



SCIENTIFIC RESEARCH OF THE SCO COUNTRIES: SYNERGY AND INTEGRATION

上合组织国家的科学研究：协同和一体化

Materials of the
International Conference

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国际会议

参与者的英文报告

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Part 3: Participants' reports in English

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

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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.

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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 83 authors from 8 countries (China, Russia, Uzbekistan, Kazakhstan, Azerbaijan, Tajikistan, Turkmenistan, 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

前言

感谢所有“上海合作组织国家的科学研究：协同作用和整合”，感谢您的发言和报告。代表所有上合组织成员国的广泛参与者谈到了这一事件的必要性和重要性。与会者的报告涉及广泛的主题科学问题，我们的联合互动将帮助不同国家的科学家进一步发展理论和应用领域的现代科学研究。会议促成了来自八个国家（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，土库曼斯坦，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”

JEL classification: G32, H52, I23

综合评估贸易公司的竞争力

INTEGRATED ASSESSMENT OF THE COMPETITIVENESS OF A TRADING COMPANY

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抽象。 本文提出了一种使用综合指标评估零售企业竞争力的方法论方法；作者计算综合竞争力的方法是合理的；确定了零售服务企业竞争力的关键指标；GC“俄罗斯鞋”和“KARI”的竞争力多边形得到了发展；计算了一些国内贸易企业竞争力的整体指标。

关键词：零售，服务，企业竞争力，综合评估，商业可持续性指标。

Abstract. *The article sets out a methodological approach to assessing the competitiveness of retail enterprises using an integrated indicator; the author's methodology for calculating integrated competitiveness is justified; key indicators of the competitiveness of retail services enterprises were identified; the polygon of competitiveness of GC "Russian Shoes" and "KARI" was developed; the integral indicators of competitiveness of a number of domestic trading enterprises are calculated.*

Keywords: *retail, services, enterprise competitiveness, integrated assessment, indicator of commercial sustainability.*

In modern socio-economic conditions, the urgent problem for retailers is to gain and maintain competitive advantages. The competitiveness management of a trading enterprise is usually based on the use of a model apparatus for its evaluation.

The keen interest of managers is the assessment of competitiveness with the help of an integral indicator, since the main advantage of this approach is the ability to combine in an integrated assessment the components of the financial capabilities of the company, the effectiveness of trading and economic activity, the use of material and technical base and labor potential, as well as the competitiveness of the product and brand success[2].

Often, the integral indicator of competitiveness is represented by the sum of the following form:

$$K = \sum (W_{ij} \times U_{ij}), \tag{1}$$

where W_{ij} - the weight of the investigated quantities in the total sum, U_{ij} - detail criteria.

The competitive sustainability indicator that characterizes a particular trading company and allows it to be compared with other business entities is determined by success components, by which we mean not only financial and material capital, but also staff, the state of management, and the quality of relations with contact audiences, and marketing effectiveness. Individual elements of competitiveness can be estimated using the number U_{ij} [1]. At the same time, the subjective nature of the methodology and the use of expert estimates to determine weighting factors is considered to be its main drawback [6].

The author's methodology for calculating integrated competitiveness was created using a system of balanced indicators and is presented as follows:

$$I_K = 0,21 K_f + 0,22 K_t + 0,16 K_{kp} + 0,11 K_p + 0,12 K_{mtb} + 0,18 K_b, \tag{2}$$

where I_K – integral indicator of competitiveness; K_f – financial opportunity component; K_t – component characterizing the trading potential; K_{kp} – product competitiveness component; K_p – labor potential component; K_{mtb} – material and technical potential component ; K_b – brand competitiveness component [3].

To assess the weight of the individual components that make up integral competitiveness, the focus group method was used. Three groups of ten people were formed. Experts evaluate the individual components of competitiveness on a ten-point system, assign weight to each parameter. Then, for each indicator, the estimates are summed up and the weighted average score is calculated within each competitiveness component[4].

The fundamental difference between this methodology and existing methods consists in determining the weighting coefficients of various j-determinants of competitiveness, when the sum of the coefficients is equal to one. The obtained weight coefficients of the components are presented in table 1.

Table 1-

Weighting factors of the components that make up integrated competitiveness

№ pos.	Parameter name	Weight ratio
1	2	3
1	Finance component	0,21
2	Trading potential component	0,22
3	Competitiveness of goods sold component	0,16
4	Labor potential component	0,11
5	Material and technical potential	0,12
6	Brand competitiveness component	0,18
Total		1,00

A feature of this approach is the determination of weighting coefficients taking into account the functional goals of the enterprise. The relationship of management functions with performance indicators is reflected in the strategic map (table 2).

Table 2 - Strategic map showing the relationship of strategic goals and key success factors (developed by the author)

Competitiveness components	Strategic goal	Key success factors	Indicators
Financial opportunities	Increase in market share	Growth in trading revenue. Optimal expenses.	Current liquidity ratio. Absolute liquidity ratio. Coefficient of financial dependence. Level of innovative costs for effective management.
Trade potential	Improvement of the efficiency of trading activities	Profitability. Quick turnover. Service level.	Return on sales. The level of distribution costs. Turnover. The level of innovative costs for the development of trading activities.
Product competitiveness	Increase in turnover	Flexible pricing. Form and conditions of sales.	Product Update Index. Logistics efficiency. The index of changes in trade due to price factors.
Labor potential	Improvement of staff productivity	Qualification of staff. Motivation system.	The coefficient of advancing the growth rate of labor productivity compared with the growth rate of wages. Staff turnover rate. Profitability of staff development costs.
Material and technical potential	Cost optimization	Effective use of retail space, equipment. Inventory Management.	The coefficient of renewal of fixed assets. The ratio of the disposal of fixed assets. The capital-labor ratio. Return on assets.
Brand competitiveness	Brand Strengthening	The effectiveness of marketing costs on brand strengthening. Sales growth driven by brand strength	The level of sales influenced by brand strength. Net profit created under the influence of brand factors. Brand-multiplier. Marketing effectiveness on brand strength maintenance.

Identification of key indicators of the competitiveness of a retail service company is the first step in assessing its level. The ability to manage the strategic competitiveness of a retail service company is realized through analysis of the data. One of the methods of analysis is the construction of a competitiveness polygon (Figure 1).

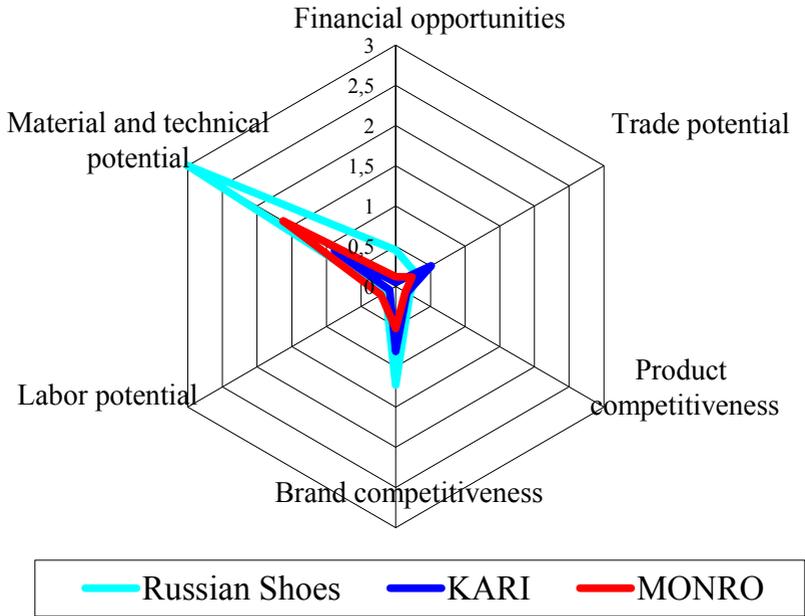


Figure 1 - The polygon of competitiveness of GC "Russian Shoes" and "KARI" in 2018

The competitiveness polygon is a graphical representation of the key indicators of the competitiveness of enterprises - competitors in given areas of activity, which allows you to compare the competitive capabilities of these enterprises. When one polygon is superimposed on another, the advantages and disadvantages of enterprises relative to each other are revealed. As a result of assessing the position of competitors in strategic aspects of the activity, the influence of each component that makes up the company's competitiveness is determined. On the example of GC "Russian Shoes" we see that the greatest contribution to strengthening competitiveness is made by indicators that reflect the material and technical potential and the competitiveness of the brand, the least - labor potential. Regarding "KARI", we can conclude that the components that reflect trading potential and brand competitiveness are of maximum importance, and product competitiveness and labor potential are of minimum importance.

The key indicators obtained at the previous stage are used to calculate the integral competitiveness indicator (table 3).

Table 3 - Integral competitiveness indicator

Enterprises	2014	2015	2016	2017	2018
Ltd «Russian Shoes»	0,482	0,538	0,625	0,829	0,789
Ltd «KARI»	0,471	0,515	0,508	0,450	0,409
Ltd «Monro»	0,234	0,257	0,312	0,346	0,358

We have proved that the integral competitiveness of Russian Shoes is ensured by the high competitiveness of material and technical potential and financial capabilities, product competitiveness and brand competitiveness, which is achieved through the use of multi-format and multi-channel sales and the implementation of competitive customer focus and differentiation strategies from competitors, which allows attracting customers of different age groups with different needs and financial capabilities.

The "KARI" shoe company is essentially engaged in cloning its own franchising business, focusing on quantitative rather than qualitative growth. It is the weak competitiveness of "KARI" products, the limited competitiveness of financial opportunities and labor potential, as well as the ongoing competitive cost minimization strategy aimed at obtaining a short-term effect from economic activity, that did not allow this company to get a higher assessment of the integral indicator.

GTC "MONRO", on the contrary, pays great attention to the quality of retail services, offering high-price segment shoes and using a patented (niche) strategy, but does not expand its network of branded stores. The relatively low indicator of integral competitiveness of the GTC "MONRO" is ensured by the low competitiveness of financial capabilities (4 times lower than the GC of "Russian Shoes"), low competitiveness of trade and labor potential, as well as relatively weak product competitiveness.

Analysis of the estimated indicators allows to timely identify weaknesses in the functioning of the enterprises of the retail services sector and to purposefully adjust the indicators, ensuring their most rational values [5]. Based on the findings, it is necessary to adjust management decisions.

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JEL classification: L67, M21, M31

国际市场知名服装品牌绩效指标研究

**RESEARCH OF PERFORMANCE INDICATORS OF WELL-KNOWN
CLOTHING BRANDS IN INTERNATIONAL MARKETS**

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抽象。 本文介绍了全球品牌服装零售市场在国际贸易中的研究结果; 介绍了公司财务业绩的分析, 以及对国际服装公司的利润和销售情况的分析。 制定建议在动荡的竞争环境中提高绩效。

关键词: 零售市场, 以客户为导向, 财务状况, 全球品牌, 国际贸易。

Abstract. *The article presents the results of a study of the retail market for clothing of global brands in international trade; an analysis of the financial performance of companies is presented, as well as an analysis of the profits and sales of international clothing companies. Recommendations are formulated to improve performance in a turbulent competitive environment.*

Keywords: *retail market, customer-oriented approach, financial condition, global brands, international trade.*

The clothing market is one of the fastest growing. A certain pool of mass market brands has developed on the world market, which have won the preference of consumers from different countries - these are the brands most famous for the mass segment, such as Zara, UNIQLO, Stradivarius, Mango, Ostin, H&M, etc.

Since the beginning of 2000, these brands have been actively promoting their products on the Russian market. The degree of activity, individual performance indicators show that they occupy a significant part in the segment for the mass consumer, both in the Russian and foreign markets [1]. A number of factors influence the preferences of Russian consumers when choosing a clothing brand. The dominant factors are price, comfort and convenience when purchasing, product design, which in turn have a significant impact on both financial and economic indicators, and the company's competitiveness in the modern market [2].

The authors analyzed the activities of these companies and their competitive positions in the market. At the first stage, on the basis of available open data in statistical collections posted on the website of the Federal State Statistics Service (Rosstat), a schedule was compiled showing the dynamics of changes in the retail turnover of non-food products [3]. The graph is shown in Figure 1.

According to the data in Figure 1, the positive dynamics of the retail turnover of non-food products is visible, which is associated with an increase in household incomes. A sharp increase in turnover begins in 2005 from a value of 3823.9 billion rubles and continues until 2014, then growth slows down due to the financial crisis and a decrease in real incomes of the population. Gradually, with the stabilization of the ruble against the euro and the dollar, the turnover of trade in non-food goods is also increasing.

According to the data on the pricing strategy of popular brands in the post-crisis period of 2015-2017, presented in the Fashion Consulting Group report for 2017, the trend of lowering average prices for products from global brands is shown. However, at the same time, Russian brands were forced to raise average product prices. At the same time, prices for Mango brand products remained at the same level. Pricing strategies for one item in the assortment - women's jeans for major clothing brands are presented in Figure 2.

Having the data obtained, one can make a graph of the change in the price of women's jeans, in percent. The graph is shown in Figure 3.

The data in Figure 2 and Figure 3 clearly shows that 4 brands were able to lower the price of this assortment position, of which 3 global brands, two of which Zara (-38%) and Stradivarius (-27%) are part of Inditex . The Mango brand managed to maintain prices at the same level - 2999 rubles. At the same time, the largest price increase in percentage terms was recorded for the domestic Ostin brand and amounted to 38%, which amounted to 1799 rubles in monetary terms, whereas in 2017 a similar position was worth 1299 rubles [4].

According to the data from the Fashion Consulting Group report on the results of the Russian fashion market in 2017, the main competitors of Zara brand stores are the following brands: Mango and H&M [5].

To conduct an analysis of the financial condition of enterprises, the period from 2013 to 2017 was chosen. The financial indicators for all brands are presented in tabular form, the data are shown in millions of rubles.

To conduct a comparative analysis of financial performance indicators, comparative histograms were compiled for a visual interpretation of the available indicators. The following indicators are presented on the histograms: balance sheet asset, sales profit and net profit. Data from 2013 to 2017.

Figure 4 shows a comparative histogram of the balance sheet assets of the companies in question..

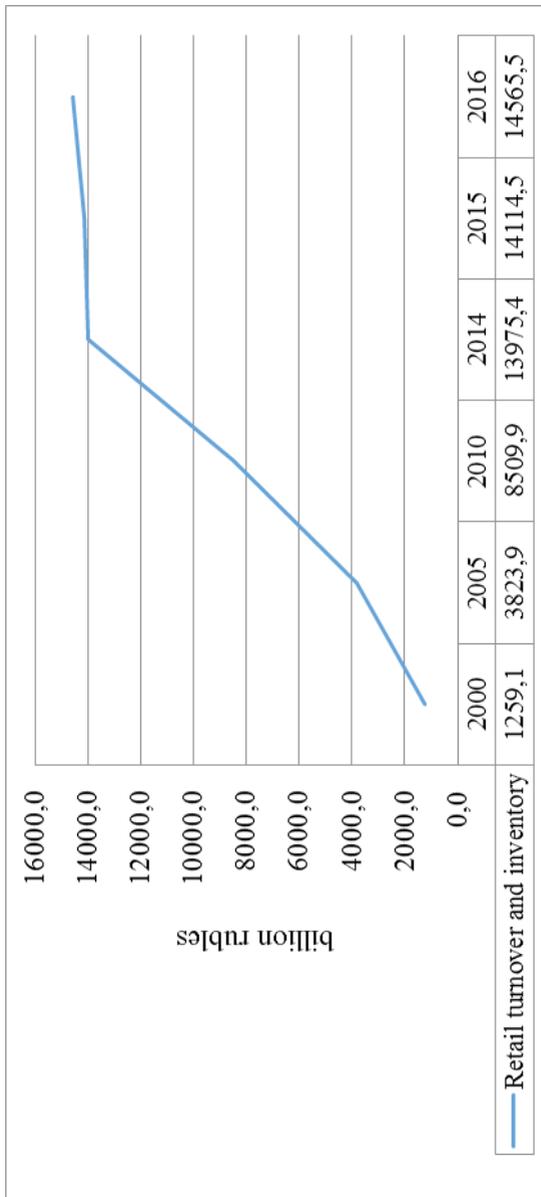


Figure 1 - Retail turnover of non-food products, billion rubles

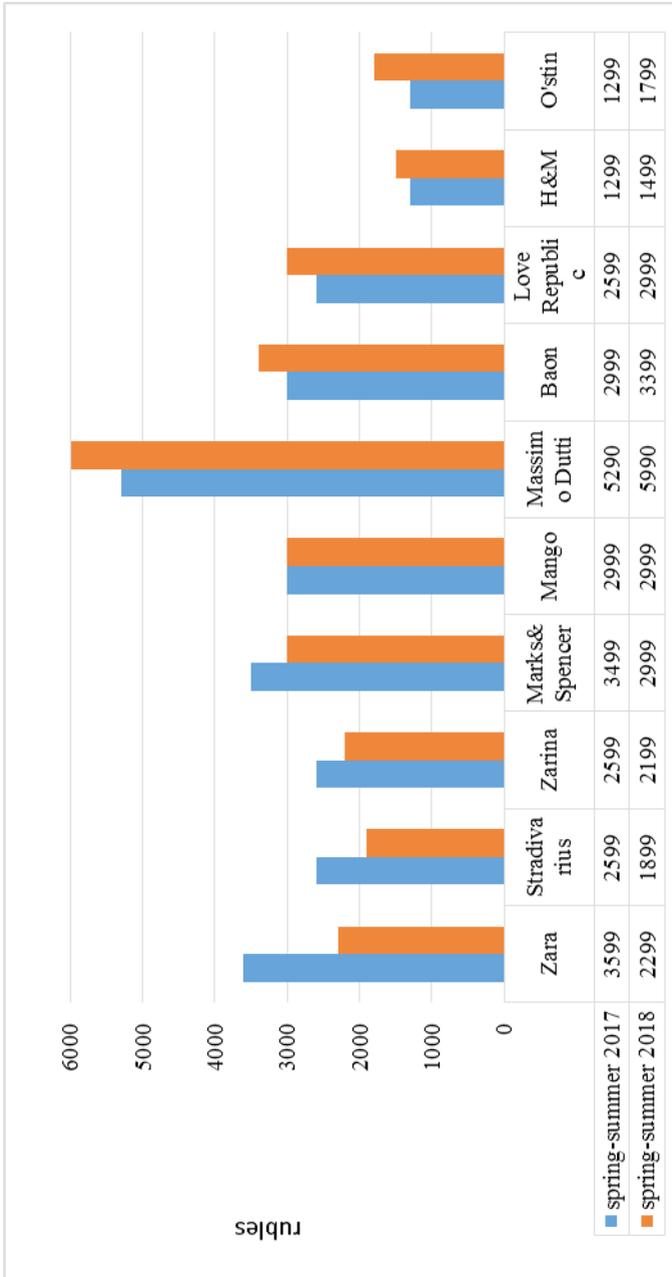


Figure 2 - Price strategies for the cost of women's jeans

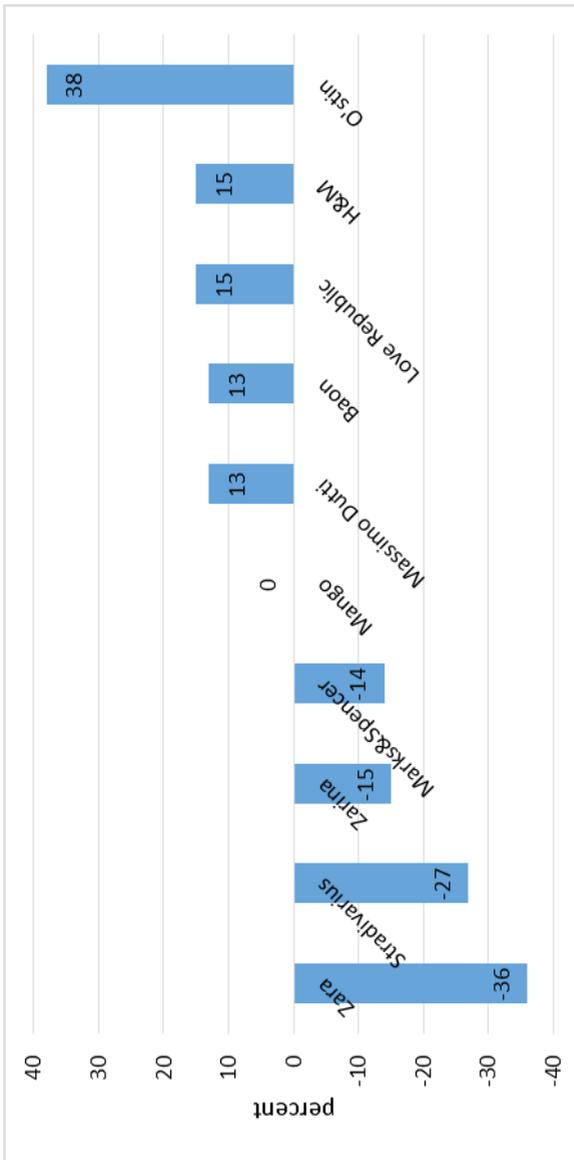


Figure 3 - Percentage change in prices for women's jeans according to the results 2017-2018

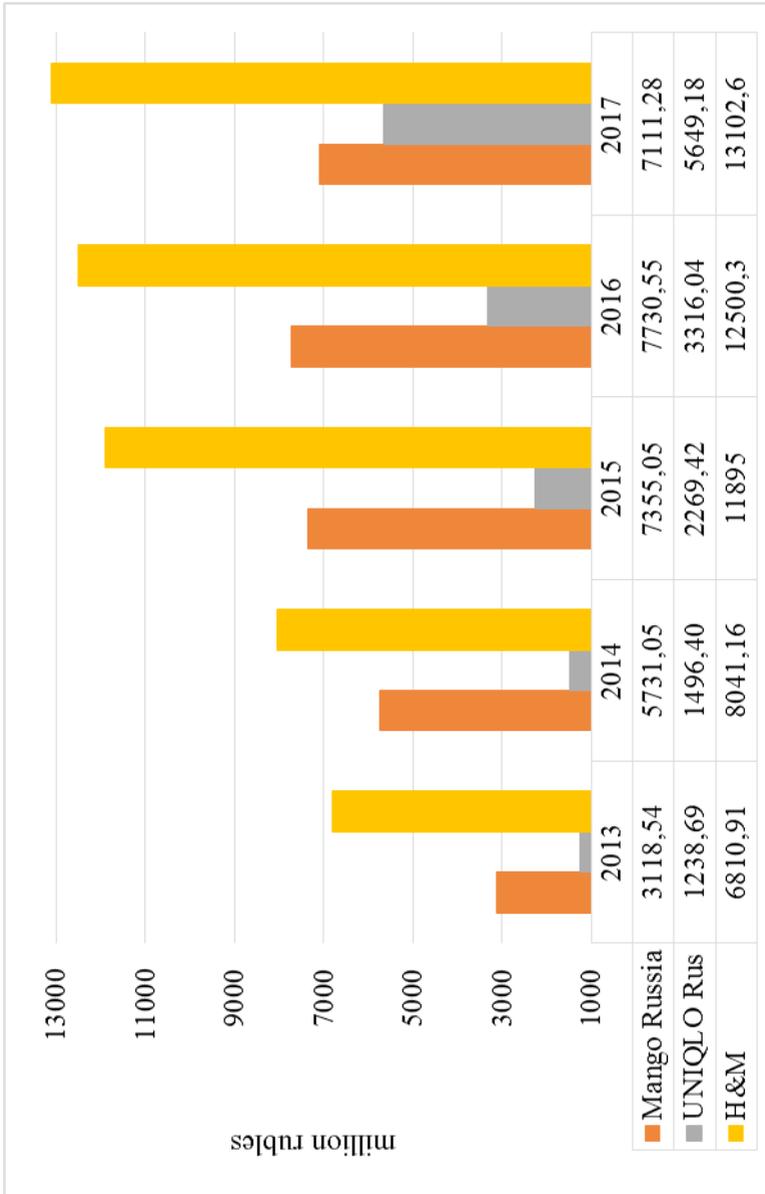


Figure 4 - Comparative histogram of the asset balance

The largest assets of the balance sheet are observed at “H&M Hennes & Maurits” Ltd, which is the managing company of the H&M brand in Russia. The highest indicator - 13102.6 million rubles was recorded at the end of 2017, the lowest in 2013 - 6810.91 million rubles. The base growth rate in 2017 compared to 2013 was 192.38%.

The lowest indicators were recorded at Uniklo (Rus)Llc, which owns UNIQ-LO brand stores. So, the largest indicator was also recorded in 2017 (5649.18 million rubles), and the lowest - 1238.69 million rubles in 2013. Such low rates are justified by the fact that the company is a relatively young player in the Russian clothing market. At the same time, the basic growth rate in 2017 compared to 2013 amounted to 456.06%, which is a much better indicator than the H&M brand [4].

Mango Russia LLC, which owns Mango brand stores, shows average balance sheet assets, while the maximum indicator was recorded in 2016 and amounted to 7730.55 million rubles, the smallest - 3118.54 in 2013. At the same time, in 2017, a decrease in the asset balance was recorded compared with 2016, to 7111.28 million rubles. Most likely, the decrease in the balance sheet asset is associated with the general trend of falling financial indicators for this brand. The next comparative histogram is a comparison of profit indicators from sales. This indicator directly shows us how much from sales was received by stores for a certain time period. In this case, this period is from 2013 to 2017.

Comparison of profit from sales is presented in Figure 5.

According to available data, for the indicated period from 2013 to 2017, the largest profit from sales was recorded in stores of the Swedish brand H&M, so the maximum profit amounted to 5,751.86 million rubles. The profit from sales of this brand for the entire period under review was the largest, compared with other brands under study. The growth in profit from sales in 2017 compared to 2013 as a percentage amounted to 402.85%. At the same time, there remains a trend towards further growth in sales profit, which indicates a competent business model and company policy.

Positive indicators of profit from sales were also recorded in stores of the Japanese brand UNIQLO. The maximum value is observed in 2017 and amounts to 1,184.32 million rubles. In 2017, sales profit growth compared to 2013 amounted to 509.32%, the growth rate as a percentage is higher than that of the H&M brand considered earlier. If the current trend continues, the profit indicator from sales will steadily increase.

The only company that incurs losses in the study period is "Mango Russia" LLC, which owns stores of the Spanish brand Mango. This company maintains a steady decline in sales profit. So, the minimum loss was recorded in 2013 and amounted to -9.9 million rubles, the maximum loss in 2017 with an indicator of -943.07 million rubles. The loss growth rate in 2017 relative to 2013 is 9525.95%. The increase in losses from sales is primarily associated with a business model that does not meet the current state of the economy, or company policy, a decrease in sales in stores of this brand.

