the child learns to make the proposed calculations in the mind. Now the numbers are perceived as pictures, and the calculation process is associated with the corresponding movement of the bones of the accounts.

Consider the main lines of learning mental arithmetic, the level of "addition and subtraction":

1) Simple addition and subtraction of numbers "easier than simple ES".

2) Adding numbers with the help of the formulas "help of brother HB":

$$+1 = +5–4,\ +2 = +5–3,\ +3 = +5–2,\ +4 = +5–1,$$

3) Subtraction of numbers using the formulas "help brother HB":

–1 = –5 + 4, - 2 = –5 + 3, –3 = –5 + 2, - 4 = –5 + 1,

4) Adding numbers using the formulas “help of a friend HF”:

+ 9 = + 10–1, + 8 = + 10–2, + 7 = + 10–3, + 6 = + 10–4, + 5 = + 10–5, + 4 = + 10–6, +3 = + 10–7, + 2 = + 10–8, + 1 = + 10–9.

5) Subtracting numbers using the formulas "help a friend HF":

–9 = –10 + 1, –8 = –10 + 2, –7 = –10 + 3, –6 = –10 + 4, –5 = –10 + 5, –4 = –10 + 6, –3 = –10 + 7, –2 = –10 + 8, –1 = –10 + 9.

6) Addition of numbers using the combined formula "Mix formula MF":

+ 6 = + 11–5, + 7 = + 12–5, + 8 = + 13–5, + 9 = + 14–5.

7) Subtraction of numbers using the combined formula "Mix formula MF":

–6 = –11 + 5, –7 = –12 + 5, –8 = –13 + 5, –9 = –14 + 5.

The classroom training in mental arithmetic for children takes place once a week for 1.5-2 hours. A considerable part of them is occupied by the game form of training and development, especially in the classroom for children 5-9 years old. Play activity helps children to escape from the painstaking counting, and all games are aimed at developing attention, concentration, speed of thinking, imagination, reaction and logic. The stage of studying a new topic is aimed at setting the fingers when working with accounts. The study of a new theme is fixed by fundamental exercises, independent work with the abacus, mentally, dictations are also written to determine how much the new material has been learned. All this work is carried out mostly in workbooks. Homework, which is also painted in workbooks, contains tasks for five days similar to the class work, but also supplemented with audio dictations, a mental solution, coloring bones. Here you can notice another feature of the method under consideration, which is the mandatory daily homework.

A daily abacus score and a mental score will help children reach their goal — learning how to perform simple and complex math tasks in their minds.

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高技能运动员管理体育训练系统的非线性协同方法
NONLINEAR SYNERGISTIC APPROACH IN THE SYSTEM OF MANAGEMENT SPORTS TRAINING OF HIGHLY SKILLED ATHLETES

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注解。　该研究的相关性基于对合格运动员的培训管理系统引入协同方法的想法。　我们已经确定了两种形式的准备：线性　－　顺序，严格定义，一致　－　和替代，创造　－　非线性。　这些形式基于两种方法，即技术中心和心理中心。

关键词：运动训练，心理中心，心理负荷，训练负荷，合格运动员。

Annotation. *The relevance of the study is based on the ideas of introducing a synergistic approach to the training management system of qualified athletes. We have identified two forms of preparation: linear - sequential, strictly defined, consistent - and alternative, creative - nonlinear. These forms are based on two approaches, technocentric and psychocentric.*

Keywords: *sports training, psychocentric approach, mental load, training load, qualified athletes.*

Based on the ideas of a systematic approach to managing the training of qualified athletes, two forms of training are distinguished: linear - consistent, strictly defined - and alternative, creative - nonlinear. The organization of nonlinear training process allows athletes to build an individual algorithm of competitive activity based on creatively reflective understanding of the options for solving motor problems in conditions of intense extreme activity. In modern conditions of sports training of qualified athletes, specialists, scientists are increasingly introducing as a qualitatively new, nonlinear synergistic approach. The main feature of this approach is that it requires a different worldview from people; a different style of managing training and competitive loads; a different understanding of the role of special psychological training of an athlete, direct interaction of the main stakeholders; a different differentiation of physical and mental stress in sports activities.

Teachers, coaches, and specialists are increasingly adopting and introducing a qualitatively new, nonlinear psychocentric approach to the system of training high-class athletes. The main feature of this approach is that it requires a different worldview from people; a different style of managing training and competitive loads; a different understanding of the psychology of the athlete, the direct interaction of the main stakeholders; a different differentiation of physical and mental stress in sports activities. The problems of increasing resources and reserves in the process of managing the training of highly skilled athletes in their most generalized form can be viewed from the standpoint of technocentric and psychocentric approaches. In the technocentric approach, human resources are considered to be along with other types of training system resources. The athlete in this approach is considered from the point of view of its limitations, like other types of resources. The essence of the psychocentric approach is that a person is recognized as the most valuable resource of the training system. This is because human resources are the most adaptive type of resources. Due to this quality, the training system is able to quickly change in response to unexpected demands of the external environment, maintain controllability under conditions of instability of parameters, time constraints, and lack of other types of resources. The laws governing the main components of physical activity to influence the level of mental fitness of qualified athletes, created for the linear training system, are insufficient. In order to see more clearly the peculiarities of non-linearity of the load, let's see what a linear technocratic approach to training load is. The linearity of the training load is observed where, firstly, the result is directly proportional to the effect (i.e., the greater impact of the load entails a greater response; the greater the load, the greater the response to it), secondly, the whole is equal to its sum components (components), and thirdly, the cause and effect are easily observable. The implication of this is that the accuracy of the prediction is determined by careful planning; a successful result is achieved through continuous monitoring, and the analysis of the system is based on the possibility of decomposing the whole into its component components. A well-known “building” description of building a system, where it is not difficult to trace one or another block structure. In nonlinear systems, the opposite is observed. Impact and outcome are not directly related. The whole is not the sum of the components (parts). Causal relationships are not obvious. The dynamics of development due to the multitude of connections is dense. In a nonlinear system, the description in the form of blocks gives way to network structures; secondly, none of the parts prevails over the other. The nonlinear system is a different flow of time and a sense of space. The nonlinear world is a world of complexity. The situation of parting with simplicity requires a different style of thinking, a new psychology of managing a competitive and training process, especially related to psychological stress. As sports, training of qualified athletes is always determined by extreme, stressful conditions in the space and time of control and regulation of motor actions and operations. Sports activity as a whole is characterized by two quality levels: imitative-reproductive (associated with programmed activity) and constructive-creative (within the framework of which something new is being created). The moment of creating a new one in sports action reveals a development paradox, which is that if a new one has emerged from the old, then it is already contained in this old one in some hidden form and is not fundamentally new [1,2]. Therefore, the new must arise from something that has never existed, did not exist. Hence, the creative act can be metaphorically understood as emergence, the process of the emergence of a fundamentally new quality, which is the subject of the analysis of synergy. Synergetic, a new interdisciplinary branch of knowledge, a kind of interdisciplinary reflection, science, about open nonlinear systems that reveal states of dynamic chaos, uncertainty at the moment of transition from the old state to the new, erected, and chaos to the rank of scientific reality. The above suggests that the athlete's sports activities are synergistically implemented in the plane of all spheres of his mental activity, since it is assumed that the holistic human body, all aspects of his mental personality take part in the act of creativity, and creativity is produced when these aspects reveal a high level of self-actualization and self-organization. The main feature of sports training at the same time can be considered its innovative nature, focus on novelty as going beyond the limits of actual given. In this, in our opinion, the nonlinear nature of creative activity manifests itself, which appears here as a nonlinear dissipative, open to the external environment process [3].

Conclusion. Modern sportsman's training should be realized, first of all, as an innovative psychophysical training, which is manifested in the original solution of specific psychomotor problems, in improvisation and impromptu motor actions and operations, to compete, resist the effectiveness of rivals and interact with teammates. The organization of a nonlinear training process will allow athletes to design an individual algorithm of competitive activity based on creative-reflective understanding of the solutions to motor problems in conditions of intense extreme activity.

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Adaptogenes：创造和发展的概念
ADAPTOGENES: CONCEPT OF CREATION AND DEVELOPMENT

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注解。　　这项工作展示了一类具有适应性效应的新型物质的发现和开发，这些物质对农业和医学都很有前途。 它们是三乙醇胺的衍生物，在其分子中含有锌，氯和锗的原子。 关于这些物质的影响的数据呈现在各种生物组织水平，从细胞质酶到整个生物体。 特别注意药物trekrean，目前可以工业规模获得。

关键词：适应，健康，紧张。

Annotation. *The work shows the discovery and development of a new class of substances with adaptogenic effects that are promising for agriculture and medicine. These are derivatives of triethanolamine, containing in its molecule an atom of zinc, chlorine, and germanium. Data on the effects of these substances are presented at various levels of biological organization, from cytosol enzymes to the whole organism. Particular attention is paid to the drug trekrean, which is currently available on an industrial scale.*

Keywords: *adaptation, health, strain.*

The outstanding discoveries of recent years in the field of molecular biology and genetics make us reconsider the concept of the formation of pathological processes. This, in turn, opens up new horizons for the creation of medicines aimed at correcting pathological conditions. At the same time, the evolution of the concept of synthesis of new adaptogens is interesting. This was initiated by the discovery by academician MG Voronkov [1, 14] of the high specific biological activity of intracomplex organosilicon derivatives of triethanolamine (TA) - RSi (CH2CH2) n silatranes. Within the framework of this branch of silicon chemistry, we began to develop a new line of Silatrano Pharma. It was found that silatranes stimulate the synthesis of proteins and nucleic acids, enhance the proliferative-reparative function of the connective tissue, accelerate the healing of wounds, burns and hair and animal hair growth, have an adaptogenic effect [2, 3].

In 1968, in the laboratory of M. G. Voronkov, 1- (organized) germatranes, RGe (OCH2CH2) 3 N, were also first synthesized and the study of their biological activity began. This gave us the basis for the formulation of a new direction - "pharmeos", or "pharmacology of organoelement compounds, silicon, germanium, as well as other TA derivatives — protatrans X-N + H (CH2CH2OH) 3" [4, 5]. At the same time, trekrezan is of particular interest. This adaptogen and immunomodulator is more active than gin - shen. We found that trekrezan changes the activity of tryptophanil-tRNA synthetase, which significantly affects the rate of protein synthesis in cells, and leads to an increase in muscle mass [6, 7].

At the same time, it has been established that the formation of an atherosclerotic plaque that blocks the vessels largely depends on the activity of the indicated synthetase. So, with an increase in the activity of this enzyme, i.e. with an increase in the rate of protein synthesis, the development of atherosclerotic plaques is inhibited. Since plaque is a lipo-protein complex, in which, we believe, lipids play a leading role, their synthesis and transformation (in particular, esterification processes leading to the formation of "bad cholesterol") depend on which way go these transformations. Otherwise, plaque formation is the way to form "bad cholesterol" or low-density lipoprotein. In this case, we assume that the higher the rate of protein synthesis, the lower the risk of the formation of its connection with lipids, i.e. both the risk and the rate of formation of the very lipoprotein complex, which forms the basis of the cholesterol plaque, are less. This leads to inhibition of the development of the disease. Helps braking trekrezan. Thus, the prophylactic anti-atherosclerotic action of trekrezan is realized through the activation of tryptophaniline synthetase [8, 11].

Of course, we are far from thinking that this is the only way, most likely, we should speak only about one link of the most complicated mechanism determining the action of this drug. Along with this, we found that trekrezan activates and acidic lipase platelets, which helps reduce blood clotting, which increases with atherosclerosis. And this is also only one of the links in the chain of the vascular sclerosing mechanism.

In a special series of experiments, we clarified the effects of trekrezan on the rate of synthesis of phospholipases A1 and A2, which are responsible for the degradation of lipoproteins in monocytes during atherosclerosis. It was established that trekrezan oppressed the synthesis of both phospholipases. Otherwise, a positive effect of trekrezan was revealed in atherosclerosis through inhibition of the total activity of phospholipases [9, 10].

In recent years, TA complexes with organic zinc or zincatran salts have been synthesized in the laboratory of MG Voronkov. We have found that zincatran also has an effect on tryptophanyl synthetase, similar to trekrezan, but zincatran was three times more effective than trekrezan [12, 13].

The data obtained indicate the promise of research on the biological activity of complex compounds of triethanolamine with trace elements. This means that our research has all the signs of an innovative breakthrough at the same time in agricultural production and in practical medicine. We call this direction "TA-pharma", which means biologically active derivatives of triethanolamine and its analogues (di- and monoethanolamine). Such is the evolution of the biochemistry and pharmacology of adaptogens of the new generation.

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UDK 378

以神经系统疾病（后脑小脑囊肿）为例的物理文化概念方法
A CONCEPTUAL APPROACH TO PHYSICAL CULTURE ON THE EXAMPLE OF NEUROLOGICAL DISEASES (RETROCEREBELLAR CYST)

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以神经系统疾病（后脑小脑囊肿）为例的物理文化概念方法
Annotation. *The cysts represent a formation similar to the bladder, more often of a benign character, which is filled with pathological contents. Cysts can have a different etiology, grow and shrink, and in some cases completely dissolve. This article will present data on what constitutes a retrocerebellar cyst of the brain, how dangerous it is, and whether its appearance can affect longevity.*
Keywords: *retrocerebellar cyst; the reasons; recommendations; experiment; physiotherapy*

Diseases of the brain-a vast group of diseases, mainly associated with the defeat of the Central nervous system, although in this category of diseases include cancer, abnormalities of the brain and its injuries. Diseases of this body are equally common among men and women, adults and children. Only some diseases are characteristic of a certain age. Some of them are diagnosed during the neonatal period, for example, hydrocephalus or intrauterine growth retardation. In the adult population, acquired pathologies are more often diagnosed[3].

If we talk about what is a retrocerebellar cyst (RCC) [1, p.62], it should be said that this formation is formed from dead brain cells (left, right, bottom, top) and is located inside it. This pathological brain process does not extend beyond the body. The tumor has several types, on which its further treatment depends:

* Retrocerebellar arachnoid cyst-a formation filled with cerebrospinal fluid. Its formation occurs between the shells of the organ. Not resolved.

* Retrocerebellar liquor-formation filled with serous fluid. There are times

when a teratoma is a congenital character. And the main role in this is the violation of fetal development in the intrauterine period.

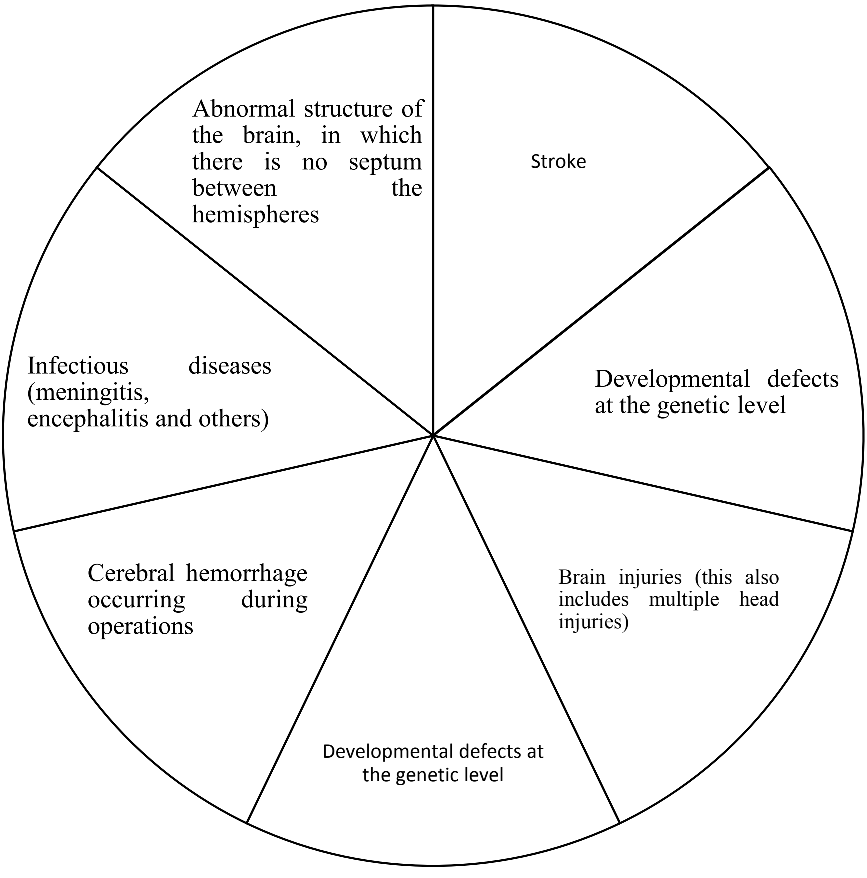
Some people are diagnosed with a so-called arachnoid liquor cyst, formed between the arachnoid membrane and brain tissues. In most cases, its occurrence is a consequence of inflammation of the brain. Depending on what kind of cyst was found in the patient, and depends on the further tactics of treatment. To determine it, an important factor is to identify the cause of the formation of education, which may require additional therapy. It should be noted that these cysts are life-threatening, so the choice of treatment tactics is very important. Here it is necessary to take into account every nuance and need to go through a lot of research.

The cyst is benign and begins to form in those areas of the brain where the death of gray matter. In itself, the tumor does not pose a great threat to human life, but it can provoke the development of more serious diseases, which are characterized by a lethal outcome. The main danger of this formation is that it tends to increase in size, squeezing nearby tissues and causing their death. In other words, if the patient does not receive adequate treatment, over time, it can destroy all brain tissue. The greatest danger is a congenital cyst in children as it develops slowly, and it is possible to identify it in a timely manner only in isolated cases. It can "hide" in the brain for a long time, and then, under the influence of some factors, begin to progress. In this case, there is a violation of cerebral circulation and its functions. And if at this stage there will be no treatment of cysts in the child, he may at best lag behind in mental development or become incapacitated.

Long-term researches of scientists have shown that the factors provoking formation of RCC can be (Fig. 1.).

A congenital cyst can be formed as a result of the mother's stay during pregnancy in areas where poor ecology prevails, as well as her taking some medications.

The lower cyst or the upper cyst at the very beginning of its development, a person does not notice any changes in his state. This greatly complicates the diagnosis, because the patient simply does not seek help from a doctor. And only when the tumor reaches a large size, begin to appear characteristic features that cause the patient to visit the clinic and undergo a full examination. As a rule, diagnosis at these stages of cyst formation is not difficult, but the treatment is much more difficult, since the larger the tumor, the higher the risks of development against the background of various complications. And to provoke an active growth of education can be the following factors: impaired cerebral circulation, infectious diseases, multiple sclerosis and other conditions. Determine the presence of cysts in the brain can be on the following grounds(Fig.2.):



Rice. 1. *Factors that provoke the formation of cysts*

1.Various kinds of disorders in the psycho-emotional state of a person
2. Headache
3. Movement disorder
4. The reduction of the functions of the senses
5. Paralysis
6. Hydrocephalus

Rice. 2. *Signs of a cyst*

If a person has a cyst of the brain, this does not mean that he will have all of the above symptoms. In some cases, the development of pathology can lead only to minor ailment. In view of this, everyone should more closely monitor their health and annually undergo preventive examinations. This will allow timely detection of the tumor and prevent complications. To diagnose retrocerebellar type cyst, doctors use the following methods: CT, MRI [2, C. 30-34], Doppler Ultrasound, blood pressure monitoring, ECG. These studies allow to identify not only the presence of cysts, but also to determine its size, as well as to identify what consequences it has already led to and what is dangerous to humans. When detecting pathology, women are not recommended to give birth naturally, as this can lead to negative consequences, and men are contraindicated by the army, because being on training grounds increases the risk of head injury, which can cause the progression of the growth of education.

If the cyst does not increase in size and does not "show" any signs, then its treatment is not carried out. In this case, the patient needs constant monitoring by a neurologist. If there is a growth of the tumor, the first doctors are trying to stop its progression through drug treatment. For this purpose, drugs are used to help eliminate infectious and inflammatory processes occurring in the brain, which caused the appearance of cysts. And in those situations where there is not only a rapid growth of education, but also significant deterioration in the patient's condition, doctors strongly recommend surgery. It can be carried out in several ways:

- Craniotomy. The operation is complex, but it is one of the most effective. During it, not only the formation itself is removed, but also all nearby tissues. This operation allows to prevent recurrence of the disease in the future. But this method of surgery has many contraindications. And when the patient can not do such an operation, choose other ways.

* Brain bypass. It is carried out if there is a constant flow of fluid in the tumor. During the operation, the damaged vessels are attached to the healthy arteries, which allows to normalize the outflow of fluid and improve cerebral circulation.

* Endoscopic method. Several punctures are made in the skull. Through them, with the help of special tools, the surgeon removes the formation.

Summing up all the above, I want to tell a little about the therapeutic physical culture in diseases and injuries of the brain. In case of damage (trauma, tumor or violation of cerebral circulation: hemorrhage, thrombosis, embolism) of the motor pyramid pathway, Central, or spastic, paralysis or paresis develops. Despite the fact that the dead nerve cells do not regenerate, exercise helps to remove inhibition from the depressed areas around the dead cells and create new functional centers.

The method of medical physical training in the educational process provides a tonic effect, the restoration of innervation and the formation of compensation (the last two tasks are difficult to separate). Student of the group Up 1-16-1 of the faculty of management of logistics And customs Kurzanova Ksenia developed a set of exercises of therapeutic gymnastics in diseases of the nervous system (see Table "Complex exercises of therapeutic gymnastics)[4].

Table. *The complex of exercises of medical gymnastics*

Exercise	**Lead time/number of times**
1) walking in a circle alternately in one direction and the other, then walking with acceleration.	2 minutes
walking in a circle on the toes, heels alternately in one direction and the other, then – with acceleration.	1 - 2 minutes
I. p. - standing, arms along the body. Relax all muscles.	
I. P. - the same. Alternately raising hands upward (first right hand, then left), movement gradually accelerate.	60 to 120 times per 1 minute
I. P. legs on width of shoulders, hands chained to the castle. Raise hands over head – inhale, then hands down through the sides and down – exhale.	3 - 4 times
I. P. legs on width of shoulders, hands are extended in front of chest. Squeeze and unclench fingers with acceleration.	60 to 120 times in 1 minute. Perform 20-30 seconds.
I. P. legs on width of shoulders, hands chained to the castle. Raise hands over head – inhale, and then his hands slumped down between the legs – exhalation.	3 - 4 times
I. P. – its feet together, hands on middle belt. Do squat-the exhalation, to return in the original position – the breath.	4 – 5 times

Scientific studies have shown that the implementation of this set of exercises can reduce the risk of symptoms of retrocerebellar cysts. Moreover, in students with RCC disease, which was confirmed by studies, the implementation of this set of exercises allowed not only to avoid the symptoms of RCC, but also increased physical and mental productivity in the educational and extracurricular processes. In 10 students (girls, special medical group, with RCC disease) who took part in the experiment (experimental group-1), after 25 days of this complex of therapeutic gymnastics, changes in the psychoemotional sphere (namely, an increase in mood and the appearance of an optimistic mood) were noted, which contributed to an increase in working capacity by 35%. Interestingly, students (girls, special medical group, with the disease of the RCC), engaged in the usual program without the inclusion of this complex, (control group-1) there was an increase in working capacity by only 18%.

Also, in addition to therapeutic gymnastics students participating in the experiment had to comply with some practical recommendations, namely:

* Avoid complications in viral-infectious diseases
• Exclude hypothermia of head
* Treat hypertension
* Avoid significant spikes in blood pressure
* Stop Smoking and drinking alcohol
* Avoid stressful situations

Compliance with these practical recommendations allowed students to get rid of bad habits (or minimize them) and reduce the frequency of symptoms of RCC, which together affected the improvement of General health and ultimately improve the quality of life.

In conclusion, I would like to note that the teaching staff of the University with great attention to students with similar diseases and advises with greater care to their health, especially in physical education. Therefore, for physical training in the educational process it is recommended to perform a set of exercises of therapeutic gymnastics and follow the practical recommendations given above, without harm to the health of students with diseases of the nervous system.

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UDC 378

特殊医疗小组学生的身体状况

PHYSICAL READINESS OF THE STUDENTS OF A SPECIAL MEDICAL GROUP

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注解。 本文探讨了特殊医疗组学生的疾病原因和体育锻炼的特点。 建议推荐一套针对这种疾病的运动。 对于此类学生，需要采取特殊方法进行体育锻炼和体育活动，以便为专业活动做准备。

关键词：学生，特殊锻炼，体育，内脏器官疾病（以多囊肾病为例）。

Annotation. *In this article the reasons of the disease and the peculiarities of physical training of students of a special medical group are examined. Recommended set of exercises for this disease is recommended. For students of this category, a special approach is required to physical training and sports in preparation for professional activities.*

Keywords: *students, special exercises, physical culture, internal organs disease (on the example of polycystic kidney disease).*

The effectiveness of physical education classes with students depends largely on the content of the program material, organizations and methods of conducting the educational process, in accordance with the Federal State Educational Standard of Higher Professional Education and its program for a special medical group. The purpose of physical education and sports is to increase the adaptive reserves of the body and promote the health of students with a diagnosis of polycystic kidney disease.

Polycystic kidney disease is a genetic defect. Depending on the type of inheritance, clinicians identify the following forms of pathology: autosomal recessive, characteristic of childhood and autosomal dominant progresses in people over 30 years of age.

In the kidneys affected by polycystic, 2 types of cysts are formed: open and closed cysts in adults, the disease progresses gradually and passes through three stages:

*Compensated:*Kidney function is not impaired at this stage. [1, medarticle. moslek.ru/articles/3222.htm].

At the stage of *subcompensated* condition of the patient is rapidly deteriorating.

Decompensated: At this stage, the patient develops chronic uremia. [5, 12. p 120].

To confirm the diagnosis using laboratory and instrumental diagnostic techniques. Laboratory: urine analysis; Reberg test; Zimnitsky test; clinical and biochemical analysis of blood. Instrumental: kidney ultrasound; Ultrasound of the abdominal organs; ECG; CT scan of the kidneys; MRI; renal angiography [6, c. 240].About how to properly treat polycystic kidney disease, can only tell the attending physician, based on the data of the initial examination and the results of tests. It is worth noting that it is impossible to completely cure the pathology, so all the therapy carried out is symptomatic, but there are practical recommendations for this disease as shown in the Picture 1.

Pic.1 *Treatmentmethods.*

Note:

1-Therapeutic treatmentofthekidneys., 2- surgicalmethodsoftreatment, 3-folk methods, 4-diet, 5-experimental methodsoftreatment, 6-therapeutic physicalculture.

Analyzing the proposed methods of treating kidney disease, we will describe in more detail sector 6 - therapeutic physical culture in case of kidney disease.

Recovery of health after acute kidney inflammation requires an integrated approach. It is necessary not only to prevent possible complications, but also to create maximum conditions for the rapid restoration of immune protection and normal functioning of the urinary system. Among all complex activities, exercise therapy for pyelonephritis and massage are excellent and effective methods of influencing the human body after acute inflammatory process.[3, p. 110].

*Muscular system and urinary apparatus:*The muscular and urinary systems are closely intertwined at both the physiological and functional levels. As is known, the activity of the kidneys is aimed at excretion of metabolic products that enter the blood, including from muscle activity. When performing physical work in humans, the quantitative and qualitative composition of urine changes. It appears substances that are usually absent, or were present in the urine in small quantities. Thus, under the influence of muscular work, the excretory function of the kidneys is enhanced, and the regulation of acid-base balance is also improved. Such positive changes are associated with changes in the renal blood flow and the functions of an individual nephron taken.

The concept of exercise therapy and its role in the treatment of kidney disease: By exercise therapy, it is customary to understand a set of means of exercise applied to a sick or weakened person for therapeutic and prophylactic purposes. This includes the motor and hygiene regimes, exercise, massage and natural factors (sun, air and water) [8].

The main means of physical therapy (hereinafter - exercise therapy) - exercise. The biological basis of exercise is muscle activity (movement) - the strongest stimulator of vital functions. Usually, specially designed and selected physical exercises are used for treatment and preventive purposes. Their use takes into account the nature of the disease, the stage of the disease process and the degree of physical fitness of the patient. [5, p. 215].

The complex of therapeutic exercises for diseases of the kidneys and urinary tract based on physical exercises for the muscles of the back, lower back and abdomen. They are performed calmly, without muscular tension, at a slow pace. With proper performance and appropriate dosage, these exercises are of great benefit, as they increase blood circulation in the abdominal cavity, strengthen the abdominal muscles and diaphragm, and improve the functioning of the kidneys and urinary tract. An important role is played by specially selected exercise for the legs. Their proper performance contributes to the elimination of edema and congestion in the kidneys and abdominal cavity.

The complex exercise therapy for kidney diseases also includes general health and breathing exercises. They activate the body's defenses, improve metabolism, heart and lungs, contribute to better adaptation of the patient to physical exertion. In addition, exercise enhances the activity of the adrenal glands, which produce anti-inflammatory hormones, which significantly reduce the inflammatory process in the kidneys.

Each set of therapeutic exercise for kidney disease, it is advisable to start with walking. Walking is one of the most useful exercises. It increases blood circulation and respiration and gradually puts the body into operation.

Therapeutic exercise has a beneficial effect not only on the work of the urinary system, but also on the whole body, strengthening it and increasing efficiency. Exercisetherapyexercisespromotevigorous, cheerfulmoodandleadto a quickhealingofthepatient.

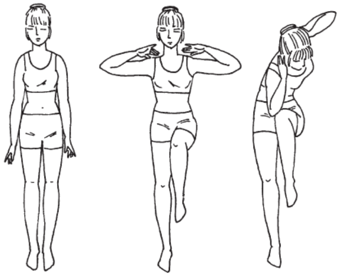
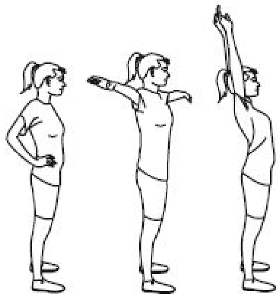
To obtain the most positive result during physical therapy exercises, it is necessary to observe three basic rules: gradual increase of physical activity, regularity of exercises, long-term use of physical exercises.

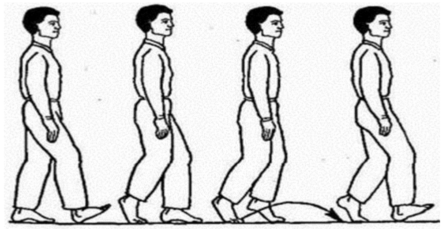
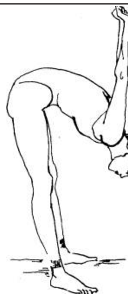
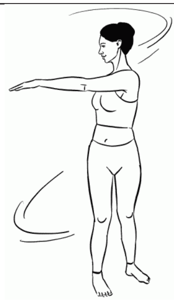
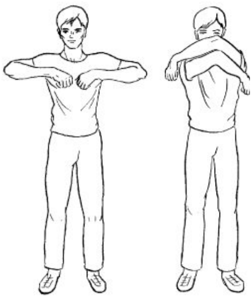
Restoration of impaired renal function is possible only under the condition of regular and long-term (for several months) exercise therapy. Correct and systematic use of exercise therapy in treating a patient significantly speeds up the healing process and prevents repeated relapses of the disease.[7, p. 72].

There are several sets of exercises. Usually, a complex of therapeutic exercises begins with lighter movements, which gradually become more complex, and end with exercises with very light exercises and walking. After the most difficult exercises, it is advisable to make short pauses (rest 30-40 seconds) [3].

When doing therapeutic exercises at home, it is necessary to keep a diary of self-control. This will allow you to properly dispense exercise and avoid overvoltages. prescribed for various renal diseases. In this article (with the active participation of students Xenia Alekseevna Smirnova and Lala Seyfaddin Gasanova of group T-16-1, faculty FMLITD, specialty Customs,), the complex of special gymnastics was developed, shown in Table 1.

Table 1 *Complex of special gymnastics*

Exercie number	Picture	Description
1		Starting position to stand straight. Then, keeping the balance on the right leg and arms bend in the elbows at the level of the chest (5 seconds). Next, touch the left knee and right elbow, then lowered. The same with the right knee and left elbow. With each leg 5 times.
2		The original position of the legs shoulder-width apart, hands on the belt. While inhaling, turn around and spread your arms to the sides and upwards. On the exhale, return to the original position .. Repeat 5 times.
3		Starting position, legs shoulder-width apart. Hands perpendicular to the body. Then perform deep squats, rolling your straight arms forward. Same thing, only hands back. Repeat 5 times.
4		Starting position, legs shoulder-width apart, arms free along the body. Tilt to the left, left hand stretches to the floor. When tilted to the right is the opposite. Repeat 5 times for each side.

5		Starting position, imitation of walking in place of the arm along the body. Follow the breath, it should not be increased or broken. “Go” for 60 seconds.
7		Starting position while standing on the exhale to bend forward, hands raised up and back. On the inhale to rise, keeping the position. Repeat 5 times.
8		Starting position, feet at an angle of 45 degrees. Turn the torso to the left and right. Perform 9 repetitions.
9		Starting position, on the inhale, bend the elbows of the arms, the hands are drawn to the shoulders and back. In this way, the blades should converge. On the exhale, relax your hands. Repeat 6 times.

Self-control during physical education and sports: should be systematic and long-term, it is desirable to perform observations at the same hours, under similar conditions: before the start of exercise therapy exercises and after their completion. Conducting systematic self-observations and analyzing them will allow you to properly regulate physical activity.

In conclusion, I would like to note that the ever-increasing number of students attributed to a special medical group for health reasons, encourages teachers of the department of physical culture and sports to look for more acceptable and effective forms of conducting training sessions. Activities organized during the classes have little effectiveness if they are not addressed to the motivational and semantic sphere of the students' personality.

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如何翻译编译读者互文性百科全书的互文性参考文献
WAYS TO TRANSLATE INTERTEXTUAL REFERENCES THAT COMPILE THE READER'S INTERTEXTUAL ENCYCLOPEDIA

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注解。　文章详述了文学阅读是什么，读者需要哪些技能和知识来解释和分析文学作品，以及检测文本和互文意义的方法是什么。　作者的兴趣是互文性参考，这是读者互文性能力的一部分，或者换句话说，是百科全书。 米哈伊尔•布尔加科夫的小说"大师和玛格丽塔"（俄罗斯经典）及其一些英文翻译说明了这些想法。
关键词：解释，意义，互文百科全书，通用互文百科全书，民族互文百科全书，个体互文百科全书，文学翻译中的互文性参照。
Annotation. *The article dwells upon the question of what literary reading is, which skills and knowledge a reader needs to interpret and analyze a literary work and what are the ways to detect text and intertext meanings. The author's interest is intertextual references that are part of reader's intertextual competence or, in other words, encyclopedia. Mikhail Bulgakov's novel "The Master and Margarita" (Russian classics) and some of its translations into English illustrate the ideas.*
Keywords*: interpretation, meaning, intertextual encyclopedia, universal intertextual encyclopedia, national intertextual encyclopedia, individual intertextual encyclopedia, transferring intertextual references in literary translation.*

As we know, a literary work is a very complicated and multi-dimensional phenomenon. A good literary writing provides fecund soil for interpretations. Moreover, it is born in cooperation with its reader and may accommodate a much wider range of interpretations than intended by its author.

On the way of appreciating a literary piece of art the reader is inevitably guided by his/her own life experience, individual way of thinking, analyzing and feeling, his/her culture, beliefs, tastes, attitudes, prejudices, values and etc. As a result, there cannot be a case when two interpretations are alike. We value fictional literary works for the variety of interpretations they can sustain. Each interpretation gives a chance to look at the literary work from a different point of view. It may give new life to a piece of art and make it immortal.

When reading a text a reader also relies on his/her experience of dealing with other texts, on so-called encyclopedic/ intertextual competence (in the terminology of an Italian semiotician Umberto Eco). The knowledge that forms this competence compiles the intertextual encyclopedia of a person [1].

Its structure is far from being homogeneous among linguo-cultural communities the Russian researcher Galina Denisova believes. She suggests distinguishing the three types of the intertextual encyclopedia: the *universal*, *national* and *individual* ones.

The universal intertextual encyclopedia is formed by “the texts of the global semiosphere”, those which are universal for the representatives of different linguo-cultural communities.

The national intertextual encyclopedia, claims the author, contains literary texts that “make the academic education canon”. In other words, it consists of texts that we read and analyze when studying at school. The national encyclopedia also includes the names of particular people of history, culture and art.

The individual intertextual encyclopedia exists within the national one and comprises the individual knowledge [2, p. 147-149].

We suppose the principle of defining encyclopedic/ intertextual competence in the way discussed above, may explain the reason why intertextual decoding inevitably evolves multiple levels of complexity for the reader.

The deciphering of the intertextual signs meaning becomes much more complicated in the case when the author and the reader of a literary writing belong to different socio-cultural communities with their own literary traditions. Thus, great responsibility is laid upon the translator of a piece of art who appears to be the first, the most careful and attentive reader, the interpreter and the mediator between cultures. The translator confronts the challenge to find the ways to convey the knowledge presupposed by intertextual signs.

The intertextual theory is developed rather many-sided today. The study of intertextuality is broad and ranges across many foci and definitions. Let us mention the theories of its founders – Julia Kristeva, Roland Barthes, Gérard Genette, Michael Riffaterre. The later research works belong to I. Arnold, I. Smirnov, P. Torop, B. Gasparov, L. Hutcheon, H. Plett, N. Fateeva, N. Kuzmina, G. Denisova, E. Chernyavskaya and many others. The viewpoints and results of different authors depend on their methods, materials, the taken approach and purposes. This fact is valuable in the quest towards a definition and categorization of intertextual relationships.

Although the theory is quite well-developed, a thorough analysis shows that there are very few scientific works at present which examine the possible ways to convey intertextual references when translating a text.

A Tartu University scholar, Peeter Torop, presents the most detailed model of transferring intertextual signs to a different culture in a book entitled *Total Translation*. In Torop's opinion, translation should be total. By "translation" the author means not only interlingual translation, but metatextual, intratextual, intertextual, and extratextual translation as well.

P. Torop postulates that there are two ways to achieve "adequacy" in translation of intertextual elements. They are *recoding* and *transposition.* Recoding conveys the expression plan of the translated text while the content plan is transposed. In Torop's theory, each type is subdivided into subtypes. Thus, recoding is presented by *exact translation*, *macro-stylistic translation*, *quotation translation, micro-stylistic translation.* The other four types of adequate translation belong to the transposing translation group*: descriptive translation, thematic translation*, *free translation, expressive (or receptive) translation* [3, p. 132-134].

Many theorists do not deny Torop's contribution into the intertextual and translation theories. However, they consider his model too complicated to put it into practice. Among them is G. Denisova who follows F. Schleiermacher and L. Venuti and distinguishes two methods of intertextual sign translation. They are *domestication* and *foreignization methods* in Venuti's terminology: "domesticating method – an ethnocentric reduction of the foreign text to target-language cultural values, bringing the author back home, and a foreignizing method, an ethnodeviant pressure on those values to register the linguistic and cultural difference of the foreign text, sending the reader abroad" [4, p. 20].

Z. Lvovskaya places an emphasis on rendering of *communicative force* of an intertextual reference in translation. According to the author, translation involves far more than replacement of lexical items between languages. Therefore, there cannot be a single ideal method of translation in the case. The translator can either manipulate the TT (target text) to make the intertextual meaning more or less explicit or can decide even to neglect an intertextual sign and do without it when translating. It may happen in case its communicative function is of little importance in his/her opinion.

Z. Lvovskaya suggests extension of the ST (source text), making comments and notes at the beginning or end of a literary work, compensation techniques and others as examples of translator's decisions [5, p. 82-88].

Her opinion is shared by I. Alekseyeva. She also acknowledges the fact that intertextual elements bring specific problems to the translator. Even in case the intertextual reference can be provided with "exact" translation equivalent it will never have the function it fulfilled in the source culture. So, Alekseyeva believes, the translator chooses the way of *conveying cognitive components* of the ST. As a result, the TT fails to show "the intertextual depth" and it is impossible as we cannot "transfer the whole iceberg of the cultural context which is inseparable from the history of a nation which gave birth to the ST" [6].

B. Hatim and Y. Mason point at the necessity of observing *author's intention* when transferring intertextual links to the TT. They stress the fact that "a text is not merely an amalgamation of bits and pieces culled from other texts. Nor should intertextuality be understood as the mere inclusion of the occasional reference to another text. Rather, citations, references, etc., will be brought into a text *for some reason* <…>. In travelling from source to host text, the intertextual sign undergoes substantial modification of its code" [7, p. 128].

Thus, the researchers say, in the case of intertextuality the principal aim for the translator is "to evaluate which aspects of the sign are to be retained and which aspects must be jettisoned in the act of transferring that sign into another language". As a result, the translator finds the solution whether it is reasonable to retain semiotic status, intentionality, linguistic devices which uphold coherence, to preserve the informational and extra-linguistic status. In practice "what actually gets transferred is a sign that has brought with it across semiotic boundaries its entire discursive history including new sign values which it has gathered on the way" [7, p. 133-137].

Let us take as examples translators' decisions from several translations of Mikhail Bulgakov's novel "The Master and Margarita" into the English language. These translations belong to Michael Glenny (1967), Diana Burgin and Katherine Tiernan O'Connor (1995), Richard Pevear and Larissa Volokhonsky (1997).

The novel is among the first in the Russian literature from the point of intertextual signs that are part of it. A great number of allusions and reminiscences refer the reader to the world famous literary works, world history and culture. In other words, they address his/her universal intertextual encyclopedia and in theory their recognition, understanding and transferring must not cause serious problems for the reader-translator.

In practice, it is so in many cases. For example, translators seem to encounter few problems when transferring the references that make Woland's character. Woland is the devil, the Satan, "Spirit of Evil and Sovereign of the Shadows". He has intertextual links to several literary characters but his main prototype is Mephistopheles from the Faust legend. Many references to Goethe's novel are translated in a very similar way by all the translators. There are just discrepancies in the choice of syntactical structures. One of the examples is the description of this character. Bulgakov names a walking-stick with a knob in the shape of a poodle's head as an accessory of Woland's image. In Goethe's novel Mephistopheles first gets to Faust by taking the form of a black poodle. The allusion is transferred in the following ways:

1. "a walking-stick with a knob in the shape of a poodle's head" [8].
2. "a walking-stick with a black knob shaped like a poodle's head" [9].
3. "a stick with a black knob shaped like a poodle's head" [10].

R. Pevear and L. Volokhonsky comment on the reference in the notes at the end of the book.

The analysis shows that not all intertextual elements which make the universal knowledge are transferred more or less the same.

For instance, the author chooses the name "*Lysaya Gora"* for the place of Yeshua's execution. It is a reference to Mount Golgotha where Jesus Christ was crucified. In the Hebrew language Golgotha means a skull or a hill in the shape of a skull. Thus, Bulgakov prefers the Russified version. In Glenny's translation we find "Mount Golgotha" [8]. The translator makes his choice in favor of the explicit way of conveying the intertextual meaning. But the TT lacks a very important item as a result: the author's intention to step aside from the traditional interpretation of the Gospel and to try to create his own version of those events. In the other two translations the variant "Bald Mountain" [9, 10] is used which answers the author's purposes. R. Pevear and L. Volokhonsky make a comment again.

The same picture is found when translating another Biblical reference – "*Povesheniye na stolbah"* – the way of the execution. Bulgakov avoids using the words "cross" and "crucifixion" in his novel intentionally. In English texts we find "crucifixion" (M. Glenny) [8] and "hanging on posts" (D. Burgin-K. O'Connor, R. Pevear-L. Volokhonsky) [9, 10].

The loss in the first translation can probably be explained by the fact it was made soon after the first full publication of the original and the absence of a great number of research papers dedicated to Bulgakov's work that appeared later.

There are intertextual signs in the novel that refer the reader to the realia and events of the Stalin epoch, remind of the politicians and typical characters and situations of the time. They form the national encyclopaedia of the reader and cause more difficulties for the translator.

Let us remember the episode at the Patriarch's Ponds when Berlioz does not feel well as if having a foreboding. The character thinks of going to "*Kislovodsk"* – the well-known place for the Soviet reader. Kislovodsk was a popular resort in the northern Caucasus where an ordinary Soviet citizen could hardly have a rest. The Kislovodsk health resorts were for members of the government and the Soviet elite. Writers had a chance to get there through the Literary Fund. Thus, the allusion plays a characteristic function in this case. It makes the reader understand the character is not an ordinary writer; he holds an important post and keeps to the order established by the ruling party. The translators transfer the reference in the following ways:

1. "I think it's time to chuck everything up and go and <u>take the waters</u> at Kislovodsk" [8].

2. "Maybe it's time to throw everything to the devil and go off to Kislovodsk" [9].

3. “Maybe it’s time to send it all to the devil and go to Kislovodsk” [10].

M. Glenny explicates the idea Kislovodsk is a resort when adds the phrase “take the waters” which the original does not contain. The other two translations just transcribe the proper name. Both TTs are supplied with translators’ notes. But D. Burgin and K. O'Connor do not comment on the reference anyhow. The final translation contains the following explanation: *Kislovodsk: Literally “acid waters”, a popular resort in the Northern Caucasus, famous for its mineral springs.* R. Pevear and L. Volokhonsky consider it important to emphasize the etymology of the proper name and the main purpose of visiting the city. The reference has lost its characteristic function.

Another interesting example is the reference to the Soviet power campaign that started in 1918 and then took place again in 1928-1929 and 1931-1933. The representatives of power-wielding structures confiscated foreign currency, gold, antiques and jewelry from people. It was the period when it was considered to be a patriotic duty to squeal on those ones who had any to the secret police. The discussed reference is implied in the episodes with the chairman of the house committee at 302B Sadovaya Street Nikanor Ivanovich Bosoi and especially in Chapter 15 (Nikanor Ivanovich’s Dream). The character dreams and finds himself inside a theatre where a voice from a black loudspeaker calls and says to hand over the foreign currency (*“... sdavaite valyutu”*). The translators seem to face no difficulties to translate the appeal:

1. “Hang over your foreign currency” [8].
2. “Hand over your foreign currency” [9].
3. “Turn over your currency” [10].

Although D. Burgin and K. O'Connor try to explain certain details in the comments (*foreign currency – it was a crime for a private Soviet citizen to possess it at this time without special permission. The state preferred to absorb all hard currency itself*), “the iceberg of the cultural context” (I. Alekseyeva’s term) [6] remains invisible for the English-speaking reader.

The intertextual world of the novel is also shaped by means of facts, names, events that refer the reader to the life of the author, his relatives and friends, other literary works of M. Bulgakov. Their understanding and decoding demand particular knowledge from the reader. The reader can draw this knowledge from biographic and critical literature and it forms his/her individual encyclopedia. The examples are quotations from earlier works of the author, relations of the Master and Margarita which reduplicate the author’s relations with his third wife Yelena Sergeevna, the Master’s misfortunes in the world of literature which are also Bulgakov’s ones and etc.

The analysis proves that such references are translated semantically but their deeper understanding depends on each of us, our background knowledge, the desire to get acquainted with the work of the author and his personality.

The conclusion emerges that we cannot but agree with R. Barthes who says that reading is hard work. Reading *is* work in case the reader holds a literary masterpiece in his hands. It appeals to his/her reading experience, demands his/her cultural and historical knowledge, intercultural and intertextual competence.

The translator of a literary work, being the most careful reader, becomes the mediator between the two cultures. It is clearly the task of the translator to find a solution to even the most insoluble problem. Such solutions may vary enormously when the task is to transfer the intertextual meaning of the ST. There is not and cannot be the one, unique translation strategy which would allow us to speak of the adequate transferring of intertextual components into a language of a different culture. The translation method is determined by the translator's interpretation, the situation, the communicative function of the element, author's intention, the potential reader of the ST, etc. Still losses are inevitable when transferring the intertextual layer of a literary work.

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Photoshop术语及其翻译成俄文

PHOTOSHOP TERMS AND THEIR TRANSLATION INTO RUSSIAN

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注解。 本文讨论了Photoshop术语的翻译功能。 这个主题在现代世界中非常重要，因为对于许多人来说，这个平面设计师的工作是非常必要的。 但是，如果不了解控制面板上显示的术语，则无法在Photoshop中工作。 在本文中，我们使用Photoshop词汇示例研究了各种术语和方法的分类，以便进行充分的翻译。

关键词 Photoshop，翻译，术语，特殊功能，术语分类，翻译。

Annotation. *This article discusses the features of the translation of the Photoshop terms. This topic is very important in the modern world, because for many people the work in this graphic designer is extremely necessary. However, working in Photoshop is impossible without understanding of the terms presented on the control panel. In this article, we study various classifications of terms and methods for their adequate translation using the example of Photoshop vocabulary.*

Key words. *Photoshop, translation, terms, special features, classification of terms, interpreter.*

In modern society, where some of the most popular and highly paid professions are associated with graphic design, everyone needs to know at least the basics of working in Photoshop. This program is considered the most popular graphic editor in the field of commercial photo editing tools. However, Adobe Photoshop allows you not only to edit and process photos, but also create your own illustrations. This is what attracts people of such professions as a photographer, illustrator, architect, designer, editor, plastic surgeon and engineer.

It should be clarified that the original version of Photoshop is available only in English, which for many people becomes a significant obstacle in the development of this graphic editor. If you can install the program by analogy with others, without delving into the essence of the instructions, then working in the editor itself without understanding the terms is very problematic. After all, the purpose of Photoshop is to use various tools and impose all sorts of effects. To do all this without knowing English is impossible. In this situation, the profession of the translator is useful, one of the aspects of which is the translation of various terms.

Defining the concept of the term, B.N. Golovin wrote: "The term is a unit of a specific natural or artificial language, possessing a special terminological meaning as a result of a spontaneously formed or special conscious collective agreement ..." [2, pp.18-19]. As with any phenomenon, the term must answer certain questions. Thus, the term should satisfy the rules and regulations of the respective language; the term should be systematic; the term is characterized by the property of definitivity, that is, each term is matched with a clear separate definition, focusing on the corresponding concepts; the term is characterized by relative independence of context; the term must be exact; the term should be short; the term should aim for unambiguity; the term is expressively neutral; the term should be harmonic [3].

For an adequate translation of the terms of Photoshop, the translator needs to understand that each term is followed by a specific action that, in one way or another, affects the original image. This means that the translator, to begin with, needs to determine which category the term belongs to. The following categories can be distinguished in this graphic editor:

1. effects (Hard Mix – Жёсткое смешение, Inner Glow - Внутреннее свечение);
2. commands (Open – Открыть, Paste – Вставить, Print - Печатать);
3. tools (Art History Brush - Художественная историческая кисть, Magic Eraser - Волшебный ластик).

After the translator has chosen the right category of the term, he can already have an idea of the possible variants of translation (verb in infinitive form or noun). The next step in the process of translating Photoshop terms, as E.V. Pavlova and T.G. Lapteva believe, is the differentiation of terms according to the structural basis, according to which they are divided into: a) single-word terms; b) terms-phrases [4].

With single-word terms, the translator understands everything. If in English this is a verb, then in Russian in this case it is translated as an indefinite form of the verb (Edit – Редактировать, Delete - Удалить). If this is a noun in English, then in Russian it will also be a noun without any changes (Distort – Деформация, Color - Цвет).

As for the working with terms-phrases, the main task of the translator in this case is the definition of the main word and its role in the phrase. In this case, it is not so simple, because many adjectives are reduced or are completely replaced by nouns, which significantly saves space and simplifies the visual perception of the graphic editor, but at the same time slows down the process of understanding the main task of a particular button. Vivid examples of this phenomenon include the following terms: “Layer Mask” - Маска слоя (“mask” ranks second in the phrase, but it is a definable word and already comes first in translation) and “Mosaic Tiles” - Мозаичные фрагменты (“mosaic” is in the first place and is the definition of the word “tiles”, in translation the word order does not change).

After all these classifications and parsing of terms, the translator proceeds directly to their translation. Translation of terms can be done in the following ways:

1. method of selection of equivalents;
2. method of transliteration / transcription;
3. translation from right to left;
4. translation from left to right.

The first two methods are applicable to single-word terms (monosyllabic or compound nouns), such as «Mix - смешение», «Mask - маска», «Brush - кисть», «Diffuse - диффузия» и «Export - экспорт». The essence of the method of selection of equivalents is that these terms can be used in various areas of society and have different meanings, however, in Photoshop they will have one specific meaning. The method of transliteration and transcription is characterized by the transfer of the English spelling of the word in Russian letters, regardless of its pronunciation. This method is usually used if there is no equivalent in English to the English term. However, transcription is undesirable because it does not adequately convey the content of the concept of the English term [1].

The second two methods are used to translate terminological phrases. The translation from right to left is suitable for phrases “noun + noun”, in which the second noun most often defines the first (Image Size - Размер изображения, Layer Comps - Состояния слоя). The translation from left to right is used with the constructions “adjective + noun”, where the first word in the phrase defines the second (Magic Wand - Волшебная палочка, Other Dynamics - Другая динамика).

Resorting to these methods, the interpreter can easily translate Photoshop terms from English into Russian. However, one should not forget about the ambiguity of words, which even in this context can be translated differently. The only solution to the problem in the case of a graphic editor is not to look through the dictionaries, but to study the program itself. If the translator knows all the commands and actions in the program in practice, then the translation of the terms of the editor will not cause him any difficulties.

Thus, the translation of Photoshop terms is based not only on the primary classification of actions (commands, tools and effects), the division of terms into groups (single-word, word-combinations) and the choice of the method of their translation from English into Russian, but also on the practical knowledge of the translator about this program.

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卡夫卡创意中的中国图案
CHINESE MOTIFS IN KAFKA'S CREATIVITY

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注解。 本文概述了弗兰兹卡夫卡作品（1883-1924）中的"中国动机"，并研究了他的书信遗产。 通过中国棱镜的研究，提出了每个伟大艺术家的身份问题。 值得注意的是，卡夫卡的中国与二十世纪初的天国的欧洲形象存在矛盾关系。 众所周知，卡夫卡致力于解决中国解决人类生命的永恒问题。 研究方法基于背景和解释分析。
关键词：中国，中国动机，弗朗茨卡夫卡，身份。
***Annotation**. The present article outlines the "Chinese motives" in Franz Kafka's works (1883-1924) and investigates his epistolary heritage. The problem of identity relevant for each great artist is presented in the research through the prism of China. It is noted that the China of Kafka is in the ambivalent relation to the European image of Celestial Empire dating from the beginning of the XX century. It is generally known that Kafka addresses China to resolve eternal problems of human life. The methodology of the research is based on contextual and interpretative analysis.*
***Keywords**: China, Chinese motive, Franz Kafka, identity.*

Creativity of Franz Kafka (1883-1924) is unique, a statement of this fact today is a generally recognized phenomenon. Kafka's uniqueness lies in the fact that he created his own artistic world, a kind of "aesthetic system" [5, p. 282], which, despite its seeming simplicity, is also incredibly difficult because the writer's small heritage is characterized by a certain sense frame - "semantic connectivity", which allows to consider it in the form of a "single text" [2, p. 7]. According to W. Eco's point of view, Kafka's work appears as an "open work", attempts to interpret Kafkian symbols only partly exhaust the possibilities of the work: in fact, it remains inexhaustible and open in its "ambiguity", because universally recognized laws, comes the world, based on ambiguity <...>" [8, p. 38].

Stories and parables, as well as diary entries and letters are not an exception in this sense, “even after thousands of years in the tomb”, they will sprout [1, p.58].