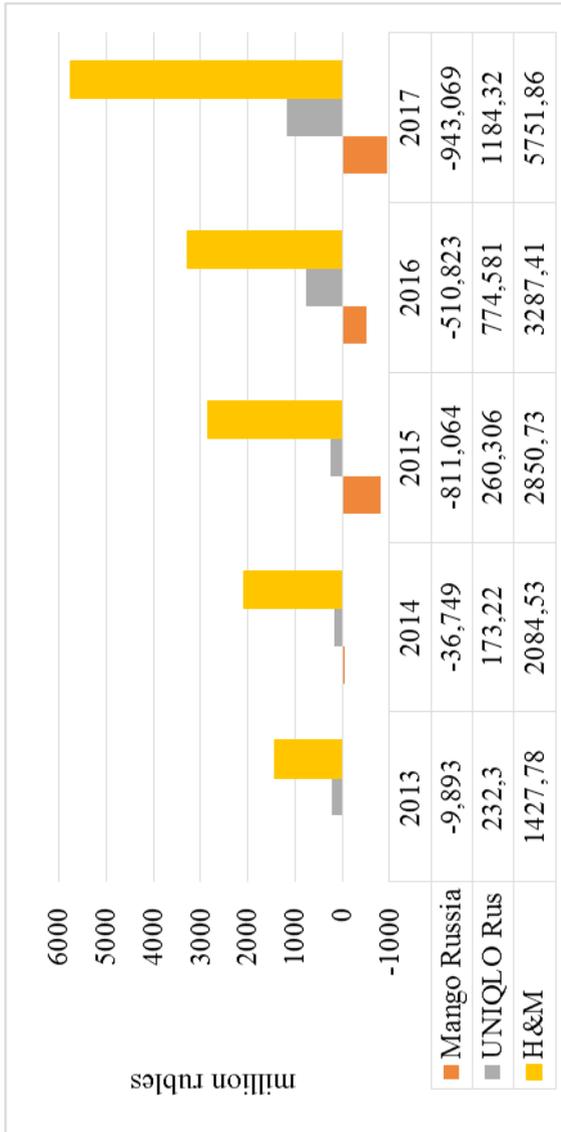


Figure 5 - Comparative histogram of profit (loss) from sales

After analyzing the profit indicators from sales, it becomes obvious that only two out of three companies maintain a positive upward trend in profit from sales, and only one company stably incurs losses, increasing the loss ratio.

The next indicator, also showing the success of doing business, is the net profit of companies. The period under review is from 2013 to 2017. A comparative histogram is shown in Figure 6.

A trend similar to the situation from the previous figure 5 remains on this chart. So, the Swedish brand H&M is the leader with a maximum indicator of 4,030.65 million rubles in 2017. The minimum net profit indicator in the pre-crisis 2013 with a mark of 828.416 million rubles. The growth rate as a percentage of 2013 is 486.55%.

At the same time, the Japanese brand UNIQLO shows the instability of its indicators, so in 2017 net profit amounted to 681.8 million rubles, while in 2014 and 2015 the figure was negative: -387.03 and -93.91 million rubles in 2014 and 2015 respectively. At the same time, a sharp increase in net profit was recorded in 2016 and its indicator amounted to 576.76 million rubles, which is 614.16% in relation to 2015. The basic growth rate of net profit in 2017 compared to 2013 is 434.16%.

The negative trend remains in stores of the Spanish brand Mango: net profit in 2017 amounted to -52.27 million rubles. Thus, the company operates at a loss. At the same time, the maximum net profit indicator was recorded in 2015 and amounted to 71.62 million rubles. A similar situation can be explained by the fact that during this period prices of the pre-crisis period remained.

Summing up, it can be stated that the companies studied have completely different indicators, in particular - indicators of profit from sales and net profit. Two of the three companies are characterized by stable profit growth over the entire period under review, with the exception of 2014 and 2015 at UNIQLO, when the net profit indicator had negative values (loss). H&M brand stores show a steady increase in the considered profit indicators. Profit indicators at Mango brand stores acquired negative values, with the exception of net profit in 2015 (71.62 million rubles).

The considered profit indicators of global brands operating in Russia allow us to conclude that a well-developed strategy, a customer-oriented business model of the company, the general policy of the company, as well as pricing in relation to customers are the main factors contributing to maximizing profit.

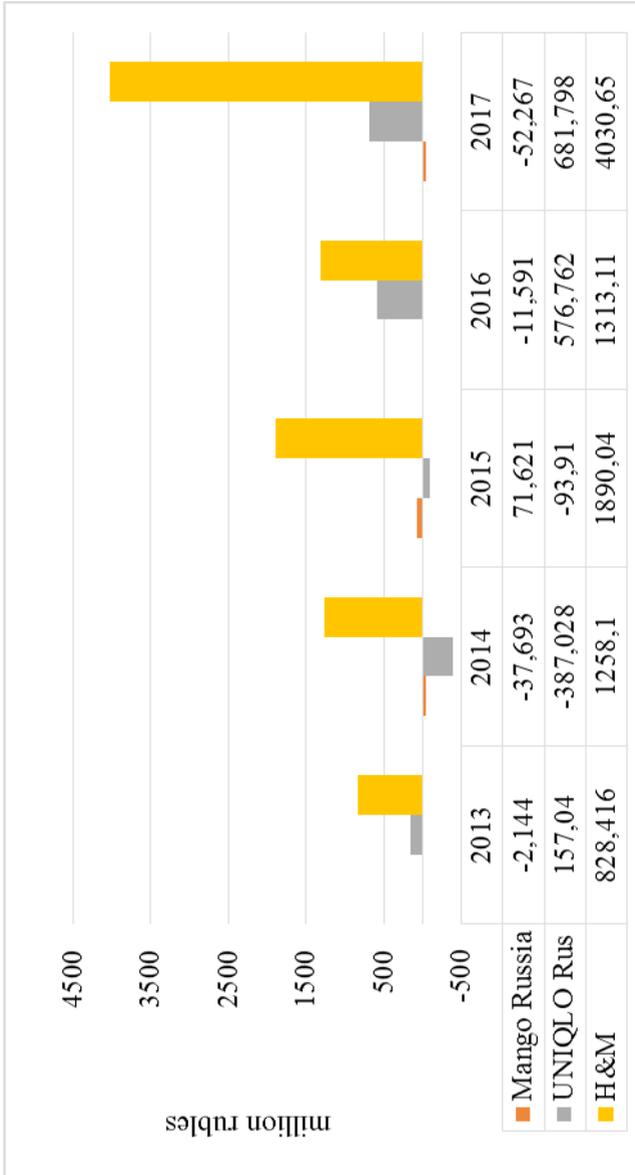


Figure 6 - Comparative histogram of net profit

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JEL classification: L83, M21

餐饮客户服务组织的特点
**FEATURES OF THE ORGANIZATION
OF CUSTOMER SERVICE IN CATERING**

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抽象。 文章阐述了在餐饮服务领域组织服务的方法, 提供了该领域的服务分类, 阐明了影响服务质量和文化的因素, 描述了餐饮业务的渐进式服务
关键词: 公共餐饮, 服务形式, 餐饮业, 餐饮服务, 餐厅。

Abstract. *The article sets out approaches to organizing a service in the field of catering services, provides a classification of services in this area, clarifies factors affecting the quality and culture of service, describes progressive forms of service in the restaurant business*

Keywords: *public catering, service forms, restaurant business, catering services, restaurant.*

Temporal characteristics are inherent in the processes of direct contact of service providers with consumers. These contacts form what is called a service, a service process.

At the same time, service is understood as a system of technological operations, useful actions, various efforts that the restaurant service manufacturers carry out, expressed in ensuring their comfortable stay in the restaurant and in response to their desires and needs.

In turn, as a rule, service is an activity aimed at realizing certain consumer expectations regarding the quality of service. One of these activities is the implementation of a service standard [5].

From the point of view of ensuring the quality work of the staff, the range of services for customers can be represented in the form of the following scheme (Figure 1).

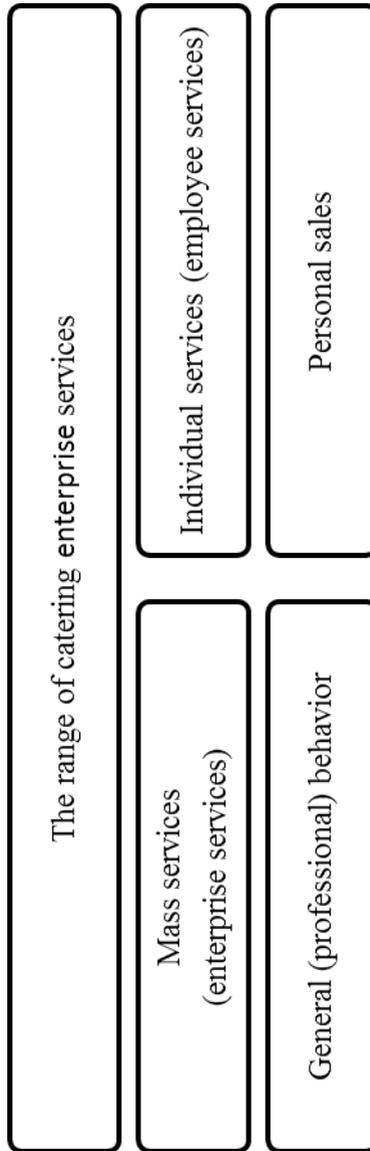


Figure 1 - Structure of a complex of services

The services of public catering enterprises can be divided into two groups:

1. Mass services are impersonal “enterprise” services that are provided to everyone who comes to this enterprise. These services are not connected in the client’s mind with the work of individual employees, but relate to the general “atmosphere” and “convenience” of the enterprise. The mass services include: convenient parking and entrance to the restaurant, beautiful shop windows, convenient layout of the trading floor, a beautiful and convenient menu, comfortable lighting, climate and much more.

Despite the fact that these services are provided by the enterprise, it is important to understand that it is with these services that the visitor first of all encounters and forms, on the basis of their perception, a general idea of the enterprise. In the future, the initial idea of the enterprise may be manifested in the choice and purchase of dishes, in the perception of prices and the level of service from waiters, etc. It is true in many respects that the mass services provide 50% of the economic performance of the enterprise. The task of each employee of the enterprise is to monitor a set of mass services, to offer ideas to increase the quantity and improve the quality of these services [5].

2. Individual services are services that are provided by each company employee individually and are perceived by visitors as "employee services." Accordingly, each employee is responsible for providing these services personally.

Individual services, in turn, are divided into general behavior and personal sales.

General behavior - this is the professional behavior of the employee, which ensures a loyal customer and high sales. Professional conduct means that employee behavior must be based on clear rules and internal corporate standards approved for the enterprise. Among such rules and standards, for example, there may be: a dress code (appearance rules), a code of conduct for a hall employee, a list of recommended poses and phrases for a hall, and others. The implementation of these rules and standards by the employee in many respects guarantees the effectiveness of contact and customer service. Despite the fact that the standards are developed by the employees of the central office, they take into account the specifics of working “in the field” and the specifics of customer behavior. Moreover, in the process of implementation, most standards go through the process of adaptation, taking into account the wishes and additions of the company's linear employees.

Personal sales - direct communication between the employee and the client around the offer of selling the service. Personal sales are also described by a set of documents within corporate standards, which, based on a pre-selected system of communication with the client, contain descriptions of specific techniques and methods for presenting goods, customer beliefs, answers to questions and objections of the client, etc. In modern conditions, due attention is paid to the concretization of organizational behavioral standards.

Ethical requirements are reflected in the “Internal Labor Rules”, in job descriptions and contracts, ordering abroad shows that the basis of business behavior should be official, business and speech etiquette, readiness for contact, both the service provider and the visitor.

To establish contact with the visitor, the waiter’s speech should have the following characteristics: content, expressiveness and motivation.

To fulfill the order, the waiter must prompt the visitor to reveal his wishes, gastronomic tastes of preference.

Clarity of presentation, simplicity of syllable, sequence of explanation, clear pronunciation, average pace of speech, politeness and tact will help the waiter to better cope with this task.

Therefore, the process of serving visitors consists of patterns of behavior of the waiter, i.e. formed skills of habitual reactions of a particular person. The organization of labor at all levels of service should provide flexibility and courtesy in relation to each consumer, the quality and safety of services. Any wrangling between the service personnel and the visitor is not allowed [2].

The level of service is a constant headache for restaurateurs and perhaps the most valuable quality for customers. It is the poor quality of service that the restaurant visitor most often complains about. Five important components are distinguished in restaurant services: timeliness, the ability to answer all customer questions, a well-organized complaints handling system, the correctness of the final calculation, and competent recommendations on the choice of dishes and drinks [4].

Nowadays, visitors, making an order in a restaurant, most of all want to order a good service. Unfortunately, it does not appear on the menu. However, with increasing competition, poor service is a thing of the past. The fact that restaurateurs are paying increasing attention to customer service is also reflected in the development, implementation and progress of internal corporate training programs for personnel. Depending on the type and class of the restaurant, the personnel manager develops a service standard and training programs. Trainings give the practice of multi-level communication, and are also an effective method of practical learning, training, the formation of skills, as well as maintenance techniques [3].

The main factors that determine the service culture at public catering enterprises include the availability of a modern material and technical base, the volume, types and nature of the services provided, the range of products, the introduction of progressive forms of service, the rational organization of labor at all levels of service, and the professional skill of the enterprise’s employees and its constant increase, creating an atmosphere of hospitality.

In this regard, the culture and quality of service directly affect the results of the restaurant business. With the growth of service culture, the number of visitors is growing, the turnover is increasing, the profitability of the enterprise is increasing, and production costs are decreasing.

However, there are enterprises in the restaurant services market in Russia that do not have service standards for several reasons: the management does not rank the quality of service as strategic goals, the management is confident that the service, in principle, cannot meet the expectations of customers. The service process itself cannot be brought into any orderly standards; standards exist, but are based on management's views, not taking into account the expectations of customers.

As the research results show, the four main reasons determining the decision to visit the institution again are: quality of food, service, price level, atmosphere.

In order for the restaurant to be profitable and prosperous, it is enough to develop the right concept, carefully work it out, skillfully put it into practice and raise the offered service to a high level.

The most important task of the management of a restaurant business enterprise is the constant development of the service complex for the target customer group, the expansion of services to other groups and customer categories.

In this regard, it is important to keep track of all the innovations in the organization of the restaurant business and services in Russia and abroad, to try to adapt and introduce innovations in the work of your enterprise.

Many forms of service in the restaurant business have been replaced by advanced technologies that are prevalent in the world. Such processes are especially clearly visible in the hotel and restaurant business.

In some “high-tech-style” restaurants, tables are served in a freestyle manner, abandoning the classic serving. This style, also called author's, led to a certain simplification of the preparation and serving of dishes, which was manifested in the rejection of fried dishes, giving way to dietary, healthy vegetable stews.

Many previously required elements (substitution plates, full laying out of cutlery, various glasses for different drinks) have disappeared from the classic serving. Some restaurants switched mainly to multi-colored glassware. At the same time, round plates were replaced by triangular, rectangular and square.

Changes in table setting were made by a new style of cooking technology, called “cross-cooking”, or “fusion” - a combination of products and technologies of different countries and climatic zones in one dish. As a result, soy sauce sauces, chopsticks, wooden snack trays were added to the classic restaurant table setting.

Simplification in table layout has led to the fact that even some luxury restaurants began to lay on the table less and less additional appliances. White and red wine is offered in identical glasses, bread is served on the table in the breadbasket, but not served, for coffee and tea, cups of the same size are used. Thus, in accordance with the “cross-cooking” or “fusion” style, the dishes are served in a way that is convenient, and not in the way that is required by the classical rules.

Traditional classic dishes are also used in a new way. The author's style finds expression even in the design and presentation of dishes.

So, for example, beef stroganoff can be served on a plate - a shredder with three compartments (for meat, mashed potatoes, pickles) so that the meat, rich in sauce, does not mix with the side dish. In this case, the separation of the dishes into individual ingredients is not only original and beautiful, but also practically justified.

To speed up the service process, innovative technology, such as a waiter's electronic notebook, is proposed.

Test trials conducted by the "IL Patio" restaurant passed and showed a good result of using electronic notebooks for waiters: the time for guests to receive drinks was reduced from 9 to 2-3 minutes, and the waiting time for hot dishes was also reduced from 35 to 20 minutes.

In the restaurant business, there are not many ways to increase profits. One of the most obvious is to increase the speed of service and the turnover of the table. An electronic notebook, reducing the guest service cycle by about one and a half to two times, allows to implement these tasks. The use of portable terminals during lunch is especially relevant, and this is the case when the goals of the guest and the restaurant absolutely coincide. The limited time of the lunch break makes the guest hurry, and it is in his interests to be served quickly, because the purpose of such a visit is to eat, and not spend time.

Benefits of Using Waiter's Electronic (Mobile) Notebooks are:

1. Due to the rejection of the use of paper notebooks, the number of operations when making an order in the system is reduced. Consequently
2. the time spent on making an order is reduced, losses from unintentional personnel errors are reduced.
3. Placing an order directly at the customer's table enables timely order clarification.
4. Portable terminals do not require the allocation of a separate space, adding a new terminal does not need any additional work on the installation of electrical and computer networks.
5. In portable terminals, the paging function is implemented, which allows the client to call the waiter using the button located on the table.

In a number of cafes and restaurants, the customer service process is built using purely professional portable waiters' terminals. These wireless devices were originally developed for commercial use and are therefore optimally designed to meet the specific needs of the hospitality industry. The presence of hot keys in them and convenient navigation through the menu allow to quickly add dishes to the order, which is especially important for cafes and restaurants during peak hours, for example, when serving business lunches. Data exchange is carried out through the terminal's own radio protocol, which can significantly improve the reliability of the system.

Due to the authorization of workers in the system using magnetic cards, it is possible to control the work of personnel. The manager can track the actions of the waiters, and his work, in turn, is evaluated by the manager.

This allows to implement measures to stimulate sales, control orders and provide discounts, exchange meals between tables, implement a measure to stimulate sales.

Thanks to specially developed software solutions, it became possible to display menu items on the touch screens of “tablets”. In the Number of e-Menu functionalities, the connection with various peripheral devices (fiscal printers, video surveillance system, etc.) should be mentioned.

In this case, two service options are possible. In the first case, waiters equipped with e-Menu tablets independently place orders. In the second case, guests have the opportunity to form an order themselves and send a request for a kitchen production.

At the same time, they can evaluate the appearance of dishes and their ingredients, find out about the calorie content of foods, portion size and cooking technology. Often, it gives not only a description of the dishes, but also recommendations on their taste combinations with other menu items and drinks.

Thanks to the e-Menu, which has an intuitive multilingual interface, in addition to reducing the time for processing orders, one can avoid the tedious questioning of waiters. Further, after creating the order, the system notifies the waiter about this, which confirms the order and sends it wirelessly to the service printers at the cooking points (kitchen, bar).

The benefits of using e-Menu are quite obvious. The system is programmed in such a way as to unobtrusively push visitors to increase the order and the sum by offering additional positions.

It is also important to establish effective feedback by restaurant visitors who will be able to evaluate the quality of service in real time, leave their opinion on the restaurant, and rate the ordered dish. The e-Menu program can be used to book tables and notify about upcoming events. As a result, after reading the program of events in the restaurant, the guest can reserve a table convenient for him for a certain date [1].

Today, conceptual technological solutions are presented on the market. In particular, this applies to Dinner Touch interactive dining tables, allowing visitors with interest to spend time in restaurants. Monitors with an electronic menu system are built into the tops of the tables, which allow to make a remote order more quickly and conveniently, thereby systemizing the service. To pass the time while waiting for the order, the guests are offered a set of entertainment applications, including games, watching videos, playing music.

Statistics show that tables equipped with the electronic menu system e-Menu, on average, bring 20-25% more income, and the turnover of establishments using e-Menu increases significantly, up to 40% for certain dishes and drinks.

Thus, the organization of services at public catering enterprises is a multifaceted complex of measures in which many aspects of modern business should be taken into account: from managerial and innovative, to ethical and cultural.

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JEL classification: L83, M21, R11

新西伯利亚地区疗养院和度假服务市场的现状和发展前景
**THE CURRENT STATE AND DEVELOPMENT PROSPECTS
OF THE MARKET OF SANATORIUM AND RESORT SERVICES
IN THE NOVOSIBIRSK REGION**

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抽象。 文章介绍了作者对新西伯利亚地区疗养院和度假服务市场的监测结果，显示了短期内若干指标的动态，该地区气候潜力的特征是该地区的基础。 发展了疗养院旅游。

关键词：旅游，度假服务市场，区域旅游，自然资源，新西伯利亚地区。

Abstract. *The article presents the results of the author's monitoring of the market of sanatorium and resort services in the Novosibirsk Region, the dynamics of a number of indicators in the short term is shown, the characteristic of the climatic potential of the territory as the basis for the development of sanatorium tourism is given.*

Keywords: *tourism, the market of resort services, regional tourism, natural resources, Novosibirsk region.*

Sanatorium-resort activity is one of the most important elements of the national healthcare system, creating the necessary conditions for treatment, prevention and recovery of the population. Today, the studied area is a key social institution designed to provide a solution to the problem of improving the quality of health and life of the population. The significance of sanatorium-and- resort recovery for the residents of Russia is due to a tendency towards an increase in the incidence rate and the role in their prevention and overcoming that is assigned to sanatorium-resort business in the current concept of the development of the domestic socio-economic system [1].

Of particular relevance is the development of sanatorium-resort activities at the regional level, since the sanatorium-resort direction, on the one hand, is an integral part of the state health policy in the field of the prevention of diseases of the population, on the other hand, it makes a significant economic contribution to their budget for a number of regions. In addition, the development of the resort sector contributes to the additional investment of resources in the improvement of labor resources [2].

Currently, the Russian market of sanatorium and resort services includes more than 2.5 thousand sanatorium and resort institutions that differ in ownership, organizational and legal forms, type of enterprise, number of its personnel and number of clients served. A significant part of the sanatoriums falls on the Southern (28.8%) and Volga (22%) federal districts, which is explained by the climatic conditions of these regions.

The largest share (over 70%) in the structure of sanatorium-resort institutions is occupied by sanatoriums and boarding houses with treatment. The participants of the market are tourism companies that offer the organization of a resort product as a resort of a tourism product.

The number of consumers of sanatorium and resort services in 2018 amounted to more than 6.4 million people. Despite the fact that every resident of the Russian Federation is a potential consumer of sanatorium and resort services, however, a number of studies show that less than 4% of Russians resort to the services of sanatorium and resort companies [4].

The highest occupancy rate for health facilities falls on the period from June to September, and it is during this period that these institutions provide up to 40% of the annual volume of services sold.

Despite a slight decrease in the number of health-improving and sanatorium-resort organizations and stagnation of consumer demand, the volume of the sought-after Russian market has positive dynamics (according to some data, the annual market growth within 7% is observed).

This fact is due to the expansion of the market supply of sanatorium-resort institutions and their response to consumer inquiries for shorter terms in comparison with standard sanatorium-resort treatment programs.

The Siberian Federal District includes territories possessing a unique combination of a number of natural factors, such as: diverse relief and landscape, the presence of salt and fresh waters, high-water rivers, lakes, taiga, tundra, steppes and forest-steppes. About 85% of the all-Russian reserves of mineral resources are concentrated on the territory of the district, which differ not only in economic, but also in health-preserving character. In addition, 42.3% of the area of all Russian reserves is in the territory of the Siberian Federal District.

A number of areas of the district are distinguished by the presence of deposits of mineral and thermal waters, the bulk of which are healing. These include lakes Karachi, Danilovo, Krasnozernoje. A special status is assigned to Lake Baikal - a unique natural object that contains 1/5 of all the reserves of fresh water on the planet.

Despite the attractiveness of natural conditions, the organization of sanatorium and resort activities is complicated by the climatic factor, which manifests itself in very low winter temperatures. In addition, the average annual temperature values do not exceed zero.

According to official statistics, the last decade has shown an increase in the demand of the Russian population for the services of the sanatorium and resort market. An analysis of the current activities of sanatorium and resort institutions in the constituent entities of the Russian Federation showed that the Siberian Federal District ranks fourth among other districts in the number of recreational and sanatorium and resort institutions. The largest number of enterprises and organizations is located in the Kemerovo, Novosibirsk regions and Altai Territory (19.07%, 11.86% and 17.37%, respectively) [5]. At the same time, the Altai Territory occupies a leading position in the number of accommodated clients in sanatorium-resort institutions. Least of all sanatorium-resort activities are presented in the Republic of Altai and the Republic of Tuva.

As you know, the effective development of the market of sanatorium and resort services directly depends on the level of development of the region. The most significant indicators for this market are fertility, mortality, morbidity and the level of natural growth.

As a result of the study, it was revealed that the Siberian Federal District has a low birth rate and a positive trend towards a decrease in incidence and natural population growth. Crisis phenomena in the Russian economy led to a reduction in real cash incomes of the area population and a high level of their differentiation, including in the subjects of the Siberian Federal District.

The most important indicator of the activities of organizations and enterprises in the market of sanatorium and resort services is the revenue from the sale of sanatorium and resort services. A positive value of this indicator in recent years is observed in the Altai Territory, while other regions are characterized by a loss from core activities. The highest value of this indicator was noted in the Krasnoyarsk Territory [5].

One of the most famous sanatorium and resort sites of the Siberian Federal District is the Belokurikha complex - a balneological resort in the Altai Territory, combining a number of factors: natural, healing (due to mineral waters) and infrastructural (high level of development of accommodation facilities and leisure activities).

The organization of sanatorium and resort activities is possible only if the Novosibirsk region has the necessary tourist and recreational elements.

The fact that the Novosibirsk Region has the most powerful natural potentials that allow the development of health tourism is not required. The beginning of a new stage in the development of tourism resources of the region was laid in 2006, when the territory of the region was examined for the availability of tourist resources and the most promising territories for the development of tourism, in particular, health and recreation, were identified. Such recreational territories of international importance include such cities as Novosibirsk, Berdsk and the territory of the Novosibirsk region; of federal significance - the territories around the Novosibirsk reservoir (Ordynsky and Iskitim districts), Kolyvan district, of regional significance - the Salair range (Maslyaninsky, Iskitimsky, Toguchinsky districts), Dovolensky and Suzunsky districts, the area around the lakes Chany, Sartlan, Uryum, Ubinskoye, Karachi, Settlements: Ust-Tarka, Tatarsk, Vengerovo, Chany station. In these areas, the creation of recreational and tourist systems is provided.

The natural resources of sanatorium-resort organizations are traditionally considered first of all, since they do not require serious modifications and only need infrastructure, information and service support.

The Novosibirsk region has reserves of therapeutic mud, characterized by the presence of special microflora and enzymes. In the Novosibirsk Region (NSR), the total forest fund area is about 4,490 thousand ha, including about 22% occupied by coniferous species. In the north of the NSR - taiga with swamps, and to the south - deciduous forests and forest-steppe with birch and pine forests [3].

The climate of the Novosibirsk region is continental-temperate, very favorable for the development of the market of sanatorium and resort services. Of particular importance for recreation is the presence of local sources of mineral waters, mineralized lakes with medicinal brine, healing mud, and thermal springs.

Ostrovnoye Lake in the Krasnozersky district is a unique deposit of therapeutic silt sulphide mud. As noted by a number of scientists, only the therapeutic mud of the lakes Balakli (Uzbekistan) and Cheder (Republic of Tuva) are their counterparts. According to their characteristics, the reserves of Lake Ostrovnoy exceed, according to doctors, the healing mud of the Dead Sea. These valuable sulfide-silt mud, brine, blue and yellow clays, and healing properties are used in their health programs by the regional sanatoriums Krasnozersky and Dovolensky. The basis of the health-improving complex of services of the sanatorium is a source of high mineralization chloride-bicarbonate-sodium-iodine-bromine water that normalizes the metabolism in the body.

In the areas of the Novosibirsk Region, 16 deposits of sapropels have been explored - unique in composition of lake organomineral accumulations containing proteins, fats, biologically active substances (vitamins, growth stimulants, enzymes, hormones) and a whole set of macro- and microelements. The largest reserves of sapropelic therapeutic mud are concentrated in Toguchinsky, Kolyvan and Bolotninsky regions, as well as directly in the vicinity of Novosibirsk - on Lake Plakhino [3].

However, despite the therapeutic balneo-mud wealth of the Novosibirsk Region, not in all territories it is fully used. So, for example, the Chistoozerny region is rich in water resources: 214 lakes are located on its territory, of which 104 are fresh. The main recreational attractiveness of the region is made up of therapeutic mud and water of Lake Lechebnoye [3].