In this article, the starting point is the problem of identity, which, as is well known, includes various aspects - from the national-cultural identity to the understanding of their own "I". V.D. Sedelnik believes that Kafka, “the inhabitant of the Jewish ghetto” in Prague, “cannot be counted without reservation either as Austrian, or as Czech, or as German literature.” <...> And yet this German-speaking writer belongs to both the Austrian (primarily Austrian), Czech, and German cultures, and, moreover, European and world culture” [5, p.280]. It can be assumed that the problem of national identity for Kafka has always been very acute. According to Elias Canetti, “the only truly Chinese in its spirit writer who grew up in the West is Kafka” [3, p. 183]. In this connection, the point of view of B. Benjamin, who notes that among the ancestors of Kafka in ancient times, one can find a Jew, and a Chinese, and a Greek [1, p.16]. It should be noted that the reception of Chinese culture in the works of Austrian writers was considered earlier on the example of the works of Elias Canetti [7].

In 2016, in Germany, at the initiative of the Franz Kafka Society (die Deutsche Kafka-Gesellschaft), the China Kafka Conference (Kafkas China. Kulturwissenschaftliche Lektüren. 7.10-9.10. Erlangen –Nürnberg) [12] was held, that indicates the relevance of the topic. A monographic study of the Chinese Germanist W. Meng [15] still remains a fundamental study of the Chinese aspect in the works of Kafka. In recent decades, new studies of Kafka's art have appeared, in which the topic “China and Kafka” is viewed from different angles [9; 10; 11; 13; 14; 16; 17; 18; 19; 20; 21; 22; 23; 24 et al.]

A brief excursion into the history of the evolution of China in the minds of Europeans at the beginning of the XX century seems appropriate for this study. Traditionally, China from the time of Kafka (1883-1924) was often compared with the Austro-Hungarian Empire, which ceased to exist in 1918, and the Manchurian Empire of Qin (1644-1911) disintegrated in 1911 [15, p.17]. Kaiser Franz Joseph, ruling Austria-Hungary for almost seventy years, and the Chinese emperor from the story “How the Wall of China was Built” [4] are symbols of power, they were not perceived by contemporaries as real rulers.

The interest of the Old World to China at the beginning of the twentieth century was unusually great, but the ideas about the Celestial Empire were a kind of collective image, necessary, first of all, for opposing "East - West". “The flowering of the enthusiastic attitude towards the East” (die Blütezeit der Ostasien-Begeisterung) occurred in European society for the period from 1890 to 1925. [22, p.5]. Kafka is among the admirers of all Chinese, he associates China with some idyllic way, as well as with Chinese philosophy, primarily with Taoism, which dictates a person to follow the path indicated by nature, without interfering with the development of the world and man as part of this world.

In a letter to his bride, Felicia Bauer, dated November 24, 1912 (marked “after dinner”), Kafka refers to the poem “Deep Night” [6, p. 85-89], the author of which the Chinese poet Yang-Zen-Tsai (1716-1797) creates an image of a man who had sat up at night behind a book, his “beautiful girlfriend” complained. Kafka compares himself to a Chinese scientist, the image of a Chinese scientist (der chinesische Gelehrte) steeped in thought, detached from the ordinariness of everyday life, appears repeatedly in letters to Felicia, becoming a sign of self-identity.

From the epistolary heritage of Kafka there are many examples when the artist, describing his own internal state, addresses the topic of China. It is natural for him, he brings a book of poems by a Chinese author “from the next room”, she is always at hand, he values it. He is ready to rewrite the poem for Felicia. Kafka is pleased that Felicia, like him, is staying up late reading his letters. In one of the letters (January 14-15, 1913), Kafka again mentions the "Chinese scholar", attributing to Felicia the role of a faithful companion. Kafka believes that Felicia can become his tao. An attempt to tie the knot with Felicia seems to him an opportunity to change his life. Fearing life, he hopes for harmony with a kindred person, which, as we know, was not destined to happen.

Kafka fears that Felicia will deprive him of the opportunity to do his favorite thing until late, that she, like a Chinese woman, “will take his night lamp” (“reißt mir die Lampe weg”) [15, p.26]. Relationship with Felicia coincides with the work on the works, which in consequence will bring their author fame, this is the novel "The Verdict", "Transformation" and "In the correctional colony". Kafka is increasingly beginning to feel his destiny, the essence of which lies in self-expression through literature, so Felicia begins to cause him a sense of danger, a potential threat.

In 1916, in a postcard addressed to Felicia Bauer from Marienbad resort, Kafka calls himself Chinese: “<...> if I’ll be Chinese, which is already time to go home (and I’m essentially a Chinese and going home) <...> [6, p.569]. According to V. Maine [15, p.25-41], this sentence allows several readings from the perspective of various interpretative models: 1) in Marienbad there are many overweight people who have an excess weight, being thin (“ein so mageres langes Ding”, “klein und schwach“, Kafka unwittingly opposes himself to those around him, playing up stereotypes about plump Germans („dick wie ein Deutscher“) and his frail Chinese, thick tangerine and thin scientist, thick richer and thin poor, etc.; 2) Kafka brings together with Chinese, love for nature, desire for solitude, respect for elders, love for children m, of particular relevance to small animals and insects, as Canetti writes in detail in the essay "The other process. Franz Kafka in letters to Felice" [3], offering his version of the failed relationship with Felicia Bauer; 3) the lack of communication with the outside world, since China and “Chineseness” are associated in German literature with the notion of “alien”, etc.

Chinese motifs in the works of Kafka are considered on the material of the writer's epistolary heritage. On the one hand, Kafka fits well into the Chinese discourse of his time, shares the universal enthusiasm and enthusiasm of Europeans for China, on the other hand, identifying himself with the Chinese, he, as an artist, operates with generalized concepts and symbols. The study undertaken within the framework of the article does not claim to cover the problem. The Chinese aspect of Kafka implies a broader literary and historical context.

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俄罗斯在中国媒体中的形象
THE IMAGE OF RUSSIA IN THE CHINESE MEDIA

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Russia has always been of interest to all. Russia surpasses many countries in its territory and resources. But the country's economy in recent years leaves much to be desired, and other states, including China, have begun to notice and cover it. It would seem that the Chinese media can not be sufficiently aware of the internal situation in Russia. It may seem that it is much more interesting for them to consider foreign policy.

But the Chinese journalists studied in detail the economic situation in Russia, and came to the conclusion that the majority of Russians once again trusted Putin and elected him. According to many publications: “For the Russian people, it is a symbol of political stability and economic prosperity.” But the truth is, people are less interested in economics than politics. Everyone witnessed events in Ukraine, and, of course, against the background of all this, the people want to be sure of the security of their state. Although even foreign correspondents have noticed how unreasonably Russia manages its budget. So, Chinese journalist Lu Chen in his article says that Russia spends too much money on waging wars and ignores internal problems. In this regard, raised the retirement age, it is now believed that women can work up to 60 years without problems, although, if you follow the statistics, not all live to this age.

The second point that Chinese journalists cover is that Russia should improve relations with the West, because the development of the Russian economy is impossible without interaction with Western countries. Feng Yujun, rector of the China Institute of International Relations, writes: "Putin is able to raise the country's international authority and effectively counter terrorist attacks, but he is unlikely to be able to raise the standard of living of Russians."

In general, the Chinese media are very cautious in their statements, so they "coolly watch" from the outside. They also adhere to the strategy of China - they try not to quarrel with anyone.

Over the last period, the Chinese media covered in a greater degree the relations between Russia and China, and the activities of the Russian Federation, including relations with Ukraine and the fight against ISIL.

Chinese journalists themselves emphasize that relations with Russia are at the best stage of their development. They also agree that there are no political contradictions between Russia and China. In one edition, the author notes that the word "convenience" reflects the current state of Russian-Chinese relations. The Chinese media are quite positive towards Russia, they try not to touch on weak topics and to inform readers more about the positive aspects of Russian life.

For example, in June 2016, attention was directed to the visit of Vladimir Putin to China, which was timed to the 15th anniversary of the signing of the Treaty on Good-Neighborhood, Friendship and Cooperation between the Russian Federation and the PRC. Chinese journalists highly appreciated the documents signed during the visit, as well as the statement on strengthening global strategic stability.

The correspondent of the Chinese edition noted that the signing of three documents on cooperation at such a high level in one meeting is a rarity in modern international practice.

"Although relations between Beijing and Moscow are not perfect, they can certainly be considered outstanding for their time," writes a journalist from a Chinese publication. This tells us that the Chinese media are trying to show as much as possible how they are located in relation to Russia and want to continue to maintain friendly relations in the future.

Wang Jiabo said: "For the Chinese, Vladimir Putin personifies Russia and the Russian government. No wonder the American magazine put him in first place in the ranking of the most influential people in the world. And there is. He is highly respected in China. " There is even a joke among Chinese journalists: "If elections are held in China now, Vladimir Putin will win." First of all, the Chinese respect Putin for the fact that he does not bend before America, and this is very important today. The representative of the Chinese media also notes the particular speeches of Vladimir Putin, saying that he has every speech - this is a story.

The Chinese do not understand the culture of Russia, but on the other hand, the media does not give an opportunity to learn more about Russian culture, since they practically do not write about it. They try to publish sensational information, although Chinese readers would be interested to learn about the culture of Russia.

But the topic of Crimea's entry into the Russian Federation was practically not covered in Chinese media. They are more discussing the crisis in Ukraine, and the role of Russia in this situation, as well as a sharp aggravation of relations between Russia and the West.

As for the Russian-Turkish relations, the Chinese journalists here believe that they can not be called positive, they see no reason for establishing these relations. They believe that only Turkey needs Russia, and not vice versa.

In conclusion, it should be noted that Russia and China have friendly relations. Chinese media actively cooperate with the Russian. Joint media, television, radio, newspapers, and Internet media began to appear. The Chinese media objectively and in detail covers the main events of the internal political life of the Russian Federation, informing about the problems, but not focusing on them. And most importantly, Russia and China, no doubt, began to write a new page in the history of their strong friendship.

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教育活动是提高社会生活水平的工具
EDUCATIONAL CAMPAIGNS AS A TOOL TO IMPROVE THE STANDARD OF LIVING OF SOCIETY

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注解。 本文致力于通过高等教育机构开展的教育活动来分析提高社会生活水平的问题。 同样迫切的任务是需要将老年人引入现代技术和教育过程。作者考虑了为第三个年龄段的人创建教育活动的特征。
关键词：宣传活动，教育，教育活动，第三纪人，高等教育机构
Annotation. *The article is devoted to the analysis of the problem of raising the standard of living of society through educational campaigns conducted by higher educational institutions. No less urgent task is the need to introduce older people to modern technologies and the process of education. The authors consider the features of creating educational campaigns for people of the third age.*
Keywords: *communication campaigns, education, educational campaigns, people of the third age, higher educational institutions*

In order to understand the essence of communication campaigns, let us turn to the classics of public relations. D.P. Shishkin and S.L. Brovko argued that a PR campaign is a purposeful, systematic and complete set of actions aimed at solving a particular problem or task, supported by a strategic plan, carried out by a PR subject [1; eight]. Based on this definition, it is possible to identify the main features of communication campaigns: focus, problem-oriented, systematic, time-bound, performance. M. Gundarin and E. Gundarina argued that a PR campaign is a communication, mostly designed for a mass audience, with a clear execution algorithm, like any project, but aimed at solving tactical tasks, rather than achieving the strategic objectives of a commercial entity [one; 9]. It is necessary to clearly distinguish between public relations operating in the commercial sector, and vice versa. In addition, the majority of specialists in the field of public relations, like any others engaged in project activities, are concerned with two important questions: who is the target audience and how to correctly assess the economic effect of such an event. It is definitely impossible to answer here. Under the target audience refers to a united group of people on specific grounds: interests, hobbies, purpose, etc. Accordingly, in a communication campaign, the target audience is a group of people to whom your project will be directed. For example, an educational campaign is being created. The audience will be huge, since such a program can be developed for schoolchildren, for students, for pensioners, for civil servants, etc. In general, this issue does not cause difficulties. But the dispute arising in assessing the effect of such a project does not go unheeded.

Well-known specialist in the field of public relations - A.N. Chumikov is prone to such an approach as the creation of a quantitative assessment system [1; 134]. This is primarily due to objectivity, because nowadays there are no better quantitative indicators that accurately reflect aspects of reality. They can only be supported by qualitative indicators in the form of the results of a questionnaire or survey, which cannot be expressed by numerical indicators. Secondly, the simplicity and accessibility of the presentation of results. Ultimately, opinions on the issue of the evaluation system are ambiguous.

Communication campaigns can be classified according to various criteria: by scale, by type of basic subject, by type of target audience, by functional type. This article considers the educational campaign as a tool to improve the standard of living of society, related to the functional type of campaigns.

At the present stage of development of society, the problem of the standard of living of various segments of the population is the most urgent. This is primarily due to the fact that society is a dynamic system - it is constantly evolving. The development of society is undoubtedly influenced by many factors, such as: scientific and technical progress, the level of civic consciousness, the types of communications that take place in society, etc. However, there are many ways to create an individual's image of well-being with certain tools. These include modern information technologies [2; 142], and social levers of influence, psychological techniques to modernize the perception of a person’s being. Consider, for example, the most numerous group - people of the “third age” - pensioners. Undoubtedly, the quality of life of this category, like any other, depends on such aspects as the economic well-being of the state as a whole and the economic progress of the region in which it lives, as well as the policy pursued by the legislative and executive authorities with respect to certain strata, psycho - social awareness of their position in society, and of course, the degree of informatization of an actor in society.

Most sociological researchers suggest that, to a greater degree, the standard of living of a particular group depends on the quality of education. Classically, education refers to the process of transition from one role to another - “from schoolchild to student” with the acquisition of certain skills, knowledge and skills. But if we consider the educational process globally, this implies something else. Education is a communicative process that is accompanied by the transfer not only of actually documented information, but also of latent knowledge gained in the course of professional activity. Based on this, let us imagine how such information can be obtained by a group of people who have already completed the educational process [3; 103]. Let us ask ourselves where, in principle, "people of the third age" receive information. Undoubtedly, television, radio, print and so on. However, if you change the approach to obtaining information of this group by immersing them in the information space, it will most likely cause enormous changes in public consciousness and perception. The most effective tool for the implementation of such tasks can serve as educational campaigns. The peculiarity of such projects is based primarily on who is the target audience. For example, pensioners and children with disabilities make up a fairly large percentage of the country's population [4]. Pensioners make up about 30% of the population - 42 million people [5]. Accordingly, campaigns that are aimed at working with this kind of audience with a wide coverage will have great success, especially if the specifics of working with this kind of people are taken into account.

Secondly, educational campaigns need to be worked out in detail - to develop an objective system for evaluating the knowledge gained as a result of passing the program, which must be expressed in quantitative terms.

And finally, thirdly, the question of the practical application of the knowledge gained. It is necessary to confirm any theoretical aspect with practice, i.e. to conduct a theoretical and practical educational campaign.

Consider the individual subjects of the Russian Federation, which set out to change the attitude of older people to modern technology and the process of education. For example, in Moscow, the Education Center initiated an educational program to improve financial literacy in children with disabilities [6; 85]. This kind of social project is based on an exact algorithm of actions. To begin with, it was necessary to develop an educational program taking into account the characteristics of the target audience, in fact, just like for any project, regardless of the result.

In the Stavropol Territory, in Pyatigorsk State University, a social project was implemented - an educational program - “University of the Third Age: Restart”. The peculiarity of this project was directly the target audience - “people of the third age”. The program assumed that participants would take several educational modules, including a series of classes on information technology. According to the results of the study, it was found that the group that received such training received a number of advantages and skills that enabled them to overcome social barriers, to study and master modern technologies, including the Internet space.

Summing up, I would like to focus on how relevant social campaigns are at this stage in the development of society, since they perform a number of important functions:

1. Scale (meaning the globality of communicative processes).

2. Communication (educational campaigns - a model of social behavior, in which the interaction process is aimed at teamwork).

3. Promotion of social problems (educational campaigns as they come to fruition, they themselves represent one or another aspect of social tension, but at the same time, they can highlight a number of other problems growing in society).

Thus, educational campaigns are a key moment in the development of society. Carrying out an educational - educational function, within the framework of this kind of project, it is possible to focus attention on the most diverse problems of society, thereby expanding the scale of civic consciousness, creating new types of communication between actors. All this confirms the fact that educational campaigns are necessary for modern society.

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教育服务（高中教育计划）推广的特点
PECULIARITIES OF EDUCATIONAL SERVICES (HIGH SCHOOL EDUCATIONAL PROGRAMS) PROMOTION

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注解。 本文致力于分析高等教育机构推广教育服务的特点。 作者考虑了目标受众（学生和家长）的大学工作特点，以吸引申请者并提供教育服务。
关键词：高等教育，教育服务，目标受众，大学形象定位，大学营销研究
Annotation. *The article is devoted to the analysis of the features of the promotion of educational services conducted by higher educational institutions. The authors consider the features of the work of universities with a target audience (students and parents) in order to attract applicants and provide educational services.*
Keywords: *higher education, educational services, target audience, image positioning of university, university marketing research*

Educational service in modern terminology is a system of certain knowledge, acquired skills in the course of practice, a special level of thinking that satisfies the needs of the individual, society, state; educational and teaching activities; training professionals for consumers in public institutions or private organizations.

In order to be a worthy competitor in the field of educational services in the modern world, institutions need to actively express themselves in the external environment, as well as interact and communicate with their target audience. Initially, an educational institution needs a clear understanding with which target audience it is necessary to work in order for further progress to be most effective. The target audience is a group of people consisting of potential or actual consumers, who are influenced by the promotion program [1]. The specificity of the target audience in the field of educational services lies in the discrepancy between the recipient of educational services and the one who makes the decision to purchase the service. In our case, the consumer is a student, and parents (or their legal representatives) often make decisions about purchasing a service. Therefore, there is a need to develop two interrelated programs of exposure to prospective students and their parents.

The basic principle of working with parents is based on the principles of working in a business environment, because the decision to purchase a service, the main characteristic of which is its intangibility, is made on the basis of rational considerations. From this point of view, such indicators as the image and business reputation of the university come to the fore.

Analyzing the data of our research, we can conclude that students are rather poorly informed about many existing educational services. At least half of the respondents need information about a particular educational service. Our sociological survey showed that students have the greatest need for information about the following services in the field of education: obtaining a second higher education in universities in the region (61%), additional courses in a foreign language (57%) and personal growth courses (54%). Also, half of the respondents (52%) feel the need for information about internships, internships in foreign universities, and 50% of the respondents need information about master classes in employment and self-presentation. 48% noted that there is not enough awareness to get a second higher education in Russian universities. 44% have a shortage of information on programming courses, web design and computer graphics.

When promoting an educational service, an institution should form a positive image and a correct opinion about the quality of services, through publications in the media and online sites, through various activities that are aimed at promoting the educational environment and other tools. By promoting an educational environment, there is a possibility that the number of new customers and partners will be increased [2].

Maintaining an image requires systematic work with communication both inside and outside the organization. Image positioning of the university should be directed to different target audiences:

• The following indicators can be the basis for image positioning for groups of the public: the quality of student training, employment indicators and the importance of a university for a city, region, or the country as a whole.

• for applicants and parents it is necessary to focus on the relevance of university graduates and employment opportunities for students.

• for students it is important to emphasize the stability of the university in the region, country, world; its prospects for them as for students and future specialists (the possibility of further education, training, research, innovation, etc.).

• for teachers to focus on the idea of the importance of the university, its scientific schools, scientists, specialists.

• for the scientific, business and business community, the central idea of the image will be the positioning of the university as a cultural, scientific and innovation center of the region.

• for legislative and executive authorities, the role of a university in the training of highly qualified specialists for the national economy of the region and Russia, in the development of modern high technologies [3] can be a basic idea.

It must be remembered that the behavior of university staff in relation to their main consumers should be the main object of attention of the top management of an educational institution. It is important to remember that when forming a positive image of a university, a university brand is formed.

In order for an image to become a truly effective tool for the development of an organization, it is necessary to regularly examine the opinions of various groups of the public to determine the current image and adjust the concept to reflect the identified ideal image and time requirements. In the modern world, it is important for each image organization to have a website, after the promotion of which they conduct marketing research.

Conducting marketing research will get to know the site visitor, his interests, opinions, as well as use secondary information from the Internet and develop strategies and behaviors on this basis. Among other things, the site can become a center for the provision of consulting services, a center for the formation and communication of professional communities and the provision of other services [4].

The university website should develop and change in accordance with the changing demands of the audience, with the advent of new technologies, with changes in the external environment, as an effective tool for ensuring the activities of the university [5].

Thus, the conduct of marketing activities aimed at informing the target audience about the services of higher educational institutions, is the most important task of the university to attract applicants. Particular attention should be paid to such types of communication activities on the Internet as the development and development of the official information resource, its optimization for search engines, social networks, organization of communications with existing and potential students through social media tools and services. In the framework of marketing research, it is advisable to conduct research of your own resource, which includes conducting surveys, questioning, monitoring the attendance of a resource, collecting and analyzing marketing information. The development and use of Internet marketing tools in the promotion of educational services gives universities a competitive advantage, attracts applicants, students, graduate students, and contributes to the quality of education.

Today we can talk about a number of trends in the field of promotion of educational services:

• cooperation of educational institutions belonging to the same and to different levels of education;

• marketing of relations, which is manifested in the conclusion of agreements on cooperation with companies on staff development, on the opening of specialized classes in schools, etc .;

• Internet communications with external and internal public with a focus on the rule of "three clicks";

• development of Internet promotion technologies in the form of blogs, social networks;

• mobile marketing;

• development and promotion of its own brand;

• development of corporate identity;

• co-branding with commercial organizations;

• active interaction with the external public;

• consistent work of high schools with a youth audience in the logic “applicant - student - graduate”;

• working with internal audiences: students and staff;

• event PR: conferences, contests, festivals, participation of universities in exhibitions, etc .;

• promotion of universities through their own short programs on regional television;

• focus on active presence in the information space and trust relationships with target audiences;

• development of a variety of additional educational services [6].

Summing up, it should be noted that when promoting educational services, it is important to take into account the uniqueness of the service that is being put on the market, to determine the target audience for which the program of the educational service is aimed, and also to create the image of the enterprise that offers the service to the consumer. Creating an image should take into account the opinion of the target audience, how effective is information about a particular service. For this purpose, they use marketing research, thanks to which it is possible to track what the consumers of the service are more interested in, which should be given special attention in the further promotion of this educational service.

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奥塞梯国际民族旅游的发展
DEVELOPMENT OF INTERNATIONAL ETHNOTOURISM IN OSSETIA

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注解。 首先，本文致力于奥塞梯青年民族旅游的发展。 最近，奥赛梯人的人种学特征成为热门话题。 一般来说，人们的民族志吸引着任何好奇的人。尤其是奥赛梯人的民族志以其独特而令人兴奋的历史而着称。 他们的习俗非常有趣，人们不能对他们的文化漠不关心。 奥赛梯人的传统和仪式是如此丰富，多样和有趣，他们的研究拖延了这个人的历史

关键词：风俗，文化，山区河流，奥赛梯人的传统和仪式; 国际民族主义。

***Annotation**. The article is devoted, first of all, to the development of youth ethno-tourism in Ossetia. The topic of ethnographic features of Ossetians has recently become topical. In general ethnography of peoples attracts any curious person. Especially the ethnography of Ossetians beckons with its unusual and exciting history. Their customs are so interesting that one can not remain indifferent to their culture. Traditions and rituals of Ossetians are so rich, diverse and interesting that their study drags into the history of this people*

***Keywords:** customs, culture, mountain rivers, traditions and rites of Ossetians; international ethnotourism.*

Today the Republic of North Ossetia-Alania occupies a very insignificant place in the world classification of tourist visits, its share is only 0.002% of the global inbound tourism market. At the same time, being at the crossroads of the main routes of Eurasia, North Ossetia has a tremendous tourist potential.

The Republic of North Ossetia is located on the northern slope of the Greater Caucasus, bordered in the west by Kabardino-Balkaria, in the north by the Stavropol Territory, in the east by Ingushetia and Chechnya, in the south by Georgia and the Republic of South Ossetia. The capital is the city of Vladikavkaz.

Of the total area of 4121 sq. km occupied by lowlands and plains, the share of the upland is slightly less than half. In the North – Stavropol plain, South-Terek and Sunzha ranges in the Central part-North Ossetian plain. In the South-the Main or Watershed ridge Of the greater Caucasus. The highest point-mount Kazbek 5033m. In the mountainous part of the Republic, North of the Main ridge in parallel are four large ridge: Side, Rocky, Pasture and Wooded. Ridges cut by gorges, in particular Darial, Healthscope, Kurtatinsky, Kassirsha, Alagir and Digor.

Occupying a relatively small area, North Ossetia-Alania has unique natural and climatic features. Of the 11 climatic zones of the planet, 9 (from subtropics to high-alpine alpine meadows) are present in one form or another in the territory of North Ossetia-Alania. The animal world is very diverse here. In the republic there are 12 natural and historical reserves, 17 reserves and hunting farms. RNO-Alania is a country of rich history and ancient culture. More than 3 thousand archaeological, architectural, natural and cultural monuments have been preserved on the territory of the republic [1, p.14].

In North Ossetia, 2343 objects of cultural heritage are on state registration: 1312 of them are archeology, 918 history, 77 are architecture and 21 are arts. The cultural center of North Ossetia is the city of Vladikavkaz, which has preserved monuments of culture, history and architecture. Not far from the city is the village of Dargavs, in which the monument is located, which is part of the UNESCO World Heritage Site “The City of the Dead”.

The edge, so generously gifted with the beauty of nature, does not need advertising. Developing tourism in Russia as a whole, much attention is paid to subjects who have everything in order to become a meeting place for thousands of lovers of unique nature. You can see the mountain peaks behind the mists and clouds, breathe in the crystal air filled with the scent of amazing plants, feel the energy of the mountain river and meet the rarest animals of the planet right now.

Hospitable residents of the North Ossetian Republic with great love and devotion relating to their country, opened up new roads and new opportunities for tourism in North Ossetia to become developed and in demand. What are the roads led to the protected mountain gorges and the construction of huge tourist complexes in remote gorges. All this would have no weight if the North Ossetian Republic were not a real diamond, sparkling edges of which are high-mountainous ravines, such as Tsey, and the mighty Terek with its tributaries, and, of course, the handsome Kazbek, which cannot be subdued but climb at its summit is considered a great achievement among climbers around the world.

Mountain slopes with snowy peaks, whose height reaches about 4500 m. Five giant steps rise in the south and south-west of the Republic of North Ossetia-

Alania, the mountain ridges of the North Caucasus. More than a hundred glaciers descend from the ridges and about the same number of mountain rivers appear in their tongues. The largest glaciers of North Ossetia are Tsey and Karaugomsky, on which mountaineering routes are laid. The climate in the mountains is a bit peculiar. In the summer, during the daytime in the highlands it is very hot, and at night the air temperature drops sharply, winters are snowy and cold. The republic has great potential to attract tourists who prefer extreme types of tourism.

Caucasian mountains, waterfalls, historical and cultural monuments - North Ossetia attracts tourists with its natural beauty and originality. Guests here can offer several tourist destinations. For lovers of outdoor activities, ecological paths are created in nature reserves, mountain and hiking trails are developed. Also, visitors have the opportunity to improve their health.

The Republic of North Ossetia possesses rare resources of various types of medicinal mineral waters, which serve as the basis for creating a sanatorium-resort zone. About 260 outlets of various types of mineral waters have been studied on the territory, which are grouped in more than 40 fields. For example, the Karmadon healing source “Warm Source”, which is located at the source of the Genaldon river. The terrain is high above sea level and is almost always covered with snow. The contingent of patients here are: tuberculosis, rheumatics and various kinds of anemic. Every year the number of visitors increases, and most of the patients come here in the direction of doctors. Mineral springs of the Republic of North Ossetia - Alania are not inferior to the well-known Caucasian mineral waters in their healing properties. Therefore, the number of tourists who want to rule their health is growing.