Vengerovsky district is characterized by the presence of iodine-bromine thermal waters, which allow organizing activities for the provision of health-improving services.

On the territory of the Kyshtovsky district, there is Lake Danilovo (Serbryanoe), which, thanks to its significant silver content, has healing properties.

Gorkoe Lake, located in the Kupinsky district, also has healing properties. The largest deposits of Lake Gorkoe, along with Lake Ostrovnoy, are included in the cadastre of therapeutic mud in Russia. But they are also not fully in demand in terms of sanatorium and resort treatment.

The resort resources of the region also comprise deposits of mineral, thermal, and high-thermal iodine-bromine waters discovered in many areas. In Novosibirsk and its environs, 12 sites of radon waters for medicinal use have been explored. The conclusions of experts indicate the suitability of radon water for external use in the treatment of a wide range of diseases.

In the eastern part of the region, mineral table water, having value as natural fresh water, has gained its distribution.

"Karachinskaya" water refers to mineral water with a large set of chemically active elements, which is why it is called the counterpart of "Essentuki-4", "Arzni" waters.

Iodine-bromine and bromine waters of sodium chloride composition, medium and high salinity are common in the northern and central areas of the region. Predicted reserves of such water allow creating hydropathic clinics practically anywhere on the territory of Kyshtovsky, Ust-Tarksky, Vengerovsky, Kuibyshevsky districts.

In the Ust-Tark district in the villages of Kozino and Elanka there are mini-sanatoriums with pools of underground thermal mineral water. Near the city of Iskitim is the memorial and natural complex "Holy spring", which has certain healing properties.

In the Novosibirsk Region, 53 natural monuments, 26 reserves, including one of federal significance, are registered.

Visitors to sanatorium and resort organizations can be attracted by the sights of the city and the region.

A picturesque place is the Barsukovskaya cave, which is located in the Maslyaninsky district, 1.5-2 km south-east of the village of Barsukovo.

In the Iskitim district, near the village of Belovo, Belovsky waterfall is located. Four kilometers from the village of Novososedovo, Iskitim district, there are Berd cliffs.

The Bugotak hills are a unique place and are located 70 km east of the city of Novosibirsk, in the Toguchinsky district and in the vicinity of the village of Gorny.

Burmistrovo is an ordinary village in the Iskitim district of the Novosibirsk region, 85 km from Novosibirsk with a population of 1680 people.

Krasny Yar is a village located in the Ordynsky district of the Novosibirsk region. It is a weekend vacation spot for many Novosibirsk citizens and not only thanks to the “own” Ob Sea.

An attraction of the Ordynsky district is the Ordynsky Biological Reserve, whose area is 46.631 thousand hectares. The reserve was founded in 2000, dozens of rare trees and shrubs grow on its territory.

Another attraction of the Horde region is the Karakan forest. This territory has long been developed by unorganized tourists, who come from all over the Novosibirsk Region, and from June to September up to 15 thousand people can simultaneously be in the forest. In the future, the region plans to create tourist and recreational parks.

Thus, the Siberian Federal District and the Novosibirsk Region, due to its unique natural potential, have significant prospects for the development of many types of activities in the market of sanatorium and resort services. The key conditions for the development are the variety of medical resources and their availability, a significant number of natural complexes and the presence of a number of targeted programs that contribute to increasing the socio-economic importance of sanatorium and resort treatment.

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JEL classification: L83, M21

基于创新的酒店企业发展现代趋势
**MODERN TRENDS IN THE DEVELOPMENT
OF HOTEL ENTERPRISES BASED ON INNOVATION**

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抽象。 本文描述了作者对酒店业实施的创新分类的方法； 突出了酒店服务业发展的现代趋势； 总结了创新形式酒店有前途的运作领域； 提供了酒店业务中IT创新的特点。

关键词： 酒店业, 酒店酒店服务, 创新, 现代趋势, 发展。

Abstract. *The article describes the author's approach to the classification of innovations implemented in the hotel industry; modern trends in the development of the hospitality services sector are highlighted; promising areas of functioning of hotels of innovative formats are summarized; the characteristic of IT innovations in the hotel business is given.*

Keywords: *hospitality industry, hotel hotel services, innovations, modern trends, development.*

The hotel industry in modern conditions is inherent in the problem of increasing the load of rooms.

Like any other industry, the hospitality industry has a high importance of creativity and innovation to attract new consumers and increase their loyalty. For example, there is no doubt that in the hospitality industry high-level hotels must work around the clock, which distinguishes them by their uniqueness and level of customer satisfaction, and also justifies their high costs [8].

For the modern hotel industry, the following innovations are characteristic:

1. Creation of banquet hotels. Banquet hotels have become traditional players in the hospitality sector. In modern conditions, “change the time” is a relevant slogan for the hotel industry. Banquet hotels mainly provide late discos and technology concerts, which are becoming an alternative to the usual concerts [9].

2. Creation of energetic SPA hotels. “Energy medicine” in the hospitality industry is growing rapidly. The essence of the activities of these hotels is to offer guests SPA-services throughout the stay. As a result, the guest’s “fatigue energy” is converted to “dynamic energy”. Such hotels are gaining popularity among people working in an intensive mode and people of mature age, inclined to purchase this kind of service.

3. No pets allowed. The presence of this initiative is due to such factors as: the disagreement of a number of guests to live in a hotel where the rules of residence allow pets (cats and dogs) and the need for additional comprehensive cleaning of rooms where guests stayed with their animals.

4. The creation of eco-hotels or the initiative of environmental hospitality.

The creation of eco-hotels is the main trend in the hotel industry. The status of such a hotel allows you to achieve significant financial success without making significant investments in hotel marketing. A distinctive feature of eco-hotels is the location on the principle of harmonious proximity to nature. The activities of hotels are based on the use of innovative environmental technologies that allow the maximum use of natural energy. However, it should be noted that city hotels have proved that it is not the terrain that is important, but thinking in order to become ecological and have adopted a philosophy of nature protection [6].

Representatives of the hotel industry support the rejection of carbon coating and a change to the green logo. Special training programs are now being provided to prepare for the conservation of the environment. Hotels prefer to build buildings from environmentally friendly materials. There are some of the most effective areas of activity in eco-hotels:

1. Eco-friendly hotels in harmony with nature, eco-friendly hotels offer a harmonious environment, mainly located in quiet places with such well-developed environmental procedures as rainwater processing. The hotel’s desire to preserve nature is expressed in every small initiative.

2. Truly environmentally friendly hotels, these hotels do their best to make guests feel the importance of nature and its beauty, the hotel provides trainings on nature protection , and even while sleeping, being surrounded by nature, the guest begins to think about its importance and necessity of its safety.

3. The environmental friendliness of the place of residence, when hotels pursue a policy of minimizing the use of non-natural materials, water and waste are recycled, and resources that do not pollute the atmosphere during disposal are used.

4. Promotional Hotels. They use a policy that can easily be adapted by hotel guests and staff. Such hotels develop special training programs that force the employee to conduct the most environmental work in each action [3, 4, 6].

Along with the innovations presented above, a number of innovative actions based on computerization and automation of service processes are currently distinguished [2].

Computer and automated technologies are beginning to dominate society. They play a key role in work and on vacation. Hotel enterprises need to be proactive and take the latest technology into service. In order to keep up with time, hotels should begin to provide their guests with the same technologies that are available to them at home [5].

Among the innovations due to computerization, it is advisable to include:

1. Digital kiosks. More and more hotels are installing digital kiosks or terminals in their lobby so that guests get into the familiar Hi-Tech environment. They are used to register, receive materials or information about the hotel and local attractions. Information from them can be easily downloaded to your smartphone or tablet as a PDF file. In the lobby of the “1000 Hotel” in Seattle, there is a Microsoft interactive game table where you can play virtual chess or learn all about the hotel from a digital concierge [7].

2. Digital room decoration. At the Ruby Hotel in Vienna, digital technology has been brought to the rooms. Guests are welcomed by a tablet that digitally downloads newspapers, as well as hotel information, provides access to the Internet, downloads the application for room checkout, guest reviews, and also offers a button for booking a room in the Ruby Hotel for the future. Guests can register in person, they do not have to do this through the tablet. Having offered a choice, the hotel was able to eliminate the queues at the reception and freed up more time from the staff for the quality service of guests [1].

3. The key to the room - is a cellphone. Starwood Hotels and Resorts recently introduced a mobile lock in their rooms. The SPG Keyless system is the first system in the world that allows customers to open their numbers by scanning a smartphone (with the SPG application). When the number is ready, a message and code is sent to customers. They can come to the hotel and go straight to the room; front desk registration is not needed.

4. Interactive news of social networks. All attention is paid to the quality of customer service. And social networks play a huge role in this, make the service more enjoyable. Some hotels, kind of bring a third dimension, establishing access to social networks right in the lobby. The scoreboard shows the content created by users, the best photos of guests and the data of pages on the social networks of those who visited this hotel. Such novelties show guests photos and events, and also promote various services.

Thus, the hotel industry is a significant sector of the global economy and the platform for its further development is the transformation of hotel services consumers in close interconnection with new technological and marketing solutions. Innovation in the hotel industry is a process that should be supported from the beginning of the hotel's foundation, since it is impossible to maintain the competitiveness of the hotel without introducing something new for consumers whose tastes and preferences change at a high speed due to the active development of information technologies and the formation of new trends among hotels around the world.

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孔子作为亚太地区睦邻关系基础的哲学法律思想
**PHILOSOPHIC-AND LEGAL IDEAS OF CONFUCIUS AS A BASIS
FOR THE FOUNDATION OF GOOD-NEIGHORLY RELATIONS
IN ASIAN PACIFIC REGION**

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抽象。理解两个邻国文化中的哲学和法律概念，可以在国家间和社会间的层面上合作，制定正确的方向。

关键词：合作；文化；社会；法律空间；法律政策；传统；哲学。

***Abstract.** The comprehension of the philosophic-and legal concepts in the cultures of two neighbor countries allows to elaborate a correct direction in their cooperation both on inter-state and inter-social levels.*

***Key words:** cooperation; culture; society; legal space; legal policy; traditions; philosophy.*

Introduction

In a short article a problem can only be defined, but it is not possible to cover all the foundations for cooperation. It is clear. A statement or a definition of a problem is like a recognition or detection of some veil, covering of which prevents clear seeing the essence... The definition of a problem in connection with the grounds of interaction of cultures, therefore, says, that we suppose that some veil was noticed and we try to lift it and to see the foundation of cooperation uncovered. Along with that, such a view reflects only the comprehension of the author, and the author realizes that at any case his conclusions might not be free from mistakes.

Considering the cooperation of countries in the Asian Pacific Region (APR), it is appropriate to touch the relations between the China and Russia, as an example. It would sound ridiculous but we may discover so many similarities and differences which might bring us to the thought that China and Russia are “two sides of one medal”, on which (nothing less than) the picture of the world is reflected.

Similarities and differences between neighbor countries

It is known that Russia, being placed both in Europe and in Asia, is sometimes called as ‘bridge connecting Europe and Asia’. One of supports of that ‘bridge’ rests on ‘Celestial empire’, and that means Russia and China have something common. What is it, exactly?

First, both Russia and China surprise many people by their wideness, territory, love of life, vitality. Even in terms of population, according to prognosis of D.I. Mendeleev, Russia should be equal to China about to the middle of the 20th century. Rapid population growth of Russia at the end of 19th – beginning of the 20th centuries gave grounds for such a prognosis. Though, the further events of Russia’s history brought to the fact that nowadays the population of China exceeds that of Russia more than by 10 times.

Second, both in China and in Russia live many ethnicities: in China – 56, in Russia – more than 120. And it means that nations of Russia and China have a rich experience in liveliness, tolerance, mutual respect.

Third, the history of China and the history of Russia showed some attraction to the Patriarchal way of life (Confucius: ‘The emperor should be the emperor, a subject should be subject; a father should be father, a son should be son’ [3,114-115]). That means, each should know his own place, honor his elders (in age and in social position), because in that is a key to harmony in a society. However, if such an approach in China might be explained by a tribute to tradition, a necessity to follow a ceremony keeping the order and harmony in the society, in Russia the estimation of elders is sanctified by the Commandment of God’s Law: “Honor your father and your mother, so that all would be well with you and your days on Earth would last” [2,81]. During many centuries the Chinese society was a clan society. Unlike social contacts between other people, great importance was attached to relationships between parents and children, husband and wife, brothers and sisters. They always assumed: “if in a family would be all right, then in the Celestial also would reign piece and calmness” [3].

In modern society social contacts became more frequent and closer. The people are bound to spend less time in their families and, instead of that, to more and more communicate with the acquainted and not acquainted people, as well. The structure of the society had changed, and the significance of the family in the society becomes less important. The social progress depends on the united efforts of people from different families, regions and even countries. Consequently, the social morality becomes more important. A modern man should be not only a good son, good husband or brother, but a good citizen, too [4,145-146]. The moral level in the modern society is manifested not only in personal moral qualities of its members, but also, and that might be even more important, - in the social morality, that is, in morality directed at social priorities.

Furthermore, both in China and in Russia political and ideological diversity is allowed. Or, better to say, the uniformity is prohibited, none of ideologies or religions, in Russia, for instance, can be official or obligatory. It is even stated in the Constitution of Russian Federation (1993) in Articles 13 and 14. In China also the Constitution in force (1982) had restored freedom of conscience, and the new Criminal Code established severe sanctions for the infringement of this freedom [1,11]. In order to demonstrate real fulfilment of freedom of conscience, there were organized associations of Catholics, Muslims, Buddhists etc. [7,502-509].

Ye.P. Bazhanov in his observations on the life in China uses the expression “multidimensional religious-ethical world of Chinese people”. We suppose that it is nearly the same as pluralism, democratic, temporal world known for Russian people, but expressed in other words. On the whole, very often what is shown as the uniqueness, originality of China appears to be a known thing expressed in other terms or word forms. So as it appears when comparing definitions in a professional language and commonly used conversational expressions. Besides, different native speakers having different world views might use different definitions in their languages which might not totally coincide when interpretation.

Heritage of Confucius

The scientists, philosophers may be divided (conditionally) into two great categories. Some of them, penetrating into the essence of things, when exploring the world, observing it, recognize, that behind it stands That, Who had created it and rules by established by Him laws. Others, comprehending the creative character of a human individuality, allow themselves to interfere into the laws of existing world, explaining: If you do not like an old law – cancel it and invent a new one (Rousseau, Montesquieu).

China is a unique example of a traditional country, the stability of which during more than twenty centuries was closely connected with duration of existence, with continuity and steadiness of the whole complex of dominant traditional ideas. In many respects ideas of traditionalism are connected with the name of a wise man (western style: a philosopher) - Confucius. Not without reason Chinese thinkers even up to the 19th century always tried to dress a new idea in old clothes, or, in other words, to confirm it by referring to a historical “precedent”. The text, which became canonic, were interpreted as a history of events, deeds and norms, understood as the evidence and justification of function of eternal moral values and truths.

Before Confucius, a man and the nature were considered as a unity. There appeared a concept of interaction between the Heaven and people: the Heaven may be pleased or be angry with the deeds of people, so It could consequently either honor or punish people. A man, being a part of the triad Heaven – Earth – Man, should adjust or fit himself to this unity in such a manner that the universal har-

mony would not be damaged. If “Shi Jing” and “Shu Jing” considered sacrificial offering in order to get favor and protection of gods and spirits, then Confucius shifted the focus on regulation of a man in the society. The main idea referred not to religious side of the cult, but to exercising certain duties by people, that is to demonstration of some moral qualities, imposed by Confucian’s norms [6,6 et al.].

According to O.L. Fishman, Confucianism elaborated a sum of moral laws, rules of man’s behavior in the family and society (depending on the social status of a man), developed some certain behavioral patterns, some kinds of “roles” (sovereign and subject, father and son, husband and wife and so on), thus giving to the China comprehension of that true foundations of a society are social but not religious. Chinese historians and writers created models which might encourage people to do the Good and prevent them from doing the Bad.

To rule, in the ancient China, meant to improve the manners by good examples and special teachings. It was considered that the behavior of the people depends on the behavior of the ruler. Therefore – a great focus of Confucianism is on the “self-improvement”. That is why: “A good government might be only there, where a sovereign is sovereign, a minister is minister, a father is father, a son is son”. The Philosopher told: “If one, having wide knowledge, would restrain oneself by ceremonies (i.e. rules), then due to this one could not avoid the truth” [3,114-115; 8,2]. Studying more profoundly, we, suppose, may consider about some resemblance with the discussion about relation between the Positive Law and Natural Law.

‘Where a sage comes, there is none of the people who would not give him respect, when a sage speaks, there is no one who would not trust him’. ...He who has “the highest sincerity” “may regulate the main interrelations in the society”, “establishes the great foundation in Celestial and comprehends the changing and nurturing force of Heaven and Earth” [5,20-21].

Taking into account the role of Buddhism, Daoism and of the folk religion in the life both of an individual and of the whole groups of Chinese society during its large history, it would be not correct to reduce the traditional Chinese ideology only to Confucianism. In spite of its rational dominant Confucian ideology accepted supernatural concept of Heaven, heavenly predestination, the theory of “Yin-Yang” and five primary elements. Maybe, the functional connection between Confucian ideology and religion made possible coexistence of Confucianism with Buddhism and Daoism, as well as with the folk’s religion [6,7-8]. Certainly, the system and hierarchy of moral values was based on Confucianism, with the focus on social “virtues” of a man and not on religious ones, however, the basis was in the principle of ‘ren’ (humanism), which was essential not only for Confucianism but for Buddhism, for Daoism and for the folk religion as well.

Official history of state and law insists, that China has been one of the oldest states in the world. At the end of his life Confucius compiled explanations and interpretations on the ‘Book of Changes’ (Yi Jing) [3,217]. By the way, P.S. Popov supposed that “pedantic reverence for ceremonies (of Confucius) ... paralyzed the whole consequent life of China”. Besides, in the opinion of Popov, the Chinese philosopher very often acted according to the circumstances but not to his own convictions [3,207-212].

Perhaps, one of the factors of unusual vitality of traditions, which aids to some conservativeness, and at the same time – to creative thinking, what allows to keep and maintain the centuries-long experience of the people, its “historical memory”, in addition to Confucian teaching, is hieroglyphic or character writing. Scientific and technical progress can break links in a chain of ‘historical memory’. Thou, in China, there is a kind of countermeasures in forming scientific and technical terminology on the basis of Chinese word roots. Where in Russia, for example, scientific and technical terminology is based mainly on the word roots from the Greek and Latin, and this fact surely does not contribute to the preservation of ‘historical memory’.

Conclusion

Problems of the foundations for the development of relations between countries in the APR, as it was shown here on the example of China and Russia, reflect multilateral or bilateral character. In fact, they are problems of global, universal scale. It can be said without exaggeration, that from their solution depends the future of the whole Earth, mankind. The philosophical and legal problems, reflecting the world view are in their kind a barometer, detector, indicating what we have and how we can it improve... But in order that the improvement came true we need bilateral political will. To sow and to reap, all the participants of interstate relations should go towards each other in comprehending mutually traditions and cultures of partners. The problem is highly serious. Because without harmonization of relations among countries, and between mankind and nature (Heaven), that is without due moral self-improvement, there is no chance to survive. The essence is nowadays even not in the transfer of political power from one hand to another, but in the salvation of mankind. In solution of this problem the role of China and Russia, of mutual acquaintance and study of cultural and traditional heritage of our folks is of great importance.

The mentioned saying - ‘while there are Chinese characters there is Chinese culture’ might be paraphrased: ‘while there is the teaching of Confucius, there is high level morality, and where is morality, there is mutual respect between peoples and between countries. Confucianism was once spread throughout whole territory of modern APR, thus its focus on effective regulation of relations between people might effectively be used in cooperation of countries in this region.

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俄罗斯和中国实施高等教育联合教育计划的现状和前景
**CURRENT STATUS AND PROSPECTS FOR THE
IMPLEMENTATION OF JOINT EDUCATIONAL PROGRAMS
OF HIGHER EDUCATION IN RUSSIA AND CHINA**

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抽象。 本文致力于研究俄罗斯和中国目前的国家联合教育计划。 考虑联合教育计划的概念，提出联合教育计划的分类，包括联合学位课程（联合文凭），双学位课程（双文凭）和包括培训的计划。 对2018年访问的俄中两国和俄中联合教育项目进行了分析。

关键词： 俄中联合教育项目，中俄联合教育项目，俄罗斯和中国双重文凭项目，俄罗斯和中国培训项目，俄中教育合作

Abstract. *The article is devoted to the study of the current state joint educational programs by Russia and China. The concept of the joint educational program is considered, the classification of joint educational programs is proposed, including joint degree programs (joint diploma), double degree programs (double diplomas), and the program of included training. The analysis of visiting Russian-Chinese and inbound Sino-Russian joint educational programs as of 2018 was carried out.*

Keywords: *Russian-Chinese joint educational programs, Chinese-Russian joint educational programs, programs of double diplomas of Russia and China, programs of included training of Russia and China, Russian-Chinese educational cooperation*

Introduction

In the international educational space, two forms of academic mobility are distinguished: exit and entry. The subjects of exit mobility are citizens of their state who are recipients of import of foreign educational services. The subjects of entry mobility are citizens of foreign countries who are recipients of the export of domestic educational services. Exit and entry mobility is carried out both within the

framework of independent academic mobility, and as part of the implementation of joint educational programs. The development and implementation of joint educational programs is of great interest to the professional pedagogical community [1–5]. One of the most important aspects discussed by researchers is improving the quality of training in joint educational programs [6–7].

A joint educational program (JEP) is an institutional academic mobility in which programme students are involved. Mobility in the framework of joint educational programs is short-term, since it is carried out for one semester, one year or two years. Such mobility is also called credit mobility, since it is based on the principle of recognizing periods of mobility and credit transferring (credit units) in partner universities.

The legislation of Russia and China provides for the joint development and implementation of educational programs with foreign partners. In Russia, this form of implementation of the educational program is called the “network form”; in China, the concept of “joint educational program” (中外合作办学项目) is enshrined in law.

We distinguish the following types of JEP: programs awarding a joint degree (joint diploma), double degree programs (double diploma), programs of included training. Russia and China cooperate in the implementation of various types of JEP [8–11].

Russian-Chinese joint educational programs

We conducted a study of on-site educational programs implemented jointly with the PRC [12]. The research methods were the analysis of university sites, the analysis of Internet information resources, and the snowball method. As a result, it was found that the ongoing joint diploma programs, double diploma programs, and inclusive education programs with Chinese universities include: undergraduate programs - 103 (80.5%); specialty programs - 4 (3%); Master's programs - 21 (16.5%). Thus, their total number was 128.

Of the undergraduate programs, joint degree programs comprise - 0%, double degrees (double diplomas) - 31.3% (40 programs), and inclusive education programs 49.3% (63 programs). For the specialty programs, the programs of included education make up 3.1% (4 programs). For master's programs, joint degree programs make up 0%, double degrees (double diplomas) - 10.2% (13 programs), included studies - 6.1% (8 programs). Thus, of all the implemented Russian-Chinese JEPs, double diploma programs account for 42% (53 programs), and 58% (75 programs) of inclusive education programs.

However, we assume that the real number of Russian-Chinese JEPs may be slightly larger due to the included education programs (which are not announced, but are actually implemented by some universities). The total number of Russian-Chinese JEPs, according to our estimates, can be about 150 programs.

Directions for preparing Russian on-site educational programs implemented jointly with Chinese partners are as follows: social sciences - 62% (economics and management occupy 41% of all areas of study, followed by legal sciences - 7%), engineering, technology and machinery - 18 %, humanities - 13% (8% are philological sciences - Chinese), natural sciences - 5%, education and pedagogical sciences - 1%, art and culture - 1%.

The territorial distribution of Russian universities, of which Russian students are sent to China under the JEP, is as follows: Central Federal District - 30% (Moscow's share is 20%, Belgorod - 8%), Siberian Federal District - 23% (leading positions in Irkutsk - 14%, Tomsk - 7%), the Far Eastern Federal District - 20% (the maximum share in Vladivostok is 8%, Ulan-Ude - 5%), the Urals Federal District - 15% (leading positions in Chelyabinsk - 8%, Yekaterinburg - 5 %), North-western Federal District - 6% (accounted for by Sank t-Petersburg), Volga Federal District - 6%.

The regional distribution of Chinese partner universities to which Russian students are sent as part of the JEP is as follows: 49% are in Northeast China (26% are in Liaoning Province, 12% are in Heilongjiang Province, 11% are in Jilin Province), 25% located in East China (20% - in Shandong province, 4% - in Jiangsu province, 1% - in Anhui province), 10% - in Northern China (7% - in Beijing, 3% - in AWP), 7% - in Central South China (5% in Henan province, 2% in Hunan province), 3% in Northwest China (in Gansu province).

Chinese-Russian joint educational programs

The subjects of joint educational programs traveling from China to Russia are Chinese citizens who act as recipients of the export of Russian educational services. Information on all educational programs implemented in China together with foreign partners is presented on the website of the Ministry of Education of the PRC, where lists of all JEPs implemented with foreign partners for undergraduate programs, as well as for master's and doctoral programs are published [13].

An analysis of the educational programs presented, implemented jointly with foreign partners, showed that China is implementing 125 JEP with Russia, including 121 undergraduate programs and 4 master's programs (data for May 2018) [13].

Since, according to Chinese regulatory documents, a joint educational program refers to any program with the participation of foreign partners, it is also possible to divide these programs into programs of joint degrees, double degrees and included training.

The types of entry to Russian JEP are as follows. Bachelors: joint degree programs - 0%, double degrees - 16% (19 programs), included studies - 84% (102 programs). Different models of Sino-Russian JEP are being implemented: 3 + 1, 3 + 2 (for programs with a total training period of 5 years), 2 + 2. As a rule, to get a second Russian diploma, one needs to study in Russia for at least one year.

As for the four master's Sino-Russian JEPs listed in the Ministry of Education of the PRC, three of them enroll Chinese students at Chinese universities, after which the programs are fully implemented in Russia (within 2-2.5 years); according to the results of their development, only a Russian master's degree is awarded and a diploma of a Russian university is issued, a diploma of a Chinese university is not issued.

The professional areas of the joint implemented entry programs to Russia were as follows: social sciences - 24% (economics and management occupy 18%, followed by legal sciences - 3%), engineering, technology and machinery - 18%, mathematical sciences - 17% (7% - computer sciences, 5% each - mathematics and applied mathematics), education and pedagogical sciences - 14% (8% are music education), medicine and health sciences - 9%, humanitarian sciences - 7% (6% account for the study of the Russian language), natural science - 6% (evenly distributed between physics, chemistry, biology), arts and culture - 5% (visual arts, design and computer graphics).

The territorial distribution of Chinese universities, of which Chinese students are sent to study in Russia: Northeast China - 77% (Heilongjiang Province - 69%, Jilin Province - 8%), Central-South China - 8% (accounts for Henan Province), East China - 6% (Jiangsu Province - 4%, Shandong Province - 2%). The remaining 9% is equally distributed between the cities of central subordination Beijing and Tianjin, Zhejiang, Sichuan, Hunan, Inner Mongolia Autonomous Region and Xinjiang Uygur Autonomous Region.

The regions of Russia in which Chinese students come to study as part of the entry JEP are as follows: the Far Eastern Federal District - 57% (of which the leaders are Vladivostok - 25%, Blagoveshchensk - 18%, Chita - 6%, Khabarovsk - 5%), Siberian Federal constituency - 12% (Krasnoyarsk - 5%), Southern Federal District - 11%, Central Federal District - 9% (leader Moscow - 8%), Northwestern Federal District - 9% (accounted for St. Petersburg), Volga Federal District constituency - 1%, Ural Federal District - 1%.

Conclusion

An analysis of the documents and practices of Russian-Chinese educational cooperation in the joint development and implementation of educational programs showed that the main problems in organizing this type of cooperation are: legislative, language of teaching, tuition, information.

The creation of special legislation in the field of development and implementation of JEP, improving the quality of teaching the Chinese language, diversification of JEP funding and the creation of an information platform for international educational cooperation in Russia will bring the implementation of Russian-Chinese educational cooperation in the field of JEP implementation to a qualitatively new level corresponding to the level of comprehensive partnership and strategic cooperation between Russia and China.

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未来专业活动的单身汉“艺术和美学准备”概念的精髓
**THE ESSENCE OF THE CONCEPT «ARTISTIC AND AESTHETIC
READINESS» OF BACHELORS
FOR FUTURE PROFESSIONAL ACTIVITIES**

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抽象。 在文章中, 我们试图从俄罗斯和外国科学家的角度分析单身汉的“艺术和审美准备”概念的本质, 以用于未来的职业活动。

关键词: 艺术和审美准备, 学士, 教育, 科学。

Abstract. *In article, an attempt is made to analyze the essence of the concept of “artistic and aesthetic readiness” of bachelors for future professional activity from the standpoint of Russian and foreign scientists.*

Keywords: *artistic and aesthetic readiness, bachelor, education, science.*

In philosophy, pedagogy and other sciences, the very concept of “essence” is rarely used. The philosophical encyclopedia interprets “essence” as a combination of such properties of an object, without which it is unable to exist and which are determined by its other sides. Neopositivism rejects existing entities in themselves, only recognizing phenomena as real [1, p. 20].

The concept of “artistic and aesthetic readiness” came to the pedagogy of Russia in 1980, due to changes in the educational system. Consider the essence of this concept, its structural components. During the development of the education system in the late 20th century and early 21st century, only two types of systems can be identified: standard and innovative. Within the framework of the standard educational system, the main emphasis is placed on the recognition and memorization of teaching materials taught to bachelors.

P.F. Kapterev, speaking of the "innovative" system, noted that in the classification of social and material changes, an energetically developing progressive society, there is a rethinking of the primary goals of learning, the purpose of which is to identify the characteristics of each student, creating a classification for the formation of artistic and aesthetic abilities, development of dedication, initiative and activity [5, p. 271].

In other words, an innovative educational system can be turned towards creating artistic and aesthetic readiness among bachelors.

The ideas of artistic and aesthetic readiness in the learning process are studied in the foreign works of R. O. Jacobson, F. I. Taylor, E. P. Torrens, D. P. Gilford, D. Renzulli, G. Gardner, E. L. Thorndaikai and others [3, p. 97].

We turn to the term “readiness” and clarify its meaning, according to our data. The term “readiness” means a personal quality, which has the character of a multi-stage system and covers the following components: cognitive (skills in the intricacies of a student’s professional activity, ways of mastering it), affective (experiencing at the level of emotions, what’s happening), motivational-value (presence a high level of motivation to work, in accordance with the fundamental aspiration of the student) and activity (productive use of effective strategies for the implementation of this work) [8, p. 135].

R.O. Jacobson by willingness means "the totality of such pedagogical functions that a bachelor possesses, realizing the socially important powers and obligations of citizens in society, the social layer, group" [12, p. 40].

According to F. I. Taylor, readiness is a list of tasks with which the person is well acquainted, possesses skills; the complexity of the interdependent personality traits (theoretical and practical skills) needed for high-quality productive work [9, p. 109].

Having studied modern works, we consider readiness as the complexity of experience in knowledge and skills; willingness can also be defined as knowledge, passed through labor, personality traits, combining intramotivation, to realize their capabilities in practical activities.

The general connection of these views can be indicated in this way — readiness can be attributed to the manifestation of a zone of responsibility, which is modified and manifested in the process of work.

Let us designate the space of artistic and aesthetic readiness in a single row of readiness.

Classifications of readiness are quite heterogeneous - scientists combine them into categories for various reasons.

For our study, the classification created by the Russian scientist E.G. Kostyashkin on the basis of the studies of L. S. Podymov and including: cognitive readiness, creative readiness, social and pedagogical readiness and professional readiness has a more suitable basis [6, p. 148].

Focusing on this typology, we can attribute artistic and aesthetic readiness to a professional group. To find the components of artistic and aesthetic readiness, we first separately consider two types of readiness - “artistic” and “aesthetic”.

E.P. Torrens in his studies believed that artistic readiness establishes the image of aesthetic moods through the perception of culture. It depends on skills, intel-

lectual vision of the world around, on the recipient possessing various styles of atypical tastes and art genres, with the help of which one can “translate” the essence of these art styles into the language of universal human feelings and values [10, p. 371].

We single out in this concept the importance of the intellectual vision of the surrounding reality of the bachelor, the ability brought to him to realize art in all its greatness.

Let us designate that the concept of “artistic readiness” is distributed in the form of aggregate definitions, namely: “creative readiness” (E.P. Torrens, D.P. Guilford), “social and artistic readiness” (D. Renzulli), “aesthetically-humanitarian readiness” (G. Gardner) [2, p. 57].

We will now analyze this component from these scientists.

E.P. Torrens, giving the main characteristic of artistic and aesthetic readiness, emphasized artistic and creative, personal and creative part. The artistic and creative component, he believes, encompasses knowledge of the rules of art and practical skills in mastering them using the knowledge of a single rule and the technique of shaping shapes and illustrations in various types and styles of design graphic art using established and innovative methods, mechanisms and equipment according to a creative idea; possessing techniques of exposition and sketching image of objects.

In general, based on the above concepts, we establish that the artistic component of each system readiness means, first, theoretical skills and practical skills in the basics of compositional drawing, color, painting and so on; second, skills in artistic work on the implementation of creative design and fine art; third, the ability to assess the degree of creativity of various artistic works and, fourth, a single intellectual vision of the world around the bachelor.

Let's move on to the aesthetic component of our readiness being analyzed.

We studied the origin of aesthetic readiness as a separate readiness, and it was designated by the scientist E. L. Thorndike.

E.L. Thorndike, under aesthetic readiness, determines the mechanism of the interdependent personality traits, with the help of which she shows her own readiness for creative work, applying the rules for volumetric and coloristic compositions, practical skills for shaping the environment according to the requirements of a creative composition based on strong personality values in the form of aesthetic style, artistic properties and expansive-evaluative orientations [11, p. 64].

Having made an analysis of the above resources, we determined that aesthetic readiness is a structure of qualified personality traits that contains: the ability to recognize and interpret objects of art; the ability to perform creative work at a high aesthetic level, a developed artistic style, developed motivation for creative work and a creative upsurge, developed focus on the artistic and aesthetic transformation of the environment.

Let's consider the term artistic and aesthetic readiness, which was developed by scientists G. Doman and R. Muller.

G. Doman investigated the formation of artistic and aesthetic readiness of bachelors. The scientist suggested that artistic and aesthetic readiness is an important part of culture, which ensures the development of a person, embracing a complex of theoretical databases, practical experience and personality traits that are of great importance for successful implementation in further formation [4, p. 157].

R. Muller clarifies that artistic and aesthetic readiness is the installation of a student on the person's initiative actions for artistic and cultural realization, using his own resources to study art, and artistic evaluation of creations [7, p. 214].

In general, all scientists are similar in their own definitions and distinguish the following main components of artistic and aesthetic readiness, these are: artistic and aesthetic knowledge, art and research; aesthetic orientation based on knowledge and emotional research; readiness for artistic and aesthetic implementation; readiness for an aesthetic assessment of the works of art.

Focusing on the foregoing, we can define the artistic and aesthetic readiness of a bachelor of a pedagogical university as a professional zone of responsibility, which is a complex characteristic of a future professional in his field. We list these essential components: artistic and aesthetic knowledge, experience and skills, which include theoretical knowledge and practical skills on the basics of painting, colouristics; formed personal motivation for artistic and aesthetic work and creative upsurge; general capacity to perceive, comprehend and interpret works of art; formed artistic and aesthetic style; formed desire for the artistic and aesthetic transformation of the world.

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学生在教育过程中的动机问题解决方案的可能策略
**THE PROBLEM OF MOTIVATION OF STUDENTS
WITHIN THE EDUCATIONAL PROCESS AND
POSSIBLE STRATEGIES FOR ITS SOLUTION**

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抽象。本文试图考虑现代大学学生动机的一些问题。给出了动机的定义，以及它在教育过程中的作用以及成功的学生个性的形成。考虑了大学以外的家庭和环境对学生动机的可能影响。该文章的作者强调了大学教育过程对于创造和维持学生获得所提供知识的兴趣，以及为自我发展和教育塑造可持续动力的特殊重要性。

本文给出了教学中典型错误的例子，这些错误可能导致学生的动机减少，并提出了避免这些错误的方法。此外，作者提出了一些策略，可以帮助学生在不同的工作阶段保持高水平的参与和兴趣与课程的培训材料。学生成功学习动机的重要条件之一是教师自身的动机。

总之，作者得出结论，大学作为培养和形成一个完整人格链的重要元素的作用，指出教师对学生的动机影响的重要性，以优化教育过程符合学生，教师 and 整个社会的个性利益。

关键词：动机，策略，现代大学，教育过程，教育质量

Abstract. *The article attempts to consider some problems of students' motivation in a modern university. The definition of motivation is given, as well as its role in the educational process and the formation of a successful student personality. Possible influences on students' motivation from the family and the environment outside the university are considered. The author of the article emphasizes the special importance of the educational process in the university for creating and maintaining students' interest in obtaining the knowledge it offers, as well as in shaping a sustainable motivation for self-development and education.*

The article gives examples of typical mistakes in teaching which may lead to decrease in motivation among students, and suggests the ways to avoid them. In addition, the author presents a number of strategies that can help maintain a high level of involvement and interest of students at different stages of work with the training material of the course. One of the important conditions for the successful motivation of students is the motivation of the teachers themselves.

In conclusion the author draws a conclusion about the role of the university as an important element of the chain of upbringing and formation of a full-fledged personality, points to the importance of motivational influence of teachers on students in order to optimize the educational process according to the interests of the personality of the student, teachers and society as a whole.

Key words: *motivation, strategy, modern university, educational process, quality of education*

Introduction

The modern world is developing dynamically and rapidly and requires the same progressive improvement from a person striving to achieve certain heights in it in terms of status and financial situation, ready and able to satisfy the needs of society through the realization of his own personal and professional potential. Competition becomes an integral part of any activity and, it would seem, should also motivate people to develop and improve their abilities, knowledge and qualities.

It is especially important to understand the need for self-improvement for students who are preparing after graduation to enter the adult world, find decent work and ensure well-being for themselves and their close people, make a career and create a happy family. In achieving all these goals, they are called upon to help education and life experience that they gain over the years of study at the university. This circumstance imposes a huge responsibility on the university as a conductor of a young personality in a new active life, a guarantor of its success and further self-realization. Thus, if a university (each of its employees and a teacher in particular) is aware of this responsibility and provides students with high-quality educational services, a successful future for graduates would seem to be fully ensured. But is it really so?

Here, an acute problem arises, which in itself can completely determine the effectiveness or inefficiency of the educational process for a student, smooth out or emphasize deficiencies in teaching and assimilation of knowledge. This is a problem of student motivation.

The essence of motivation and its impact on the learning process

“Motivation is an internal energy that includes a person’s activity in life and at work” [1]. It is based on motives, which mean specific incentives that force a person to act and do things. The motivation of students is the processes, methods and means of encouraging them to cognitive activity, the active development of the content of education. “The motives can be a bunch of emotions and aspirations, interests and needs, ideals and attitudes. Therefore, motives are complex dynamic systems in which the selection and decision-making, analysis and evaluation of choice are made” [2].

Motivation for students is the most effective way to improve the learning process. If a student sincerely strives for successful mastering of educational material, his motivation can significantly optimize the process of mastering knowledge and even partially compensate for the lack of ability of “weak” students.

However, this is precisely one of the main problems of education, if the student’s motivation is low or completely absent, no useful knowledge whatsoever can find the ground in the student’s mind and take root. Without proper measures to increase interest and motivation, students who do not understand and do not try to realize the importance of education are doomed to waste their time and their teachers. Lack of motivation should be equated with a disease that is extremely dangerous and harmful both for the student himself and for society as a whole, which may lose a promising specialist in the future.

External (extracurricular) factors affecting student motivation

The formation of student motivation should occur not only within the university, but also beyond. The author of the article is deeply convinced that the upbringing in the family plays a paramount role in the formation of personality (including its motivation). Parents are often an absolute role model for their children. And even when it is not so, the behavior of adults anyway, one way or another, affects the behavior of their children. In addition, these are the parents who have more access to the child throughout the process of growing up and can lay certain values and motives in the emerging consciousness. Unfortunately, often parents do not realize this responsibility and, for one reason or another, do not cultivate the desire for knowledge in their children. Sometimes parents show by their example the imaginary lack of the need for education. Another sad circumstance is that not all parents are able to provide their children with a decent education.

All these negative aspects of the influence of improper upbringing in the family have the strongest effect on the personality of a teenager who has to enter a university or be left without a higher education. In addition, some students, even while studying at a university, do not receive proper motivation from their families. An extremely widespread belief among students, not always disproved by their parents, is that only the diploma is important, and not the knowledge that is attached to it. And, unfortunately, sometimes it turns out that way. But, even despite the imperfection of the system of society, in no case can the younger generations be educated in the spirit of blind adaptation and imitation. Also, parents should not allow children to feel that they are being forced to learn. It is important that the family always, under any circumstances, support in children a voluntary and fully conscious desire for self-improvement and development, including through education.

If the upbringing in the family is absolutely correct, this, alas, also cannot completely protect the emerging personality from negative influence. Friends, peers, classmates, classmates - all of these people can also influence the personality of the student and student. The Internet and television also replace the correct ideals with distorted and perverted ones. For example, films often show that people without

education and culture succeed, dishonest methods of enrichment are drawn as acceptable and many times more promising than honest intellectual work. And modern reality, unfortunately, does not contribute to the refutation of these phenomena, directing the motivation of the younger generations in a dangerous direction.

And the more negative the influence of the environment on the formation of the correct motivation of a teenager is, the more important the role of education - school and university - in adjusting a person's life priorities and directing him to adulthood becomes. The main thing is not what level of motivation an applicant comes with, but what kind of motivation he will receive at the university and after graduation.

Possible problems and strategies to increase student motivation as part of the educational process at the university

There are many reasons why student motivation remains low or even decreases in the process of studying at a university. The most common include the following:

1. "Poor knowledge". In the current situation, when the number of classroom hours at a university in certain disciplines (in particular, in foreign languages, which are actually translated into independent study, which in itself adversely affects the quality of language learning) is steadily declining. In conditions of time constraints, teachers are forced to give concise material and often neglect the important stage in the presentation of any educational material - justification of its relevance and practical significance for students. From the standpoint of their life experience and its meaningfulness, not every student is able to independently evaluate the significance of a particular educational material or task. And, if this understanding is not incorporated into it by the teacher, the student will simply lose interest in the subject and the productivity of his work with the material will be extremely low.

Thus, in anticipation of any new educational material, the teacher must make sure that students are motivated to learn it, and if students from the very first minutes of exploring a new topic do not show due interest, do everything possible to motivate them and contribute to the emergence of interest. This can be done in the best way provided that constructive confidential contact is established between the teacher and students. And this is the second frequent problem of the educational process.

2. The lack of "contact" between the teacher and students. Without a doubt, students and the teacher should have different hierarchical status in the classroom. The teacher should be higher, but not because of age, authority and other trivial parameters, but because of his status as a mentor, who carries knowledge and is ready to share them with grateful students. However, many teachers make a mistake - they distance themselves too much from students. This circumstance 1) harms the creation of a positive atmosphere in the classroom, 2) reduces the motivation of students who do not feel participation and friendly support from the teacher. The extreme occurrence in some cases is the absence of any respect for the teacher in relation to his students. This situation is a powerful demotivator that completely destroys the connection between the learning and the learning sides of

the process. Moreover, students do not always outwardly show that they feel a lack of respect on the part of the teacher, but their motivation and, consequently, their effectiveness is significantly reduced.

One of the ways to control and prevent such a demotivating factor may be questionnaires offered to students after completing the course in each subject, which make it possible to evaluate the educational process in a number of parameters, including motivation. This control mechanism can be used in parallel to motivate teachers and encourage their effectiveness and quality of teaching. An unmotivated or weakly motivated teacher will most likely not make additional efforts to motivate students, confining himself strictly to the scope of his actual professional obligations.

In addition to avoiding errors in the learning process, leading to a decrease in student motivation, teachers should use all possible ways and means to increase the interest of their students in their subject. In our opinion, the following factors should be considered as important strategic factors contributing to the growth of increasing student motivation:

1. At the stage of preparing students for work with new educational material:

1) acquaintance with students: with their personal and professional interests, identifying ways to influence their motivation. The easiest way: when starting work with a new group of students, devote part of the first meeting to a confidential conversation, ask students to briefly tell about themselves (interests, hobbies, reasons for choosing this study direction, plans for the future, etc.). Such a preliminary dialogue almost always helps to win over students and show them that the teacher does not just “do his job”, but also wants full cooperation (learning is always a two-way process), respects and appreciates students as individuals.

2) the correct selection of educational material should be carried out taking into account the characteristics of specific students. This primarily relates to additional material. There are much more chances to interest a student if, for example, one develops a theory using examples directly related to his future specialization, or cites examples from a professional field of interest to students, if possible refer to the experience of working students.

2. At the stage of work with educational material:

1) the correct selection of methods and methods of supplying material. “Even the most useful material becomes more difficult to perceive if its flow is monotonous and monotonous” [3]. A logical way to maintain students' interest can be the constant alternation of various forms of work with the material, a dynamic change of formats for working with students: monologue - conversation - work in pairs - work in groups, etc.

2) the constant maintenance of a positive working atmosphere in the classroom. This requires maintaining a balance between discipline, authority, status on the one hand, and friendliness, cooperation, interest on the other. Achieving and, most importantly, maintaining such a balance is an extremely difficult task that requires experience and practice, as well as the ability (and desire) of the teacher to adapt slightly to the parameters of a particular group of students.

3) healthy competition. Students are important and need to be prepared for a “real” life, where competition is inevitable and often extremely fierce. At the same time, within the framework of the educational process, competition should be exclusively positive in nature and pursue the only goal - to further motivate and “warm up” students' interest.

3. At the final stage of work with educational material:

1) effective control. The final work, whether it is a test or an exam, should not cause students a negative. However, we are not talking about experiences - they are often inevitable and can be useful as an additional motivator. In addition, the final control should be clear to students in terms of its relationship with the training material and the relevance of the tested knowledge, skills for future professional activities. If the student does not feel the practical value in the assessment control, he will perceive it formally on the principle of “passed and forgotten.”

2) a sense of forward movement. “When completing the course, the student should feel that he has taken another step on the road to success” [4]. Thus, even ending, the course should continue to motivate students to move on and expand their knowledge through additional self-education and in the development of other interrelated disciplines.

Conclusion

Based on the foregoing, it can be concluded that the university, like all other stages of the educational process, can and should have a motivating effect on students, correcting the consequences of the negative impact of the environment on the student's personality or enhancing the positive support provided by family and society. Ultimately, the correct motivation of the student will not only help him gain and better acquire knowledge, but will also facilitate the work of teachers and give society a qualitatively developed new personality as a specialist.

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准备学生使用的现代趋势在教育研究中应用统计学
**MODERN TRENDS IN PREPARING STUDENTS FOR THE USE
OF APPLIED STATISTICS IN PEDAGOGICAL RESEARCH**

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抽象。 文章揭示了组织学生在教学研究中使用应用统计学的培训的特点：指出了需要注意和解决的实质性和方法论性质的问题。 揭示了提高学生在教学研究中应用统计学的准备程度的潜在可能性。

关键词：高等教育，应用统计学，教育研究。

Abstract. *The article reveals the features of the organization student training for the use of applied statistics in pedagogical research: problems of a substantive and methodological nature that require attention and resolution are indicated. The potential possibilities of increasing the level of student readiness for the use of applied statistics in pedagogical research are revealed.*

Keywords: *higher education, applied statistics, pedagogical research.*

The statistics used in pedagogical research, in fact, is an interdisciplinary science, the disclosure of the applied orientation of which, on the one hand, contributes to the improvement of various sections of this discipline, on the other hand, it determines the boundaries of its applicability in other scientific disciplines. In this case, the use of applied statistics helps to obtain objective information about the properties of the studied pedagogical phenomenon, to determine the more likely development of a pedagogical event depending on certain factors, and therefore to identify the determinants that underlie the effective organization of the educational process.

When using the classical apparatus of applied statistics, it is necessary to take into account the specifics of the theoretical and methodological apparatus of pedagogical science, manifested in the "uncertainty of pedagogical terminology." What is the basis for the emergence of a problem related to the construction of a mathematical model, since not all pedagogical phenomena defined by one or another

pedagogical term can be unambiguously interpreted using a mathematical language. A similar problem can arise with the reverse interpretation of the obtained mathematical data in the language of pedagogy. Insufficient preparation for the use of applied statistics in scientific research can lead to its incorrect use in processing the results of pedagogical research.

The mathematical apparatus of applied statistics can become a reliable tool of scientific research in the field of pedagogy, which allows describing pedagogical objects in the form of an adequate mathematical model, taking into account the prediction of possible changes under the influence of any factors, only if the researcher has the skill to correctly use applied statistics in scientific research taking into account the specifics of pedagogical science. Based on this statement, S.I. Belova and E.I. Desa emphasize the need for the introduction of training disciplines, in the development of which students should form competencies that require the use of statistical methods in pedagogical research (Belova, Desa, Tylkina, 2015, p. 11). At the same time, the content of these academic disciplines will be built taking into account both the professional orientation of the studied material, which is manifested in issues directly required in future professional activity, and the fundamental nature implying the construction of this discipline, taking into account the disclosure of a holistic system of theoretical knowledge by solving classical and professional tasks.

The modern scientific and methodological literature presents a wide range of works reflecting various theoretical aspects of statistical methods used in pedagogical research: theoretical foundations of the use of mathematical methods in pedagogical research (V.P. Bepalko, M.N. Grabar, K.A. Krasnyanskaya, L.B. Itelson, G.V. Sukhodolsky, V.Ya. Yakunin, etc.); substantiation of a set of criteria allowing the use of sections of applied statistics for assessing the quality of education and educational systems (A.G. Bermus, B.S. Gershunsky, A.A. Markarov, M.M. Potashnik, T.A. Rodygina and others); methodological foundations of qualimetry of the quality of education (V.I. Vasiliev, I.A. Zimneyaya, N.A. Selezneva, A.I. Subetto, etc.). However, the majority of existing literature is focused on people with a mathematical or technical education, and is difficult for those who do not have such an education to comprehend. Moreover, these textbooks reveal individual, most often encountered, types of tasks involving the analysis of data arising in pedagogical research. To solve such problems, there is no need to study the entire arsenal of statistical methods. In the same textbooks that are developed taking into account a holistic system of pedagogical tasks (A.D. Nasledov, G.A. Ososkov, E.V. Sidorenko, etc.), the emphasis is on the psychological and pedagogical component of the phenomenon being studied, which leads to fragmentation and, as a rule, inconsistency of the appearance of individual sections of applied statistics.

An attempt to resolve the contradiction between the high degree of general theoretical development of statistical methods and the insufficient level of their extrapolation into the procedure of pedagogical research was reflected in the works of S.P. Grushevsky, O.V. Mitina, O.Yu. Ermolaev-Tomina, L.V. Shelekhova. The basis of this approach is the assumption that preparing students for the use of applied statistics in pedagogical research will be effective if the content of the corresponding academic discipline is developed taking into account: the fundamental nature of the presentation of the material while maintaining the necessary rigor, with a detailed study of the key mathematical concepts, algorithmic; creating conditions conducive to the development of practical skills among students of applying statistical methods in the process of working with empirical data; the need to form the ability to competently perform an analysis of experimental data, including using modern information technologies, and correctly interpret the result (Shelekhova, 2015, p. 3). All this made it possible to build the content of the information technology support system preparing students for the use of statistical methods in pedagogical research based on the assimilation of the undifferentiated whole in its first approximation, reflecting the construction of the classification of statistical methods used in pedagogical research depending on: the mathematical nature of the results of pedagogical research; type of variables (signs); the type of scale (nominative, ordinal, interval, and relationships) that is used in measuring psychological and pedagogical indicators; type of data distribution; the number of elements in the sample selection; type of research task; formulations of the main (zero) and alternative statistical hypotheses; the boundaries of the application of statistical methods for various types of pedagogical research (Grushevsky, Shelekhova, 2019, p. 5-6). Separation of individual criteria in a holistic system of statistical methods depending on the type of research task (identifying differences in the level of the trait being studied, assessing the shift in the values of the trait being studied, identifying differences in the distribution of the trait, identifying the degree of consistency of changes, determining the degree of influence of independent variables on the dependent), revealing the degree of their generality and differences suggest the creation of conditions under which the awareness of the essence of the studied pedagogical phenomena is manifested, defining the direction of their development, depending on the conditions, and, consequently, their more effective use in the real educational process.

All of the above allows students to form an idea of applied statistics as a science, the subject of study of which is the quantitative characteristics of real objects and phenomena of any degree of complexity, which also reflect some aspects of the pedagogical process. At the same time, in the learning process, it is necessary to create conditions under which students have an understanding that each statistical method has its limitations in its application depending on the characteristics of

the object being studied, ignoring which can lead to incorrect statistical conclusions that do not allow to give the correct assessment of the result of the study, which not only reduces the practical and theoretical significance of the work, but can completely level it. This aspect of the use of applied statistics was repeatedly pointed out in his studies by S.P. Grushevsky, O.V. Mitina, O.Yu. Ermolaev-Tomina, L.V. Shelekhova et al. As an example, the most frequently quoted words of Yu.A. Mitropolsky was: “The application of mathematics to other sciences makes sense only in unity with the deep theory of a specific phenomenon. It is important to remember this in order not to stray into a simple game of formulas, behind which there is no real content”(Mitropolsky, 1973, p. 14).

In the educational process aimed at developing the skill of using statistical methods in pedagogical research, one can note the practical lack of introducing new scientific achievements in the field of mathematical statistics and mathematical modeling in the training course. According to the research of M.M. Yuzbashev, we can distinguish objective and subjective factors affecting a slight extrapolation of the achievements of modern mathematics in the educational process: reducing the classroom load allocated to the study of academic disciplines; The theoretical material of modern mathematics involves a high level of mathematical knowledge among students; the prevailing stereotype of the content of academic discipline, reflected in textbooks recommended by Educational-methodical association of Russia (Yuzbashev, 2007, p. 56). One way to resolve this contradiction, according to A.P. Zinchenko, is the need to improve the content and methods of studying applied statistics as not only academic disciplines, but also as science (Zinchenko, 2009, p. 7). Which implies, on the one hand, the need to develop the theory of applied statistics as a science, initiated and coordinated by mathematical organizations, to develop new textbooks with the community of scientists and practitioners. On the other hand, the organization of research activities of students in the form of completion of term and graduation work, presentations at scientific and practical conferences, participation in competitions of scientific works. All this should allow students to conduct independent empirical research, in terms of his planning, organization, analysis and interpretation of empirical data.