Ethno-tourism in North Ossetia, which began with a detailed study of the unique customs and traditions of the local people, is also gaining its development and, one might say, new life. Visit the Ossetian wedding as a guest of honor or plunge into the world of the oldest traditions of artisans and needlewomen - this is where you can feel and understand the very “time connecting thread.” As mountain streams, merging, create the power of a large river, so the development of all directions makes tourism in North Ossetia modern and of high quality.

The population of RNO-Alania is an unsurpassed ethnic and religious society. Today, North Ossetia is the only Orthodox republic in the entire North Caucasus. In turn, the indigenous people of the republic are divided into ethnographic groups. Each group was able to preserve its long-standing traditions, folklore, folk crafts and linguistic appearance. Therefore, tourists are recently attracted by ethnographic tourism, the desire to learn the culture and history of the people [1, p.14].

All sorts of meetings and festivals, organized to expand borders and familiarize with the culture of the North Ossetian Republic, give tourists a unique chance to touch the past, and at the same time acquire for themselves the priceless works of the masters. Cherkessk, all stages, the manufacture of which is done by hand, or a unique, one-of-a-kind silver dagger, with a national ornament - all this cannot be found in modern boutiques, because these emeralds are hidden from a common world. The whole master classes on making various household items are opening. According to research, tourism in Russia and its subjects, to a greater extent, was developed precisely because of the preservation and restoration of traditional crafts and crafts.

Tourism in North Ossetia is an opportunity to see rare and sometimes extremely rare representatives of the fauna. Chamois and roes, bears and raccoon dogs, yaks and deer and many others, nowadays almost fabulous animals - here, very near, their home is the North Ossetian Republic. Much attention is paid to restoring the popularity of bison and leopard. Only in order to capture a picture of these animals, people are sent along difficult routes and float along raging rivers.

Political instability and other threats turned out to be more weighty arguments against inexhaustible resort resources and the powerful tourist potential of the region, the effective use of which will make it possible to obtain effective returns, create additional jobs, and involve specialists in various fields in the field of work.

On the one hand, the current state of tourism in the country is regarded as a crisis, due to a sharp drop in the volumes of tourist services that were achieved earlier, a reduction in the material base of the tourism industry and a significant discrepancy in the needs of the population in tourist services. On the other hand, there are high rates of construction of tourist facilities that meet the highest international standards, a significant increase in local visits to foreign travel, an increase in the number of tourist organizations throughout the country. Therefore, it seems relevant to assess the potential for the development of tourism in the region.

Assessing the state of tourism in the region, it should be noted that in recent years there have been some positive developments in the development of tourism in RNO-Alania. However, it is still difficult to call full-fledged development of this sector of the economy in the republic. At the same time, the development of the tourism market in RNO-Alania is characterized by a significant volume of services rendered, primarily in the field of international tourism, as well as by the growth in the number of companies engaged in this sector. Therefore, at the present time, a search is underway for new forms of work in the market and ways to solve the problems arising in this industry.

RNO-Alania has the necessary conditions for the effective development of the tourist and recreational sector of the economy. This is the advantage of the geographical location of the RNO-Alania northern slopes of the Central Caucasus, excellent characteristics of natural conditions.

The republic has a high potential for the development of ethnographic tourism, but the program providing for the formation of this type of tourism has not yet been worked out. For less than 5 years, the flow of tourists has increased 4 times and most of the tourists are interested in ethnic tourism. People want to get to know the Ossetian culture better. Each resort should have its own historical and cultural "highlight". In addition to the ski and spa components, the resort must have cultural and educational facilities. Consequently, the development of the ethnic tourism program in RNO-Alania is necessary in order to fully meet the needs of tourists.

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镁制剂对急性中毒性肝损伤代谢参数的药理作用
PHARMACOLOGICAL EFFECTS OF MAGNESIUM PREPARATIONS ON METABOLIC PARAMETERS IN ACUTE TOXIC LIVER DAMAGE IN THE EXPERIMENT

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Introduction. Acute toxic liver damage (ATLD) develops as a result of exposure of toxicants of various chemical structures, including drugs, to the body. Currently, more than 200 chemical compounds are known that cause damage to the membranes of hepatocytes, or its' dysfunction, leading to the development of a hepatitis clinic. The decisive role of hepatocytes in the implementation of metabolic homeostasis is indisputable. In this regard, no one doubts that acute or chronic liver damage causes severe metabolic shifts and organs and systems dysfunction (Zabrodsky P.F., Mandych V.G., 2007; Litvinova E.S. et al., 2012; Khamidulina Kh.H. et al., 2014).

Indomethacin is one of the drugs negatively affect the hepatocytes structure and function. Indomethacin is a non-steroidal anti-inflammatory drug derived from indole-acetic acid and is a potent inhibitor of prostaglandins synthesis. At the same time, this drug causes a number of side effects, including a pronounced hepatotoxic effect. In connection with the above, the Indomethacin model of ATLD was chosen in this experiment (Prokopenko L.G. et al., 1997; Lepekhova S.A. et al., 2014; Medvedeva S.Yu. et al., 2015)

Most of the enzymatic reactions in the body take place with the participation of coenzymes, which are different microelements. One of these elements is magnesium. Among of the pharmacological effects of magnesium preparations, it is to be noticed the vasomotor action, that improves the microcirculation during their administering. In addition, magnesium has a mild diuretic and choleretic effects, and individual magnesium compounds with high-energy structures, in particular ATP, lead to the appearance of membrane-protective and antioxidant properties in these compounds, as with advococard (Gavrilyuk V.P., et al., 2011; Morozova T.E., Durnetsova O.S., 2014; Zabrodsky P.F., and others, 2015).

The aim of the study was the experimental determination of the corrective effects of magnesium preparations on metabolic parameters in acute toxic liver damage.

Material and methods. The experiments were performed on 98 healthy mature rats of the Wistar line, weighing 150-200 g. All animals used, were raised in vivarium of the Kursk State Medical University, underwent a quarantine regime and had no external signs of sickness before the experiment. Groups of 10 - 12 animals formed to provide statistically reliable results. The scatter in the groups did not exceed 10% onto initial mass.

All studies were carried out at the same time of day, from 8 to 12 h, following the principles set forth in the «Convention for the Protection of Vertebrate Animals used for Experimental and Other Purposes» (Strasburg, France, 1986) and in accordance with rules of laboratory practice (GLP) of the Russian Federation (Order of the Ministry of Health of the Russian Federation No. 708н dated August 23, 2010). Animals were killed by an overdose of anesthesia drugs in 24 hours after the last injection of the test drug and / or toxicant. Toxic liver damage was modeled by administration of indomethacin at a dose of 5 mg / kg, intragastrically, three times in 24 hours (Saratikov A.S., 1995).

Blood sampling in experimental animals was carried out under anesthesia, by intracardiac injection. Plasma was obtained from heparinized blood by centrifuging for 5 minutes at 400 g. To assess the functional state of hepatocytes in the blood plasma, the activity of enzymes was determined: aspartate and alanine aminotransferase (AST, ALT), alkaline phosphatase (AP), gammaglutamine transpeptidase (GGT), as well as the content of total protein (TP), albumin, bilirubin , urea, creatinine, pancreatic amylase, thymol sample by standard methods of clinical biochemistry on an automatic biochemical analyzer COBAS c311 (Roche, Germany) with Analyticon® Biotechnologies AG reagents (Germany).

The prothrombin index (PTI) was determined by a clotting method on a semi-automatic analyzer of coagulation indexes “Start 4” (Stago, France) using «Human» reagents (Germany). The fibrinogen concentration was determined by the Clauss method with semi-automatic analyzer of coagulation indexes “Start 4” (Stago, France) with Diagnostica Stago reagents (France).

The intensity of lipid peroxidation (LPO) was assessed by the content of acylhydroperoxides (AGP) and malone dialdehyde (MDA) in plasma using a «TBA-Agat kit» («Agat-Med», Russia, thiobarbituric acid as chromophore agent) using the Apel-330 spectrophotometer (Japan) at a wavelength of 535 nm and 570 nm. To evaluate the state of the antioxidant system, we performed the method of direct / competitive enzyme-linked immunosorbent assay (ELISA) with the detection of reaction products in the wavelength range of 405-630 using ready-made commercial kits: «Bender Medsystems» superoxide dismutase (SOD) activity and catalase «Cayman Chemical» (USA). The total antioxidant activity (TAA) was determined by a method based on the degree of inhibition of ascorbate- and ferro-induced oxidation of Tween-80 to MDA.

All ELISA results were recorded using a Sunrise photometer microtablet, Tecan (Austria).

Dosing of preparations for administration to experimental animals was carried out using dosage conversion factors for rats and humans (mg / kg per mg / m^2) depending on body weight (FreIreich E.J., 1966). All animals were divided into groups: in the 1st group there were 15 intact animals, daily receiving a solution of sodium chloride (0,9%) for 14 days, in the 2nd group there were rats (18 animals) with a simulated ATLD, not treated with magnesium preparations. The 3rd group consisted of 22 rats with ATLD, daily receiving "Magnelis B6" *per os* within 14 days, the 4th group included 21 animals with ATLD, receiving «Panangin» after 24 hours for 14 days, and 5th group was composed of 22 rats with ATLD, administered «Magnesium plus B6», after every 24 hours for 14 days.

All magnesium preparations were standardized at the rate of 6 mg of magnesium per animal weighing 200 g. Administration of the toxicant was started 3 days before the end of the experiment.

Statistical processing of the research results was carried out according to the criteria of variation-statistical analysis with the calculation of average values (M), arithmetic mean error (m) using a computer program package. Differences with $p < 0.05$ were considered statistically significant.

Results. Compared with intact animals, there was a decrease in the level of albumin, de Ritis coefficient and an increase in the activity of pancreatic amylase, transaminases (AST, ALT), ALP, GGT, GGT / AST ratio, bilirubin, thymol, urea and creatinine levels in plasma of animals with experimental intoxication. This indicated the development of cytolytic, cholestatic, mesenchymal-inflammatory syndromes, and hepatocellular insufficiency syndrome. The administration of «Magnelis B6» to animals with ATLD corrected, but not up to the normal level, the activity of alkaline phosphatase, GGT, bilirubin, urea and creatinine. The use of “Panangin” in animals with acute toxic liver damage normalized the activity of alkaline phosphatase, and more pronouncedly compared with «Magnelis B6» corrected the activity of AST, GGT, GGT / AST (Table 1).

Table 1. *The effect of magnesium preparations on biochemical parameters of blood plasma during ATLD (M+m).*

Indicators	**Units**	**1**	**2**	**3**	**4**	**5**
		Control (0,9% sodium chloride)	**ATLD**			
			Without drugs	**Magnelis B_6**	**Panangin**	**«Магний плюс B_6» (Russia)**
Total protein	g/l	57,1±4,8	55,8±3,3	63,2±4,2	60,5±5,7	56,8±4,6
Albumen	g/l	30,2±3,3	21,1±2,4^{*1}	23,7±2,2^{*1}	20,9±1,8^{*1}	22,6±2,5^{*1}
AST	E/h•l	21,7±2,0	26,4±1,7^{*1}	25,2±1,9^{*1}	23,8±2,2	22,9±2,0
ALT	E/h•l	19,5±1,8	29,8±2,1^{*1}	27,6±1,87^{*1}	25,7±1,1^{*1,2}	24,3±1,04^{*1-3}
De Ritis coefficient	□	1,11±0,04	0,89±0,03^{*1}	0,91±0,03^{*1}	0,93±0,02^{*1}	0,94±0,02^{*1}
Alkaline phosphatase	E/h•l	241,5±14,8	295,3±10,8^{*1}	265,1±9,1^{*1,2}	260,4±10,2^{*2}	257,3±8,7^{*2}
GGT	E/h•l	4,9±0,3	11,8±0,9^{*1}	7,2±0,73^{*1,2}	8,54±0,6^{*1-3}	6,1±0,51^{*1,2,4}
GGT / AST	□	0,23±0,02	0,45±0,03^{*1}	0,29±0,02^{*1,2}	0,36±0,03^{*1-3}	0,27±0,03^{*2,4}
Bilirubin	µM/l	6,7±1,1	10,7±1,3^{*1}	8,1±0,9^{*1,2}	9,4±1,1^{*1}	7,9±0,61^{*2,4}
PTI	%	59,8±2,7	45,2±3,1^{*1}	56,5±3,2	60,3±3,7	59,1±3,3
TP	Unts. S-H	3,1±0,12	4,08±0,07^{*1}	4,1±0,06^{*1}	3,9±0,2^{*1}	3,6±0,23^{*1-3}
Urea	M/l	4,41±0,22	8,4±0,3^{*1}	6,3±0,43^{*1,2}	7,9±0,5^{*1,3}	6,45±0,34^{*1,2,4}
Creatinine	µM/l	60,5±2,7	81,2±4,3^{*1}	70,5±3,8^{*1,2}	72,4±4,1^{*1,2}	69,8±3,7^{*1,2}
Amylase pancreatic	E/h•l	60,5±3,1	78,7±4,03^{*1}	71,2±3,8^{*1}	68,5±4,1^{*1,2}	67,1±3,04^{*1,2}

Note: an asterisk indicates significant differences in arithmetic means (p <0.05); the numbers next to the stars are in relation to the indicators of which group these differences are given.

Table 2 *- Effect of magnesium preparations on the oxidative indices of blood plasma during PRP (M + m).*

Indicators	Units	1	2	3	4	5
		Control (0,9% sodium chloride)	**ATLD**			
			Without drugs	**Magnelis B_6**	**Panangin**	**«Магний плюс B_6» (Russia)**
MDA	μM/l	1,45±0,14	5,34±0,87[*1]	3,39±0,34[*1,2]	4,1±0,38[*1,2]	3,02±0,3[*1-3]
AGP	Arb.unt.	0,21±0,02	0,43±0,04[*1]	0,4±0,03[*1]	0,38±0,04[*1]	0,32±0,02[*1-3]
Catalase	mcat/l	11,1±1,2	12,5±1,04	10,8±2,5	13,1±3,2	11,8±2,7
SOD	Arb.unt./ml	8,9±0,37	6,1±0,7[*1]	7,5±0,4[*1,2]	6,34±0,5[*1,3]	7,73±0,46[*1,2,4]
TAA	%	50,2±3,6	44,3±2,8	46,8±3,1	51,2±4,3	47,04±3,3
CM_{NO}	μM/l	7,1±0,4	3,67±0,52[*1]	4,6±0,43[*1,2]	4,94±0,38[*1,2]	5,44±0,45[*1,2]

Note: an asterisk indicates significant differences in arithmetic means ($p < 0.05$); the numbers next to the stars are in relation to the indicators of which group these differences are given.

The most significant corrective effects were found when animals with ATLD « Magnelis B6» were injected, as they normalized the activity of alkaline phosphatase, GGT / AST, bilirubin level and, to a greater extent, the activity of GGT and AST (table 1).

When assessing the content of peroxidation products in the blood plasma of rats treated with a toxicant, activation of lipid peroxidation processes (increased levels of MDA and AGP), a decrease in SOD activity, CM_{NO} level was established. The administration of «Magnelis B6» in animals with ATLD corrected the content of MDA, CMNO, and SOD activity. Unlike the previous drug, «Panangin» corrected SOD activity less effectively. The most effective was the administration of «Magnelis B6», since there was a maximum correction of the content of MDA and AGP, CMNO, SOD activity (Table 2).

Conclusion. Thus, the administration of indomethacin in rats causes the development of biochemical syndromes of liver damage, the activation of lipid peroxidation, the decrease in the activity of antioxidant systems. The administration of magnesium preparations corrects the activity of hepatic enzymes, the level of metabolic products, and the degree of activity of antioxidant enzymes with varying degrees of effectiveness. However, «Magnelis B6» turned out to be more effective in treatment of indomethacin toxic liver damage.

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存在高血压的脑I和II期慢性缺血的代谢参数
METABOLIC PARAMETERS IN CHRONIC ISCHEMIA OF THE BRAIN I AND II STAGE WITH PRESENCE OF HYPERTENSION

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注解。 该研究的目的是根据疾病的阶段确定患有动脉高血压的慢性脑缺血（CBI）患者的代谢紊乱。 在库尔斯克地区临床医院治疗的这种病理学患者中，大多数研究的代谢参数与疾病两个阶段的定量和定性值相同。 结果表明，氧化应激，内皮功能障碍，脂质过氧化活化受到调节和相互联系，导致血管通量受到干扰，第一阶段进展起始的CBI受到干扰。 早在疾病的第一阶段就旨在降低临床表现严重程度的治疗可以恢复神经系统的正常活动并减少致残作用。
关键词：慢性脑缺血，代谢紊乱。
Annotation*. The aim of the study was to identify metabolic disorders in patients with chronic brain ischemia (CBI) with arterial hypertension, depending on the stage of the disease. In patients with this pathology treated at the Kursk Regional Clinical Hospital, most of the studied metabolism parameters turned out to be the same as in quantitative as qualitative values at both stages of the disease. The results make it possible to conclude that oxidative stress, endothelial dysfunction, activation of lipid peroxidation are conditioned and interconnected, which leads to the disturbance of vascular throughput and the CBI of first stage progression starting. Treatment aimed at reducing the severity of clinical manifestations as early as the first stage of the disease can restore normal activity of the nervous system and reduce the disabling effects.*
Keywords: *chronic brain ischemia, metabolic disorders.*

Introduction.

Cerebrovascular insufficiency is manifested by acute states (transient ischemic attack, ischemic stroke) and chronic brain ischemia (CBI). The environment deterioration and the increase of senior and senile age in most developed countries led to an increase in the proportion of cerebrovascular and neurodegenerative diseases in the overall morbidity structure of the population. The number of residents over 65 y.o. in the Russian Federation is about 20% at present time. Chronic disorders of the brain blood flow progress gradually and lead to diffuse or focal lesions with a large acute cerebrovascular accident risking (Gusev E.I. et al., 2009; Esin R.G. et al., 2016).

The successful development and implementation of the newest technologies into medical science made it possible to clarify ideas about the pathogenesis of brain ischemia and lay the basis of fundamentally new concepts of the cerebral circulation pathogenesis.

The initial links of this pathological chain that forms on the background of various risk factors are the primary systemic humoral (cytokine) response and, subsequently, endothelial dysfunction, resulting in impaired permeability of the blood-brain barrier.

The latter is due to impaired energy metabolism in the cells of blood vessels, which is primarily associated with impaired mitochondria. Endothelial dysfunction is closely associated with destabilization of atherosclerotic plaques and inflammation, and an imbalance between vasodilatative, vasoconstrictive, antithrombotic, proliferative and proinflammatory factors occurs (Gusev E.I., Chukanova A.S., 2015; Konoplya A.I. et al., 2015; Gavrilyuk, E.V., et al., 2016; Spencer, J.D. et al., 2014).

Formation and progression of CBI is usually multifactorial in nature, and in patients of older age it is also associated with proper involutionary changes in brain tissue. Typically, the individual patient combines several risk factors, the contribution of each of those is rather difficult. At the same time, none of them can fully explain neither the severity of neurological disorders, nor the nature of the disease course, which confirms the complexity of the mechanisms for the onset and progression of acute and chronic vascular cerebral insufficiency (P.R. Kamchatnov et al., 2012; Gusev E.I., Chukanova, A.S., 2015; Lukens J.R. et al., 2012). The literature does not cover the issues the studies factors ensuring the interaction of these pathogenesis' mechanisms at various stages of the onset and development of CBI, primarily immune and oxidative ones, knowledge of which makes possible to conduct the specialized pathogenetic pharmacological correction. (Gusev E.I. et al., 2009; Shurdumova M.Kh., Konstantinova Ye.V., 2013; Antipenko Ye.A. and others, 2015).

Objective: to identify metabolic disorders in patients with CBI with presence of arterial hypertension at various stages of the disease.

Material and methods. A total of 104 patients admitted the neurological unit of BME Kursk Regional Clinical Hospital participated.

All patients with chronic brain ischemia (76 women and 28 men) at the age of 50 ± 5 years underwent pharmacological correction of arterial pressure to the target level. The first main group consisted of patients with disease of the first stage (52 people). The second main group consisted of patients with second-stage hypertension (52 people). Laboratory parameters in 22 healthy donors (52 ± 2 years), which formed the control group 1 taken as a conditional rule.

Randomization of patients with CBI was carried out by gender, age, comorbidities, duration of the disease. Criteria for inclusion into the main group were: age from 40 to 60 years; the absence of concomitant diseases in the acute stage, the presence of CBI on the background of stage II hypertension, diagnosed 5 and more years ago in accordance with the recommendations of the World Health Organization and the International Society of Hypertension. The exclusion criteria were: symptomatic hypertension; pronounced or moderate atherosclerotic changes in the fundus vessels; cardiac rhythm and conduction disorders; chronic heart failure over II FC in accordance with the classification of the New York Heart Association (NYHA); hemodynamically significant stenos of the brachiocephalic and cerebral vessels, heart defects; myocardial infarction, post-infarction cardiosclerosis and progressive angina pectoris, or a history of indications for them; diabetes mellitus or impaired glucose tolerance.

All patients underwent a comprehensive clinical and instrumental examination according to generally accepted standards, while in all cases there was a verification of CBI diagnosis stage I and II.

Estimation of clinical and laboratory data in the main groups was carried out at the beginning of treatment. From 10 ml of heparinized blood by centrifugation, plasma and the erythrocyte mass were obtained, than which were settled into 20 ml of 10 mM Na-phosphate buffer (pH = 7.4) containing 0.9% sodium chloride and 3% dextran T -500, within 30 minutes at 37 ºC. After centrifugation, the supernatant was removed, and the erythrocytes were purified through HBS-cellulose. The sorption capacity of erythrocytes (SCE) (Togaybayeva AA and others, 1988) and the sorption capacity of glycocalyx (SCG) (Semko G.A., 1998) were immediately determined.

The lipid peroxidation (LPI) intensity in the blood plasma and erythrocytes was estimated using the TBA-Agat kit (Agat-Med Russia) by the amount of acyl hydroperoxides (AGP) and malonic dialdehyde (MDA). The optical density of the obtained solutions was measured on an Apel-330 spectrophotometer (Japan) at a wavelength of 535 nm and 570 nm. The state of the antioxidant system was determined by direct / competitive enzyme immunoassay with the detection of reaction products in the 405-630 wavelength range using ready-made commercial kits: Bender Medsystems (Austria) superoxide dismutase (SOD) activity and Cayman Chemical (USA) catalase activity. Total antioxidant activity (TAA) was detected by a method based on the inhibition degree of ascorbate- and ferro-induced tween-80 oxidation to MDA. The level of stable metabolites of nitric oxide (SMNO) was detected at a wavelength of 540 nm using a «R & D» enzyme immunoassay kit (England). In the blood plasma, the level of neopterin ("IBL", Germany), endothelin-1 (ET-1) ("Biomedica", Slovakia) and erythropoietin (EP) ("Biomerica", USA) was also determined by ELISA. Ceruloplasmin (CP) was determined by immunoturbidimetry (the «Sentinel» kit, Spain), and C-reactive protein (CRP) using the same method with the «Vector-Best» kit (Russia) on a «BTS-350» semi-automatic analyzer (BioSystems, Spain) .

To compare the qualitative parameters in the statistical processing of the results, we used the χ-2 criterion. To assess the membership of quantitative traits in the form of distribution, the Shapiro-Wilk test was used. For comparison of normally distributed values, Student's t-test was used. The statistical significance of differences in quantitative values with abnormal distribution was evaluated using the Mann-Whitney U-test and the Wilcoxon test (when comparing dependent groups). Values of normally distributed quantitative parameters are represented by the arithmetic average (M) with the error of the arithmetic average (m), and abnormally distributed values by the median (Me) with the interquartile interval (P25; P75). Relationships were established on the basis of factor analysis, cluster analysis, and Spearman's rank correlation coefficient. Differences were considered statistically significant at $p < 0.05$.

Results. Prior to the start of treatment at the system level (blood plasma) in the CBI stage I, activation of the processes of lipid peroxidation was established (an increase in the concentration of MDA and AGP, respectively, 3,6 and 5,7 times), a decrease in the antioxidant protection parameters (TAA 1,3 SOD activity 1,5, catalase 1,3 times). In addition, an increase in the level of SMNO by 2.8 times, a decrease in ET-1 and EP by 2.9 and 2.7 times and an increase in the concentration of inflammatory markers: neopterin by 1.6 times and CRP by 3.5 times (Table 1).

At stage II of the CBI, initially at the system level laboratory metabolic changes similar in focus compared with stage I were detected: activation of lipid peroxidation processes with a decrease in antioxidant protection factors, as evidenced by an increase in MDA and AGP levels in blood plasma respectively, 3.7 and 6.4 times, a decrease in antioxidant protection indexes: TAA by 1.2 times, SOD activity by 1.7 times, catalase by 1.4, and ceruloplasmin concentration by 1.3 times. An increase in the level of SMNO by 3.2 times, neopterin by 1.8 times, CRP by 3.2 times and a decrease in ET-1 and EP, respectively, by 2.6 and 3.1 times (table 1) were also revealed (Table 1).

In patients with stage I CBI, before starting treatment, red blood cells showed activation of peroxidation processes (an increase in the concentration of MDA and AGP, respectively, 5.0 and 4.0 times), a decrease in the antioxidant protection factors (TAA 1.4 times, SOD activity and catalase, respectively, 1.5 and 1.9 times). In addition, there was an increase in the SMNO level by 1.7 times and the indicators of sorption properties of erythrocytes: SCG by 1.6 times and SCE by 1.7 times (Table 2).

Patients with stage II CBI at admission to the clinic revealed laboratory metabolic changes in erythrocytes that were similar in orientation as compared to stage I: activation of lipid peroxidation processes with a decrease in antioxidant protection factors, as evidenced by an increase in MDA and AGP, respectively, 5 7 and 4.5 times, a decrease in TAA by 1.3 times, SOD and catalase activities, respectively, 1.7 and 1.9 times. Also, an increase in the level of SMNO by 2.1 times and a decrease in SCG and SCE by 1.6 and 1.7 times (table 2) were revealed.

Table 1. *Metabolic indices of blood plasma in CBI stage I and II before treatment.*

Parameters	**Meas.unit.**	**1** **Control (n=22)**	**2** **CBI-1 (n=52)**	**3** **CBI-2 (n=52)**
MDA	mM/L	0,9 [0,8; 1,0]	3,2*1 [3,0; 3,3]	3,3*1 [3,21; 3,52]
AGP	Conv.unit.	0,14 [0,11; 0,16]	0,8*1 [0,69; 0,84]	0,9*1,2 [0,85; 1,04]
TAA	%	44,3 [42,8; 46,1]	35,2*1 [33,5; 36,8]	35,9*1 [33,8; 37,1]
SOD	pg/ml	53,8 [51,5; 55,2]	35,6*1 [34,1; 36,6]	32,1*1,2 [30,1; 33,0]
Catalase	mCat/L	21,9 [20,5; 23,1]	16,9*1 [16,2; 17,2]	15,7*1,2 [14,7; 16,5]
Cerulolasmin	mg/dL	0,4 [0,3; 0,45]	0,4 [0,34; 0,45]	0,3*1,2 [0,24; 0,38]
SM_{ON}	mM/L	1,2 [1,05; 1,3]	3,4*1 [3,2; 3,6]	3,8*1,2 [3,7; 4,0]
ET-1	fmol/ml	2,3 [2,1; 2,5]	0,8*1 [0,6; 1,0]	0,9*1 [0,84; 0,95]
EP	ME/L	5,2 [5,0; 5,4]	1,9*1 [1,82; 2,06]	1,7*1,2 [1,6; 0,8]
CRP	mg/dL	1,2 [1,1; 1,4]	4,2*1 [4,0; 4,4]	4,9*1,2 [4,7; 5,1]
Neopterin	pg/ml	5,1 [4,9; 5,3]	8,2*1 [7,6; 9,0]	9,4*1,2 [9,1; 9,8]

Note: here and in other tables: the asterisk indicates significant differences in arithmetic means (p <0.05); the numbers next to the stars are in relation to the indicators of which group these differences are given.

A quantitative comparison of the number of disturbed metabolic parameters studied (mainly characterizing directly or indirectly oxidative disorders) revealed that with CBI and stage I and stage II, all 19 (100%) blood plasma and erythrocyte parameters studied were different from the normal values. At the same time, it was revealed that in stage I of the disease, 5 (26.3%) had a degree I of violation; and II and III, respectively, 6 (26.3%) and 8 (42.1%). In the group of patients with stage II disease with grade I, 4 parameters (21.1%) were violated; with II and III, respectively, 6 (31.6%) and 9 (47.4%)

Table 2. *Metabolic parameters of red blood cells in CBI stage I and II before treatment*

Parameters	Meas. unit.	1 Control (n=22)	2 CBI-1 (n=52)	3 CBI-2 (n=52)
AGP	Conv.unit..	0,2 [0,15; 0,28]	0,8*1 [0,72; 0,85]	0,9*1,2 [0,86; 0,93]
MDA	mM/L	0,3 [0,25; 0,36]	1,5*1 [1,4; 1,62]	1,7*1,2 [1,6; 1,9]
SOD	Conv.unit..	19,2 [18,1; 20,9]	13,2*1 [12,8; 14,0]	11,1*1,2 [10,1; 12,6]
Catalase	mCat/L	9,6 [9,2; 10,1]	5,0*1 [4,8; 5,3]	5,0*1 [4,5; 5,4]
TAA	%	31,1 [30,2; 32,8]	22,8*1 [21,1; 24,0]	24,3*1 [23,3; 26,1]
SMNO	mM/L	2,3 [2,2; 2,5]	3,9*1 [3,8; 4,1]	4,9*1,2 [4,7; 5,3]
SCE	%	32,6 [31,6; 33,2]	18,8*1 [17,4; 19,8]	19,4*1 [18,2; 21,0]
SCG	10^{-12} g/eryth.	1,6 [1,4; 1,9]	1,0*1 [0,92; 1,2]	1,0*1 [0,92; 1,1]

Conclusion. In the study, in patients with CBI, most of the metabolic laboratory parameters studied turned out to be the same in quantitative and qualitative terms at both stages of the disease. These results can be considered as the presence of oxidative stress already at the stage I of CBI, which is expressed in the interrelated indicators - endothelial dysfunction, activation of POL. These changes lead to a vessel permeability violation and the progression of CBI, in which the energy deficit becomes the main patho-biochemical component of the of cellular, tissue and organ ischemic syndrome. Brain hypoxia triggers a cascade of pathological and physiological mechanisms that lead to brain tissue damage. Fundamental and clinical data currently obtained allow us to consider as primary effects of cerebral ischemia a decrease in the delivery of energy metabolism substrate, delayed elimination of lactic acid, neurotransmitters and toxic substances involved in the ischemic cascade. In areas of the brain subject to ischemia, energy deficiency, transition to anaerobic glycolysis, accumulation of calcium ions in cells, metabolic acidosis, and “oxidative stress” develop, which, in turn, leads to peroxidation of cell membrane proteins and lipids. (Kamchatnov P.R. and others., 2012; Shurdumova M.Kh., Konstantinova E.V., 2013; Antipenko E.A. and others, 2015; Konoplya A.I., Shulginova A.A., 2016).

A hallmark of pathological changes in chronic cerebral ischemia is currently considered cerebral endothelium dysfunction, the laboratory display of which are altered levels of markers in the blood (nitric oxide, endothelin-1, homocysteine, vascular endothelial growth factors, etc.) before debuting symptoms of CBI. The clinical picture of CBI stage I is determined by non-specific neurological and psycho-emotional manifestations, which are the criteria for the diagnosis of this disease. Quite often, their clinical severity is insignificant and does not always reflect the true severity of the condition, the degree of CNS damage and the prognosis of the disease.. If not to take into account the main complicating factors indicators such as the plasma concentration of LDLP and VLDLP, blood coagulation indexes, the results of laboratory examination are practically not used at diagnosis (Karpov Yu.A., 2010; Fateeva VV, Vorobyeva O .B., 2017).

However, the importance of identifying early clinical and laboratory signs of CBI is due to the fact that appropriate therapeutic measures are most effective in the early stages. Treatment reducing the severity of clinical manifestations at stage I of the disease, restores the normal nervous system activity and prevents disability, which reduces the medical and social significance of this nosological form of the disease (Kamchatnov P.R. et al., 2012, 2016; Konoplya A. I. et al., 2015).

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支气管阻塞的肺量测定指数«肺年龄»和社区获得性肺炎预后量表的动态指标

SPIROMETRY INDEX OF BRONCHIAL OBSTRUCTION «LUNG AGE» AND THE DYNAMICS OF THE INDICATORS OF PROGNOSTIC SCALES IN COMMUNITY-ACQUIRED PNEUMONIA

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注解。 社区获得性肺炎(CAP)是最重要的肺炎组。 CAP的严重程度受肺通气功能速度指标变化的特殊性影响。 该研究的目的是研究肺部通气功能的速度指标以及住院治疗阶段CAP患者CRB-65和SMRT-CO预后指标的动态变化。 在传统抗生素治疗的背景下,支气管通畅受损的指标,以及死亡风险,呼吸支持和血管加压剂的需求显着降低,已经出现了显着的积极趋势。

关键词：社区获得性肺炎，第一秒用力呼气量，6秒用力呼气量，“肺龄”，预后量表。

Annotation. *Community-acquired pneumonia (CAP) is the most significant group of pneumonia. The severity of CAP is influenced by the peculiarities of changes in the speed indicators of the ventilation function of the lungs. The purpose of the research is to study the speed indicators of the ventilation function of the lungs and the dynamics of the indicators of the prognostic scales CRB-65 and SMRT-CO in patients with CAP at the inpatient treatment stage. Against the background of traditional antibiotic therapy, a significant positive trend has been registered in terms of indicators of impaired bronchial patency, as well as a significant reduction in the risk of mortality, the need for respiratory support and vasopressors.*

Keywords: *community-acquired pneumonia, forced expiratory volume in the first second, forced expiratory volume in six seconds, "Lung age", prognostic scales.*

Pneumonia is a group of different in etiology, pathogenesis and morphological characteristics of infectious diseases, characterized by focal lesions of the respiratory departments of the lungs with the obligatory presence of intra-alveolar exudation [2]. Community-acquired pneumonia (CAP) is a widespread disease in adults, occupying a leading place in the structure of morbidity and mortality from infectious diseases in developed countries [3]. An important direction of the state policy in the sphere of public health is the preservation of the health of the able-bodied population, on which the socio-economic development of the country directly depends. In the next three to four years, the working-age population in the Russian Federation will decrease by 4.6% to 82.6 million in 2016. This is stated in the official forecast of the balance of labor resources, prepared by the Ministry of Labor and Social Protection of Russia.

According to foreign epidemiological studies, the incidence of CAP in adults (> 18 years old) varies widely: in young and middle-aged people, it is 1-11.6 ‰; in older age groups - 25-44 ‰. During the year, the total number of adult patients (> 18 years) CAP in 5 European countries (Great Britain, France, Italy, Germany, Spain) exceeds 3 million people [2].

The presence of broncho-obstructive syndrome as a result of local obstruction (inflammatory edema of the bronchial mucosa) and / or mechanical obstruction of the airways by endobronchial contents, as well as local or generalized bronchospasm makes the clinical picture more difficult and requires additional analysis of pathogenetic CAP therapy [1].

The purpose of the study is to study the speed indicators of the ventilation function of the lungs and the dynamics of the indicators of the prognostic scales CRB-65 and SMRT-CO in patients with CAP at the inpatient treatment stage.

The survey included 14 men and 16 women of middle age (47,03 ± 3.2 years). Patients had a mean (53.3 ± 9.1%) and severe (46.7 ± 9.1%) CAP course. The duration of the disease at the outpatient stage was 8.23 ± 1.05 days, during which 43.3 ± 9.05% of the subjects used antibacterial therapy. All patients were first admitted to hospital with a diagnosis of CAP. In order to assess the severity of the broncho-obstructive syndrome, we conducted a study of the function of external respiration, which was carried out using the Vitalograph copd-6 spirometer (Vitalograph Model 4000, Ireland). According to the results of functional pulmonary tests, the following indicators were recorded: forced expiratory volume in the first second (FEV1), forced expiratory volume in six seconds (FEV6), and "Age of the lungs." The use of clinical prognostic scales made it possible to promptly assess the risk of an unfavorable CAP prognosis [2, 5]. The probability of death was estimated on a CRB-65 scale. Patients requiring intensive respiratory support and vasopressor infusion were identified using the SMRT-CO scale. To interpret these scales, the following parameters were estimated: age, impaired consciousness, frequency of respiratory movements, level of systolic and diastolic pressure, x-ray data of the chest organs, heart rate. The minimum number of points was 0, the maximum was 4. The prognosis and the severity of the disease were evaluated on admission, on the 3rd, 7th day of hospital treatment and on discharge from the hospital.

The calculation of arithmetic means of the studied parameters and their standard deviations, the study of the type of distribution was carried out using software packages Microsoft Ecxel 7.0, Statgraphics Plus 3.0 and SPSS 9.0 for Windows. When comparing the mean values, in the case of equal variances, the homoscedatic t Student's t test was used, for different variances - heteroscedatic. The calculations were carried out in a 95% confidence interval. Data are presented as M ± m.

Table 1 shows the structure of groups of patients with CAP in accordance with the level of FEV1. A traditional (p <0.05) increase in the number of patients with FEV1 levels> 80% and a significant (p <0.05) decrease in the number of patients with impaired bronchial patency (FEV1 <80%) were registered against the background of traditional antibacterial therapy, as in 12 and 18 hours.

The dynamics of spirometry in patients with CAP who are treated at hospital is presented in Table 2. Against the background of ongoing inpatient therapy, there was a tendency to an increase in the FEV1 and FEV6 indicators, without a significant increase

Table 1. *The structure of the group of patients with CAP by FEV1 level*

Observation time	FEV1 (%)	Treatment day						Statistical significance of differences
		I. 1st day		II. 7th day		III. 14th day		
		Number of patients	%	Number of patients	%	Number of patients	%	
12:00	>80	1	3,3	1	3,3	8	26,7	P I-III<0,05 P II-III<0,05
	<80	29	96,7	29	96,7	22	73,3	P I-III<0,05 P II-III<0,05
18:00	>80	-	-	3	10	14	46,7	P II-III<0,05
	<80	30	100	27	90	16	53,3	P I-III<0,05 P II-III<0,05

Table 2. *Dynamics of spirometric parameters in patients with CAP*

Spirometric indicators	Observation time	Treatment day		
		1st day	7th day	14th day
FEV1 (%)	12:00	49,2±9,1	62,03±8,9	72,3±8,2
	18:00	49±9,1	57±9,04	71±8,4
FEV6 (%)	12:00	45,5±9,09	54,4±9,09	62,8±8,8
	18:00	44±9,06	51±9,1	63±8,8

Note: the differences in the subgroups of the examined patients are not significant (p> 0.05)

Changes in the mean values of "Lung age" in CAP patients are presented in Table 3. A significant decrease in the mean values of the indicator "Lung age" was recorded with the ratio of the 1st and 7th day of therapy (p <0.01), as well as the 1st and the 14th day of supervision (p <0.001) with the control of respiratory functions at 12 o'clock. When registering spirometry at 18 o'clock, a significant decrease in age-related pulmonary dysfunction was recorded when comparing the 7th and 14th day of treatment (p <0.05), as well as the 1st and 14th days of treatment (p <0.001).

Table 3.

Изменение средних показателей «Возраст легких» у больных CAP

Respiratory function index	Observation time	Treatment day			Statistical significance of differences
		1st day	7th day	14th day	
Lung age	12:00	98,72±3,7	84,1±3,9	75±3,6	P I-II<0,01 P I-III<0,001 P II-III>0,05
	18:00	97,7±4,1	89,4±4,3	78,7±3,1	P I-II>0,05 P I-III<0,001 P II-III<0,05

The dynamics of predictive scales is presented in table 4. When comparing the indicators of the CRB-65 scale, when entering the hospital with the 7th day of curation and the level of points at discharge, there was a significant (p<0.05) decrease in average values. According to the results of the analysis of the modified scale SMRT-CO significant decrease in scores occurred in the ratio of the average values of the 1st to the 7th day of observation and data at discharge from the hospital (p<0.01), as well as when comparing the indicators of the 3rd day of curation with the data at the end of therapy (p<0.05).

Table 4. *Dynamics of CRB-65 and SMRT-CO in patients with CAP*

Treatment day / Indicators	I. On admission	II. 3rd day	III. 7th day	IV. At discharge	Statistical significance of differences
CRB-65 (points)	0,73±0,16	0,45±0,14	0,32±0,1	0,27±0,09	P I-II>0,05 P I-III<0,05 P I-IV<0,05 P II-III>0,05 P II-IV>0,05 P III-IV>0,05
SMRT-CO (points)	0,59±0,14	0,32±0,12	0,14±0,07	0,05±0,04	P I-II>0,05 P I-III<0,01 P I-IV<0,01 P II-III>0,05 P II-IV<0,05 P III-IV>0,05

The direct average strength correlation (r=0.52) between the CRB-65 and SMRT-CO scales was registered only on the 1st day of the curation.

Thus, empirical drug therapy without the inclusion of bronchodilating agents contributed to the compensation of reduced airflow rates and a significant reduction in the risk of mortality, the need for respiratory support and vasopressor in patients with CAP. According to some authors [5], the decrease in the speed indices of the ventilation function of the lungs with CAP is due to extrapulmonary factors: general weakness, weakness of the respiratory muscles, disregulation of respiratory movements caused by inflammatory intoxication.

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代谢紊乱纠正的可能性在子宫腺肌症患者中
POSSIBILITIES OF METABOLIC DISORDERS CORRECTION IN PATIENTS WITH ADENOMYOSIS

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抽象。

目的：研究免疫调节剂，抗氧化剂和膜保护剂在子宫腺肌病患者传统药物治疗中的有效性。

材料和方法。该研究涉及57名经验证的子宫腺肌病患者。为了在月经周期的3-7天期间验证诊断，进行盆腔小器官的超声进行进一步的宫腔镜检查并同时从子宫腔取出抽吸物。在系统（循环血浆）和局部（子宫腔，红细胞的抽吸活检）水平评估脂质过氧化过程（LPO）和抗氧化系统状态的强度。

结果：子宫腺肌病患者将POL激活与氧化应激，内皮功能障碍和免疫炎症的发展相结合。免疫调节剂，抗氧化剂和膜稳定药物在子宫腺肌病的标准治疗中的应用纠正了免疫炎症进展，平衡氧化应激，恢复抗氧化酶的活性，降低脂质过氧化的强度，从而稳定细胞膜。

结论。基于病理学上合理地将免疫调节，抗氧化和膜保护药物纳入标准治疗/子宫腺肌病的全身表现是可能的/

关键词：子宫腺肌病，矫正，代谢作用，红细胞。

Abstract.

Objective: *To study the effectiveness of immunomodulators, antioxidants and membrane protectors in traditional pharmacotherapy of patients with adenomyosis.*

Materials and methods. *The study involved 57 patients with verified adenomyosis. In order to verify the diagnosis in the period of 3-7 days of the menstrual cycle, an ultrasound of the pelvic minor organs was carried out with further hysteroscopic examination and simultaneous taking of aspirate from the uterus cavity. The intensity of lipid peroxidation processes (LPO) and the antioxidant system* *status were evaluated at system (circulating blood plasma) and local (aspiration biopsy of the uterine cavity, erythrocytes) levels.*

Results: *Patients with adenomyosis have a combination of POL activation with the development of oxidative stress, endothelial dysfunction and immune inflammation. The use of immunomodulators, antioxidants and membrane stabilizing drugs in standard therapy of adenomyosis corrects the immune inflammation progress, levels oxidative stress, restores the activity of antioxidant enzymes, reduces the intensity of lipid peroxidation, thereby stabilizing cell membranes.*

Conclusion. *The leveling of adenomyosis systemic manifestations is possible on the basis of pathogenetically justified inclusion of immunomodulatory, antioxidant and membrane-protective drugs to the standard therapy/*

Key words: *adenomyosis, correction, metabolic effects, red blood cells.*

Endometriosis is a multifactorial disease, based on interrelated, probably hereditary components of pathogenesis, which include abundant proliferation; nonphysiological angiogenesis; inadequate local immune response; aseptic inflammation [1-5].

The complexity of the endometriosis pathogenesis makes it difficult to choose drugs for optimal impact on the main parts of progression of this disease. The literature actively discusses the use of antioxidants and immunomodulators, which along with hormonal preparations in the standard treatment corrects changed clinical and biochemical parameters and reduces the severity of clinical symptoms [6-12]. However, the small number of such studies and the ambiguity of the results obtained necessitate further in-depth studies.

Based on this, **the objective** of the assay was to study the effectiveness of immunomodulators, antioxidants and membrane protectors in the traditional pharmacotherapy of adenomyosis.

Materials and methods: 57 patients participated (main group (OG)) with verified I – II degree adenomyosis [1], confirmed by clinical and instrumental methods (ultrasound and hysteroscopic research), examined at the Lipetsk Regional Perinatal Center in 2014–2017.

All patients were randomized by age (34.7 ± 2.6 years), body mass index (no more than 26 kg / m2). The control group (CG) was formed over the same period of time from a contingent of gynecologically healthy women and accounted for 38 patients. The severity of menstrual blood loss was determined by the illustrated pictogram (Wyatt, 2001) [13]. In order to detect latent iron deficiency, serum ferritin levels were determined by immunofluorescence based on the detection of fluorescent labeled molecules. The content of ferritin from 5 to 15 ng / ml was regarded as an indicator of latent iron deficiency [13]. Patients with extragenital pathology in the acute stage, acute bacterial and viral infections, blood diseases, gastric ulcer and duodenal ulcer, necrotizing ulcerative colitis, cancer, administering anticoagulants, disaggregant agents, nonsteroidal anti-inflammatory drugs were excluded from the examination.

Patients of the experimental group received accepted clinical and laboratory examination: on days 3-7 of the menstrual cycle - ultrasound examination of the *pelvis minor* organs, hysteroscopic examination with simultaneous removal of aspirate from the uterus. After verification of the diagnosis, all EG (experimental group) patients received standard treatment (ST) (Clinical Guidelines of the Ministry of Healthcare of 2016 [1]), including Dienogest («Vizanna») at a dose of 2 mg / day *per os* for three months.

19 patients received the standard treatment only (1st subgroup).

The 38 examined patients from the experimental group received various combinations of antioxidants, immunomodulators and membrane protectors additionally to the standard treatment, and were divided into two subgroups.

20 patients (2nd subgroup) in addition to the standard treatment received Sodium ribonucleate solution («Ридостин») 1.0 i/m in 48 hours N 5; «Hypoxenum» («Гипоксен») 1 tab. per os 3 times a day, N 30 and phospholipids («Essentiale forte H») 2 capsules 3 times a day with meals N 10.

18 patients (subgroup 3) additionally administered solution «Inosine + Nicotinamide + Riboflavin + Succinic Acid» («Цитофлавин») intravenously 10 ml 2 times a day for 7 days; Meglumine acridone acetate («Cycloferon») - 3 tab. per os in 24 hours N 10, and solution «Glycyrrhizic acid + phospholipids» («Phosphogliv») intravenously in 10 ml each after 24 hours N 7.

All drugs were administered in accordance with the recommendations set forth in the Federal Manual on the Use of Drugs (formulary system) [14].

Laboratory studies were carried out on admission of patients and on the 15th day. The intensity of lipid peroxidation (LPO) was assessed at the system (circulating blood plasma) and local (aspiration biopsy of the uterine cavity) levels. Clinical and biochemical indicators of patients CG taken as a conditional rate.

Erythrocytes and plasma were obtained from 10 ml of heparinized blood after centrifugation. The erythrocyte mass was subjected to additional purification on a chromatographic column through HBS-cellulose, followed by determination of the sorption capacity of glycocalyx (SCG) [15]. The LPO processes were evaluated by the content of acylhydroperoxides (AGP) and malonic dialdehyde (MDA), forming a colored complex with a thiobarbituric acid [16]. The state of antioxidant system (superoxide dismutase activity (SOD), catalase), the level of stable nitric oxide metabolites (CMON), and neopterin were determined by direct / competitive solid phase enzyme immunoassay [16-20].

Blood plasma levels of α1-antitrypsin (α1-AT), α2-macroglobulin (α2-MG), ceruloplasmin (CP), C-reactive protein (CRP) by immunoturbidimetry were detected.

The statistical analysis of the results was carried out using the Microsoft Excel software package, 2010. The reliability of the differences was evaluated by the U-criterion. Significant differences were statistically considered with $p < 0.05$.

Results. The main complaints of patients in the experimental group referred to dysmenorrhea (78%), chronic pelvic pain (65%), dyspareunia (72%), and the inability to conceive during regular sexual life without contraception (48%).

The age of menarche among the patients of the main and control groups was co-posited, and was 13 ± 1.4 years ($p_{1\text{-}2} > 0.05$). The amount of menstrual blood loss in the EG was 134 ± 10.2 ml, which is almost three times higher than the results obtained in the CG. The level of ferritin among EG patients was 10.6 ± 1.2 ng / ml, which was significantly lower in comparison with the CG data (84.6 ± 4.9 ng / ml). The vast majority of EG patients (72%) had one or more pregnancies in history, and in 78% of births passed *per vias naturalis*. 84% of women in the CG had no intrauterine manipulations. In every third patient (31.2%) of EG patients, delivery was performed by cesarean section. 86% of women underwent instrumental emptying of the uterus due to abortion.

The data of the ultrasound study in the EG in 15% of cases revealed heterogeneity, fuzziness of the endometrial contours in combination with multiple hypo- and hyperechoic inclusions in the myometrium extending to more than 1/3 of its depth.

In 85% of cases, pathognomonic ultrasound signs of diffuse adenomyosis involved more than 2/3 of the myometrium depth. The data of the clinical and ultrasound picture in 92% of the observations were confirmed by the results of hysteroscopic examination.

At the date of admission to the clinic, patients with adenomyosis at the system level (in blood plasma) showed an increase in MDA by 2.6 times, AGP by 4.7 times, a decrease in the number of antioxidant protection factors (TAA by 1.3 times, level CP 1.5 times, SOD and catalase activity 4.8 and 1.2 times, respectively). In addition, the plasma concentration of neopterin increased by 2.3 times, α2-MG by 1.5 times, CRP by 2.3 times, CMON by 2.6 times and the α1-AT level by 2.1 times decreased (Table 1).

The standard treatment showed a tendency to incomplete normalization of the following indicators: the content of POL products, the antioxidant enzymes activity, the concentration of neopterin, α2-MG, CRP and CMON. The use of standard treatment with the combination «Ridostin», «Hypoxenum» and «Essentiale Forte H» normalized the level of α2-MG, corrected more TAA, AGP and neopterin levels compared to the group that received the standard treatment.

Compared to the previous combination of drugs, the use of «Cycloferon», «Cytoflavin» and «Phosphogliv» with the standard treatment additionally normalizes the concentration of lipid peroxidation products, CP and approaches the level of α1-AT and CRP to the parameters of healthy donors (Table 1).

The study of the uterus aspirate, showed an increase in the concentration of MDA in the liquid phase and erythrocytes by 1.8 and 3.2 times respectivetly, AGP 2.4 and 9.6 times, CMON 4.9 and 3.7 times respectively. A decrease in TAA, SOD and catalase activity in cervical vaginal lavage, respectively, was found to be 1.2; 1.5 and 1.3 times, and in erythrocytes in 1.4; 1.3 and 1.4 times. In addition, a decrease in the sorption capacity of erythrocytes was revealed (SCG in 1.3 times and SCE in 1.6 times) (Table 2).

After the standard treatment in the first subgroup, normalization of TAA, SOD and catalase activity was revealed, and a normalization of MDA and CMON content to the control values was detected. In erythrocytes, standard treatment normalizes SOD activity, indicators of POL, level of CMON and SCE, compensatory increasing catalase activity above the level of corresponding values in donors.

The usage of «Rydostin», «Hypoxen» and «Essentiale Forte H» (2nd subgroup) in the standard treatment increases the activity of SOD and catalase above their levels in the control, and normalizes the content of MDA. In erythrocytes, this combination of drugs normalizes TAA, SCG and the concentration of MDA, corrects the SCE and the level of AGP compared with the standard treatment group.

The use of «Cycloferon», «Cytoflavin» and «Phosphogliv» (3-d subgroup), in comparison with the previous combination of drugs, additionally normalizes the content of AGP and CMON in cervical vaginal lavage and increases the activity of antioxidant enzymes even more. In erythrocytes, the use of this combination normalizes the SCE, increases the antioxidant protection factors (TAA, SOD, catalase activity) and brings the level of CMON to the parameters of healthy donors (Table 2).

Thus, the study shows that in patients with adenomyosis there is a combination of POL activation and the development of oxidative stress at the systemic and local levels; a significant decrease in antioxidant protection [7, 21] with endothelial dysfunction and immune inflammation, an increased level of pro-inflammatory cytokines [6, 11, 21]. The inclusion of drugs with immunomodulating, antioxidant and membrane stabilizing effects to the standard pharmacotherapy [10, 11, 20, 21] showed their high efficiency in the correction of altered metabolic status in adenomyosis.

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Table 1

Systemic pharmacological correction of metabolic disorders in patients with adenomyosis.

Units, parameters	**1**	**2**	**3**	**4**	**5**
	CG (n-38)	**EG (n-57)**			
		Before treatment	**1-st subgroup (n-19)**	**2-nd subgroup (n-20)**	**3-d subgroup (n-18)**
MDA, μM/L	2,47±0,21	6,31±0,23^{*1}	3,35±0,24^{*1,2}	3,4±0,25^{*1,2}	2,37±0,09^{*2-4}
AGP, con. un.	0,25±0,03	1,17±0,05^{*1}	0,81±0,04^{*1,2}	0,42±0,03^{*1-3}	0,27±0,02^{*2-4}
TAA, %	57,2±0,92	45,2±0,93^{*1}	47,9±0,78^{*1}	51,5±1,1^{*1-3}	50,4±1,08^{*1-3}
SOD, con.. un./ml	59,0±4,6	12,35±0,32^{*1}	17,28±0,39^{*1,2}	16,2±0,53^{*1,2}	16,1±0,31^{*1,2}
Catalase, Cat/L	12,5±0,42	10,7±0,88^{*1}	17,6±0,94^{*1,2}	19,9±0,47^{*1,2}	18,6±1,84^{*1,2}
CP, mg/dL	60,3±3,1	39,4±2,8^{*1}	42,6±3,3^{*1}	50,3±4,8^{*1,2}	62,2±5,0^{*2-4}
Neopterin, pg/dL	7,12±0,15	16,2±1,3^{*1}	12,4±1,2^{*1,2}	9,02±0,71^{*1-3}	8,1±0,45^{*1-3}
α_1-AT, g/L	90,4±3,93	43,7±3,34^{*1}	40,3±2,22^{*1}	42,4±2,36^{*1}	79,4±5,3^{*1-4}
α_2-MG, g/L	4,85±0,32	7,4±0,4^{*1}	6,3±0,2^{*1,2}	4,3±0,31^{*2,3}	4,47±0,33^{*2,3}
CRP, mg/dL	3,3±0,32	7,55±0,5^{*1}	5,2±0,3^{*1,2}	5,7±0,6^{*1,2}	4,47±0,33^{*1-4}
$CM_{ON,}$ μM/L	1,87±0,2	4,82±0,33^{*1}	2,84±0,15^{*1,2}	2,67±0,12^{*1,2}	2,56±0,11^{*1,2}

Note. On this and subsequent tables: 1. An asterisk indicates significant differences in arithmetic means ($p < 0.05$).

Table 2

Local pharmacological correction of metabolic disorders in patients with adenomyosis.