The specifics of the use of applied statistics for the analysis of empirical data obtained as a result of pedagogical research is manifested in the fact that the totality of data that is analyzed is characterized by a large number of indicators of various types, their high variability under the influence of uncontrolled random events, and the need to take into account objective and subjective factors, the complexity of the correlation between the indicators of the sample selections. The solution to this problem, at present, is practically impossible without the use of appropriate modern specialized statistical computer programs. Based on the requirement to use exclusively licensed software in the educational process and reduced govern-

ment funding of higher education institutions, MS EXCEL is considered as available statistical software for most universities in Russia. This program presents an informative minimum of classical statistical methods and procedures, which has not been updated recently. At the same time, the use of professional versions of modern statistical software packages, for example, such as Matrix Laboratory, Statistica, STATGRAPHICS PLUS, SPSS, Stata, is practically not used in the educational process due to their cost. This leads to a contradiction between the relevance of statistical methods in the process of evaluating the effectiveness of educational innovations and the fragmentation of ideas about them formed during the process of vocational education, due to the inability to demonstrate analytical studies of any complexity, including the construction of mathematical non-linear models of the educational process.

Thus, the analysis of modern conditions for preparing students for the use of applied statistics in pedagogical research has revealed that the content of the relevant academic disciplines should be built taking into account: 1) the professional orientation of the material studied, which manifests itself in issues that arise directly in future professional activity, including the need to use statistical methods in the process of evaluating the effectiveness of educational innovations used, the search for optimal decisions in the organization of educational process, 2) solidity, implying the construction of this discipline, taking into account the disclosure of a holistic system of theoretical knowledge of applied statistics through the solution of classical and professional problems. It should be noted that the modern educational process with respect to the subject matter under consideration is built on the basis of the fragmentation of the ideas about these methods formed in the process of vocational education, since, on the one hand, the use of the statistical apparatus in pedagogical research has its own limitations, due to the specifics of modern humanities. On the other hand, teachers do not have the opportunity to demonstrate the implementation of new scientific achievements in the field of mathematical statistics and mathematical modeling, analytical studies of any complexity, both due to the lack of the necessary software, and the reduction in the hours allocated for the development of this discipline.

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BILOTHERAPY。 声音治疗的新方向

BILOTHERAPY. NEW DIRECTION IN SOUND THERAPY

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抽象。 自古以来, 为了治疗目的, 使用了各种声音振动源, 这导致在声音治疗中产生了许多方向。 声音震动的一个来源是bilo, 一种古老的自演奏打击乐器, 旨在执行警报功能。 目前, bilos以更高级的形式出现。 由于新一代bilos (扁平铃铛) 的生成调整为生物有效频率, 因此可以对一个人的身体和心理 - 情绪状态产生多方面的积极影响, 这有理由强调它们在独立中的使用 声音治疗的方向 - BILOTHERAPY。

关键词: Bilo, 扁平铃, BILOTHERAPY, 生物有效频率, 愈合。

Abstract. *For healing purposes since ancient times, various sources of sound vibrations were used, which led to the creation of a number of directions in sound therapy. One of the sources of sound vibrations is the bilo, an ancient self-playing percussion instrument that was designed to perform alert functions. Currently, bilos appeared in a more advanced form. Thanks to the creation of a new generation of bilos (flat bells) tuned to bioeffective frequencies, it became possible to have a multifaceted positive effect on the physical and psycho-emotional state of a person, which gives reason to highlight their use in an independent direction of sound therapy - BILOTHERAPY.*

Keywords: *Bilo, flat bell, BILOTHERAPY, bioeffective frequencies, healing.*

For the purposes of healing since ancient times, various sources of sound vibrations were used, which led to the creation of a number of directions in sound therapy - music therapy, vocal therapy, word therapy, bell therapy, etc. One of the sources of sound vibrations is bilo, an ancient self-sounding percussion instrument that can be made of wood, stone or metal. For a long time, Bilos was intended solely to perform the functions of warning about a particular important event for a person, and in this form existed until our days.

In 1991, bilos appeared in a more advanced form. Thanks to the invention, it was possible to turn an ordinary signal instrument into a harmonious musical instrument with a harmonious and pleasant sound for hearing, which led to the creation of a musical instrument - semantron (flat bells).

As it turned out, the beauty of sounds emitted from the belfry from the bilos (flat bells) of sounds allows you to get not only aesthetic pleasure from listening to them, but also has a beneficial effect on the person. Observations, scientific research and accumulated in the Methodological Center "Drevo Roda" ^[1], experience of the practical use of flat bells helped to better understand the mechanism of the effect of acoustic vibrations emitted by flat bells on the human body, on the basis of which the author of this article in 2012 came up with the idea of creating flat bells tuned to bioeffective frequencies.

The fundamental difference between the new generation of flat bells and those already known is that the new instruments are not tuned to the frequencies of the musical scale, but to the most significant bioeffective frequencies for humans, including those resonantly related to the frequency of the daily and annual rhythms of the Earth, which opens up new, inaccessible earlier opportunities for their application.

To date, a whole line of new generation flat bells has been created in various designs, tuned to bioeffective frequencies, and methods for their application have been created, which allows many problems to be solved without the use of medicines and without touching the human body - removal from a state of discouragement or depression, recovery normal functioning of the cardiovascular system, a change in the nature of brain activity, an increase in the effectiveness of various psychotherapeutic techniques, and many others.

The ability of flat bells tuned to bioeffective frequencies to have a beneficial effect on the psychoemotional, spiritual and physical spheres of a person makes it possible to single out the use of third-generation flat bells in an independent direction of sound therapy - BILOTHERAPY.

BILOTHERAPY – is a non-drug method of correction of deviations in the state of health, based on the effects of sounds and vibrations emanating from bilos (flat bells) tuned to bioeffective frequencies in order to eliminate stress conditions, alleviate the condition in diseases that can be classified as psychosomatic and have a multifaceted positive effect on psycho-emotional, spiritual and physical spheres of man.

BILOTHERAPY® is registered as a trademark, received a state certificate for trademark № 680547.

A beneficial effect on the human body occurs through the summation of five different, but interrelated effects:

First effect – is the direct physical effect of acoustic waves on the human body. After penetrating the body, they spread in the form of a hydraulic wave throughout the body and have an effect comparable to a deep massage.

Second effect is determined by the psychological characteristics of the perception of sounds by a person. The beauty of the sound of metal evokes in a person psychological experiences associated with turning to the forces of Nature, to an active good start.

Third effect is due to the peculiarity of the human consciousness, which initially has integrity. Thanks to the long aftertone of flat bells, any rhythmic pattern is perceived by a person integrally and inextricably.

Fourth effect is associated with the phenomenon of bioresonance, due to which it is possible to use the sounds of a certain frequency to have a given effect on the work of organs or systems of the body.

Fifth effect arises in the case of the use of round bilo with a given beat frequency, which allows you to form the rhythmic activity of the brain in the right direction.

If the specialist has the appropriate knowledge and skills to use flat bells tuned to bioeffective frequencies, BILOTHERAPY® can be considered as a safe, informative, non-invasive and reliable method for solving a wide range of problems, including those related to correcting the psycho-emotional state of a person and eliminating various deviations in health condition.

From 2012 to the present, a great deal of experience has been gained in the successful use of third-generation flat bells tuned to bio-efficient frequencies, which allows us to consider them as an effective tool for solving various applied problems. The results are presented in four books [2], [3], [4], [5], in numerous articles [6], in scientific journals [7] and in materials of scientific conferences [8].

In particular, the sound effect of round bilo with a beat frequency of 7.8 Hz leads to a positive structural rearrangement of the cellular elements of the blood. As a result of the breakdown of erythrocyte sludge, blood becomes similar to the blood of healthy people. At the same time, white blood cells are released, which contributes to increased phagocytosis and increased body immunity.

When conducting a study of the activity of the brain by electroencephalography while listening to this instrument, a change in the bioelectric activity of the brain is recorded, an increase in the amplitude of Alpha rhythms by 16-40% is observed, the left and right hemispheres of the brain are synchronized. The results of the mapping of brain biorhythms indicate a person's exit from a drowsy state, a transition to a conscious state and the gradual acquisition of holistic thinking. At the same time, a more uniform distribution of rhythms is noted over the entire frequency range (normalization of the psychoemotional state).

The use of the flat "Earth Salt" bell tuned to an octave frequency image resonantly associated with the Earth's daily rhythm allows one to get out of stress, aggressiveness and nervousness, facilitates the perception of reality at the level of images, helps to achieve maximum results when conducting body-oriented practices, etc.

The bass bilo "Voice of the Earth", tuned to an octave image of a frequency resonantly associated with the annual rhythm of the Earth, allows one to disconnect from external stimuli, find a state of inner calm, relieve pain, facilitate access to events long ago, enter a state of mental silence, and also solve a number of other tasks. When carrying out the adjustment of the voice with the sound of this instrument, the body gradually transitions to the optimal mode of functioning, which is instrumentally confirmed.

During the thermal imaging study, it was recorded that acoustic vibrations emitted by the bass bilo after 1.5 minutes from the start of the BILOTHERAPY session lead to an increase in the temperature of the skin of the human body, which indicates the removal of somatic tension, the improvement of capillary blood supply and the optimization of hydrodynamic processes in the circulatory and lymphatic systems.

BILOTHERAPY has proven itself in the implementation of various correctional and developmental programs for working with special children on the basis of children's rehabilitation centers in Sergiev Posad, Taganrog and Moscow, which allows to achieve maximum results when conducting body-oriented practices and creating optimal conditions for the child to reveal its potential capabilities.

A person's perception of acoustic vibrations during a BILOTHERAPY® session occurs in the most optimal position for solving an existing problem - sitting, standing or lying down (passive BILOTHERAPY®). The active participation of a person in a music therapy session is also possible, which allows to achieve maximum effect by combining the beneficial effects of acoustic waves emitted by flat bells and the active involvement of a person in playing the instrument. In this case, a person gets the opportunity to manifest and hear his own rhythm, which contributes to the disclosure of creative potential and positively affects the physical and psycho-emotional sphere (active BILOTHERAPY®).

At the same time, it must be remembered that the healing effect can only be provided if **live** sound of flat bells tuned to bioeffective frequencies is used. A successful solution to such problems is possible only if the specialist has correctly tuned instruments that have acoustically accurate sound without aberrations and dissonant overtones.

BILOTHERAPY®, as a psychotherapeutic method for correcting the functional state of the body and maintaining the moral purity of a person, can be used:

- specialists: psychologists, sound therapists, medical professionals, healers, etc.;
- in BILOTHERAPY® rooms or psychological unloading rooms for fatigue relieve, rest and quick recovery of personnel of companies and organizations;
- to provide a regulatory effect on the physiological systems of the body;
- in hospitals, health centers and rest homes;
- in rehabilitation centers for children with functional limitations of the musculoskeletal system, central and peripheral nervous system, rehabilitation centers after a stroke, rehabilitation centers for military personnel after being in hot spots, etc.;
- persons engaged in self-development;
- individually at home.

BILOTHERAPY® can be used in combination with any other methods of therapeutic effect (physiotherapy, massage, etc.) or to reduce the side effects of drug therapy.

Thus, thanks to the appearance of planar bells tuned to bioeffective frequencies, the experts have at their disposal new, surprisingly powerful tools, which allows us to consider BILOTHERAPY® as an effective method for solving a wide range of problems without the use of medications and without touching the human body.

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适应另一种语言环境的华人的亲子关系概念 (以FEFU的中国新生为例)

**CONCEPTS OF THE PARENT-CHILD RELATIONS
OF ETHNIC CHINESE WHO ARE IN CONDITIONS
OF ADAPTATION TO ANOTHER LANGUAGE ENVIRONMENT
(ON THE EXAMPLE OF CHINESE FRESHMAN STUDENTS OF THE FEFU)**

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抽象。 本文介绍了中国青年, 远东州立大学新生学生关于他们的亲子关系的实证研究结果。 该研究对于提高外国学生在教育空间中的心理适应能力及其在俄罗斯学生社区中的快速同化的工作是有价值的。

关键词: 亲子关系, 投射“三树”方法, catimato-imaginative疗法, 表征, 图像, 幼儿冲突, 情感剥夺, 人格问题。

Abstract. *The article presents the results of an empirical study of the ideas of Chinese youths, freshman students at the Far Eastern State University, about their parent-child relationships. The study is valuable for work to increase the effectiveness of psychological adaptation of foreign students in the educational space and their rapid assimilation in the Russian student community.*

Keywords: *parent-child relationships, the projective "Three trees" methodology, catimato-imaginative therapy, representations, images, conflicts of early childhood, emotional deprivation, personality problems.*

The study of representations in psychological science is important. They are of great importance for all mental processes: on their basis, personality attitudes and relationships with surrounding reality are formed. Sullivan (Harry Stack) [5] argued that the unit of analysis of the researcher is not the personality itself, but

the interpersonal situation, a consequence of interpersonal relationships arising in it. And since the individual's consciousness develops based on protective mechanisms that resist outgoing threats, wherever they come from, all motivations are based on hidden motivational systems or complexes. They are deeply dissociated into the realm of the unconscious and manifest in dreams, fantasies, delirium, and, of course, in interpersonal relationships. Following Sullivan, we can say that early interpersonal relations determine the integration and integrity of the *I* in the social space. The internal content of an adult is formed by the content of existing early experience in communicating with other people. And since the first communication experience takes place in the dyad Mother - child, the first reactions to society arise in the same place.

Initial knowledge about the world in the form of a series of separate, disordered and disorganized processes of the psyche: sensations, emotions, images - prototaxis - are characteristic of infants. In this knowledge and in the formation of a correct perception of reality, ideas play a large role. Prototaxis underlies the reconstruction of past experience, past perception of objects of reality, including significant objects from the early environment [5]. The first reactions to society arise in the maternal-paternal field. This is how the character or the existing system of behavior, its copings and strategies are formed [1]. Since in modern psychological literature there is no single approach to the problem of representation, in an empirical study, representation was understood as a complex of elements combined into an integrated structure that allows to deepen the function of emerging images [2].

The object of the empirical study was the idea of parent-child relationships in Chinese first-year students of FEFU. The development of ideas is primarily necessary to address issues of both the educational process at a university, which requires the competent setting of tasks taking into account the quality of students' presentations, as well as the speedy assimilation of foreign students in Russian society. Thus, taking into account the quality of representations of foreign students, their parent-child relationships can become the target of psycho-correctional work on adaptation in the foreign language environment of the student campus and allow to make the learning process better.

Research methods

The study was conducted on the basis of the Far Eastern Federal University in the city of Vladivostok. The object was the study was the parent-child relationship in Chinese families. The subject of study is the idea of parent-child relationships in Chinese families. An empirical study was supposed to solve the following problems: to study the possibility of applying for diagnostic purposes the projective three-tree methodology on a sample of Chinese students; to study the parent-child relationships of Chinese students using the projective method of "three trees"; and identify resource components in campus adaptation work.

A sample of 35 first-year ethnic Chinese students was determined. All of them did not speak Russian and went through the stage of adaptation to the Russian environment. The age range of the studied sample is from 18 to 21 years.

As a diagnostic toolkit, the projective drawing technique “Three Trees” was used, which is applied when it is necessary to determine the unconscious aspects of parent-child relationships. The method used by us was developed by Hansarl Laner [2] and proposed by the German psychotherapist Edda Of Klessmann [6] in psychotherapy with images. We conducted it in the form of group work. The text was pronounced in Chinese in a free translation by Jan Bohan in the format of meditation.

The Leiner method represents free imagination in the form of images - “paintings” on a given topic. It is believed that the emerging images-fantasies reflect emotional and personal problems and conflicts of early childhood. The presented image, according to the psychologists of the Jungian direction, has a psychotherapeutic effect, releasing blocked emotions and removing obstacles for further development, and, therefore, improves the quality of adaptation.

According to Ya.L. Obukhov [3], each symbol in catatonic psychotherapy (and in this study, three trees became this symbol) is formed by the type of condensation, that is, in each image and, therefore, in its reflection in the figure, at the same time, many different events from different time layers appear. This is why the use of fantasy images in adapting to a new environment can become so relevant.

During the presentation of the “Three Trees” image, the psychologist accompanied and directed the presentation of the participants in the empirical study at a calmly-hasteless pace of voice. Before the presentation of the image, relaxation was carried out, aimed at relaxing and eliminating the protective reactions of the study participants. After relaxation, all respondents were given instructions:

“Please imagine three trees that you have ever seen or your imagination draws for you. Everything will be right and good. We can work with any of your ideas. ”

Further, as an accompaniment in the presentation of the image, the following questions were proposed:

What season is in your image?

What is the weather like in the image you imagine?

Air temperature?

Time of day?

How far are the trees from each other?

Mentally approach one tree.

What is the sky over it?

What are your feelings about this tree?

How old is the tree?

Consider the crown of a tree, its leaves.

Touch the bark.

How thick is the trunk?

Pay attention to the root system, do you see the roots?

What is the soil under the tree?

Now look at another tree, how is it located in relation to the first, at what distance?

What does it look like?

What feelings do you have towards this tree?

Similar questions follow, which helps to maintain a stable image for detailed consideration.

After the presentation, it was proposed to draw an imaginary image-fantasy and answer in writing questions:

How did you feel before the visualisation and after it?

What was the most unpleasant in the view?

What was unexpected for you?

What was the most pleasant for you in the performance?

In writing, characterize the image taking into account the parameters: weather, season, time of day, what the trunk, crown, roots looked like, the distance between the trees, the feelings that arose during the presentation, etc.

The work ended with a group discussion of the presented images, during which the participants shared their experienced emotions and feelings. This made it possible to integrate the visualisation into the current life situation - adaptation to life away from home.

Qualitative analysis of the results.

In this study, only high-quality data processing was applied. After presenting the image of “Three Trees” in the analysis, we used both drawings and test reports written by subjects immediately after drawing [4]. The main requirement for the reports was the following - all of them should relate to the real experienced experience of the subjects.

In the article, we focused on the description of only some of the available deep-seated experiences of the studied individuals. The emphasis was placed on three parameters in the interpretation.

Distance. In 30 figures, the trees are close to the interaction distance. This presented us with the opportunity to appreciate the presence of good family interactions. So, in figure 1 three trees are located nearby.

They have well-defined crowns and powerful roots, which can serve as an indication of the proximity of family members to each other and friendly relations within the family.



Fig. 1 Good family interactions and the proximity of family members to each other



Fig. 2 Lush crowns with fruits

In one figure from the analyzed practical material we see magnificent crowns with fruits. In the analysis, this can be regarded as a good life opportunity of the respondent, who imagined the image and reflected it on a piece of paper (Figure 2).

In the 5 analyzed figures, we saw the remoteness of trees from each other and the bad weather around them (it was raining or snowing, the wind was blowing).

This was regarded by us as a reflection of the difficult interactions in the families of these students, and also indicated the presence of respondents' experiences saturated with negative emotions and contributing to an increase in anxiety level (Figure 3). G. Sullivan believed that anxiety is one of the personality traits that can determine a person's development, being constantly present in his life. This is a product of interpersonal relationships, transmitted initially from mother to child and is associated with a security risk. To eliminate anxiety, a person forms various ways of protection.

Relations with fathers in families are mostly positive and are friendly. So only in 6 people in the drawings are the father trees shown at a far distance. Based on the traditional way of life of the Chinese family, fathers are the main earners in the family and are often outside the home. Therefore, the remoteness of the tree representing the father turned seemed be natural for us. At the same time, one figure shows the perception of the removed father tree as being brightly positive, sunny, while the other two trees are depicted in the rain and without crowns. The respondent who presented this image noted the existing homesickness and difficult relationships in the family (Figure 4).

In the overwhelming number of figures - 29 figures - we saw an image of good **weather**, which reflects, respectively, the good mood and optimism of the subjects. One figure schematically depicted a person with a sad face, which may indicate a depressed mood and experienced melancholy and sadness in connection with separation from home (Figure 5).

One figure reflects the testee's perception of the mother's detachment to life in the family and to himself. The picture was snowing and it was cold. The respondent noted that during the performance, he cried and felt the bitterness of separation. So, it should be noted that in 6 figures, rain was drawn, black clouds hung over or even snow flew. Trees in the latter cases were either without foliage or without roots. Such ideas and, consequently, the drawings became indications of the presence of a common minor mood background and the experienced depression (Figure 6).

It is these students, in our opinion, who need psychological help in assimilating to life in Russia and, therefore, in adapting to living on campus.

Thus, the study presented the possibility of a new approach in the work of adapting Chinese students to life and study in Russia. Given the ambiguity, multifunctionality and duality of symbolism, we do not seek to draw hard conclusions. At the same time, the use of such an approach can allow expanding interaction with foreign students and will provide an opportunity for specialists to carry out their work on the basis of fairly accurate and objective diagnostic findings.

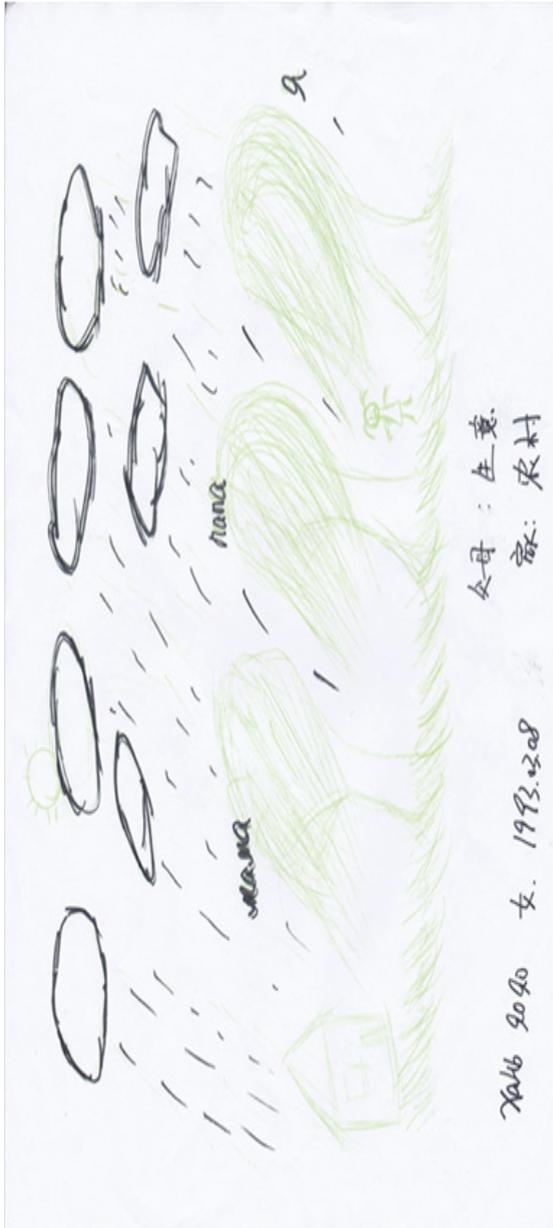


Fig. 3 Rain and wind as evidence of impaired adaptation and high levels of anxiety



Fig. 4 The father tree stands a little off, and the sun shines above it



Fig. 5 Depressed mood and experienced melancholy and sadness



Fig. 6 Minor mood background and experienced depression

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年轻一代代表音乐作品感知动机的特征

FEATURES OF MOTIVATION IN THE PERCEPTION OF MUSICAL WORKS IN REPRESENTATIVES OF THE YOUNG GENERATION

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抽象。在音乐感知心理学中存在的问题中,通常会提出与音乐刺激感知的必要相关主题。本文讨论了个体心理和社会心理因素决定音乐对象的感知的问题,音乐感知的确定在多大程度上表现为:性别,年龄,音乐技能。作为研究方法,我们对受访者对与听音乐有关的动机的看法进行了定性分析,对受试者对各种类型的优先音乐作品的评价和属性的相关关系进行了比较分析。该研究揭示了与音乐感知相关的需求与主体的个人属性和社会因素之间的关系。找到了社会,认知和情感需求与音乐作品感知选择的相关性。揭示了由音乐感知引起的需求指标与音乐对象选择的行为反应之间的关系中社会群体之间的差异。

关键词:需求,动机,音乐感知,音乐的情感感知,音乐的认知感知,行为反应,社会群体,音乐流派,感知,社会心理学。

Abstract. *Among the problems in the psychology of music perception, topics related to aspects of music needs are often raised. This article addresses the issue of which individual psychological and socio-psychological factors determine the perception of a musical object, how much the determination of music perception is manifested by factors: gender, age, musical skills. As research methods, we used a qualitative analysis of respondents' opinions about motives related to listening to music, a comparative analysis of subjects' assessments of priority musical works of various genres and correlation relationships of attributes. The study revealed the relationship between the needs associated with the perception of music, with the personal properties of subjects and social factors. The correlations of social, cognitive and emotional needs with the choice for the perception of musical works are found. The differences between social groups in the relationships between the indicators of the needs caused by the perception of music, and behavioral reactions in relation to the choice of a musical object are revealed.*

Keywords: *needs, motives, music perception, emotional perception of music, cognitive perception of music, behavioral reaction, social groups, musical genres, perception, social psychology.*

Introduction. In modern studies in the study of music perception, scientists fo-

cus on social values and personality traits of subjects determining the motives for music perception, which become: emotions, friends, family, escapism, background, dancing, self-concentration, values, politics, culture [4, 6, 9, 10, 11, 12, 13, 17, 19, 21]. «The need» for psychology is defined as “the state of an individual created by the need experienced by him for the objects necessary for his existence and development and acting as a source of his activity”, while «the motive» has two meanings: this is either an impulse to activity, or a choice of direction of activity [14, C. 287, p. 219]. Representatives of theories of cognitive theories of motivation associate motives with the process of thinking, giving them the meaning of “selection mechanisms” of a certain form of behavior, they believed that all actions are motivated “internally”, in accordance with innate features. If we compare the characteristics of the motivational sphere in the perception of music with the hierarchy of needs of A. Maslow, then it is obvious that the needs for a musical object are connected with the needs for attachments, in involvement in the group and self-realization [5, p. 244-245]. A massive study (834 subjects) about the relationship between needs and motives in music perception was carried out by German scientists, pointing out the existence of three main factors in the motivational sphere of music perception: firstly, music is listened to reach a new level of “self-awareness” when music perception is performed helps to enter a state of contemplation and adds meaning to existence; secondly, they listen to music with the goal of “stimulating and regulating mood” when a piece of music makes a subject cheerful or helps him relax; the third factor indicates the perception of music in order to feel “social closeness” with people around, when perceived musical works make it possible to belong to a particular social group, and facilitate communication with friends. Studying the field of motivation in the perception of music, scientists pay attention to the peculiarities of the influence of musical works of various nature, in this context, cross-cultural research is carried out. Representatives of various sectors of society, of different age and professional composition from different countries of the world were interviewed [21, p.9, p.21]. When studying the perception of music and the related need sphere of subjects, the topic of “mood”, related to the motives for listening to musical works, was touched. To indicate a range of positive emotions (or mood, according to M. Argyle), there are many verbal notations. Of the numerous studies, including in various cultural environments, M. Argyle identified two main ranges of manifestation of emotions “pleasant - not pleasant” and “activation-inhibition” (degree of interest and excitement) [3, p. 184]. These terms (nice - not nice) can well be attributed to the perception of music when it comes to the emotional aspect of the perception of a musical work. Moreover, in this assessment of music there are various phenomena, such as, for example, the need for perception of “sad music”. In foreign studies, the authors became interested in the need of individuals for the perception of “sad music”, discovering in this “paradox” the effects of socially conditioned empathy that underlies this motivation. The perception of “sad music” occurs through psychological infection and is associated with catharsis and emotional communication, sharing

the sadness of another person who composed the work or performed it. If you need to perceive “sad music”, the process of perception occurs with the inclusion of emotional, social, cognitive and aesthetic aspects. “Sad music” causes not only sadness, but also a wide range of complex and partially positive emotions, such as nostalgia, peacefulness, tenderness, transcendence and surprise. “Fun music” is listened to with friends or in public places in order to experience pleasure and maintain a positive mood or emotional state. A number of functions of listening to “sad music” (memory, background, excitement) partially overlap with the functions of “funny music”, while the frequency of elections show significant differences in the values that psychological functions of listening to music have for listeners when interacting with sad music [22]. Foreign authors studied the motivational sphere in the perception of music not only in situations of rest and entertainment, but also in a work situation. T. Lesiuk studied the influence of music on labor productivity, in this case, on software development. 56 employees of Canadian software companies were investigated. The results showed that the positive impact on the quality of work was the lowest in the absence of music, while the execution time of the task was greatest when the music was deleted. Thus, it was revealed that the motivation in the perception of music does not always coincide with the real benefits for the activity that the subject of perception is engaged in. The works of some authors have appeared in Russian literature, claiming that there is a relationship between the physiological reactions of the individual, his personality traits, and motivation in the perception of musical works [8]. V.E. Semenov noted the multifunctionality of the musical object, which carries an aesthetic, suggestive, hedonistic, compensatory, cathartic, educational, cognitive and informational and communicative function, which indicates a broad motivational sphere related to the perception of music, in particular, and art, in general [15]. Some domestic authors found that only when perceiving the preferred music, that is, only when the subject receives “pleasure” from the perception of music, does physiological parameters approach the “ideal” values [7].

Purpose, subject. In the study, we set a goal: to study the motivational sphere in the perception of music among Russian contemporary students. Objectives: to identify the modalities of the psychological needs of individuals in connection with the perception of music, depending on the situation in which the music is listened to; to identify differences in the needs of perception of a musical object, depending on the personal properties of subjects and social factors, to study the main literary sources that describe the functions of listening to music, as indicators of the psychological needs of the individual.

Hypotheses: 1) there is a socio-psychological and individual psychological conditionality of needs associated with the perception of preferred music; 2) needs are the determinants of behavioral reactions in connection with the perception of musical objects; 3) the needs and motives that exist in the subjects in connection with the perception of music, are associated with belonging to a social group.

Object of study: students of St. Petersburg Polytechnic University who are not

involved in musical activities (N = 221; 55% of boys, 45% of girls), students of St. Petersburg Polytechnic University attending «The Polygymnia» Polytechnic University choir (N = 48; 22% of boys, 78% girls). 80% of students studying in the choir studied at a music school, 20% of choir students did not study at a music school. Methods The following were used: semi-standardized expert interviews, questionnaires: “Value orientations” by Rokich, “Psychological functions of music” Schaefer, Sedlmeier; ranking, author's questionnaire “Social perception of music”, Spearman correlation, Mann-Whitney U-test, exploratory factor analysis (EFA).

Results of the study: As a result of the factor analysis, three main types of needs for listening to musical works were revealed: cognitive, emotional and social, which occupied a large part of the variance, and five additional factors. The study revealed that music perception is related to needs: either activate or immerse yourself in a state of relaxation. Respondents understand by “activation” that a piece of music is listened to in order to motivate them. When it came to “relaxation”, the subjects implied that the perception of music should lead them to relaxation, distraction from problems, and help to switch attention from one subject to another. Some subjects expressed the opinion that they listen to music to get the effect of catharsis or to learn new information, for some students it was important to experience the pleasure of the timbre of the performer's voice. To demonstrate the existence of these categories of activation/relaxation in the cognitive and emotional sphere of music perception in the students' view, we give as an example several phrases from the statements demonstrating the respondents' understanding of the impact of the music they perceive on their own state: “Music activates me.” “I get positive emotions, joy, a boost of energy,” “high”, some musical works make me think about life.” “Music is motivation!” “The music that I listen to helps get rid of thoughts, tune in.” “Music is exciting, relaxing, distracting.” “Music is calm”. “Rock is “ iridescent ” music, and classical is “ catchy ”. Motivations in the perception of a musical object among respondents fall into two categories: the cognitive and emotional aspects of music perception. If we take into account the existence of the “polarity of states” scale, it is obvious from the students' answers that in most cases, students with the help of music want to improve their mood, change their state to a more favorable one. The study showed that music perception is associated with the subject's need to influence his condition: either activate, tone up his nervous system, or reduce stress. A relationship was established between students' moods, which they regulate through the perception of music, for example, getting rid of the effect of monotony, with the choice to listen to music.

As a result of the correlation analysis, we revealed a correlation between the levels of severity of motivations of various modalities and behavioral responses of respondents in connection with the elections and their listening to musical works. Motivation related to the cognitive and social aspects showed a correlation with the perception of the genres Rock, Russian Rock and Classics. The needs associated with the emotional aspect of perception, showed a correlation with the perception of genres Popular music, Classics. The results showed that young students

choose the genre of rap for perception, which interprets the factor "age" as belonging to a generation. Senior students, showing a higher level of maturity, have a need to listen to complex music, for example, Classics. Gender differences were manifested in the different needs of students of different sexes. The girls indicated that melodic, calm music evokes a pleasant sensation; the boys have never chosen "calm, melodic" music as preferred. A comparative analysis showed that girls are more often motivated through music to find a state of contemplation and memory ($p \leq 0.05$). Young men showed motivational, hedonistic motives for perception of a musical stimulus ($p \leq 0.1$). A comparative analysis of the motives and needs of students is confirmed by the statements of the subjects. In the opinions of young men (physics students, 4 year, average age 22.5 years, 2018) there were motives in the perception of a musical object related to the need for activity: "Music helps to tune in to various types of activities - I often listen to Kish ("King and Jester"), and I prefer genres: rock, Russian rock, folk, metal." "Music helps me focus on a certain activity, I listen to any music, more often it is rap, Russian rock, folk." The statements of the girls (physics students, 4 year, average age 22.5 years, 2018) showed a more emotional perception of the musical stimulus: "Music helps to concentrate, I find reflection of my emotional state in it, inspiration, I'm interested in political views, moral values, and I listen: classics, jazz, folk, rock." "It's nice to listen to just good music. I want to sing along to beautiful songs. Music raises my mood, and I listen to rock, pop, jazz, Russian rock." When comparing two groups of students engaged in the choir and students who are not involved in the choir, who are representatives, as defined by G. M. Andreeva, of two large social groups [2] (with and without musical skills), significant differences were manifested in the relationship of states with the assessment of listening to Classics ($p \leq 0.05$). Students with musical skills demonstrate competence in terms of awareness in a musical object, affect social issues related to music perception in their statements, while music perception reveals a cognitive and social component of perception. The perception of Classics by students involved in the choir is associated not only with the emotional factor, but also with value orientations, as their statements show: "Classical music harmonizes, leads to a knowledge of the world." Students with musical skills in the perception of Classics perceive musical works in many ways. Probably, the versatility of the perception of Classics by choir student's singers, a deep understanding of this music explains the fact that preferences for classical music among students with musical skills are manifested significantly more often, which indicates the relationship between the needs associated with the perception of classical music and the personality characteristics of individuals. These research results confirm the idea that understanding of classical music is interconnected with an emotional reaction to it [8, 18]. When a subject understands the content of a piece of music, it is more likely that an emotional reaction will not be present. The differences in the perception of musical genres: folk, metal, and

classical music are explained by the fact that students belong to different social groups - those who studied a musical subject and those who did not study a musical subject. Folk and Classics are more preferred by students studying in the choir, since the basics of folk and academic music are studied in musical educational institutions, and students understand this music, and, as has been proved by many authors [8, 18, 19], the cognitive aspect of music perception actualizes emotional responsiveness to a musical object. Our assumptions about the socio-psychological and individual psychological reasons for the need for music in groups of students of different directions of activity confirm the statistical results of the correlation analysis. In both samples of students involved in and not involved in the choir, there were correlations with other variables showing signs of "choice, as preferred, of the genres of Rock, Russian Rock." The variable "interest in music" has several correlations in both samples, while the correlates of "interest in music" among students studying and not studying in the choir are different from each other. In the group of students who are not involved in the choir, interest in music positively correlates with "I-concept", "mood" and the choice to listen to genres: Jazz and Reggae. In the group of choir members, "interest in music" is positively associated with "listening on", that is, with a concentrated perception of music, with "timbre" and inversely correlates with "rhythm" and "text" in a piece of music. "Mood" in the group of students who are not involved in the choir positively correlates with the choice for the perception of the Rock and Jazz genres, in the center of the correlation galaxy are two indicators: "Rock music" and "mood". For students in the choir, the variable "mood" is associated with the variable "choice for the perception of Classics". In the center of the correlation constellation in the sample of students from the choir are Classics, Popular Music and Communication with Friends. Students who are not involved in the choir more often have a need to listen to the genres of Rock music (0.514 *, $p \leq 0.05$) and Jazz (0.467 *, $p \leq 0.05$). The mood associated with the perception of music is inversely correlated with the perception of Classics (-0.717 **, $p \leq 0.01$). It has been shown that the choir musicians are more inclined to perceive music as an aesthetic object, as experts, by the definition of T. Adorno, included [1]. The perception of musical works of students not participating in the choir, for the most part, is not included listening, their perception connects with background, regulatory function. H. Hekhausen explained the emergence of an emotional need depending on the cognitive assessment of the situation: "Emotion is absent until the activation state is integrated on the basis of situational determinants, or until a positive or negative assessment of the situation leads to an increase in this state." Scientists mentioned, in connection with this problem, the theory of attraction of H. Schechtre, who determined the level of activation when the object is needed, as the level of activation that has a common energy function, and the cognitive component of assessing the situation - as the content, color and direction that informs the emotions being experienced

[18, p. 161].

Conclusion. The study identified the following modalities of music perception needs: cognitive, emotional, social. The needs associated with the perception of music are determined by factors: “gender”, “age”, the presence or absence of musical skills in individuals. Musical works are most often perceived in order to: 1) motivate oneself to study, perceive the work included, switch to another kind of activity, switch consciousness from one thought to another; 2) relax and take a break from study, work, relieve stress, or become more active, bring a charge of energy to your activity. The adherence to fashionable music, which is currently trending, can be associated with the suggestibility of young people, manifested in the "fidelity" of the subculture. It is also likely that this phenomenon is an indicator of youthful non-conformism, a tendency to rebellious behavior, rebellion to authorities, and the search for independence. The girls showed more social motives in the perception of music, and the desire to remember past events with the help of music, the boys showed hedonistic needs, a desire to motivate themselves for activity. The needs arising from belonging to a social group are manifested in the fact that the perception of music in students with musical skills is more often associated with value orientations, and in students without musical skills, the motivation when listening to music is more often associated with the regulation of their mood. Thus, the study proved the hypothesis of the existence of various modalities in the demanding sphere of music perception and the conditioning of students' cognitive and emotional needs in a musical object by social and personal factors. These findings are likely to help educators and psychologists involved in the education of the younger generation.

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18世纪下半叶年轻贵族道德品质的形成 (以早期俄罗斯儿童文学为基础)
**THE FORMING OF MORAL QUALITIES OF YOUNG NOBLES
IN THE SECOND HALF OF THE 18TH CENTURY
(BASED ON EARLY RUSSIAN CHILDREN'S LITERATURE)**

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摘要。 文章分析了欧洲影响下俄罗斯帝国儿童文学的形成。 考虑了在年轻一代贵族中形成道德品质的典型情节。

关键词: 儿童文学, 贵族, “儿童的心灵阅读”, 道德。

Abstract. *The article analyzes the formation of children's literature in the Russian Empire under European influence. The typical plots that contributed to the formation of moral qualities in the young generation of noblemen are considered.*

Keywords: *children's literature, nobles, "Children's reading for the heart and mind", morality.*

In the XVIII century, domestic children's literature was only in its infancy, and it was mainly represented by translations of European publications into Russian. The reasons for the appearance of these texts are also interesting. The answer to this question we can see in the journal "Children's reading for the heart and mind. Part 1. 1785 "in an appeal to the" noble Russian youth ":" Dear children! It may be surprising to many of you to publish a special magazine for you, and so that you are not surprised, we want to notify you in a few words about the reasons, intent and content of these sheets.

1) *The reason* that prompted us to publish them is that until now there was nothing in our native language to serve for children's reading; why do children studying in French or German have to be content with reading French and German books ...

2) *our intention* is to deliver an exercise in our natural language to all young comers for reading, imitating that of the best German works ...

3) *the content* of this journal will be different, but necessary and proportionate to your age, your strengths and your developing mind ...»[1, p.3-4]. Magazines for children coming out of the printing house of N. Novikov from 1785 to 1789

had a significant impact on the development of children's domestic literature. The traditions established by "Children's Reading" have long been held in children's journalism. Sometimes they retreated from them, but then returned again, so that the influence of "Children's Reading" extends to all the magazines of the first half of the 19th century. [2, p. 92]

Years of the 18th century	Number of children's books		
	Original	Translated	Total
From 47 to 60 inclusive	2	25	27
70s	9	18	27
80s	19	61	80
90s	25	68	93
Total	55	172	227

As we see from the table [2, p. 27], the number of original works is gradually increasing, but until the end of the 18th century the leading role is retained by translated literature. More often than others, French (46%) and German (35%) books were translated to Russian. [2, p. 28].

Morality is the internal state of a person, expressed in relation to others. Therefore, in children's literature, the most talked about was virtue in general and the performance of good deeds, which were primarily associated with prudence, religiosity, knowledge, upbringing and noble dignity [3, p. 64].

Morality and virtue takes first place in terms of appeals to this concept in works and amounts to 40%, according to researcher E. B. Kudryavtseva. [3, p. 63].

In 1783, the book "Children's Library" was published in the translation of Alexander Semenovich Shishkov. The original was written by I. Kampe 4 years earlier. But this book cannot be called an exact translation of the work of Kampe, because the original works of Shishkov were added to the domestic version as well. "My book," said Shishkov, "amused children with its simple style and instructed them in good behavior" [4, p. 6].

The story "Young Bull Liar" tells of a young bull who had a bad habit of lying. "... When he was with big bulls on the pasture. He found stupid pleasure in scaring them and laughing at them. He hid behind the bushes and howled like a wolf. " At first, the bulls were frightened and believed that it was a wolf howling, and then "... they noticed that he was mischievous, and stopped to believe him since then." Then, when the wolf came and the bull called for help, no one came to him, since they no longer believed. The wolf attacked the bull and ate it. "Ah!" He said with a sigh, dying, "how bad it is for those who deceive others." [4, p. 61]. The plot is rooted in Antiquity and is very reminiscent of Aesop's fable "Liar", a translation which was made by L. N. Tolstoy. [5; 6]

In stories with a moralizing content, morality is closely linked to generosity. A vivid example is the story “Magnanimous Affair”, published in the journal “Children's Reading for the Heart and Mind”. “An elderly father, during his lifetime, divided his wealth into three sons. “I still have an expensive diamond, the old man said: “I want to give it to the one of you who will get the right to it through some generous deed. ”Sons parted in different directions and looked for an opportunity to show their generosity. After returning home after three months, everyone began to share their successes.

“Listen, the eldest son said: “A stranger entrusted me with his estate, without having taken a receipt from me that I had received it. I could easily hold this estate and get rich; however, I returned everything faithfully to him. Tell me, is this not a meritorious thing?” “You did the thing my son ... what the position requires from any honest man ... Your deed was good, however, I do not see generosity in it.” The second son came next and said that he had saved a drowning child from death. “My son, you have done what every human owe.” And the third son said that he saw his enemy sleeping, but in danger, because a snake crawled towards him. “...I did not need a better opportunity to get rid of him; however, I didn't want to seize this opportunity, I killed the snake and woke him up. ” The act of his father's third son was impressive and he called it generous. [7]

The educational moment of this work is obvious. Young people had to learn to distinguish the actions that they did according to conscience or on the basis of selfish motives. For a clear understanding, they needed a standard example, which they saw on the pages of works.

In the Russian Empire in the second half of the 18th century, pedagogical thought was actively developed thanks to foreign educational literature. Anton Antonovich Prokopovich-Antonsky (1763-1848) professor, teacher, promoted a humanistic education system based on the enlightening ideas of French material scientists and the democratic principles of native thinkers. In his treatise *On Education*, he develops very progressive ideas. “... only the beauty of the soul can deliver true beauty, harmony and even the very strength of the body. But how are these unappreciated moral treasures acquired? Enlightenment of the mind and education of the heart, moral education” [8, p. 350].

Thus, we can conclude that Russian children's literature was formed under the influence of European works. [9] Actually, the original children's literature in the second half of the 18th century was quite small (less than 1/3 by the end of the century). The theme of morality and virtue is in first place in most children's stories. Children's literature, even at the stage of its formation, became an important pedagogical tool in the upbringing of the young generation of nobles.

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预防与医疗有关的感染的问题
**QUESTIONS OF PREVENTION OF INFECTIONS RELATED
WITH MEDICAL CARE**

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抽象。 目前,患者和医疗机构工作人员的传染性安全问题正变得至关重要。这是由于存在许多传染性(寄生)疾病的传播途径:接触 - 家庭,空中,人工等。医务人员提供医疗保健(IAMC)的其他感染风险是由以下因素造成的:急救护理,大量患者同时到来(疾病的质量性质,疫情上升等),大量的实验室检查,人为因素。

关键词。 与提供医疗护理相关的感染,微生物对消毒剂和皮肤防腐剂的抵抗力。

Abstract. *Currently, the problem of infectious safety of patients and staff of medical organizations is becoming of paramount importance. This is due to the presence of many transmission routes of infectious (parasitic) diseases: contact-domestic, airborne, artificial, etc. Additional risks of infections associated with the provision of medical care (IAMC) among medical personnel are created by such factors as emergency care, the simultaneous arrival of a large number of patients (mass nature of the disease, epidemic rise, etc.), a large number of laboratory tests, human factor.*

Keywords. *Infections associated with the provision of medical care, the resistance of microorganisms to disinfectants and skin antiseptics.*

In modern conditions of development of health care and humanity as a whole, the prevention of infections associated with the provision of medical care (IAMC) is one of the global problems of the world. To the solution of these serious issues today the activities of a significant number of scientists, numerous healthcare practitioners and most large companies representing their products and services on the world market are subordinated. At present, it is difficult to overestimate the social and economic damage that the IAMC does annually to the world community. Thus, according to official statistics, in the United States more than 2 million patients suffer from IAMC annually, 88,000 patients die, annual economic damage is 4-10 billion dollars; in the UK, taking into account IAMC registrations, hospital treatment of patients increases by 3.6 million days, the annual economic damage is about 1 billion pounds [3-5].

Unfortunately, today in the Russian Federation there is no generalized reliable statistical information about the specific social and economic burden caused by the IAMC to the population, there are only certain ideas about its scale, which are based on the results of scientific studies of domestic scientists in recent years. It has been shown that 5–10% of inpatients are affected by IAMC and occupy tenth place among the causes of mortality. In Russia, according to official statistics, approximately 25-30 thousand cases of IAMC are recorded annually (0.7–0.8 per 1,000 patients), but domestic researchers believe that their true number is at least 2–2.5 million. (i.e. no more than 1–5% of the real incidence is subject to registration!). Depending on the action of various factors, the incidence of IAMC varies. Some groups of patients are especially vulnerable: newborns, elderly people, patients with severe underlying pathology and multiple concomitant diseases, patients undergoing aggressive and invasive medical procedures, organ transplantations, etc. In these groups, the incidence rates of IAMC are significantly higher [4].

Infections associated with the provision of medical care significantly reduce the quality of life of the patient, leading to a loss of reputation of the healthcare institution.

The intensive development of high-tech, invasive diagnostic and treatment methods, combined with the wide spread of multidrug-resistant microorganisms, determines the need for continuous improvement of IAMC surveillance and control systems.

The causative agent of infection is one of the main links in the epidemic process. It should be emphasized that, in relation to almost all IAMC nosoforms, there are no specific preventive measures, and therefore disinfection and sterilization measures determine the basis of their prevention system. Given this, the problem of resistance of IAMC pathogens to antibacterial drugs, including antibiotics, disinfectants (DS) and skin antiseptics, is currently in the focus of close attention of scientists and practitioners of practical public health in many countries. The presence of resistance of microorganisms to disinfectants has been studied for several years. The presence of resistance to various groups of disinfectants in different types of microorganisms has been established. Knowledge of the mechanisms of resistance of microorganisms range from revealing the genetic aspects of its formation to quaternary ammonium compounds (QAC) and oxygen-containing DS to the lack of reliable ideas and only a description of the phenomenon of resistance. Even less information is available on the prevalence of resistance and the influence of various factors on its formation [7,2,9].

One of the priority places in the effectiveness of medical care for infectious diseases, including IAMC, is the ever-increasing frequency of poly-, extremely, and pan-resistant strains of microorganisms to the effects of antimicrobials. Recently, various publications highlight the problem of the growth of the development of IAMC pathogens not only for antibiotics, but also for disinfectants.

The use of antibacterial drugs and antiseptics leads to the constant selection of microorganism strains resistant to these factors that form the microbial landscape of a medical organization. This dictates the need for its monitoring in dynamics, which

allows us to develop a strategy for the adequate use of antimicrobial agents. Regular microbiological monitoring of the resistance of microorganisms released from patients and from nosocomial objects to disinfectants allows us to assess the proportion of the most important microorganisms from the epidemiological point of view, their level of resistance, and perform correct selection and timely rotation of disinfectants [6].

The next factor in the emergence of IAMC in medical organizations is equipment that comes in direct contact with the patient, his biological environment and personnel. Processing equipment (including endoscopic), instruments and auxiliary equipment is quite laborious and complicated, while poor-quality cleaning, disinfection and sterilization, as well as a limited time resource for disinfection measures (due to the increased flow of patients) create a risk of IAMC among patients and staff. The solution to this problem is to use for disinfection (including combined with Complete sanitization), high level disinfection and sterilization of modern disinfectants that do not fix organic compounds, do not spoil the treated surfaces, as well as utensils, medical devices (MD) and patient care items from corrosion-resistant metals, glass, rubber and plastics, polymeric materials, and are cost-effective. The use of chemical indicator strips is justified as a method of rapid control of disinfection measures (control of the concentration of active substance in working solutions).

Maintaining an epidemiologically safe nosocomial environment in healthcare facilities is critical to ensure IAMC prevention.

Recently, the use of the latest technologies in cleaning events in medical organizations has become increasingly relevant. One of the promising ways to implement disinfection measures is the use of the aerosol disinfection method, based on the transformation of the disinfectant into a finely dispersed state using special equipment, and the introduction of aerosol into the indoor air. The aerosol method has several advantages. This is a high efficiency of processing rooms, including inaccessible and remote places; simultaneous disinfection of air and surfaces in rooms, ventilation and air conditioning systems; minimization of the human factor (carrying out processing in the absence of people).

A separate group of factors affecting IAMC are the performance of medical procedures, including procedures for caring for the patient. These manipulations prevent, significantly reduce or delay infectious complications in patients. Of particular importance in hospitals are issues of nursing care and the use of appropriate medical devices for caring for severe patients in ICUs, due to the significant length of stay in these departments of patients with certain nosologies (botulism, HFRS, leptospirosis, sepsis) [1,8].

Of no small importance is the organizational and methodological work with medical workers to comply with the rules of hygienic processing of staff hands as the most likely factor in the transfer of IAMC during various types of manipulations and operating processes.

All this indicates the need to introduce modern effective methods of infection control into healthcare practice, which will improve the quality of medical care and reduce the risk of nosocomial infection of patients and staff.

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关于未来药剂师社会责任能力形成的问题

TO THE QUESTION OF THE FORMATION OF THE COMPETENCE OF SOCIAL RESPONSIBILITY OF THE FUTURE PHARMACIST

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抽象。 社会责任的主题对国家和社会的要求越来越高。 越来越多的公司参与社会对话领域，涉及商业与社会之间的互动问题，试图创建一个对社会负责的组织的形象和声誉，并证明公众对其产品或服务的期望。 制药业务专家（包括药房）的社会责任能力的形成非常重要，因为该国经济部门目前是最具社会意义和社会责任感的部门之一。

关键词：组织社会责任，社会责任标准，组织价值观，员工价值观，社会责任能力。

Abstract. *The topic of social responsibility is becoming increasingly demanded both for the state and for society. A growing number of companies are involved in the sphere of social dialogue, in the issues of interaction between business and society, trying to create the image and reputation of a socially responsible organization and to justify public expectations regarding their products or services. The formation of social responsibility competence among pharmaceutical business specialists (including the pharmacy) is of great importance, since this sector of the country's economy is currently one of the most socially significant and socially responsible.*

Keywords: *organization social responsibility, criteria of social responsibility, organization values, employee values, social responsibility competency.*

The relevance of social responsibility of organizations was discussed by the President of Russia at the State Council of the Russian Federation on April 5, 2018: “Business representatives should not forget about the need for social responsibility. It is clear that profit is the main priority for business. But this should not be achieved at all costs. You know why I'm talking about this today. Why is the social responsibility of business to people and society so important...”.

It should be mentioned that since 2017 in Russia an international competition of managers “Leaders of Russia” has been held, where the main criteria for selecting finalists are competencies such as social responsibility and strategic thinking.

The first ideas about the concept of social responsibility were formulated in the middle of the 20th century by foreign researchers. In the late XIX - early XX centuries, the first billionaires in the history of mankind, carrying out charitable activities (that is, providing free assistance to those in need) on a voluntary basis, laid the foundation for the concept of social responsibility [1].

The history of the formation of socially responsible behavior of producers of goods and services in Russia dates back several centuries. A significant role in the development of social responsibility of business was played by the era of Peter I, who laid the foundations of Russian industry and the responsibility of the class of entrepreneurs to the state and society. It should be noted that despite the harsh and often cruel measures, Peter was far from always succeeding in achieving socially responsible behavior from the business. “The nascent business often produced poor-quality products, misused natural resources, bribed officials, stole government money, sought to avoid taxes, that is, demonstrated social irresponsibility.” It is also important to note that socially responsible behavior in a number of issues was demonstrated only by the advanced Russian business, which made up a clear minority in the entrepreneurial environment [1].

It must be noted that the reforms of Peter I laid the foundations for the development of socially responsible business in Russia.

The criteria that a socially responsible company must meet are set out in the “Green Book on Corporate Social Responsibility” [3]. The basic principles of the activities of companies within the framework of social responsibility are openness, consistency, significance, and the prevention of conflicts. The principle of openness involves transparency in the implementation of social programs, publicity and reliability of information about the organization's social responsibility, as well as a mutual dialogue between business and stakeholders. The principle of consistency reflects the requirement for consistent and regular allocation of priority social programs. The principle of significance reflects the problem of demand and relevance of implemented social programs, their effectiveness and scale. The principle of conflict prevention implies social activity that is not related to the support (or denial) of political parties, religious movements, nationalist movements.

At present, determining social responsibility (as some authors believe) should be not just as the organization’s responsibility to the state, to people and other organizations, but as the philosophy of a company that takes care of its development in the long term, to ensure a decent standard of living for its employees, as well as about improving the reputation and image of the organization [1,2].

Documents governing the social responsibility of organizations are:

- National standard of the Russian Federation GOST R ISO 26000-2012 “Guidelines on social responsibility”;

- Social charter of Russian business, developed by the Russian Union of Industrialists and Entrepreneurs (RUIE);
- Code of Entrepreneurial Ethics of the Chamber of Commerce and Industry of the Russian Federation (RF CCI) “12 Principles of Doing Business in Russia” [4,5,6].

The pharmaceutical market has its own history of development and characteristic features. A distinctive feature of the social responsibility of pharmaceutical organizations (manufacturers, distributors, pharmacies) is to provide the population with quality and safe medicines.

Over the past 10 years, the pharmacy sector of the pharmaceutical market has changed dramatically, and is currently represented by various organizations (pharmacy chains, pharmacies, drugstores). These organizations set different goals in the framework of social responsibility and have different opportunities for their achievement [2].