Units, parameters	**1**	**2**	**3**	**4**	**5**
	CG (n-38)	**EG (n-57)**			
		Before treatment	**1-st subgroup (n-19)**	**2-nd subgroup (n-20)**	**3-d subgroup (n-18)**
Aspirate from the uterus					
MDA, μM/L	0,3±0,04	0,54±0,02^{*1}	0,48±0,02^{*1,2}	0,31±0,03^{*2,3}	0,29±0,04^{*2,3}
AGP, cond. un.	0,05±0,01	0,12±0,05^{*1}	0,15±0,04^{*1}	0,11±0,03^{*1}	0,04±0,01^{*2-4}
TAA, %	21,8±0,85	18,3±0,46^{*1}	20,6±1,2^{*2}	22,3±0,87^{*2}	20,4±0,13^{*2}
SOD, con.un./ml	10,8±0,37	7,31±0,33^{*1}	10,52±0,26^{*2}	15,5±0,39^{*1-3}	18,4±0,4^{*1-4}
Catalase, Cat/L	10,4±0,78	8,3±0,58^{*1}	9,9±1,03^{*2}	17,8±0,5^{*1-3}	19,6±1,4^{*1-4}
$CM_{ON,}$ μM/L	0,42±0,06	2,05±0,09^{*1}	0,76±0,05^{*1,2}	0,69±0,06^{*1,2}	0,44±0,02^{*2,3}
Erythrocites					
MDA, μM/L	0,43±0,05	1,37±0,13^{*1}	0,81±0,02^{*1,2}	0,38±0,03^{*2,3}	0,41±0,03^{*2,3}
AGP, con. un.	0,09±0,01	0,86±0,02^{*1}	0,49±0,03^{*1,2}	0,21±0,02^{*1-3}	0,17±0,02^{*1-3}
TAA, %	30,5±0,91	22,2±1,52^{*1}	24,1±1,2^{*1}	32,1±1,62^{*2,3}	43,3±1,1^{*1-4}
SOD, con.. un./ml	13,86±0,3	10,3±0,7^{*1}	14,3±0,73^{*2}	16,5±0,53^{*1-3}	18,5±0,48^{*1-4}
Catalase, Cat/L	8,46±0,24	5,99±0,17^{*1}	13,2±0,78^{*1,2}	19,5±0,46^{*1-3}	25,3±1,84^{*1-4}
$CM_{ON,}$ μM/L	1,2±0,07	4,4±0,2^{*1}	3,1±0,12^{*1,2}	2,87±0,14^{*1,2}	1,71±0,1^{*1-4}
SCG, 10^{-12} g/eryth.	1,37±0,04	1,08±0,03^{*1}	1,12±0,03^{*1}	1,31±0,06^{*2,3}	1,38±0,05^{*2,3}
SCE, %	33,2±1,1	21,3±0,68^{*1}	26,3±0,81^{*1,2}	29,9±1,7^{*1-3}	32,6±1,62^{*2,3}

根据结果预测妊娠丢失综合征第一次筛选试验
PREDICTION OF PREGNANCY LOSS SYNDROME BASED BY THE RESULTS OF THE FIRST SCREENING ASSAY

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抽象。 由于其社会意义而造成的生殖损失是当代产科的实际问题。 我们研究了第一次医学筛查对妊娠丢失综合征妇女的预后能力，其原因是血栓形成倾向。 在研究过程中，确定了Ist筛查对早期诊断胎盘复杂畸形，妊娠丢失和妊娠并发症的重要性。

关键词：妊娠丢失综合征，医学筛查，胎儿胎盘复合体，血栓形成倾向。

Abstract. *Reproductive loss due to its social significance is the actual problem of contemporary obstetrics. We have studied the prognostic ability of the first medical screening in women with pregnancy loss syndrome, the causes of which are thrombophilia. In the course of the study, the significance of Ist screening for early diagnosis of fetoplacental complex malformation, pregnancy loss, and pregnancy complications were identified.*

Key words: *pregnancy loss syndrome, medical screening, fetoplacental complex, thrombophilia.*

Pregnancy loss syndrome remains the most important problem of modern obstetrics [3]. The leading pathogenetic role in the development of this syndrome belongs to congenital and acquired thrombophilia, which is clinically manifested by reproductive losses in the early stages of gestation and such complications of pregnancy as decompensating placental insufficiency, severe preeclampsia, abruptio placentae [2]. The embryo implantation, invasion of cytotrophoblast and the further functioning of the placenta are represented by the multistage processes of endothelial-hemostasis-based interactions with complex autocrine-paracrine regulation, which are objectively disturbed in the thrombotic tendency and in the case of hemostasis genetic defect [4].

Women with a hereditary predisposition to thrombophilia represent a risk group not only for obstetric pathology, but also constitute a prognostically unfavorable part of patients with a thrombotic complications threat, especially since pregnancy can aggravate existing hemostasis disorders.

Therefore, it is important to classify women as potential risk groups not only at the stage of pregravid preparation but also at early stages of pregnancy with a perspective to preventing pregnancy loss syndrome.

The aim of our assay was to study the specificities of ultrasonic and biochemical medical screening in women in the 10-12 weeks of gestation with pregnancy loss syndrome in the presence of thrombophilia genetic polymorphisms in the Kursk region.

The retrospective study included 115 patients in the Ist trimester of pregnancy. The main group consisted of 78 patients with genetic thrombophilia polymorphisms of and reproductive losses after 12 weeks of gestation (from 1 and more pregnancy losses).

The control group included 37 patients with uncomplicated pregnancy and labour, without thrombophilic polymorphisms, giving birth to healthy term infants.

Exclusion criteria: use of auxiliary reproductive technologies; multiple pregnancy; anatomical, genetic and hormonal causes of reproductive losses; the presence of ischemic-cervical insufficiency; exacerbation of chronic inflammatory diseases.

The analysis of medical records, childbirth histories of patients; somatic, family, obstetric histories; peculiarities of the current pregnancy. The echographic evaluation of the uterus and the elements of the ovum was carried out by the Aloka-SSD-1700 apparatus at periods of 10–12 weeks of gestation using sensors with a frequency of 3.5 MHz and 5 MHz. The diameter and shape of the fertilized egg were determined, the myometrium hypertonus value; the thickness and structure of the chorion, the presence of retroplacentar hematomas, the size of the yolk sac; the coccyx-parietal size, heart rate and motor activity of the embryo. The rate of blood flow in the uterine arteries with the determination of the resistance index was estimated. The study of the cytotrophoblast hormonal function was performed by determining of the β- moiety of human chorionic gonadotrophin (β-hCG) quantity and the pregnancy associated plasma protein A (RARR-A) level. The presence of thrombophilic PAPP-A polymorphisms (methylene tetrahydrofolate reductase (MTHFR: 677C / T), methionine synthase reductase (MTRR: A66G), methionine synthase (MTR: A2756G), Leiden (FV: 1691 G / A), prothrombin (FII: 20210 G / A), plasminogen activator inhibitor (PAI-1: 675 5G / 4G), fibrinogen platelet receptor (PGIIIa 1a / 1b Leu33Pro), fibrinogen (FGB: 455 G / A)) was determined by polymerase chain reaction methods:

The processing of the research results was carried out using Microsoft Office Excel 2010, Statsoft STATISTICA 10, with the Student coefficient estimate. The differences between the mean values in the comparable groups were considered reliable at $p < 0.5$

The average age of the patients in the main group was 31.5 ± 3.7 years. The age range of 18 to 25 years old included 14.1% (11) women, from 26 to 30 years old - 38.5% (30) patients, 47.4% (37) pregnant women were over 30 years old. According to the age composition of the patient, the main and control groups were comparable ($p > 0.05$).

Among the women of the main group, varicose veins of the lower extremities dominated in the structure of extragenital pathology in 52.6% (41). The number of patients with pathology of the cardiovascular system in the control group was significantly lower compared to the main group - (4) 10.8% ($p < 0.01$). Lipid metabolism disorders in the main group were detected in 48.7% (38) cases, which is 12.5 times more than in the control group (8.1% (3)).

In the main group, urinary system inflammation remission at the time of pregnancy were 48.7% (38) women, which is 9.5 times more than the control (4-10.8%), anemia of mild degree - 24.4% (19) (in the control group - 6 (16.2%) ($p < 0.05$).

The family history of women in the main group is burdened by the presence of cardiovascular disease in relatives of the first line up to 50 years. It was revealed that a higher percentage is attributed to arterial hypertension (28.9%). In the control group, only 5.4% (2) of patients referred to cardiovascular system diseases in close relatives.

In the analysis of obstetric history, the overwhelming majority of women in the main group were re-pregnant (65.4% -51), and 15.4% (12) of the patients were re-birth outcomed. The control group consisted mainly of primiparous women (75.7% - 28).

Among the multiparous mothers of the main group, 8 (66.7%) had a history of delivery *per vias naturalis*, 1 of which were complicated by premature partial abruptio of a normally located placenta, 1 by bleeding in the early postpartum period. Two infants born to mothers with these complications had the arrested developmental syndrome. Four women had outcomed a caesarean delivery. The indications for cesarean delivery in these 4 patients were premature partial abruptio of the normally located placenta, the fetus intrauterine hypoxia, clinically narrow pelvis. In 1 woman, the previous operative delivery was complicated by deep vein thrombosis. 18.9% (7) women in the control group had a history of physiological labour that proceeded without features.

In 10.3% (8) of women, an isolated “defect” of MTHFR 677C / T was detected. Multigenic mutations were detected in 89.7% (70) patients. The combination of two mutations was found in 48.6% (34) of pregnant women, a combination of three mutations - 27.1% (19), a combination of four mutations - in 18.6% (13), five - in 5.7% (4). With the combination of two mutations, the most common combination of such genetic polymorphisms of thrombophilia as MTHFR: 677C / T and PAI-1: 675 5G / 4G. With a combination of three mutations, the polymorphism of the MTHFR 677C / T genes, MTRR: A66G and MTR: A2756G; four - MTHFR: 677C / T, MTRR: A66G, MTR: A2756G and PAI-1: 675 5G / 4G.

The current pregnancy in the main group of patients was characterized by the phenomena of threatened abortion in early terms (62.8% - 49), subcompensated and decompensated fetoplacental insufficiency (76.9% - 60), severe pre-eclampsia (14.1% - 11), eclampsia (1.3% - 1). In 60.2% (47) of women, pregnancy was interrupted during the period from 12 to 22 weeks of gestation, from 22 to 36 weeks in 29.5% (23). Fetal death at term occurred in 10.3% (8) of pregnant women, due to decompensated fetoplacental insufficiency.

The analysis of the cytotrophoblast hormonal function carried out in the main group shows that within the limits of the norm at a period of 10-12 weeks (1–1.5 M uM) in terms of β-hCG data included 43.6% (34) patients. At 56.4% (44) women, the level of β-hCG was < 1 (0.503 - 0.766MuM). PAPP-A indices demonstrate that in 37.2% (29) patients correspond to the norm (1-1.5 MuM), in 42.3% (33) patients <1, in 20.5% (16) patients the level PAPP-A> 1.5 MuM. In women of the control group, β-hCG and PAPP-A values belonged to the interval of absolute norm (1-1.5 MuM).

According to ultrasound in the first trimester, 87.2% (68) women in the main group showed deformation of the ovum. The myometrial hypertonus in the main group in 71.8% (56) cases averaged 15.3 ± 2.2 mm (9-16 mm), in the control group it did not exceed 10 mm (5.4%). In the patients of the main group in 39.7% (31) cases, there was a decrease in the embryo's motor activity, fetal heart rate to 117 ± 2.6 beats / min in 17.9% (14). The preferential chorion localization in patients of the main group (at the bottom of the uterus) in 62.8% (49), cases on the front wall was 24.4% (19), 10.2% (8) on the back wall which did not significantly differ from the control group (p <0.05). The chorion thickness in the main group averaged 7.5 ± 4.3 mm, in the control group - 9.7 ± 0.4 mm. In 70.5% (55) cases in the main group and in 8.1% (3) in the control, the chorion structure was heterogeneous (p <0.05).l

The incidence of retrochorial hematoma in the main group was 62.8% (49), which is 6 times more compared to the control - 10.8% (p <0.05). The coccyx parietal size of the embryo of the main and control groups was comparable and amounted to 39.5 ± 5.2 mm and 41.4 ± 2.4 mm, respectively. The diameter of the yolk sac in the main group was 7.3 ± 2.2 mm (74.4% - 58), which was significantly larger compared to the control group (4.9 ± 0.6 mm), in other cases the yolk sac did not visualized.

According to the Doppler study of pregnant women of the main group for 10-12 weeks, the blood flow in the right and left uterine arteries was asymmetrical, the resistance index of the right uterine artery was 0.93 ± 0.3, the left - 0.62 ± 0.2, which is confidently more in comparison with the control group - 0.79 ± 0.2, where a symmetric blood flow was observed in the right and left uterine arteries ($p < 0.05$).

Our study showed that a thorough pregravid collection of family and obstetric history of women with genetic markers of thrombophilia, as well as clinical and laboratory examination allows us to form a risk group for reproductive losses. This group will include women with a burdened family history, thrombotic history; cardiovascular pathology; metabolic disorders; reproductive failures in history, as well as patients in whom previous pregnancies were complicated by subcompensated and decompensated fetoplacental insufficiency, intrauterine growth retardation the II-III degree, severe pre-eclampsia, abruptio placentae.

Women with pregnancy loss syndrome during the first medical screening is characterized by the early ultrasound markers of fetoplacental system disorders manifestation, characterized by a dissociated type of ovum development, uterine hypertonus ($p<0.05$), ovum deformation ($p<0.05$), changes in the structure of the chorion and signs of its abruptio ($p<0.05$). Also, reduced motor activity and heart rate of embryo, changes in the size of the yolk sac were observed.

Hemorheological properties of maternal blood change due to inhibition of the fibrinolytic system, a tendency to thrombosis and thrombosis of the spiral arteries. Therefore, in more than 56.4% of cases, the level of β-hCG and PPAP-a decreases (42.3%) ($p<0.05$), which reflects a decrease in the cytotrophoblast hormonal function and its invasion violation due to the blood properties change.

Thus, Ist biochemical and ultrasound screening can be used not only for the diagnosis of malformations, but also as a method of determining the early biochemical and ultrasonic markers of fetal loss and for predicting of the pregnancy complications development in order to choose the further tactics of the patient.

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男性不育症回顾性分析结果在吉尔吉斯共和国

RESULTS OF RETROSPECTIVE ANALYSIS OF MALE INFERTILITY IN THE KYRGYZ REPUBLIC

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注解。使用共和党电子卫生中心的数据，对吉尔吉斯共和国2003 – 2016年期间男性人口（15-49岁）的不孕症患病率和发病率进行回顾性流行病学分析。总的来说，证据表明吉尔吉斯斯坦对这一问题的公共卫生重要性。在研究期间，吉尔吉斯共和国的育龄人口男性不育患病率增加了3倍。至于男性不育的新病例，该参数显示出更明显的上升趋势 – 增加5.4倍。在比什凯克市，男性不育患病率增加了8.3%，而在奥什市，这一参数下降了64.2%。根据比什凯克和奥什市人口中记录的新病例的参数，发现趋势正在减少。对男性不育的患病率和发病率进行的回顾性流行病学分析证明了这一问题的重要性以及吉尔吉斯共和国建立男科服务的必要性。

关键词：男性不育，患病率，发病率，时间变化，趋势

Annotation. *Retrospective epidemiologic analysis of the prevalence and incidence of infertility in the male population (ages 15−49 years) of the Kyrgyz Republic for the period 2003−2016 was carried out using data of the Republican Centre for Electronic Health. On the whole, the evidence reveals public health importance of this problem for Kyrgyzstan. For the period under study there was a 3−fold increase in the prevalence of male infertility among persons of reproductive age in the Kyrgyz Republic. As for new cases of male infertility, this parameter showed still a more pronounced rising tendency – a 5.4-fold increase. In the city of Bishkek there was found an 8.3% increase in the prevalence of male infertility, while in the city of Osh this parameter decreased by 64.2%. By the parameter of recorded new cases in the population of the cities Bishkek and Osh, the trends were found to be decreasing. The undertaken retrospective epidemiologic analysis of the prevalence and incidence of male infertility demonstrated the importance of this problem and the need for establishing andrologic service in the Kyrgyz Republic.*

Keywords*: male infertility, prevalence, incidence, time change, tendencies*

According to WHO experts, the situation regarding male infertility and the protection of male reproductive health causes concerns, there are reports that 40–50% of infertile marriages are related to the reproductive health of the male spouse [1, 2, 3].

Retrospective epidemiologic analysis of the prevalence and incidence of infertility in the male population (ages 15–49 years) of the Kyrgyz Republic for the period 2003–2016 was carried out using data of the Republican Centre for Electronic Health.

On the whole, it is revealed that male infertility stands as quite a serious public health problem for Kyrgyzstan. There is a 3–fold increase in the prevalence of male infertility among persons of reproductive age in the Kyrgyz Republic (from 21.8 in 2003 to 66.4 per 100 000 population in 2016). By the parameter of new cases a still more pronounced rising tendency is seen – a 5.4 times rise (from 9.1 in 2003 to 66.4 per 100 000 population in 2016). It is especially graphic with grouped average measures for the periods of the years 2003–2009 and 2010–2016, revealing an increase in the incidence in the Kyrgyz Republic as a whole – from 58.0 to 79.6 per 100 000 population (+37.2%).

But the situation is appreciably different regarding individual regions, for instance, in the two largest cities Bishkek and Osh. In Bishkek in the same period there was an 8.3% increase in the prevalence of male infertility (13.0 per 100 000 population in 2003 and 14.0 in 2016). On the contrary, in the Osh city, the prevalence of male infertility in adults and adolescents is observed to decrease. Thus, in the city of Osh the prevalence of this condition decreased by 64.2% (18.8 per 100 000 population in 2003 to 6.7 in 2016).

As for the parameter of recorded new cases of male infertility in the population of the cities Bishkek and Osh, decreasing trends are found. In the city of Bishkek the incidence of male infertility in adults and adolescents decreased for the period under study by 2.6 times (from 12.5 per 100 000 male population of respective age in 2003 to 4.8 in 2016), while in the city of Osh only by one third or 33.5% (from 10.1 in 2003 to 6.7 in 2016).

However, by the average grouped measures for the periods 2003-2009 and 2010-2016 there is an increasing incidence of male infertility in all regions studied: for the Kyrgyz Republic as a whole - an increase from 58.0 to 79.6 per 100 000 population (+37.2%), for the city of Bishkek – from 5.1 to 5.8 per 100 000 population (+13.6%), for the city of Osh – from 15.7 to 33.1 per 100 000 population (a 2.1-fold increase). All this indicates that in the last years more new cases of male infertility have come to be reported.

Unfortunately, it should be said that notwithstanding that the existing statistical reporting system demonstrates a growth in this condition in the country, it is not such one as to allow us to judge about the true prevalence and incidence of male infertility in the country. This data reflects more seeking medical services by the population and alertness of doctors than the real epidemiologic situation with male infertility.

It is especially problematic to reveal the real situation regarding the prevalence of reproductive disorders leading to impairment of androgenic fertility when adolescents and children are concerned. This is because parents are not alert regarding this pathology and consequently miss seeking consultation of needed specialists. It should be noted that infertility-causing diseases at child and adolescent age have mostly an asymptomatic course (cryptorchidism, varicocele, hypogonadism, delayed sexual development). It should also be mentioned that family practice physicians are also not involved in the building of male reproductive health and the prevention of male infertility.

The existing system of delivery of andrologic services in the country is not perfect. The number of urologists was 189 physicians in 2015. Of them 38.1% work in republican level health care organizations (tertiary level), 13.1% in organizations of the city of Bishkek, 13.6% in Osh and Chui Regions, and still less in other regions. There are only 3 andrologists in the entire country, who work in Bishkek organizations. Specialists delivering medical care services for children and adolescents work only in three tertiary organizations: 4 wage-rates in the National Centre of Maternal and Childhood Protection, 3,75 wage-rates in the Osh Clinical Children's Hospital, 1.5 wage-rates in the Bishkek city Clinical Children's Emergency Care Hospital. There is a lack of specialists providing other medical services close to reproductive health: one dermatologist-venereologist, 4 pediatric nephropathologists and 4 pediatric endocrinologists.

Our retrospective epidemiologic analysis of the prevalence and incidence of male infertility demonstrated the importance of this problem and the need for establishing andrologic service in the Kyrgyz Republic. It is necessary to conduct an assessment of reproductive health attitudes of men from different social groups, a comprehensive assessment of the efficiency of delivery of urologic, andrologic and STI services to the male population in the study area, to develop a new functional–organizational model for the protection of male reproductive health and to introduce into practice secondary male infertility prevention measures.

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SCOLIOSIS是现代人的问题：概念，消极后果，预防和治疗

SCOLIOSIS AS A PROBLEM OF MODERN PERSON: CONCEPT, NEGATIVE CONSEQUENCES, PREVENTION AND TREATMENT

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注解。 二十一世纪是许多危险疾病的胜利者，但即使在现代，并非所有疾病都能治愈。 这些疾病中的一种是脊柱侧凸，其具有许多危险和不良后果。

关键词：脊柱侧凸，脊柱侧凸程度，原因，不良后果，预防，治疗方法。

Annotation. *The twenty-first century is the winner of many dangerous diseases, but even in modern times not all diseases can be cured. One of these diseases is scoliosis, which has many dangerous and undesirable consequences.*

Keywords: *scoliosis, degrees of scoliosis, causes, undesirable consequences, prevention, methods of treatment.*

Every year the number of children and young people suffering from diseases such as scoliosis increases. It can be found in almost every inhabitant of the population to one degree or another, and people are accustomed to not paying attention to it, but there are also cases that cannot be avoided. And such cases from year to year is becoming more and more. Children and adolescents are most susceptible to this disease, less often young people.

Scoliosis is a complex deformity of the spine, in which there is a side curvature in the plane of the back and twisting (torsion) rotation of the spike through its axis [1].

Scoliosis causes a change in the location of the ribs, as well as the bones of the chest, pelvis, squeezes and shifts the internal organs that are close, why the heart, lungs and other organs begin to suffer.

Types of scoliosis:

1) congenital (dysplastic), when there is underdevelopment of the ribs and ringing;

2) acquired when a person has experienced a back injury or illness;

3) idiopathic, when the cause of the unknown [1].

Scoliosis can be: cervicothoracic, thoracic, thoracolumbar, lumbar, lumbosacral [1].

Also, scoliosis is subdivided: C-shaped - curvature in one direction, S-shaped - in two sections and usually in different directions, Z-shaped, when in three sections curvature, kyphoscoliotic goes already to the curvature of the spine is added to stoop, chest deformity, rib hump (right-sided and left-sided scoliosis. They are heavy and rapidly developing) [1].

Causes of scoliosis:

1) genetic, when the transmission of the disease is likely to be inherited;

2) congenital when a person was born with weak and deformed vertebrae

3) stoop, incorrect position, sitting at the desk, sedentary lifestyle;

4) weak back muscles with the rapid growth of the spine;

5) injuries, strikes [1].

Degrees of scoliosis:

1) 1 degree - the angle of curvature to 10 degrees. Small, barely noticeable stooped, slight asymmetry, elevated shoulders;

2) 2 degree - the angle of curvature from 11 to 25 degrees. More noticeable curvature and asymmetry;

3) 3 degree - from 26 to 50 degrees. Begin to bulge costal arches, the appearance of a costal hump;

4) 4 degree - more than 50 degrees. Violation of the internal organs, cardiovascular and digestive diseases, curvature of the chest and pelvis, asymmetry, severe curvature [1].

Scoliosis causes enormous difficulties in humans, especially in the third and fourth degrees. The disease causes severe pain and fatigue in the area of deformities, spasms, difficulty and stiffness of movements, changes gait, posture, and due to clamping of the cervical vertebrae, insufficient blood supply to the brain, weakness, shortness of breath. As internal organs begin to suffer, diseases of the cardiovascular system appear in a person, which begins to cause dizziness, fatigue, weakness, lack of oxygen, shortness of breath, loss of consciousness; digestive diseases [2].

Rapidly rapid development of the disease requires timely and prompt treatment to stop the disease and prolong human life. Treatment is prescribed by an orthopedic physician: physiotherapy (massage, electrophoresis, paraffin therapy, and others), therapeutic physical training (exercise therapy), swimming pool, hippotherapy, walking, sanatorium-resort treatment. Translation from the main physical culture in a special group. Be sure to wear a specially selected corset.

When constructive treatment does not bring results, and the disease continues to gain rapid rates, then surgical treatment is prescribed. It is prescribed when the angle of curvature is 45 degrees [1].

Operation methods are selected individually, based on the parameters of age, curvature, etc. In the operative case, the spine is straightened in special surgical conditions, by stretching [1].

Further curvature is suppressed by the fact that the spine is fixed by a special metal construction (the design is selected based on the case of curvature). The length of the structure depends on the localization of the curvature. For example, in the thoracolumbar curvature of the thoracic and lumbar sections are fixed. Basically, skeletal traction is used using the NITEK design based on the city of Novosibirsk, the city of Khabarovsk [1].

After the operation, the problems in people with scoliosis do not disappear. In each case, individual problems arise, but there are also common ones. For example, pain symptoms persist and increase as you exercise. Pain symptoms are from moderate to extremely severe, which requires an anesthetic [2].

There is a painful symptom from any sudden movements, attempts to lean, walk, long stay in an upright position, standing or sitting. Torsional movements, sharp movements, attempts to bend the back in the area of fixation, running, jumping, tumbling, hypothermia, pull-ups, hanging on the crossbar are contraindicated for people with the design. In addition, it is forbidden to be in a long vertical position while sitting or lying down. Neglect of the rules causes destructively agonizing pains [1].

One of the postoperative problems is that a person needs to take care of himself, since the construction can suddenly come out, which may lead to paralysis and much more. This can happen if the medical regime is not followed, for example, to sit for a long time, after collisions, falls, strikes, careless movements. In addition, this can happen suddenly, for no apparent reason [1].

A person with a construction has to walk, as if with an inner corset, avoid any collisions and falls, move with caution, change the vertical position (it is best to relax and soothe the back lying position). The situation is aggravated by cardiovascular diseases that cause weakness, drowsiness, rapid fatigue, dizziness, loss of consciousness, lack of oxygen, loss of balance, and so on. Neurological diseases such as insensitivity of the back muscles, vegetative-vascular diseases.

It is especially difficult when there are certain obstacles in medical treatment after the age of eighteen. Some of these obstacles, when forced to pay for massage in municipal clinics, have to buy expensive medications, corsets, pay for the pool, spend a lot of money on food due to the need for calcium and magnesium, and endure rudeness and humiliation from medical workers [2].

As a result of the above, certain difficulties occur in terms of everyday and professional communication. For example, in everyday life there are problems in terms of housekeeping and various seasonal work, since many types of work are very difficult to carry out; for example, to sweep the floor, it is necessary to bend down, which causes excruciating pain, and therefore the patient will do this task not very conscientiously.

In terms of professional activity there is a problem of how to sit out in seven hours of work. Also, the problem is that it is difficult to perform the work of the physical plane, which is caused by a sharp and breaking back pain.

Also one of the problems is how to get to the place of work, if at seven o'clock the buses are all crowded, and you do not have the means to take a taxi. Is it possible for the grandmothers on the bus to explain that this person is difficult to ride while standing, because he can be shaken badly, perhaps lose his balance and fall, or that someone accidentally pushes [2].

Among other things, many people who have survived this operation suffer psychologically. For example, their self-esteem is underestimated, faith in oneself is lost, fear arises in the future. Difficulties arise with self-acceptance, interpersonal conflict ignites. Particularly inclined to this are those who played sports or dreamed of a professional career related to mobile activities. The complexity is aggravated by the fact that this operation was experienced by a great many during adolescence when they were in school, and some school years had to be spent on home schooling in social exclusion. In the future, it becomes difficult to socialize [2].

One of the most difficult problems of people who survived this operation is that the society does not understand them. In appearance, these people seem to be healthy, they can walk and perform some simple activity, but in many ways they remain limited and cannot afford much. They are forbidden to engage in physical culture and even more so to participate in sports competitions, you can not play sports, you can not dance, you need to restrict your sitting mode at the table, you can not stand for a long time, do not lift weights, no events with an innumerable crowd of people where they can push. We have to wait for the bus with free seating, control their movements [2].