In the course of the study, we analyzed the sites of a large number of pharmacy organizations, it was established that pharmacy organizations, positioning themselves as a socially responsible organization, actually demonstrate only its individual elements: ensuring low prices, the availability of high-quality certified products, support for educational institutions, and programs for preferential provision of pensioners, participation in the implementation of state programs, participation in charity events, campaigns, discounts, discount systems, etc.

In the course of further research by the method of sociological survey (interviewing), we studied the attitude of employers and / or leaders of pharmaceutical organizations to social responsibility. A special questionnaire was developed for the interview, including 12 questions. The interview was recorded on the recorder with the permission of the interviewees, each interview lasted more than 2 hours, the transcript of the finished interview takes from 10 to 18 pages. Five heads of organizations were interviewed. Below are examples of managers' answers to some of our questions.

To the first question, “Can you characterize the social responsibility of business?” - none of the leaders gave a characterization. To the second question, “Can you tell if your organization is socially responsible?” - all the leaders answered: “Yes, we do pay taxes.”

All answers to the question “Does your organization have a corporate code? Were negative.

To the question “How and with what do you motivate your employees?” - each of the leaders answered especially willingly. During the most vivid interview, it was noted that they consider the presence of a social package to be the main feature of their organization. “A social package is one of the means of internal PR that increases the loyalty of company employees, causing them to feel a need and concern. Employees tend to rejoice at such moments of human relationships, value them, and often even brag about how the company values them”, he said.

An analysis of the sites of pharmacy organizations and interviews with managers indicate that managers do not have sufficient knowledge on issues of social responsibility and in practice use only its individual elements.

In order to understand the role of social responsibility in the development of companies abroad for many years, all the curricula for the management of leading universities include the study of concepts of social responsibility.

Russia is just beginning to learn the experience of other countries in teaching social responsibility issues; the number of universities and business schools that pay great attention to this area is increasing [7, 8].

Based on the foregoing, we proposed to include in the educational process of the Department of Management and Economics of Pharmacy for fifth-year students new lectures and practical classes on the topics: “Social responsibility of the pharmacy business” and “Ethics of the pharmacy business”, which will allow graduates to develop the social responsibility competency.

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超临界CO₂萃取用于广泛压力和温度下人参微生物灭活的应用
**THE USE OF SUPERCRITICAL CO₂ EXTRACTION FOR
MICROBIAL INACTIVATION OF *PANAX GINSENG* USING A WIDE
RANGE OF PRESSURES AND TEMPERATURES**

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抽象。本研究的目的是确定使用超临界二氧化碳 (sc-CO₂) 对人参提取物进行灭菌以进一步用于食品工业以及作为功能性产品中的生物活性成分的可能性。sc-CO₂灭菌的发展历史被广泛描述, 并且该过程的基本科学部分也被深入考虑。本研究中使用的人参C. A. Meyer人参样本最初取自土壤, 表明其对真菌和细菌的显着污染。该研究使用了200-300巴的显着压力范围和35°C-65°C的萃取温度范围。事实证明, sc-CO₂对植物补救剂中的好氧微生物和真菌的灭活非常有效。研究了工艺持续时间, 工作压力, 温度和改性剂对sc-CO₂灭菌效率的影响。在足够低的温度下微生物失活为许多热不稳定的药物产品和食品的灭菌提供了非常有趣的可能性, 这无疑在经济上非常有吸引力。

关键词: sc-CO₂, 人参, 超临界萃取, 灭活, 微生物污染和抑菌效果。

Abstract. *The purpose of this study was to determine the possibility of using supercritical CO₂ (sc-CO₂) to sterilize ginseng extracts for further use in the food industry and as biologically active components in functional products. The history of the development of sc-CO₂ sterilization is widely described, and the fundamental scientific part of the process is also deeply considered. The *Panax ginseng* C.A.Meyer ginseng sample used in this study was originally taken from the soil, suggesting its significant contamination with fungi and bacteria. The study used a significant range of pressures 200-300 bar and a spread of extraction temperatures from 35°C to 65°C. Sc-CO₂ proved to be very effective for the inactivation of*

aerobic microorganisms and fungi in plant remedies. The influence of the duration of the process, working pressure, temperature, and the effect of the modifier on the efficiency of sterilization with sc-CO₂ was investigated. Microbial deactivation at a sufficiently low temperature gives very interesting possibilities for sterilization of many thermally unstable pharmaceutical products and food products, which is undoubtedly economically very attractive.

Key words: *sc-CO₂, Panax ginseng, supercritical extraction, inactivation, microbiological contamination, and bacteriostatic effect.*

1. Introduction

Thermal preservation of foods is well known to reduce the amount of microbial contamination. This method is well used in conditions when it is necessary to avoid excessive heating (deterioration of the organoleptic properties of food) and insufficient heating (insufficiently sterilized food products). For heat sensitive food, thermal pasteurization can introduce unwanted organoleptic changes and a negative effect on the appearance and quality of food. Due to the increase in consumer demand for nutritious, fresh food products with high organoleptic qualities and extended shelf life, the scientific teams proposed other non-thermal methods for processing products.

Among nonthermal technologies for inactivation of microbiological activity, high hydrostatic pressure (HHP) and pulsed electric fields (PEF) are the most studied (Devlieghere *et al.*, 2004). In particular, the HHP method is considered as a very promising alternative to improving the treatment of microbial inactivation of foods, while retaining the initial agrochemical and organoleptic parameters. Despite the fact that the method of high hydrostatic process offers excellent opportunities for preserving food ingredients, it also has some serious limitations, for example:

1. An emergence of pressure-resistant vegetative bacteria after pressure treatment;
2. The large investment costs (due to the use of high pressure);
3. No developed continuous process (Estrada-Girón *et al.*, 2005).

These shortcomings hamper the large-scale implementation of the HHP method in food preservation processes in the food industry.

In contrast to the above method, for almost two decades, the use of sc-CO₂ has been proposed as an alternative method of nonthermal pasteurization for food products (Spilimbergo *et al.*, 2002). The number of published journal articles pertaining to microbial inactivation of food products using sc-CO₂ has increased significantly over the past 10 years. In this method, when exposed to sc-CO₂, the food is contacted with sub- or sc-CO₂ (under pressure) continuously or strictly defined time periods. Sc-CO₂ is a fluid at a temperature and pressure above the critical point ($T_c = 31.1\text{ }^{\circ}\text{C}$, $P_c = 7.38\text{ MPa}$), it has a unique ability to diffuse

through solid particles, behaving like a gas, and dissolve chemical compounds, as a liquid. It also easily changes in density with insignificant changes in temperature or pressure.

On the other hand, subcritical (gaseous or liquid) CO₂ is at a temperature or pressure slightly below its thermodynamic critical point. Sc-CO₂ technology offers great advantages over other inactivation methods associated with milder conditions of use. In addition to the environmental safety of the sc-CO₂ process (CO₂ is non-toxic, no dangerously explosive, easily renewable), the CO₂ pressure for conservation and microbiological inactivation is significantly lower (typically <20 MPa) compared to the hydrostatic pressure used in the HHP method (~ 300 MPa). Despite the increase in research over the past ten years, the sc-CO₂ treatment technology for microbiological inactivation of products has not yet been widely introduced in the food industry.

The results of these studies offer an excellent opportunity for sc-CO₂, as a promising deactivation agent for the sterilization of food, pharmaceutical products and biological materials. However, the vast majority of these studies were performed on bacteria in suspension or nutrient medium; therefore, apparently the method will act differently when biomaterials are exposed in the solid state. Experimental conditions for various working temperatures and pressures may be appropriate, but the important question is whether it is possible that carbon dioxide, extracting the active components of the biomaterial, changes its biological activity? And will microbial deactivation at low temperature open the way for the sterilization of many thermally unstable pharmaceutical products and foods that include compounds that are sensitive to reactive antiseptic action?

2. The mechanism of bactericidal action of carbon dioxide

Valley and Rettger almost 100 years ago discovered that CO₂ have an inhibitory effect on bacterial growth. Since then, many scientific articles have been published on the study of the effect of CO₂ on the growth of microbiota and the positive impact of sc-CO₂ on the quality of food. For a long time, the specific mechanism of the bacteriostatic effect of CO₂ was not known (Valley and Rettger, 1927). In 1985, Daniels *et al.* analyzed the basic theory that explains the bacteriostatic effect gaseous CO₂ in their review (Daniels *et al.*, 1985). Most of these theories were proposed for discussion by many authors to explain the inactivating effect of compressed CO₂ (Spilimbergo & Bertuccio, 2003; Damar & Balaban, 2006). The decontamination mechanisms are still not precisely defined; we can make only more or less correct assumptions on the basis of experimental work and accumulating statistics (Spilimbergo, 2002).

The mechanism of inactivation can be conditionally divided into 7 stages (Garcia-Gonzalez *et al.*, 2007):

1. Solubilization of compressed CO₂ in the liquid phase;
2. Non-convertible change in the cell membrane;
3. Decrease pH in intracellular level;
4. Inactivation of key enzymes / inhibition of protective cellular metabolism due to a decrease in pH;
5. Inhibitory effect on metabolism of molecular CO₂ and HCO₃⁻;
6. Breakdown of intracellular electrolyte balance;
7. Elimination of vital components from cells and cell membranes.

All of the above steps inactivation of microorganisms does not occur consistently, but as a rule, in a complex manner. Each microbial inactivation study with sc-CO₂ reports the effect of pressure and temperature on the inactivation efficiency. These parameters affect microbial inactivation to the greatest extent, directly affecting the characteristics of CO₂ mass transfer and the biological activity of microbial cells.

In general, inactivation of microorganisms accelerates with increasing pressure of CO₂. Accordingly, a shorter exposure time is required at higher pressures to inactivate the same level of microbial cells (Hong *et al.*, 1997). Basically, the pressure controls both the rate of CO₂ solubilization and its complete solubility in the nutrient medium. Therefore, a higher pressure enhances the solubilization of CO₂, facilitating both acidification of the external environment when solubilizing compressed CO₂ in the liquid phase, and the interaction of CO₂ with cells. In addition, CO₂ at higher pressures exhibits a higher solvating ability, which also facilitates the elimination of vital components from cells and cell membranes.

Microbial inactivation is also sensitive to the applied temperature. The inactivation rate increases with increasing temperature. High temperatures stimulate the diffusion of CO₂, and can also increase the fluidity of the cell membrane to make penetration easier (Lin *et al.*, 1993). Thus, increasing the temperature of the process stimulates an irreversible change in the cell membrane and, accordingly, the elimination of vital components from the cells. But you should be careful not to use sc-CO₂ at temperatures that significantly exceed their critical temperatures, since with a strong increase temperature; the density of the solvent decreases quite quickly (Lucien & Foster, 1999).

It should also be noted that the effect of sc-CO₂ should not be performed at too high temperatures also because it can deteriorate or spoil the quality of food in many cases (Lin *et al.*, 1994).

3. Practical use of the inactivating properties of sc-CO₂ with respect to the extract of *P. ginseng*

3.1 Overview of sc-CO₂ extraction *P. ginseng*

Far East wild ginseng *P. ginseng* is a perennial plant used for millennia in traditional oriental medicine. The following properties of ginseng have been confirmed: tonic, adaptogenic and stimulant (Kitts *et al.*, 2000). The most fully investigated active components of ginseng, known as ginsenosides, are a homologous sequence of triterpenoid saponins with different glycolysis profiles (Elyakov *et al.*, 1962; Court *et al.*, 1996).

Ginsenosides have been reported to have a variety of positive drug effects: antitumor, chemopreventive, immunomodulatory and antidiabetic effects (Woo *et al.*, 2011). At present, data have been accumulated on studies of the level of acetylcholine in Alzheimer's disease and the possible inhibitory effect of ginsenoside ginseng on the formation of senile plaques (Yan *et al.*, 2017; Razgonova *et al.*, 2019). Molecular docking and in vitro studies of some ginsenosides derived from ginseng root have been shown to be acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) inhibitors (Quan *et al.*, 2016). As molecular docking and in vitro studies have shown, some ginsenosides are inhibitors of beta-secretase BACE1 (Li *et al.*, 2016). Their inhibitory ability decreases in the series of ginsenosides Rg1 > Rb2 > Rb1 > Rg3 > Re (Zhang *et al.*, 2016).

However, due to the thermal instability of some ginsenosides, the production and quality of extracts from Far Eastern ginseng depends on the extraction method. Conventional extraction methods for isolating ginsenosides from ginseng include Soxhlet extraction, ultrasonic extraction, and microwave extraction (Kwon *et al.*, 2003). Some conventional extraction methods require a long extraction period and large amounts of solvent, which can lead to thermal destruction of the target components. In addition, a subsequent filtration step and / or concentration are often required to remove the solid residue (Wang *et al.*, 2006). SFE using CO₂ and a polar modifier has shown significant advantages in the extraction of medicinal plants (Reverchon & De Marco 2006). The unique properties of supercritical fluid served as the basis for their application in the extraction of thermolabile compounds from natural plant matrices, in particular, the Far East ginseng *P. ginseng*.

Ginseng cultivation usually takes 3 to 6 years and samples are found in wild soil for the entire period. Consequently, extracted ginseng products are often contaminated with bacteria and fungi. A study published by Tournas *et al.*, 2005, showed that more than 78% of the samples were heavily contaminated with fungi and bacteria (Tournas *et al.*, 2005). Accordingly, effective sterilization is required to minimize the presence of these microorganisms, which adversely affect the final product from ginseng and can be harmful to human health.

It is known that gamma radiation changes some of the chemical properties of ginseng, despite the complete elimination of bacteria, yeasts and mold fungi (Kwon *et al.*, 1997). The study showed that gamma radiation initiates chemical reactions that alter the degree of lipid oxidation, acidity, pigments, and other characteristics of ginseng products. But, unfortunately, this method is not suitable for processing food products or biologically active substances introduced into functional foods.

The possibility of sterilizing the ginseng extract using sc-CO₂ with an ethanol modifier was evaluated in this study. Sc-CO₂ was used to extract active ingredients and remove pesticides from ginseng (Yu *et al.*, 2015). Impurity-free sc-CO₂ was not effective in extracting active ingredients and removing pesticides from ginseng even with increasing temperature and pressure (Wood *et al.*, 2006).

It was also found that CO₂ with modifier was effective in extracting pesticides from ginseng, while not affecting the content of the active ingredient in the temperature range up to 80° (Can *et al.*, 2004). The sterilization of the ginseng extract using sc-CO₂ was performed under the following conditions to extract the active ingredients of ginseng in this study: a temperature not higher 65° and a pressure in range 200 bar - 400 bar to ensure that the active ingredients would be stored in the final product.

3.2 Materials and Methods

3.2.1 The object of the study, wild ginseng (*P. ginseng*), was purchased in the Sikhotealin mountain range in the Lazovsky District of Primorye, Russia. The Far Eastern Federal University (FEFU) supplied all analytical qualitative solvents, including UN 1648 acetonitrile (PanReac AppliChem, Germany), ethanol for sc-CO₂ extraction. The HPLC grade deionized water was prepared using Siemens Ultra Clear (Siemens, Germany).

3.2.2. Extraction apparatus of supercritical pressure, Thar SFC, S.N. 3526551, USA, was used for sc-CO₂ extraction.

3.2.3 Light microscope ZEISS Axio Imager Z2 motorized with fluorescence was used to study the colonies of fungi and bacteria.

3.3 Extraction of wild *P. ginseng*

Carbon dioxide was compressed to the required pressure using a supercritical extraction compressor (Thar SFC, USA). A hot casing string heated the extraction vessel; temperature was regulated by thermostat ($\pm 1^{\circ}\text{C}$). A metering valve controlled the pressure. Shredded ginseng roots (6.5 g) were wrapped in filter paper, charged to a one litre extractor and extracted with sc-CO₂ compressed to a supercritical state at a liquid flow rate of 250 g min. Six SFE extracts were obtained under different pressure conditions (200-300 bar) and temperatures (35-65 °C). Ethanol served as the co-solvent in all cases. The extracts were collected in a separator. The pressure and temperature of the sc-CO₂ were optimized experimentally to achieve the maximum yield of the product during extraction.

3.4 Microbiological procedures

3.4.1 Preparation of analytical solutions and Petri dishes

50 g / l of meat-and-peptone agar powder was dissolved in 1 L of distilled water and the solution was boiled until all the particles were dissolved, then sterilized by autoclaving at 1.1 atm for 15 minutes. A solid nutrient medium was prepared using the last three solutions to prepare sterile Petri dishes, adding about 20 ml of each solution to each cup. After the agar cooled and solidified, Petri dishes were placed in a refrigerator at a temperature of + 5°C. The buffered solution was stored at room temperature and was used according to the rules.

3.4.2 Effective plate counting method for determination TAMC and fungi

A standard method was used for efficient counting of bacteria and determination of fungi in solid samples. The method (TAMC) was also used to determine the total number of aerobic microorganisms.

- Ginseng powder was suspended in a buffered sodium chloride solution of peptone (1 g: 15 ml) and then diluted using sterile brine according to a standard procedure. Petri Dishes with 1 ml of diluted samples containing meat-peptone agar (for TAMC) and DMEM (Glutamine-free DMEM) agar, glucose content 4.5 g / L (for mushroom detection), then the plates were covered with lids.

- The product of supercritical extraction of ginseng (1ml) was added to Petri Dishes containing meat-peptone agar (for TAMC) and DMEM (Glutamine-free DMEM) agar, glucose content 4.5 g / L (for fungal detection), then dishes were covered with lids. Six plates were prepared for dissolution and then all the labeled plates were incubated at 38 °C for 5 days. At the end of the incubation period, the number of colonies was counted. Deactivation was expressed as $\log N_0/N$, where N_0 is the number of microorganisms contained in the sample in the initial period (control sample), and N is the number of microorganisms counted after incubation at some time t.

3.4.3 Verification of sterilization procedures

Sterilization procedures for a high-pressure chamber, a typical holder, and also the autoclave operation for sterilization of nutrient media and other tools used for processing materials, were approved before the experimental procedure. The chamber and the sample holder were washed with a sterilizing saline solution and then an effective bacterial count was performed as described above. No bacteria or fungi were detected after the incubation, confirming that the procedures used were sufficient to maintain the sterility of the solution and tools.

4. Results and discussion

The purpose of the study was to determine the flow rate and pressure of sc-CO₂ to achieve complete deactivation of fungi and bacteria in the *P. ginseng* drug extract in a fairly short period of time. This process should win in competitiveness and speed in comparison with standard sterilization processes. The study was conducted in several stages; different pressures were used in the extractor, as well as different extraction time intervals provided CO₂ + co-solvent was used to minimize the level of microorganisms in the ginseng powder in a short period of time.

4.1 Influence of the duration of sc-CO₂ treatment on inactivation

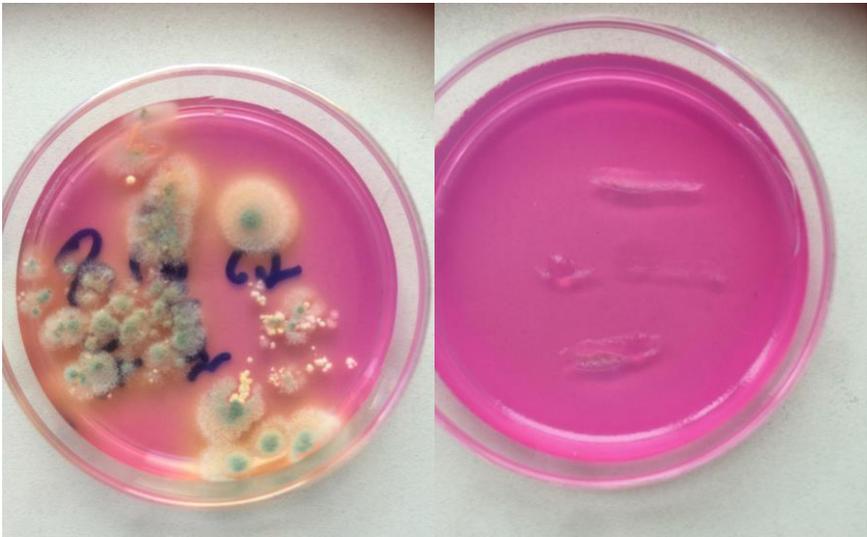
As shown by other researchers deactivation time is the main parameter in the process of sc-CO₂ treatment. The samples were treated with sc-CO₂ and distilled water for 12 hours to inactivate *E. coli* (Lin *et al.*, 1994).

Using CO₂ in combination with a co-solvent at 65°C and a treatment time of 2 hours results in a 2.93 log reduction in TAMC. A significant reduction in TAMC in supercritical ginseng extracts was achieved already within 1 h, using CO₂ + EtOH (3.4% molar fraction) at 65°C. The effect of treatment time, using the EtOH modifier, on the deactivation of bacteria and fungi was evaluated (Fig. 1, 2). Complete removal of fungi was achieved in 2.5 hours, using a modifier. It can be concluded

that the $sc\text{-CO}_2$ sterilization process is competitive in comparison with such methods as, for example, gamma irradiation with respect to treatment time (McDonnell, 2007). The main objective of the study is to reduce the treatment time to 1.5-2 hours to minimize operating costs compared to other types of sterilization.

4.2 Effect of temperature

The deactivation of bacteria directly depends on the effective diffusion of the medium. The conclusion that the increase in diffusion with increasing ambient temperature significantly increases microbial deactivation has been made in a number of articles (Hong & Pyun, 1999).



A.

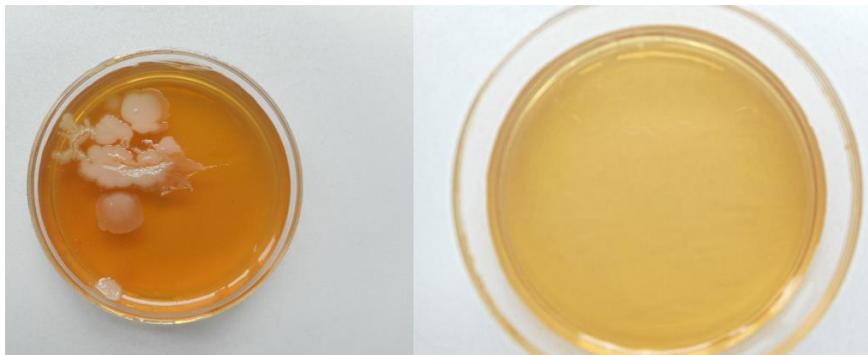
B.

Fig. 1. A. Ginseng powder without treatment with $sc\text{-CO}_2$ on agar based DMEM (Dulbecco's Modified Eagle Medium)

without glutamine, glucose content 4.5 g/l, 5 days of inoculation.

B. The product of $sc\text{-CO}_2$ extraction of ginseng on agar based on DMEM (Dulbecco's Modified Eagle Medium)

without glutamine, glucose content 4.5 g/l, 5 days of inoculation.



A. B.
Fig. 2. *A. Ginseng powder without treatment with sc-CO₂ on agar based on meat-peptone medium, 5 days of inoculation.*
B. The product of sc-CO₂ extraction of ginseng on agar based on meat-peptone medium, 5 days of inoculation.

In the study the sc-CO₂ pressure was varied from 200 bar to 300 bar, the exposure time from 0.5 h to 2 h, the same volume of the modifier was used. The temperature ranged from 35 to 65°C. As shown in *Table 1*, the deactivation efficiency increased significantly with increasing temperature.

4.3 Effect of pressure

It is known that lipids of the cell membrane are partially dissolved by carbon dioxide when the pressure rises, which increases the penetration of CO₂ into the cell walls and, consequently, increases microbial inactivation. In addition, increased pressure stimulates the release of intracellular ions, changes enzyme activity and causes membrane inactivation, which directly affects the overall microbial inactivation. Many researchers have mentioned this (Lin *et al.*, 1994; Werner & Hotchkiss, 2006).

The deactivation efficiency was increased 2.66 times with increasing pressure from 200 to 300 bar, at a flow rate of 250 g / min. More interestingly, 100% deactivation was achieved for fungi at pressures above 300 bar for 1 hour at 65°C using an EtOH modifier. No fungi and bacteria were detected in the samples, at 65°C and 300 bar. This observation indicates that a pressure value of 300 bar was necessary for total deactivation of the fungi within 1 h. The general results suggest that high pressure still has a more effective result for inactivating microorganisms than the temperature.

Table 1. Impact of temperature, pressure, and time on reduction TAMC in *P. ginseng* using sc-CO₂ + EtOH.

Temperature, °C	Pressure (bar)	Time (h)	log N ₀ /N
35	200	0,5	1,08
35	200	1	1,09
35	200	2	1,1
45	250	0,5	1,32
45	250	1	1,45
45	250	2	1,65
65	300	0,5	1,12
65	300	1	1,78
65	300	2	2,93

5. Conclusions

Since pasteurization, sterilization and inactivation of viruses are of primary importance in the food, pharmaceutical and biomedical industries due to the improvement of the quality of the final product and its safety, treatment with sc-CO₂ is extremely economical because it avoids excessive heat treatment or radiation treatment that does not can always be used, especially with regard to food.

Sc-CO₂ treatment should not only improve the quality of food, but also increase the shelf life and (long-term) safety by inactivating pathogens in order to replace other food preservation methods in the future. Therefore, further research is needed to explain the effect of sc-CO₂ on food processing in relation to shelf life and food safety. In addition, it is important that the effect of sc-CO₂ treatment on the organoleptic properties and nutritional value of both liquid and solid foods is more thoroughly studied.

Finally, it should be noted that since pasteurization with sc-CO₂ has great potential for improving food safety and quality, many technological and regulatory barriers need to be improved (for example, further process optimization, industrial scale development, acquisition of the most complete data on organoleptic properties and timing storage, quality certification, etc.), which is still necessary before new technologies can get these benefits.

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在与阿穆尔地区的中国领土边界上形成和特征的组合规律和特征相结合的自然疫源地

**THE LAWS OF FORMATION AND CHARACTERISTIC COMBINED
NATURAL FOCI TREMATODOSES ON THE BORDER
WITH CHINA TERRITORIES OF THE AMUR REGION**

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抽象。 在与中国接壤的阿穆尔河地区的阿穆尔河生态系统中, 自然疫源的自然疫源地的组合是由病原体和宿主种群的寄生虫群的寄生虫病的形成决定的。 寄生虫系统形成双宿主群体相关的华支睾吸虫病灶 - 变性病, 克隆性病 - 纳米植物病和变态病 - 病原体去除区域的纳米生物病。 病灶组合的程度由共同宿主的数量和它们可互换物种的数量决定。 生物蠕虫病灶的组合可以在病灶的细胞核中和病原体去除区域中进行。

关键词: 克隆性病; metahonymosis; nanophytosis; 焦点的组合; 外满洲; 中国。

Abstract. *In the ecosystem of the Amur River in the territories of the Amur region bordering China, the combination of natural foci of trematodoses is determined by the formation of parasitocenoses of hemipopulations of pathogens and host populations. Parasitic systems form two-host population-associated foci of clonorchiasis - metagnonymosis, clonorhosis - nanophytosis and metahonymosis - nanophytosis in the zones of pathogen removal. The degree of foci combination is determined by the number of common hosts and the number of their interchangeable species. The combination of foci of biohelminthiasis can be carried out both in the nuclei of the foci, and in the zones of pathogen removal.*

Keywords: *clonorchosis; metahonymosis; nanophytosis; a combination of foci; Outer Manchuria; China.*

For the first time, publications on the problem of the combination of natural foci of infections appeared in the mid-1950s and early 1960s [16, 17].

To date, many researchers are considering the combination of natural foci of mainly vector-borne infections. By overwhelming majority of authors, the combination of foci is understood as the mixed infection of host individuals (carriers) or as a community of parasitic systems of “double species” [15] differing only in the type of pathogen.