It is terrible that people do not understand that they may have something to hurt because they think that since they are walking, everything is in order with them. People think that they are just pretending because they do not want to do anything. But it is not. They want a lot, but not everyone can afford it. If you put a heavy corset on someone from healthy people who painfully pulls off their backs and make these people live with this corset, work, move and not remove this corset even in a dream ... And people after the operation on scoliosis go with this internal corset. Or you can give the simplest example. Every person at least once felt physical pain in his life. Could this one live with this pain all the time? Perhaps I only doubt that this one would feel happy [2].

As recommendations for reducing the negative impact of such diseases as scoliosis, two components can be distinguished:

1) prevention [1].

It is necessary to observe a healthy lifestyle, properly and fully nourish, engage in therapeutic physical training, make restorative movements to create a strong muscle corset on the back.

Do swimming, hiking and jogging, spend more time outdoors. Observed by an orthopedic surgeon.

Parents watch over their children in order to prevent such a disease prematurely (if the child has a poor posture, it is in no case not to start treatment). There are certain signs by which you can notice a violation of posture: the shoulder blades are not on the same line, one shoulder is higher than the other and the other.

It is necessary to form the correct attitudes of the child, to engage in his physical and psychological education. Pick up a bed with a hard straight matrass, preferably orthopedic, properly sit down at the table, teach the correct posture.

2) treatment [2].

Early were listed methods of treatment of this disease. Often there are problems for low-budget families that it is not possible to bring a child with scool into the pool, because the pool service is expensive. But if children would have the opportunity to freely attend the pool, then children with this disease would be significantly less, because the pool helps to strengthen the back muscles sufficiently in a short time. Also very good impact has gymnastics, helping to strengthen the muscles and wearing a corset.

Thus, scoliosis is a serious problem of the modern population. Causes of occurrence are genetic, as a result of injuries, poor posture, sedentary lifestyle and others. The prevention and treatment of this disease, which torments children, adolescents and young people.

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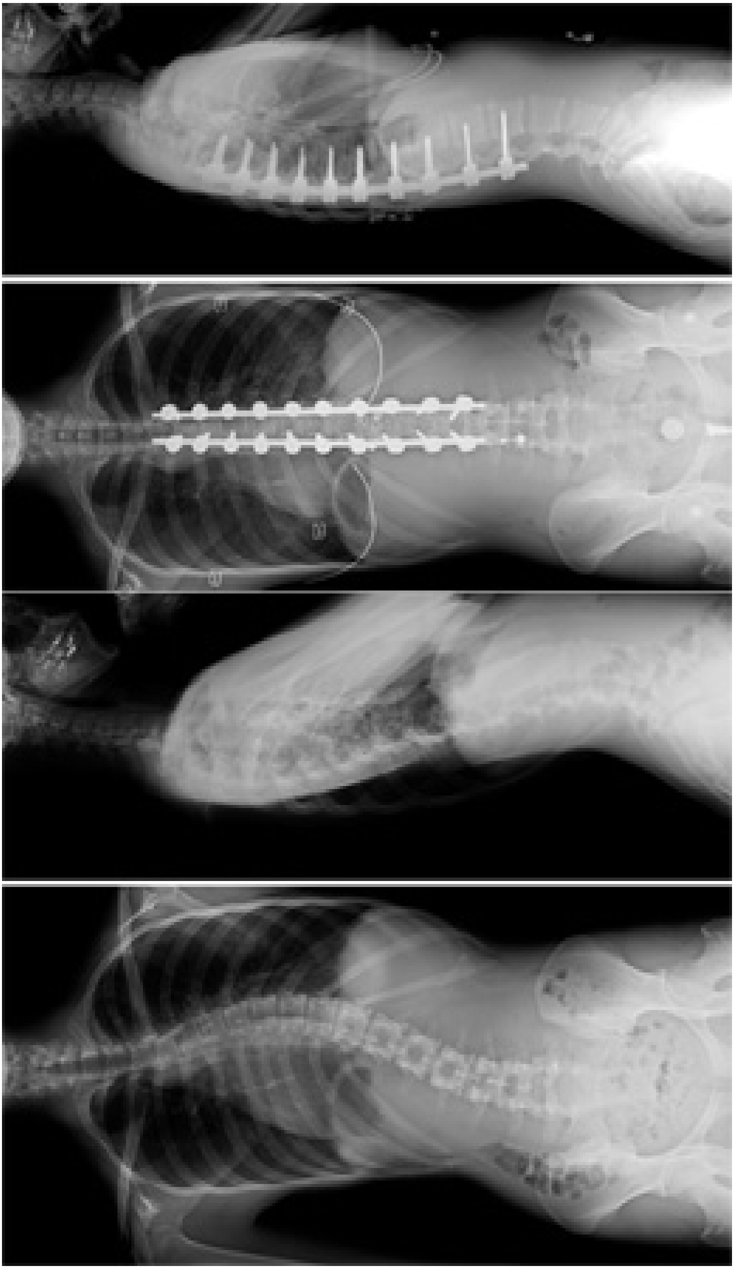

生命第一年期间小猪血管内血小板活性的生理变化
PHYSIOLOGICAL CHANGES IN INTRAVASCULAR PLATELET ACTIVITY IN PIGLETS DURING THE FIRST YEAR OF LIFE

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抽象。血小板止血是体内平衡的生理重要机制之一。其活性很大程度上决定了血液的流变学和个体发育过程中组织中代谢过程的速度。主要生产性动物，特别是仔猪的年轻生长中的血小板活性具有很大的实际意义。很明显，身体结构和功能的正确形成主要是由于血小板止血的功能活动水平。在这方面，研究早期个体发育过程中仔猪血管内血小板聚集的动力学特别重要。为了获得这些信息，检查了142头大白猪品种：38头新生动物，35头奶制品饲料，38头奶牛和蔬菜饲料，以及32头蔬菜饲料阶段。应用生化，血液学和统计学研究方法。作为处理在第一年仔猪的血液中获得的数据的结果，显示血小板的聚集能力逐渐增加。显然，发现的规律性的基础在于体内血小板聚集的大多数受体和受体后信号传导机制的活性同时增加。聚集诱导剂和血小板膜上的纤维蛋白原受体数量的增加是特别重要的。这是由于血小板质膜的脂质双层发生变化而发生的，这导致受体机制活性的调节。由于环加氧酶和血栓素合酶活性的增加，血栓素合成的强化应归因于在早期发育过程中仔猪中血小板聚集的特别显着的细胞内机制。增加的血小板聚集为当前环境提供必要程度的微血管适应，为组织营养创造最佳条件并最小化第一年仔猪出血的风险。

关键词：仔猪，早期发育，血小板，聚集，血栓素。

Abstract. *Platelet hemostasis is one of the physiologically important mechanisms of homeostasis. Its activity largely determines the rheology of blood and the rate of metabolic processes in tissues during ontogenesis. Platelet activity in young growth of the main productive animals, especially in piglets, is of great practical interest. It becomes clear that the proper formation of structures and functions* *of the body is largely due to the level of functional activity of platelet hemostasis. Studies of the dynamics of intravascular platelet aggregation in piglets during early ontogenesis are of particular importance in this regard. To obtain this information, 142 Large White pig breeds were examined: 38 newborn animals, 35 heads of dairy feed, 38 piglets of dairy and vegetable feed, and 32 piglets of the vegetable feed phase. Biochemical, hematological and statistical research methods were applied. As a result of processing the data obtained in the blood of the first year piglets a gradual increase in the aggregation capacity of the blood platelets was revealed. Apparently, the basis of the found regularities lies in the simultaneous increase in the activity of most receptor and post-receptor signaling mechanisms of platelet aggregation in vivo. The increase in the number of receptors for aggregation inducers and for fibrinogen on platelet membranes is of particular importance. This occurs as a result of changes in the lipid bilayer of the plasma membrane of platelets, which leads to the regulation of the receptor mechanisms activity. The intensification of thromboxane synthesis due to the increase in the cyclooxygenase and thromboxane synthase activities should be attributed to the particularly significant intracellular mechanisms of platelet aggregation in piglets during early ontogenesis. Increased platelet aggregation provides the necessary degree of microvasculatory adaptation to the current environment, creating optimal conditions for tissue trophism and minimizes the risk of bleeding in the first year piglets.*

Key words: *piglets, early ontogenesis, platelets, aggregation, thromboxane.*

Further development of pig breeding in Russia and in the world is possible as a result of continuing active practical application of constantly received new information about the biology of pigs of any age [3, 4]. Very important in this regard stays new information about the hemostatic system, which in this species of productive animals is not fully studied. The biological role of this system is not in doubt, since its efficient operation minimizes blood loss and preserves the viability of the organism. Considering that hemostasis largely determines the rheological properties of blood, its significance for trophism and tissue metabolism in pigs of any age becomes clear. In addition, the statement that the hemostasis system is an important "point" of the potential impact on the functional state and the animal organism regulation in adverse external conditions [1] becomes certain.

Physiologically important component of hemostasis is platelet hemostasis, the activity of which largely determines the rheological properties of blood and influence on the rate of metabolic processes in the body. Currently, it is believed that the success of the body structures formation and the optimum formation of their functional activity is largely due to the level of aggregation readiness of platelets [2]. In this regard, studies of various aspects of platelet activity in piglets during the entire period of their growth and development are of great importance.

Objective: to study the peculiarities of platelet aggregation in vivo in piglets during early ontogenesis.

Materials and methods. The study was performed on 142 piglets of a Large White breed: 38 newborns (1-5 days of life), 35 dairy-feeds (6-20 days of life), 37 dairy and vegetable-feeds (21-40 days of life) and 32 plant-feeds (41st day - 1 year of life). All piglets were obtained from healthy sows with two or three farrowing.

In the platelets of the examined piglets, the intensity of thromboxane synthesis and the enzymatic activity of cyclooxygenase and thromboxane synthetase were indirectly determined using three transfer tests on a photoelectrocolorimeter. The severity of intravascular platelet aggregation was assessed using a phase contrast microscope. The article presents the average arithmetic data obtained during the examination of pigs for each of the phases of their early ontogenesis. The study results are statistically processed using the Student's criterion.

Results. In the blood of the first year piglets, the levels of freely circulating small and large platelet aggregates gradually increased, reaching an average of 7,2 ± 0,07 per 100 free-lying platelets and 0,43 ± 0,009 per 100 free-lying platelets, respectively, in the vegetable nutrition phase (Table 1.). At the same time, the number of platelets that entered into the aggregation process increased 3,6 times in piglets during early ontogenesis, which emphasized the pronounced increase in their platelet aggregation in vivo.

Table 1. *Platelet indicators in piglets during early ontogenesis.*

Indicators	**Newborn piglets, n=38, M±m**	**Breast-fed piglets, n=35, M±m**	**Dairy-vegetable-fed piglets, n=37, M±m**	**Vegetable-fed piglets, n=32, M±m**
Recovery of platelet aggregation in the collagen-aspirin test,%	66,8±0,08	71,7±0,08	76,7±0,09 $p<0,05$	84,1±0,08 $p<0,01$
Recovery of platelet aggregation in a collagen-imidazole assay,%	57,0±0,08	61,8±0,07	66,2±0,07 $p<0,05$	75,1±0,07 $p<0,01$
Platelet aggregation in a simple transfer test,%	35,9±0,06	40,2±0,04	44,4±0,08 $p<0,05$	54,0±0,08 $p<0,01$
The number of platelets in aggregated clots,%	6,9±0,11	7,6±0,10	8,5±0,11 $p<0,05$	10,5±0,11 $p<0,01$
The number of small units of 2-3 platelets per 100 free platelets	3,1±0,05	3,7±0,07	4,9±0,07 $p<0,05$	7,2±0,07 $p<0,01$
The number of medium and large aggregates, 4 or more platelets, per 100 free-lying platelets	0,12±0,007	0,20±0,005 $p<0,05$	0,29±0,007 $p<0,01$	0,43±0,009 $p<0,01$

Legend: p - statistical reliability of the dynamics of biochemical parameters in the studied groups of animals relative to the group of newborn animals.

The physiologically important mechanism for increasing the haemostatic activity of platelets in first year piglets can be considered as the enhancement of the thromboxane synthesis of arachidonic acid. This was indirectly indicated by increased platelet aggregation in a simple transfer test (from 35.9 ± 0.06% to 54.0 ± 0.08%). Intensification of thromboxane formation in piglet blood plates occurred due to the identified activation of both enzymes in its transformation into platelets - cyclooxygenase and thromboxane synthetase. The degree of recovery of platelet aggregation in the collagen-aspirin test, which allows to indirectly evaluate the activity of cyclooxygenase in platelets increased in piglets during early ontogenesis by 25.9%. The severity of the recovery of platelet aggregation in a collagen-imidazole sample, which makes it possible to indirectly evaluate the functional properties of thromboxane synthetase in their blood plates, also increased during observation by 31.7%.

Discussion

The volume of data on the physiology of piglets still can not be considered complete. In this regard, there is a need in the further detailed study of the vital systems of the pig organism for modern pig breeding. Among these systems, integrating the body at any age is a haemostatic system, in which platelets play an important role. The level of their aggregation at any age largely determines the rheology of blood in the microvasculature, affecting the metabolic process in tissues [1]. Despite the functional significance of the fine mechanism of platelet haemostasis, its' functioning in healthy piglets during the first year of life remains poorly understood.

From the data obtained it follows that there is an increase *in vivo* blood platelets aggregation ability associated with the gradual activation of external and internal mechanisms of platelet aggregation in piglets during early ontogenesis.

An increase in the number of platelet aggregates in the blood of first year piglets should be associated with an increase in the expression of receptors for aggregation factors on the platelet membrane in vivo. Moreover, this circumstance was intensified by an increase in the expression of fibrinogen receptors (GP IIb - IIIa) involved in the aggregation process. This was largely due to the activation of lipid rearrangements in platelet membrane surface, masking or unmasking receptor molecules.

In first year piglets physiologically significant intraplatelet mechanisms for enhancing platelet aggregation can be considered as the thromboxane synthesis intensification due to the increase in platelet cyclooxygenase and thromboxane synthetase activity.

Conclusion.

In the blood of piglets during early ontogenesis platelet aggregation gradually increases. This is due to the activation of receptor and post-receptor platelet mechanisms. An important role in this process is played by the increasing of intra platelet synthesis of thromboxane as a result of the activation of the corresponding enzymes. The revealed dynamics of platelet activity regulates the processes of microcirculation and metabolism, providing optimum organism growth and development in piglets during the first year of life.

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新型烘焙产品技术的发展功能方向
DEVELOPMENT OF TECHNOLOGY OF NEW BAKERY PRODUCTS OF THE FUNCTIONAL DIRECTION

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说明：哈萨克斯坦在农业领域具有巨大潜力，是粮食生产国的主导地位之一。 建立健康的人口饮食是哈萨克斯坦共和国国家政策的优先事项之一。 最近将纤维添加到烘焙产品中有两个原因：膳食纤维摄入量的增加和烘焙食品的热量密度的降低。 膳食纤维对健康的积极影响主要归因于肠道转运时间的减少，心脏病风险的降低。 今天面包店可以获得以上数量的膳食纤维来源，其中一些具有相对高水平的可溶性膳食纤维。

关键词：文化，烘焙产品，玉米粒，小麦粉，面团发酵。

Annotation: *Kazakhstan has a great potential in the agricultural sector and one of the leading positions among grain producing countries. Formation of a healthy diet of the population is one of the priorities of state policy in the Republic of Kazakhstan. Recently there are two reasons to add fibre to baked products: the increase of dietary fibre intake and the decrease of the caloric density of baked goods . The positive health effects of dietary fibre are mainly ascribed to the reduction of gut transit time, decreased risk of heart disease . An above number of dietary fibre sources are available to bakeries today, some of them with a relatively high level of soluble dietary fibre.*

Keywords*: culture, bakery products, corn grits, wheat flour, fermentation of dough.*

Kazakhstan has a great potential in the agricultural sector and one of the leading positions among grain producing countries. Formation of a healthy diet of the population is one of the priorities of state policy in the Republic of Kazakhstan.

Recently there are two reasons to add fibre to baked products: the increase of dietary fibre intake and the decrease of the caloric density of baked goods [1]. The positive health effects of dietary fibre are mainly ascribed to the reduction of gut transit time, decreased risk of heart disease [2]. An above number of dietary fibre sources are available to bakeries today, some of them with a relatively high level of soluble dietary fibre [3].

The previous works of the researchers demonstrated that a promising direction of development of baking is to use the full potential of the grains. In recent years there is a growing demand for new kinds of bread, whereas the bread with grain processing products becomes more popular among the population. Therefore, the increase of the grain processing extent and depth, complex usage of crops, a more complete extraction of grain's valuable components are of great importance.

Maize is one of the major crops of the modern world of agriculture. Maize can be fairly called as a chemical plant in miniature. It selectively accumulates and processes a quarter of the elements of the periodic table. Endosperm forms the most valuable amino acids (tryptophan and lysine), glutamic acid, which forms part of folic acid, an important hematopoietic vitamin, contributing to the blood cholesterol levels reduction. Maize containes more lipids, sugars, hemicellulose, compared to a grain of wheat [1].

The research objective was to study the effect of maize groats pretreatment on the processes of maturation and the formation of the bread quality.

The method based on quantifying of the carbon dioxide formed during the fermentation was used in order to study the effect of maize grain on the efficiency of fermentation caused by flour yeast. The dynamics of gas formation velocity of dough with maize addition traced for 300 min.

Maize groats previously soaked in hot water at 60°C, fermentation of cereals continued for 1,5-2 hours, after which groats were thoroughly frayed. In the study we used the first grade wheat flour, corn groats (5, 7, 10, 12 and 15% by weight of flour), compressed yeast, salt and vegetable oil, which meet the requirements of normative documents. The dough was prepared by two staged using mesophilic starter cultures in the amount of 4-6% by weight of flour in the dough, to prevent the potato disease. Dough standing and baking was carried out by traditional regimes. A sample of first grade wheat bread was taken as a control. Quality of bread were analyzed in accordance with regulatory and technical documents.

Pre-soaking and fermentation of maize groats increased the share of total cereal's sugars by 2,4 times compared to maize grains without soaking and in 4,6 times compared to the first grade wheat flour.

Analysis of gas formation intensity and dynamics showed that during the fermentation the gas formation ability of yeast increases in the beginning to a maximum and then decreases, after which the process repeats. Such changes in the dynamics of gas formation are characterized by different activity of yeast enzymes and fermentable sugar composition of the medium. In the wheat flour control sample there are two maximum peaks of gas formation were observed.

The samples were characterized by a gradual increase in the intensity of gas formation to the maximum with its gradual decline, i.e. there were no changes in the restructuring process of the enzyme system of yeast due to lack of easily digestible sugars. Best value showed the sample with the introduction of 15% maize groats - 3210 cm^3 / (kg × h), the reference value was 2360 cm 3 / (kg × h). The peak velocity of gas formation for a test sample traced after 120 min from the beginning of fermentation, in control - after 240 minutes. For the samples with the introduction of 10, 12% maize groats the maximum values were traced after 150 minutes of fermentation and amounted to 2740 and 2910 cm^3 / (kg × h) respectively.

The determining factor, contributing to the intensification of the dough fermentation in this period, is the formation of sugars, amino acids, polypeptides and other substances under the action of enzymes of maize groats, and the activity of fermentative microflora of mesophilic starter. The existing patterns of changes in dough properties are explained by the occurrence of hydrolytic processes in the dough maturation, which leads to greater compliance of dough gluten framework to stretching under the action of carbon dioxide bubbles formed in the process of alcoholic fermentation. Dough maturation process is accompanied by complex physical, chemical and microbiological processes that affect the structural and mechanical properties of the dough.

Further research works are related to the study of bread quality (Table 1) depending on the duration of dough fermentation.

***Tab I:** Effect of maize groats, depending on the length of dough fermentation on the bread quality*

Name of indicators	Parameters of technological process and bread quality indicators with the addition of maize groats					
The duration of dough fermentation, min	30	60	90	120	150	180
Specific volume of bread, cm^3 / g	3.5	3.8	4.1	4.5	4.3	4.0
Dimensional stability	0.43	0.44	0.48	0.52	0.50	0.46
Acidity, degree	2.2	2.3	2.5	2.4	2.5	2.6
Humidity of crumb, %	43.2	43.5	43.3	43.4	43.5	43.4
Structural and mechanical properties of the crumb, a unit of appliance						
ΔH_{common}	79	93	107	121	113	102
$\Delta H_{plasticity}$	50	67	74	84	78	71
$\Delta H_{elasticity}$	22	25	31	37	33	29
The appearance	regular shape					
The crust color	golden brown					brown
The condition of bread’s crust	smooth, without cracks					
The crumb color	golden brown					
The taste of bread	Taste like typical bread with a pleasant taste					
The flavor of bread	Flavor like typical bread with a pleasant flavor					

Comparison of the specific volume of bread with the fermentation efficiency indicators for the samples with maize grains showed that the at the superiority of the gas formation velocity in test samples compared to controls, the best quality of bread was observed in the case where the duration of fermentation was 120 min. The specific volume increased by 28.5%, which was confirmed by improvement in the efficiency of fermentation in 1.6 times compared to the same indicator in the control sample.

The improvements in the crumb structural and mechanical properties, physical and chemical characteristics of bread were observed in the test samples of bread with maize groats at different dosages.

Samples of bread, cooked with the introduction of 5, 7, 10, 12% of maize groats had the highest specific volume, the correct shape without cracks and explosions, light-brown crust with a pleasant taste and aroma, while the introduction of 15% of maize groats led the crust and crumb color became brown. The samples with the introduction of 10 and 12% of maize flour were the best with the physical and chemical characteristics at the level of control. In the samples with the introduction of maize groats the porosity was uniform and thin-walled. Further increase in dosage of maize grains leads to a deterioration of the main indicators of bread quality.

The use of maize groats in the bread production, its pre-soaking and fermentation leads to fermentation duration reduction down to 40-50 min., which corresponds to the basis of intensive technologies. Introduction of 12% of maize groats is the most optimal option, which leads to bread quality improvement and nutritional value increase. The raw materials with high sugar and gas formation ability, sugared maize groats, can be used in the production of bread as an improver of flour with low enzyme activity.

Based on the results of the experimental data the following were developed: production technology, “Altyn – nan” health bread recipe, weighing 0.2 kg and more, representing round, woven from three plaits bread product; technological instruction for “Altyn – nan” bread, patent of the Republic of Kazakhstan «Method of production of “Altyn – nan” bread».

At present, rapidly evolving resource base of Kazakhstan increased consumer demand. Ripening process of half-finished product was scientifically grounded on the base of flour fermentation effectiveness criterion. It is established the optimal dough ripening duration connecting with bread quality. The technology of wheat bread increased nutritional value and quality with the use of grain processing product: «Altyn nan» to include the recipe in advance sugaring grains of corn.

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西瓜果实研究开发初级加工设备
WATERMELON FRUIT RESEARCH FOR THE DEVELOPMENT OF PRIMARY PROCESSING EGUIPMENT

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注解。 本文讨论了为长期储存产品加工西瓜的实际问题，以及用于进一步开发设备的水果的主要特征。
关键词：西瓜，地壳，强度，特征
Annotation. *The article deals with the actual problem of creating lines for the processing of watermelons for long-term storage products, as well as the primary characteristics of fruits for use in the further development of equipment.*
Keywords: *watermelon, crust, strength, characteristics*

In Kazakhstan, the first place in the harvest of melon crops is the Turkestan region. The products of this area are exported outside of Kazakhstan.

For processing of melons it is necessary to create a waste-free technology, since all parts of the fruit can be used. The seeds are processed into butter, from which they produce drugs and dyes. Purified fruit pulp of melons and gourds can be widely used to produce juice concentrate, jam, jam, candied fruits, production of freeze-dried powder as additives to various culinary products, baby food, mashed potatoes, cereals, pastes, etc. Crust is used to make pectin [1].

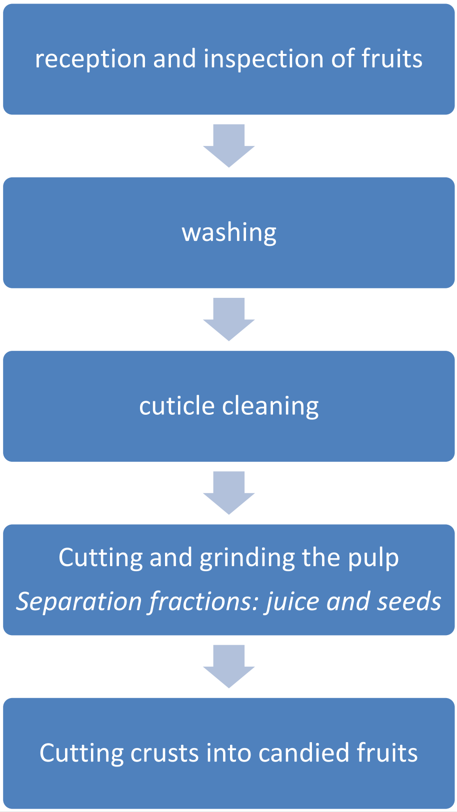
The high labor intensity of processing is one of the main factors hindering the use of fruits of melons in the food industry. In order to obtain purified pulp and products from it, it is necessary based on the analysis of the characteristics of biological and physico-mechanical properties of melon crops to justify a rational technology and to develop technical tools for mechanization of the process of cleaning the pulp of melon crops from the crust and cutting the crust into candied fruits.

There are very few reference data describing the physicomechanical properties of melon crops; to develop equipment, you need to have reliable information on raw materials: the density and strength of the peel, the minimum loading of the pulp, without loss of juice, etc.

The program of our experimental studies includes the determination of the strength characteristics of watermelon and its parts. For the study were taken winter varieties of watermelons with a thick crust and dark colored cuticle. For data recording, the device ST-2 structure meter was used, the results are presented in Table 1.

Table 1- *The results of measurements of the strength characteristics of watermelons*

Name	Peduncle	Receptacle	Equator
The force of destruction of the crust, N	475,74-499,3	431,4-439,3	411,9-434,6
Crust puncture force, N	127,1-130,3	104,5-108,7	111,8-114,7
Peel hardness, kg / mm	1,2	0,8	0,9
The force of destruction of the pulp, N	168,7-183,1	164,8-170,3	98,7-103,6



After analyzing the data in the table, we can conclude that the strength of the fruit coat decreases from the stem to the receptacle, and the strength of the pulp is greater in the area of the mechanical shell. When designing a node for the separation of the cuticle and pulp from the peel, these data will be fundamental.

The watermelon fruit processing line consists of several nodes.

Currently, the technology of removal of the outer cover from the fruits of melons crops occur with the use of manual labor, and the existing constructive-technological solutions of machines for cleaning fruits from the crust do not provide efficient and high-quality work when processing melons: high completeness of cleaning and small losses of edible pulp. In addition, in all known peel-removing machines, the quality of the technological process depends on the shape index of the fruit. In the proposed machines for removing crusts from fruits of melons and gourds, the abrasive tool is most often used as a working body, allowing to obtain a relatively good quality of cleaning, but at the same time very high losses of pulp (up to 50%) [2]. This method is known as "deep cleaning" of the fruit and refers to the method of exposure to it as abrasive. Such machines are distinguished by the obligatory use of a perforating device as an auxiliary working body and the presence of abrasive fragments in the pulp, which is unacceptable by technological requirements. Also known machines equipped with cutting tools: slit-type knife or packages of mills. But due to the complexity of the cutting process, peeling from this method is complicated by a large variety of shapes and sizes of fruits, which leads to low completeness of cleaning and high losses of edible pulp [3].

To solve this problem, we designed a machine with a floating head of a slit-shaped knife, which provides for the removal of the cuticle without the huge loss of the epidermis and parenchyma.

The flesh is cut by a rotating working body and then fed to the selection of seeds. The process of isolating seeds is the most difficult process in this scheme. Seeds are found in the pulp of a watermelon in the middle lane. Known technologies provide for the mechanical isolation and leaching of water, for watermelons, this technology is not effective, because, together with the release of seeds, there is a possibility of an increase in juice loss. Pre-crushing of the fruit used in enterprises is also not cost-effective for processing the fruits of watermelon. This leads to the loss of watermelon peel and the loss of pulp. Integrated processing of watermelon fruit involves crushing the pulp without compromising the integrity of the crust, because The watermelon crust will be processed into candied fruit, the seeds will be released after grinding and centrifuging the whole watermelon pulp. In order to meet the requirements imposed on semi-finished products from the pulp of melons and peel when processing it for candied fruits, a working body is necessary, which allows to obtain pieces of regular shape without cracks.

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比较坚果和仁的一些物理力学性质

COMPARISON OF SOME PHYSICO-MECHANICAL PROPERTIES OF THE NUT AND THE KERNELS

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注解。 本文讨论了物理特性，如长度，宽度，厚度，球形度，平均直径等。除了机械性能：分裂过程中的变形，裂缝的力，吸收的能量和坚果和核的硬度在三个方向确定：纵向 ，横向和对角线。

关键词：核桃，仁，物理和机械特性

***Annotation**. This article discusses the physical characteristics such as length, width, thickness, sphericity, average diameter, etc. As well as mechanical properties: deformation during splitting, force of cracks, absorbed energy and hardness of nuts and kernels were determined in three orientations: longitudinal, transverse and diagonal.*

***Keywords:** walnuts, kernel, physical and mechanical characteristics*

In the Almaty and Turkestan regions of Kazakhstan, a large area is used for sowing walnuts. In the Turkestan region, there are plantations of walnuts, providing the domestic market, but there are also imports from other countries. The fruits of walnuts are rich in vitamins, minerals, very useful for the health of the population. Many countries are engaged in processing of walnuts. Turkey is the third largest exporter of walnut to the world market. The leading places are occupied by China and Iran. By quality, walnuts are distinguished by the color and weight of the kernel. The lightest kernels of nuts are considered the best.

Walnut producers in Kazakhstan are eager to occupy a part of the republic's market and produce nuts for export to neighboring countries, for example, Russia. Economically more advantageous is the supply of peeled halves of nut kernels. Walnuts are cleaned by hand, which reduces the productivity of the process and is a brake on the expansion of production. In connection with the above, we can conclude that the development and production of inexpensive and effective equipment for removing the shell without destroying the cores are relevant for Kazakhstan. For the development of such equipment it was necessary to study the strength characteristics of local walnuts.

The strength of walnut shells is an important feature for their subsequent processing (sorting), as well as during transportation. It is important that the shell of the fruit is not too fragile, not crushed during the transport of nuts, and the shutters of the fruit were closed and did not crack during the technological processes of drying. In case of incomplete dense closure of the valves of the fruit, the nuts may be damaged during subsequent bleaching and washing processes [1].

The process of splitting the shell is influenced by both the force and direction of the load, the geometric parameters of the nuts and their moisture. For walnuts with a moisture content of 6% (wet basis) Borghei et al. (2000) reported that the cracking force and the deformation of walnuts are in the range from 110 to 800 N and from 0.01 to 0.045 mm / mm, respectively. The study also showed that large walnuts require more cracking and experience greater deformation than small ones [2].

Kalyoncu (1990) measured the size and tensile strength of almonds from 10 varieties of almonds and determined the relationship between the strength of the gap and the size of the nuts [3]. Oloso and Clark (Oloso and Clark, 1993) studied the effect of moisture content and load direction on the strength of the gap, deformation, and energy of roasted cashew nuts under quasistatic loading [4]. They found that all the factors considered had a significant effect on the measured parameters and the cracking structure of the nutshell. Liang et al. (1984) conducted a similar study on walnuts and found that the difference between the deformation of kernel cracks and walnut proved to be a reliable indicator for predicting the effect of moisture content and compression on the damage to the kernel [5].

We have conducted a study of walnuts grown in Kaazakhstan, Turkestan region, the harvest of 2016. At the first stage, we collected nuts from different regions of the Turkestan region and measured their geometric characteristics, the results are summarized in table 1 (the most common dimensions are listed in the table).

The length (L), thickness (T) and width (W) of walnuts, measured with a caliper, geometric mean diameter (Dg) and sphericity (φ)

were calculated using the following equations (Mohsenin, 1986):

$$D_g = (LWN)^{(1/3)}$$

$$\varphi = D_g / L\ 100$$

The deformations of each nut were measured before the first crack, in the context of a fixed time and load [6].

***Table 1 -** physical characteristics of the fruits of walnut production Kazakhstan*

Specifications	kernel	nut
Length L, mm	30,87-40,00	38,5-51,2
Width W, mm	23,76-30,03	31,1-36,3
Thickness T, mm	20,62-26,1	30,9-36,3
Mass, gr	4,6-8,69	10,01-16,2
Average diameter (Dg), mm	24,9-26,7	33,5-37,9
Sphericity,%	80,2-86,9	84,5-90,87

In the process of designing equipment for splitting walnuts, you need to have an idea about the strength of the walnut and the load and point of loading sufficient for splitting. The results of the first studies are summarized in table 2.

***Table 2 -** Mechanical characteristics of a walnut*

Specifications	**По L By L**	**По W By W**	**По диагонали Diagonally**
Deformation, mm	1,52±0,01	1,26±0,01	0,74±0,01
Strength, H	227,5	185,1	149,8
Hardness, N / mm	151,3	145,3	207,5
The quality of extraction of the core,%	99	95	95

The results of studies of walnuts in Kazakhstan are not yet completed, further studies are underway. At the first stage, the results obtained will allow to calculate the necessary parameters for the development of a machine for peeling walnuts from the shell with the highest quality of extraction of intact kernels.

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国内产业的模块化转型
THE TRANSITION TO MODULARITY IN THE DOMESTIC INDUSTRY

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注解。 文章重点介绍了俄罗斯外国汽车制造商如何实施战略模块化并从中受益。 基于我们的案例研究和深入访谈，我们开发了一个理论框架来检验战略模块化的前因和结果。 我的理论框架表明，战略模块化可以通过降低管理隐性知识的成本来帮助提高公司的地位优势。 此外，战略模块化的采用影响了与主要供应商的关系性质，进一步模糊了公司的界限。
关键词：模块化；模块化生产；隐性知识；供应链管理；全球采购
Annotation. *Article focuses on how foreign automobile manufacturers in Russia have implemented and benefited from strategic modularization. Based on our case studies and in-depth interviews, we developed a theoretical framework to examine the antecedents and outcomes of strategic modularization. My theoretical framework suggests that strategic modularization may help improve a firm's positional advantage by reducing the cost of managing tacit knowledge. In addition, the adoption of strategic modularization influences the nature of relationships with major suppliers, further blurring the boundaries of the firm.*
Keywords: *Modularization; modular production; tacit knowledge; supply chain management; global sourcing*

In an era of globalization characterized by accelerated technological change and complexity, products are becoming more intricate, while powerful customers are demanding a much wider range of products at lower prices with immediate availability. Indeed, many technology-based firms (e.g., Microsoft, General Motors, Swatch, Motorola, and Sun Microsystems) operating in dynamic environments have embraced modularization as a competitive strategy that helps them respond to customers' heterogeneous demands, manage complexity, gain flexibility, and share risk and investments with partners in their supply chain. By utilizing modular systems, firms are integrating more state-of-the-art technology in products, such as computer chips in cars, home appliances, and communication devices that can perform a diverse set of functions.

According to Langlois (2000), modularity is a general set of principles for managing complexity. Sako (2003) defined modules in the context of the auto industry as a physically proximate ‘chunk’ of components, which can be assembled into the vehicle as one unit where common interfaces and standardization of specifications are not mandatory, and components are the building blocks of modules. Therefore, modules are subassemblies that reduce complexity and time taken in the plant for assembly.

The concept of modularization has gained increased attention, because it has been linked more specifically to the design and/or assembly strategies of large multinationals and as an approach for introducing successful new pro- ducts. This study examines modularization as a competitive strategy in the manufacturing industry. The emergence of modularization is being accompanied by new knowledge management strategies (Grant, 1996), which allow firms to develop products more effectively through flexible, ‘modular’ organization structures (Sanchez and Mahoney, 1996). Thus, modularization goes beyond the idea of subassembly delivery practiced in lean manufacturing with integral product architecture popularized by Japanese automakers in the 1980s. Lean production is characterized by high- level flexibility to coordinate component and subassembly development between an automaker and its suppliers after a project gets under way. On the other hand, a modular approach emphasizes development of the ability to make selection of needed components and subassemblies before a project starts. In other words, modularization does not require much design adjustment among components and subassemblies in order to achieve the product functions that customers want, and success comes from the ability to cautiously select pre- designed components (Fujimoto and Nobeoka, 2004).

In this study, we define strategic modularization (or simply modularization) as a strategic option that goes beyond the physical and functional dimensions of the module that includes an organi- zational and managerial system linking module integrators and module suppliers to reduce the cost of managing tacit knowledge in the assembly process. Thus, modularization helps assemblers of final products remain competitive by providing a structured approach to dealing with complexity, technology, and information flow (O’Grady, 1999; Graziadio and Zilbovicius, 2003). Consequently, these firms are able to satisfy increasing customer demands by learning and adapting quickly, responding flexibly, transferring knowledge across firm boundaries effectively, and reducing the cost of managing tacit knowledge significantly (Doran, 2003; Lara et al., 2005). Thus, firms that adopt strategic modularization should realize a higher firm performance. Although strategic modularization’s benefits are many, there may also be some potential negative implications when a localized view of assembly operations is taken, because the modular assembly will always take an extra number of assembly operations. In addition, firms may experience a reduction in product distinctiveness. In our study, we examined strate- gic modularization as the degree to which firms implement the concept of modularity at both the product and process levels throughout the supply chain. The purpose of this paper is to examine the antecedents of modularization and its implications for firm performance at the firm level in the global automotive industry of Russia. Although much research has been conducted on modularization in the personal computer and automobile industry, most of this research has focused on examining specific modules. Fixson et al. (2005) examine the vehicle cockpit to explore the interactions between modularity and outsourcing. Others examine modular technological upgrading in the supply of interior systems (Lara et al., 2005). However, to our knowledge, research has yet to explore the implications of modularization in the context of global supply chain strategy. Thus, our primary contribution is to uncover those factors that contribute to successful strategic modularization in the manufacturing industry, and understand how the implementation of strategic modularization leads to the firm strategic positional advantage. The underlying logic of our research is grounded theory building (i.e., elaboration of constructs and propositions), which involves inducting insights from field-based, interview and case data. Therefore, it is important to explore a wide range of approaches and perspectives in the context of implementing modularization. Following Eisenhardt's (1989) theory-building approach, we collected data using case studies and interviews with executives and developed a 'grounded' theory of strategic modularization. We chose this methodology because there is limited extant theory examining the rarely explored phenomenon of strategic modularization. In such situations, this approach is useful in generating novel and accurate insights into the phenomenon under study (Glaser and Strauss, 1967; Brown and Eisenhardt, 1997). In addition, grounded theory building is invaluable when conducting theoretical research, as this qualitative approach allows the data to communicate, through rigorous analysis and coding of concepts conveyed in interviews (Yin, 1984; Strauss and Corbin, 1990)

The setting is the automotive industry of Russia, where our research focuses on a theoretical sampling for selecting useful cases from a specified population that have the potential to replicate or extend theory. This approach constrains extraneousvariations and sharpens external validity (Eisenhardt, 1989). The automobile industry of Russia was chosen as subjects of our study because it provided an excellent setting for various reasons. All these are important contextual factors influencing the strategy of modularization. For our study, the unit of analysis is at the strategic business unit level; the data were collected at foreign automakers' manufacturing facilities in Russia where modularization has been introduced. In other words, we validated our theoretical model through qualitative data collected from firms in the automobile industry that have adopted modularization in their production activities.

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完成煤的再生技术及其效率
TECHNOLOGY OF THE REPRODUCTION OF COMPLETED COALS AND THEIR EFFICIENCY

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注解。 在实验室和试验工厂中测试了废煤热氧化再生的开发技术。 活性回收率为97-99%，同时保持吸附剂的所有物理化学和多孔特性，并且引入可以获得巨大的经济效果。
关键词：技术; 废煤; 活动; 复苏; 氧化剂; 参数，经济。
Annotation. *The developed technology of thermal-oxidative regeneration of waste coal was tested in a laboratory and pilot plant. The degree of recovery of activity is 97-99%, while maintaining all the physico-chemical and porous characteristics of the sorbents and the introduction allows you to get a great economic effect.*
Keywords: *technology; waste coal; activity; recovery; oxidizing agent; parameters, economy.*

Today, active carbons are produced in large quantities and assortment and have found application in the following areas: drinking and wastewater treatment; treatment of circulating water in enterprises; clarification of sugar syrups; gas cleaning and vapor recovery; obtaining medicines; purification of alcoholic water solutions and wines; use as catalysts and catalyst carriers; in the gold mining industry to extract gold from working solutions [1,2].

At the gas processing plants of the Republic of Uzbekistan for the purification of natural gas from sulfur compounds is widely used adsorption purification method using di and monoethanolamines. Used amines in the process of purification of natural gas are polluted by mechanical impurities and resinous substances. The accumulation of these substances leads to the foaming of amine solutions in adsorbers and the loss of amine, and also increases the corrosion of equipment. To remove accumulated impurities and resinous substances, the regenerated amine solutions are passed through a filter filled with activated carbons of the AG-3 brand (Russia), Shemveron (France) or NH-30 (China), etc. Contaminants penetrate the pores of the activated carbon and are held there by weak chemical and physical forces and lead to a decrease in the specific surface and activity. Thus, during the purification of natural gas, waste coal is formed (annual volume of 150-160 tons per year), which are removed to the factory landfill and thus pollute the environment and have not found a way to reuse them. An alternative to recycling activated carbon is its regeneration. After the regeneration process, activated carbon can be used without fear of being reused for loading in the purification columns. Conducted literary studies on the methods of regeneration of waste coal shows the possibility of restoring activity and selectivity, as well as the economic benefits of the use of regenerated coal [3]. As a result of many years of research and development, the institute has developed a new technology - thermo-oxidative regeneration, which allows the initial activity of activated carbons to be restored to 97-99%, while retaining all the physicochemical and porous characteristics of sorbents. The degree of recovery of the sorption activity of activated carbons depends on the technological parameters of the regeneration process (time, temperature, consumption of water vapor, etc.).

In this regard, the regeneration capacity of spent coal grade HX-30 and their physico-chemical characteristics were studied in laboratory installations. The regeneration process was carried out at a temperature of 800-820 ºC, with water vapor. The results of the comparative characteristics of fresh, spent, regenerated coal brand NX-30 are shown in table 1.

***Table 1** - Physico-chemical characteristics of fresh, spent and regenerated coal HX-30*

The name of indicators	Fresh HX-30	Spent HX-30	Regenerated. HX-30
1	2	3	4
1. Fractional composition: Mass fraction on the sieve with diam.%			
5 mm	2	2	2
3,6 mm	10	5	9
From 2.8 to 3.6 mm	70	65	70
From 1,5 to 2,8 mm	15	20	15
From 1 to 1,5 mm	3	8	4
2. Bulk density, g / dm3	520±	570±	516±
3. Crushing strength kg / pellet	0,12±	0,13±	0,12±
4.Total pore volume by water absorption, cm3 / g	0,692	0,293	0,687
5.Specific surface, m2 / g	912±	305±	907±
6.Iodine activity,%	98±	21±	99±
7. Benzene equilibrium activity, g / dm3	176±	65±	177±
8. Total ash,%	4,2±	4,0±	4,1±
9. Moisture contents, %	5±	12±	5±
10. Equivalent pore radius, A°	11,3±	11,3±	11,4±

The obtained data shows the possibility of regeneration of spent coal NX-30 according to the developed technology and at the same time retaining the original physical and chemical indicators such as, specific surface area, activity, strength and porous structure. Thermal-oxidative regeneration of spent coal AG-3, BAU-A (Russia) and NH-30 (China) was carried out at the pilot plant of the institute (two-section furnace, with external heating) with a continuously moving layer of coal, in the temperature range 450-800 0C, with flow water vapor. The amount of coal fed regulate the speed of rotation of the screw. Granules of activated carbon with a speed of 5.0 cm / min under the action of rotation and tilt of the furnace are moved along the length of the pipe. Under these conditions, the degree of regeneration was 97.0-99.5%. This technology is being introduced at one of the enterprises of the Republic of Uzbekistan. With the introduction of the regeneration of waste coal with a capacity of 100 tons per year and their repeated use in cleaning the amine solution allows you to get a great economic effect.

The cost of regenerated coal obtained by the thermo-oxidative method is 2-2.5 times cheaper than the cost of fresh coal. The developed effective technologies for the regeneration of waste coal gives the following advantages:

1. Economy of means.
2. Reactivation of activated carbon at a cost does not exceed 50-75% of the cost of a new batch of sorbent.
3. There is no need to spend money on recycling waste material;
4. All calculated figures indicate that the technology is profitable, with a relatively short payback period.

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城市供水系统输送的饮用水化学成分的稳定性
STABILITY OF THE CHEMICAL COMPOSITION OF POTABLE WATER TRANSPORTED BY THE CITY WATER DISTRIBUTION SYSTEM

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注解。由于扩大了监测范围，因此评估了饮用水在向消费者运输过程中的质量变化。从配水网络的不同点取水，包括远程和死端区域，由表面和渗透型进水口供水。随着水被输送到分配供水网络的远端点，在进水中水的氯化过程中形成的卤化有机化合物浓度降低。源水中存在的技术性有机化合物的浓度在运输过程中没有变化。根据金属含量，地表水摄入量的饮用水的特征在于与渗透型的水摄入相比，组分浓度的大的变化和增加的腐蚀性。在配水供水管网的停滞和死角区域的水中，记录了一年中某些时期铁，锌以及水中浊度和角鲨烯浓度的增加，表明增加了水中腐蚀和生物转化过程的强度。在网络的分析点中，由于表面类型的氯化副产物和渗透水中的金属在饮用水中存在表面摄入而引起的致癌风险水平符合既定标准。

关键词：饮用水，配水供水管网，卤代有机水污染物，金属，角鲨烯，致癌风险

Annotation. *As a result of the expanded monitoring, the change in the quality of drinking water during its transportation to the consumer was assessed. Water was taken from different points of water distribution networks, including remote and dead-end zones, served by surface and infiltration type water intakes. A decrease in the concentration of halogenated organic compounds formed during the chlorination of water at water intakes as water is delivered to remote points of the distribution water supply network is shown. The concentration of organic compounds of technogenic nature, present in the source water, did not change during its transportation. According to the metal content, drinking water of a surface water intake is characterized by a large variation in the concentrations of components and increased corrosivity compared to water intake of an infiltration type. In the water of stagnant and dead-end zones of the distribution water supply network, an increase in the content of iron, zinc, as well as turbidity and squalene concentration in water in certain periods of the year is recorded, indicating an increase in the intensity of corrosion and biotransformation processes in water. The levels of carcinogenic risks caused by the presence of surface intake in drinking water of the surface type of chlorination by-products and metals in the infiltration water in the analyzed points of the networks correspond to the established criteria.*

Keywords: *drinking water, distribution water supply networks, halogenated organic water pollutants, metals, squalene, carcinogenic risks*

At the enterprises operating the plumbing sector, one of the most important performance criteria is the quality of drinking water. Attention requires both the water treatment technology itself, the provision of current standards, and the stability of water quality during its transportation to consumers. The city of Ufa is one of the five longest cities in Russia, in connection with which, the external urban distribution water supply network is also characterized by a large extent and branching. It is known that in remote, as well as in stagnant and dead-end zones of networks, deterioration in the quality of transported drinking water can be observed [1]. The risk of stagnation in water distribution networks increases such factors as insufficient removal of natural organic substances at water treatment plants (on average, with traditional water treatment schemes, the efficiency of their removal is 20-50% [2]), as well as the fact that residual chlorine concentrations in water not always enough to suppress bioprocesses. In such cases, there is not only a deterioration in the quality of drinking water, but the network is also disturbed as a result of the intensification of biocorrosion processes [3, 4].

The aim of the work was to assess the stability of the chemical composition of the quality of drinking water in the city of Ufa after it leaves the water treatment facilities as it is transported to the consumer.

Experimental part

The chemical composition of drinking water sampled at water intakes and at selected points of the distribution network was determined by indicators in accordance with [5]. Were determined 12 organoleptic and generalized indicators (odor, color, turbidity, permanganate oxidation, hardness, total and free residual chlorine, pH, dissolved organic carbon, optical density at 254 nm); 46 organic indicators (trihalomethanes, halogenacetic acids, volatile aromatic compounds, tri-, tetrachlorethylene, dichloroethane, carbon tetrachloride, phenol and its derivatives, naphthalene, polyaromatic hydrocarbons, phthalates); 32 metals; 6 microbiological and hydrobiological indicators (general coliform bacteria, thermotolerant coliform bacteria, total microbial number, phytoplankton abundance and biomass, zooplankton).

Due to the fact that organic water pollutants are one of the main sources of biotransformational processes in distribution networks, leading to water enrichment with degradation products, the total organic background in selected water samples was monitored using established databases covering more than 250 individual semi-volatile organic compounds (SVOC). Additionally, the following main SVOC classes were determined: alkyl benzenes, fatty carboxylic acids, organic oxygen-containing compounds (carboxylic esters, alcohols, ketones, aldehydes), normal alkanes, iso-, cycloalkanes, unsaturated hydrocarbons, nitrogen-containing compounds, and also halogenated derivatives of alcohols, ketones, alkenes, etc. The determination was carried out by chromatographic methods with different types of detection, including chromatography-mass spectrometry.

To assess the variability of the chemical composition of drinking water during its transportation through the distribution water supply networks of Ufa, the methods of mathematical statistics are used. A long-term statistical material was used - data on the quality of drinking water in clean water reservoirs at water intakes and in certain places of the urban distribution network and data on the results of water quality research during the calendar year in the most remote, dead-end zones and zones with a long dismantling time.

The calculation of levels of carcinogenic, non-carcinogenic and organoleptic risks was carried out in accordance with regulatory documents developed by hygienists of the Federal Service for Supervision of Consumer Rights Protection and Human Welfare [6, 7]. The basis of these documents is a modern approach, which consists in establishing the qualitative and quantitative characteristics of the total adverse effects on public health, due to the combined combined influence of the pollutants present.

The discussion of the results

A common result for the water intake of the surface and infiltration types of Ufa is the fact that, according to statistical criteria, potable water in the networks is more stable than water in the clean water reservoir in water intakes. This is reflected in a lower mean multiyear concentration of a number of compounds and metals, a smaller range of variation of concentrations and standard deviation values (Table 1). The close to normal distribution of concentrations of these indicators indicates the absence of significant random factors affecting water quality in the networks. This fact is explained by the fact that pure water is supplied to the tank immediately after filtration and it takes time to level the concentrations of the components. Also, there is an active interaction of water microfluids with a disinfecting agent, and the intensity of this process is especially high during the first hours of contact.

In the settled and disinfected water transported through distribution networks, the concentration of halogenated organic compounds, which are byproducts of chlorination, is reduced. An exception is the concentration of volatile trihalomethanes, increasing on average by 40% in transported water. This fact is due to the use of chlorination in Ufa as a method of disinfecting drinking water and, thus, the presence in the water of residual free chlorine, the presence of which is mandatory in the water supplied to the urban distribution network [5]. The formation of halogenated organic compounds of other classes under the action of residual chlorine in the transported water was not detected by chromatography-mass spectrometry. The values of general chemical indicators in water during its transportation do not change significantly.

Table 1 *Quantitative characteristics of the metal content in drinking water taken from clean water tanks and the distribution network of water intakes in Ufa, mg / dm^3*

Indicator	Surface water intake						Infiltration water intake					
	Clean water tank			Distribution network			Clean water tank			Distribution network		
	min-max[1)]	Av.[2)]	SD[3)]	min-max[1)]	Av.[2)]	SD[3)]	min-max[1)]	Av.[2)]	SD[3)]	min-max[1)]	Av.[2)]	SD[3)]
Al	0.0072-0.45	0.12	0.0714	0.02-0.14	0.071	0.0327	0.02-0.14	0.0704	0.0327	0.0024-0.013	0.0058	0.0044
Fe	0.011-0.32	0.045	0.0739	0.03-0.19	0.10	0.0457	0.03-0.19	0.1008	0.0457	0.012-0.081	0.0465	0.0223
Mn	0.0019-0.080	0.015	0.0120	0.0042-0.032	0.013	0.0060	0.0042-0.032	0.0125	0.0060	0.001-0.022	0.0047	0.0042
Cu	0.0010-0.016	0.0035	0.0025	0.0013-0.010	0.0035	0.0022	0.0013-0.010	0.0035	0.0022	0.0013-0.011	0.0033	0.0025
Zn	0.0020-0.037	0.0069	0.0084	0.0021-0.014	0.0057	0.0036	0.0021-0.014	0.0057	0.0036	0.0021-0.0071	0.0046	0.0018

1. min-max – minimum and maximum concentrations of metals in water
2. Av. – perennial mean metal concentration in water
3. SD – standard deviation of metal concentrations in water

In the water of remote, stagnant and dead-end zones of water distribution networks, an increase in the content of iron, zinc and water turbidity is observed, which indicates an increase in the intensity of corrosive and bioprocesses. This is confirmed by an increase in the concentration of squalene at these points, which we proposed as a reference compound, the change in the concentration of which reflects the change in the intensity of biotransformation processes in water [8]. In general, drinking water of a surface water intake requires a greater amount of a disinfecting agent, since in its preparation uses the original river water. The drinking water of this water intake is more corrosive than the water of the infiltration water intake. The level of corrosivity was assessed using the Langelier index (Fig. 1). With a decrease in this indicator, water is considered less balanced in terms of the possibility of corrosive processes.

When assessing the risks to public health in drinking water supplied, it was found that the main influence on the magnitude of carcinogenic risk in the case of drinking water of a surface intake is produced by chlorination byproducts, in the case of drinking water of an infiltration water intake along with them, zinc and lead lead to an additional effect. As the distance from the clean water reservoir of the surface type intake increases, the total carcinogenic risk decreases by an average of 13-30%, and the water intake of the infiltration type increases by 41-84%.

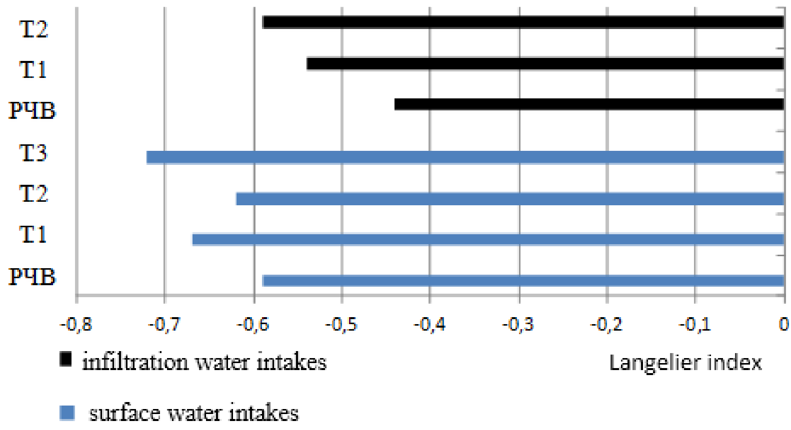

Figure 1. *Langelier index values averaged over the period 2006-2016 for drinking water of surface and infiltration water intakes of Ufa.*

РЧВ – clean water tank;

T.1, 2, 3 – remote and dead-end, stagnant zones of distribution networks of different water intakes

Note that the excess of the established quality standards for drinking water or in the water of clean water tanks at water intakes, or in the water of networks, or in water of dead end and stagnant zones was not observed.

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