In the Far East of Russia, Amur region and Primorsky Priussurye are endemic for clonorchosis, metagonymosis and nanophytosis [19]. Here, on the territories bordering China, the natural foci of *Clonorchis sinensis* Cobbold, 1875, *Metagonimus yokogawai* Katsurada, 1912 and *Nanophyetus salmincola schikhobalowi* Skrjabin et Podjapolskaja, 1931 are confined to ecosystems of numerous floodplain water bodies of the Amur River. The boundaries of the nosoareal of clonorchosis and metahonymosis in the Jewish Autonomous Region (JAR) and the Khabarovsk Territory are determined by the presence in the fauna of the mollusks of the genera *Parafossarulus* (clonorchiasis) and *Juga* (metahonymosis), fish of the *Cyprinidae* (Carp) family of the Chinese ichthyocomplex. The nosoareal causative agent of nanophytosis is determined by the presence of mollusks of the genus *Juga* and fish of the *Salmonidae* family.

Amur region accounts for the northeastern section of the nosoareal of clonorchosis. The definitive hosts of *C. sinensis* are the badger (*Meles meles*), harza (*Martes flavigula*), otter (*Lutra lutra*) [19], wolf (*Canis lupus*) [8], columns (*Mustela sibirica*) [14], raccoon dog (*Nyctereutes procyonoides*) [6, 14] and the common fox (*Vulpes vulpes*) [8, 14].

The nosoareal of the causative agent of metagnonymosis covers all Amur region and part of Primorye [19]. The definitive hosts of *M. yokogawai* are the wolf, raccoon dog, fox [8] and common lynx (*Lynx lynx*) [18]. The highest indices of the extensiveness and intensity of invasion¹ (EI and II) were observed in animals in the Khabarovsk Territory. Infection of the Amur whitefish (*Coregonus ussuriensis*) and grayling (*Thymallus arcticus grubii*) was detected in the ecosystem of the Amur River [5].

The foci of nanophytosis gravitate toward the basins of the mountain tributaries of the Amur and Ussuri. The definitive hosts of *N. s. schikhobalowi* are fox, raccoon dog [8, 14], wolf [8], harza, wolverine (*Gulo gulo*), badger, kolonok [9], brown bear (*Ursus arctos*) [12]. The highest indices of EI and II were observed in animals from the territory of the Khabarovsk Territory [6]. The EI of mollusks of the genus *Juga* reaches 20% [14], while Amur whitefish and grayling varies from 6.6% to 100% [7, 19, 27, 28]. The causative agent of nano-phytosis was also found in river minnow (*Phoxinus phoxinus*) [27].

Purpose of the study: to reveal the patterns of formation of the foci of trematodoses in the Amur River ecosystem on the border with China from the position of the landscape-biocenological concept of the combination of natural foci of diseases [20, 21], to analyze their structure and present a characteristic of these combined foci.

Materials and methods. The studies were carried out by generally accepted methods in the middle and lower reaches of the Amur River². The work was carried out in August 2011 and in June - July 2013. The main attention was paid to the study of fish, the second intermediate hosts of trematodes, since they accumulate metacercaria of pathogens and are a factor in the transmission of invasions to de-

¹Invasions should be understood as diseases caused by pathogens - animals, in particular helminthiases..

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finitive hosts. For infection with metacercaria *C. sinensis* in the JAO, 745 fish of 16 species were studied. In the Khabarovsk Territory, 1,311 fish species of 39 species were studied. For the presence of metacercaria *C. sinensis*, the muscles of fish of this family were studied. Cyprinidae, Bagridae (Ordinary), Eleotridae (Mousetrophy), Petromyzontidae (Minomidae), Siluridae (Catfish), Cobitidae (Loachweed), Channidae (Snakehead), Serranidae (Serran or Stone Perch), muscles and scales of fish of these families metacercaria *M. yoko-gawai*. In taimen *Hucho taimen* and lenoks *Brachymystax lenok*, the muscles of the fins and kidneys were examined for the presence of metacercaria *N. s. schikhobalowi*. In biotopes, mollusks of the genera *Parafossarulus* and *Juga* were searched. Population density was estimated by recalculating the number of mollusk discovered by 1 m².

The results of the study. In the Jewish Autonomous Oblast, the biotopes of mollusks of the genus *Parafossarulus* were found in the channel of the Bijan River, on the flooded bank of the In River and in the Bay of the Bira River (Birobidzhan). The population density here ranged from 180 to 300 ind./m². In the channel of the Amur River, at the mouth of the Malaya Bira River, in the channel of the Bira River (Birobidzhan), mollusks of the genus *Juga* were found, the number of which reached 40-50 ind./m².

Inspection in the Khabarovsk Territory of water-covered floodplain meadows with flooded rivers, floodplain ponds and channels of the Amur River showed the widespread presence of clams of the genus *Juga* along the edge. Biotopes with a population density of up to 20-30 ind./m² were identified. At the same time, mollusks of the genus *Parafossarulus* were practically absent here. They were found only in the ecosystem of the pond in the vicinity of. Topolevo of the Khabarovsk region.

According to the literature [14], no invasive mollusks of the genus *Parafossarulus* were found in the area of the Middle Amur Region (JAO). However, we found [25] that the infection of yearlings of fish at the mouth of the Bidzhan river, in floodplain water bodies, the Bay of the Bira River, at the mouth of the Vertoprashikha River, the Bay of the In metacercaria *C. sinensis* from 0.9% to 48 ± 7.0%, indicates that the yearlings practically non-migrating in the first year of life were invaded in the ecosystems of these reservoirs. Of the 16 species of fish studied here, in 7 (Amur bitter *Rhodeus sericeus*, silver carp *Carassius gibelio*, common topline *Chanodichthys erythropterus*, Tachysurus *Pseudobagrus fulvidraco*, Tachysurus *Tachysurus ussuriensis*, Brazhnikov Tachysurus *Leiocassis braschnicowi*, rotan *Perccottus glehni*) metacercaria *C. sinensis* were found [25]. Of the 39 fish species that we studied in the Khabarovsk Territory, metacercaria *C. sinensis* was detected in 14 (the eastern bellied *Hemiculter sp.*, Amur bitter beetle, Laitian mustard *Rhodeus lighti*, long-tailed spiny gudgeon *Saurogobio dabryi*, Cherskiy gudgeon *Gobobio goboob*, golden crucian carp *Carassius carassius*, Tachysurus, Cherskiy minnow *Phoxinus czekanowskii czerskii*, Lagovsky minnow *Phoxinus lagowskii*, common pinch *Cobitis taenia*, rotan, common chondrostoma nasus and *leptobotius manchuria*).

The causative agent of metagnonymosis was detected in 10 of 22 white silver carp *Hypophthalmichthys molitrix*. The invasion was recorded in 1 of 3 yearlings and in 5 three-year-old silver carp caught in the Amur Shershikhe river channel (near Khabarovsk), in 2 of 4 three-year-olds in Sindi Lake and in 2 out of 10 four-year-old fish in the Sindi channel of the Amur River. II in fish of all ages did not exceed single metacercariae. Trematode larvae were localized in scales, fins, and gills of fish [26].

Metacercaria *N. s. schikhobalowi* were found in the kidneys, fins, and gills during the study of one taimen *Hucho taimen* and two lenoks *Brachymystax sp.*, caught in the Khor river near village. Scourging. II in kidney tissue in taimen exceeded 1,000 larvae; in lenoks, it ranged from 269 to 720 metacercariae per fish. In other fish species, this parasite was not detected [26].

All phase parasites of vertebrates [1] form only hemipopulations in their bodies [2], which is also true for most vertebrate helminths that do not breed in the host [2]. The population of trematodes in the liver and pancreas of mammals forms a hemipopulation similar to that of metacercaria in fish muscles. And only together, including hemipopulations of parasite eggs in the external environment, miracidia in the body cavity of mollusks, parthenitis (sporocyst and redium), cercaria, developing in mollusks and free-floating in the water column, they form the pathogen population. Consequently, the combination of invasion foci can manifest itself in populations of either one, or two or all three types of hosts [23].

The only mandatory and specific component of the natural focus is the pathogen population [13]. With biohelminthiasis, it is a collection of hemipopulations. It follows that if one of the hemipopulations of biohelminth is detected in the biocenosis, the epizootological analysis allows one to judge the presence of its population in the ecosystem of the biocenosis, and at the same time, the functioning of the focus of the corresponding biohelminthosis [23]. Thus, the presence of meta-cercariae *C. sinensis* in the yearlings of Amur mustard indicates that they invaded in the eco-system of this reservoir. Therefore, the infection of yearlings indicates the presence of a focus of clonorchosis in the biotopes of the nuclei and serves as an indicator of the presence of definitive and first intermediate hosts of *C. sinensis* in the ecosystem. Thus, the invasion of yearlings is evidence of the functioning of the parasitic system and the presence of an epizootic process, since in the absence of these hosts infection of fish is impossible [22]. Based on this, we can conclude that such an interdependence also exists in the natural foci of metagnonymosis and nanofetosis.

Anticipating the analysis of the combination of foci, we note that the concepts of “spatial and functional structure of the focus” are closely interconnected, since the pathogen remains on the territory of a particular landscape in the external environment and / or in host populations [23]. In the spatial structure of the outbreak there are “outbreak nuclei” - areas of relatively persistent preservation of the pathogen, occupying a relatively small area, “areas or zones of pathogen removal”, which account for a significant area of the territory of a separate natural outbreak and “areas are permanently free from the pathogen” [10]. With biohelminthiasis, the parasite persists in the

external environment at the egg stage or in a population of at least one host species invaded by hemipopulation of the pathogen. In the foci of the trematodoses under consideration, this is a reservoir - a mollusk biotope, where invasive trematode eggs can remain for a long time in the water or inhabit mollusks invaded by pathogens at the stage of sporocysts. The latter can remain viable by overwintering in mollusks [3, 4]. Parasites can be found in treacodes of fish yearlings infected with metacercariae, as well as in the body of invasive mammals, whose biotopes, due to their environmental characteristics, are confined to the shores of water bodies. Thus, the core of the site of trematodose, i.e., a relatively small part of the site, the most favorable for the existence of the parasitic system, is a reservoir - the biotope of mollusks, which are the least mobile articulations of parasitic foci systems. The contamination of fish yearlings irrefutably indicates the presence of trematodose foci nuclei in a specific pond.

Zones of removal of the pathogen are parts of the territory of the natural outbreak, to which the pathogen periodically penetrates from places of constant conservation only during exacerbation of the epizootic process in years and seasons of mass spilled epizootics [11]. In contrast to this statement, the author of this article believes that the zones of removal of pathogens of the considered trematodoses are not formed periodically, but exist constantly due to the annual stay in river beds and in reservoirs connecting with them, pathogens of fish of older age groups infected with metacercariae are the most mobile articulations of parasitic focal systems. Therefore, the combination of natural foci of biohelminthoses can occur both in the nuclei of the foci and in the zones of removal of pathogens. During periods of spawning and feeding, fish from a year and older enter the water bodies where there are nuclei of foci of trematodoses every year. This determines the seasonal superinvasion of fish and the accumulation of metacercaria, both at the level of populations and individuals, which, in turn, determines the EI and II of fish [24].

An analysis of the parasitic systems of foci of clonorchosis and metagonimosis shows that they are interconnected in the zones of pathogens removal by populations of the wolf, raccoon dog, fox, silver crucian carp, Upper-eyed, Amur bitterling, Oriental bellworm, Amur litter, Korean bullhead, yellowhead catfish and Brazhnikov orca. Such foci, in the parasitic systems of which populations of two types of hosts, in this case, definitive and second intermediate, act as common, are two-host population-combined. C The foci are combined at the level of parasitocenoses of coacting ³ hemipopulations of Maritis ³ and populations of definitive hosts, hemipopulations of metacercariae and populations of second intermediate hosts, determining the population-associated nature of the focus. The type of foci combination is characterized as invasive-invasive population-combined. The degree of combination is defined as a polymorphic two-host, since parasitic systems at the level of definitive and second intermediate hosts are represented by several interchangeable species, both mammals and fish. Thus, the focus under consideration is characterized as a two-host population-combined natural focus of clonorchosis - metagonimosis.

³Research conducted in conjunction with Fattakhov R.G.

Parasitic systems of *C. sinensis* and *N. s. schikhobalowi* in the zones of removal of pathogens interact in populations of a raccoon dog, fox, column, wolf, badger, harza and river goose joining their parasitic systems. The combined lesion formed on the basis of data from parasitic systems, as discussed above, is a two-host population-combined. The foci are combined at the level of parasitocenoses of coacting hemipopulations of Maritas and populations of definitive hosts, hemipopulations of metacercariae and the river minnow population, determining the population-associated nature of the outbreak. The type of combination is characterized as invasive-invasive population-combined. The degree of combination of foci is defined as two-host (polymorphic single-host), since parasitic systems only at the level of definitive hosts are represented by several interchangeable mammalian species. Therefore, this focus is characterized as a two-host population-associated focus of clonorchosis - nanophytosis.

Having adopted the concept of R.L. Naumov [15] on the “double species”, we came to the conclusion that *M. yokogawai* and *N. s. schikhobalowi* are environmental counterparts. Their parasitic systems differ only in the type of pathogen. Transmission mechanisms of *M. yokogawai* and *N. s. schikhobalowi* in these coacting groups are identical. Considering the literature on the infection of populations of the fox, raccoon dog, mollusks of the genus *Juga*, Amur whitefish and grayling by *M. yokogawai* and *N. s. schikhobalowi* [5, 8, 14, 27, 28], it can be concluded that the parasitic systems of the natural foci of these trematodoses interact with each other in the nuclei of the foci at the level of parasitocenosis of coacting parasitic systems of twin species. But, since we do not have information about the infection of yearlings of the Amur whitefish and grayling, we will present a characteristic of only the population-associated natural focus of metahonymsis - nanophytosis. In the zones of removal of pathogens *M. yokogawai* and *N. s. schikhobalowi* parasitic trematode systems interact in populations of raccoon dogs, foxes, Amur whitefish and grayling. The foci are combined at the level of parasitocenoses of coacting hemipopulations of maritus and populations of definitive hosts, hemipopulations of metacercariae and populations of second intermediate hosts, determining the population-associated nature of the outbreak. The type of foci combination is characterized as invasive-invasive population-combined. The degree of combination is defined as a polymorphic two-host, since parasitic systems at the level of definitive and second intermediate hosts are represented by several interchangeable species of mammals and fish. Therefore, this focus is characterized as a two-host population-combined natural focus of metahonymsis - nanofietosis.

Thus, in the ecosystem of the Amur River on the territories of the Amur region bordering China, the combination of natural foci of trematodoses is predetermined by the formation of parasitocenoses of hemipopulations of pathogens and host populations. Parasitic systems form two-host population-associated foci of clonorchiasis - metagnonymsis, clonorchosis - nanophytosis and metahonymsis - nano-

phytosis in the zones of pathogens removal. The degree of combination of foci is determined by the number of common hosts and the number of their interchangeable species. The combination of natural foci of biohelminthiasis can be carried out both in the nuclei of the foci, and in the zones of removal of pathogens.

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越南中北部淡水水体中中华绒螯蟹的第一中间宿主分布和寄生生物
**DISTRIBUTION AND PARASITOFUNA
OF THE FIRST INTERMEDIATE HOSTS OF PATHOGENS
CLONORCHIS SINENSIS IN FRESHWATER BODIES
OF NORTH AND CENTRAL VIETNAM**

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抽象。 本文部分描述了俄罗斯 - 越南联合探险队在2016年至2018年间通过鱼类传播给人类的地方病的病灶的研究结果。关于克隆性寄生虫病 (*Clonorchis sinensis*) 的致病因子, 该寄生虫的分布有限 已被认识到来自Bithyniidae科的第一批软体动物中间宿主的链接。 揭示了影响比特尼生物群落分布的主要自然因素, 即生态系统。 假设人工水库的产生有助于增加生物群落的数量和比特的数量。 因此, 与第二中间宿主和最终宿主的关系更密切, 这导致这些地区的人口感染风险增加。

关键词: 华支睾吸虫, Bithyniidae软体动物, 水文状况, 天然和人工水库。

Abstract. *This article partially describes the results of a joint Russian-Vietnamese expedition to identify foci of trematodoses transmitted to humans through fish over the period from 2016 to 2018. With respect to the causative agent of clonorchosis (*Clonorchis sinensis*), a limited distribution of this helminth has been recognized in the link of the first intermediate host of mollusks from the Bithyniidae family. The main natural factor is revealed that affects the distribution of bitiniid biotopes, which is the hydrological regime. It is assumed that the creation of artificial reservoirs contributes to an increase in the number of biotopes and the number of bitinia. As a result of this, there is a closer relationship with the second intermediate and definitive hosts, which leads to an increased risk of infection of the population in these territories.*

Keywords: *Clonorchis sinensis*, *Bithyniidae* mollusks, hydrological regime, natural and artificial reservoirs.

The problem of trematodoses transmitted to humans through fish in the countries of Southeast Asia is studied mainly in the aspect of safety for the population of salable fish in the domestic and foreign markets. Therefore, the focus is on the study of fish farms. Natural reservoirs that are not in the interests of fish farms have practically not been studied. Trematodoses, among which clonorchiasis and opisthorchiasis are found, are natural focal diseases. And the study of the distribution of pathogens of these helminthiases is of great importance for understanding the ways and methods of their entry into fishery reservoirs from natural reservoirs. For this, it is necessary to study the distribution of intermediate hosts of trematodose pathogens in natural reservoirs and identify the conditions that determine the functioning of the parasitic systems of these helminths. In this regard, the main goal of our research was mollusks - the first intermediate hosts of the causative agent of clonorchosis in freshwater bodies with different hydrological regimes, natural and artificial origin.

Currently, there is no consensus among parasitologists in Southeast Asia on the species composition of the first intermediate hosts of trematodoses transmitted through fish. In the northern part of the range of this parasite in the Amur basin, it is found only in representatives of the *Parafossarulus* genus [1,2,3]. Some researchers in the southern part of its range in North Vietnam and China have detected it in mollusks from the *Thiaridae* family [8,7,11,15,12,14]. However, there are a lot of publications indicating the absence of invasion by *C. sinensis* larvae in representatives of the *Thiaridae* family [10,16,6,5,13]. Among the mollusks from the *Bithyniidae* family, the larvae of *C. sinensis* are most frequently recorded in *Parafossarulus striatulus*. Infection of this species can range from 0.9 to 12.0% [4,9]. In populations of another species what is also from this family *Bithynia longicornis*, the invasion reached 18% [9]. Susceptibility to the causative agent of clonorchosis in North Vietnam is noted in *B. fuchsiana*, *B. siamensis*, *B. misella*, *B. funiculata*, *Parafossarulus anomalospiralis*. In China, the first intermediate clonorch hosts also include *Assiminea lutea*, *Tarebia granifera*, *Melanoides tuberculata*, *Semisulcospira liibertina*, *Koreoleptoxis amurensis*, *Semisulcospira libertina*. The reasons for such a significant discrepancy in the composition of the parasite host mollusks are due to the strong morphological similarity of the trematode cercaria from the family *Opisthorchiidae*.

The collection of material was carried out in May-July 2016-2018. in 10 provinces of North Vietnam: Yên Bái, Hòa Bình, Hồ Thành, Nam Định, Ninh Bình, Hải Phòng, Cao Bang, Lang Son, Thái Nguyên and Vinh Phúc, Quang Binh Quang Tri Hue Quang Ngai were explored in Central Vietnam. 87 freshwater bodies were

surveyed. A total of 7115 specimens of mollusks from 4 of *Triaridae*, *Bithyniidae*, *Potamididae* and *Assimineidae* were collected. Mollusks were collected manually due to their low density in water bodies and the complexity of the microrelief of the bottom of water bodies. The study of mollusks for the presence of trematode larvae was carried out by the method of intravital diagnosis.

The results of the study. In 75 out of 87 examined reservoirs, mollusks belonging to four families were found: *Bithyniidae*, *Thiaridae*, *Potamididae* and *Assimineidae*. The *Thiaridae* family was represented by 5 species of mollusks (*Melanoides tuberculata*, *Tarebia granifera*, *Thiara scabra*, *Neoradina prasongi*, and *Sermyla riqueti*). Three species belonged to the *Bithyniidae* family: *Parafossarulus striatulus*, *Bithynia longicornis* and *Bithynia fuchsiana*. One species belonged to the *Assimineidae* family, this is *Assiminea lusia* and the other one belonged to *Potamididae* family, the species *Cerithidea quadrata*. Representatives of these families were found both in natural reservoirs, such as rivers, streams and lakes, as well as in artificial lakes and canals in urban areas. In total, 10 species of mollusks were studied, of which, according to the literature, 6 are the first intermediate hosts. A total of 5374 specimens of mollusks were investigated by the intravital diagnostic method. Of these, only 1,200 mollusks belonged to the *Bithyniidae* family, while the rest belonged to the *Triaridae* and *Assimineidae* families. All species of the *Thiaridae* family were found both in rivers and in bodies of water with slow flowing or standing water.

In the provinces of North Vietnam, the most common mollusk species was *Melanoides tuberculata*. This species was identified in 63 (72.0%) of 87 surveyed water bodies. Other members of the *Thiaridae* family were less common. The most rare species were *Neoradina prasongi* and *Cerithidea quadrata*. Thus, the biotopes *Tarebia granifera*, and *Thiara scabra* were observed in 45 (52.0%), and in 35 (36.0%) of surveyed water bodies, respectively. Among mollusks from the *Bithyniidae* family, the biotopes *Bithynia longicornis* 31 (36.0%) and *Parafossarulus striatulus* 14 (16.0%) were more often found. *Bithynia fuchsiana* was found in only 9 (8.0%) of water bodies. Mollusks *Assiminea lutea* was found in 28 (24.0%) of the examined reservoirs. There is a slight tendency towards an increase in the number of biotopes and densities of bitiniids and *Assiminea lutea* in the provinces located near the Gulf of Thin compared with representatives of the *Thiaridae* family. In 7 out of 10 studied provinces of North Vietnam, 4 species of mollusks infected with trematode parthenes were identified. In vivo diagnostics revealed cercariae belonging to only two groups of cercariae *Pleurophocerca* and *Xiphidiocercariae*. Clonorchis cercariae belong to the first group of *Pleurophocerca*. *Pleurophocerca cercariae* were found in bitiniids in 0.7% of cases, *Melanoides tuberculata* 2.5-7.0% and *Tarebia granifera* 0.9-10.0%. Most often, invasion was observed in the *Melanoides tuberculata* mollusk. They revealed cercariae *Haplor-*

chis sp., *Acanthatrium hitaense*, *Stictodora tridactyla*, *Haematoloechus similis*. The highest invasion rate for this species of mollusk was by *S.tridactyla* larvae and amounted to 3.3%. Infection with cercariae of intestinal trematodes of *Haplorchis* sp. ranged from 1.0 to 1.6% and *Centrocestus formosanus* 1.0%. The invasion by stylet cercariae *A.hitaense* of 0.7% was low. Another member of the *Thiaridae* family, the mollusk *Tarebia granifera*, was invaded by larvae of *Haplorchis* sp. in 6.7% and in 4.3% of cases by *H.similis* larvae. Among *Bithyniidae*, the greatest trematode infection was observed in *B. fuchsiana* with *C. sinensis* larvae in 5.6% of cases from Lake Yên Bái. The intensity of invasion by stylet species of cercariae ranged from 1.3 for *H.similis* to 3.9% for *A. hitaense*.

In the provinces of Central Vietnam, representatives of the *Thiaridae* family numerically predominated in the examined water bodies. They accounted for 90.4% in collections, and *Bithyniidae* to 9.6%. The most numerous of *Thiaridae* were the mollusks *Tarebia granifera*. Their infection with *Pleulophocerca* cercariae as a whole was 0.8%, and *Xiphidiocercariae* cercariae 0.1%. In reservoirs where infected mollusks were detected, invasion rates ranged from 0.9 to 10.0% for *Pleulophocerca* from 1.4 to 12.0%. For *M. tuberculata*, infection with cercariae *Xiphidiocercariae* was found in 0.4% of cases, and for the *Pleulophocerca* group, 0.9%, respectively. In samples with infected mollusks, these indicators were for *Xiphidiocercariae* from 1.2 to 2.2%, and for *Pleulophocerca* from 6.7 to 7.1%. Mollusks *N. sporangi* had invasion in only one pond with an invasive cercaria extensity of 23.3% from the *Xiphidiocercariae* group. Mollusks *Bithynia* sp. were found only in 2 reservoirs of the provinces of Quang Tri and Hue. They revealed an invasion in only one pond in the bypass channel near the rice field in the province of Quang Tri. Their invasion was 0.7% by *C. sinensis* larvae.

On the basis of the materials obtained, it can be concluded that the pathogen of clonorchosis is very low in natural water bodies. Most natural reservoirs have a significant current. Whereas in artificial reservoirs, on the contrary, the flow is slow or completely absent. Bitiniids prefer bodies of with stagnant water. Obviously, this determines the number of these mollusks in biotopes. Therefore, in mountainous regions, where representatives of the *Thiaridae* family predominate significantly in rivers. Lakes located in mountainous areas are regulated by dams and, accordingly, do not have a constant water level. This is an unfavorable factor for the development of sedentary bitinia. These lakes are mainly oligotrophic, with the exception of lakes with fish farms. In the mountain lakes of the studied provinces of Central Vietnam, there is a very poor malacofauna and a complete absence of the first intermediate hosts of clonorchis. Only in natural mountain lakes such as Yên Bái there are optimal conditions created for biotopes of bitinia. Closer to the lower reaches of the river, the current decreases and the number of artificial reservoirs for breeding fish increases. Therefore, there are more favorable hydro-

logical conditions for the first intermediate hosts of the pathogen of clonorchosis. The lower reaches of the rivers near their mouths have significant salinization and a constantly changing water level, which also create unfavorable conditions for bitinia. Thus, we can conclude that the hydrological regime of water bodies significantly affects the presence and abundance of bitiniids in natural conditions. Therefore, in mountainous areas unfavorable conditions are created for these species of mollusks, with the exception of artificial ponds. On the flat terrain, due to the large number of artificial reservoirs (canals, fish ponds, irrigation canals), the most favorable conditions are created for the life of mollusks and their contacts with the second intermediate hosts of *C. sinensis*. downstream

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猫的胃肠道疾病的临床和形态学表现, 经常食用乳糖
**CLINICAL AND MORPHOLOGICAL MANIFESTATIONS
OF DISORDERS OF THE GASTROINTESTINAL TRACT
OF CATS WITH REGULAR CONSUMPTION OF LACTOSE**

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注解。目前, 在家猫 (*felis silvestris catus*) 中, 肠和胃的退化过程很普遍。病理学中的主导地位是由经常食用乳糖引起的病症所占据。兽医胃肠病学作为一个独立的领域是一个相对年轻的科学, 每年都在不断改进。对患有肠道和胃的病理状况的猫的所有者进行兽医诊所访问的案例增加导致一般实践的兽医以及猫科社区的专业兴趣增加。本文介绍了研究结果, 证明食物抗原在早期肠道和胃退化过程中的重要作用, 导致动物生活水平显著下降, 随后出现致命结果。

关键词: 家猫, 特异性, 过敏, 预防, 食物抗原, 乳糖缺乏症。

Annotation. *Currently, in domestic cats (*felis silvestris catus*), degenerative processes of the intestine and stomach are widespread.*

The leading place among pathologies is occupied by conditions caused by the regular consumption of lactose. Veterinary gastroenterology as an independent area is a relatively young science, which is being improved from year to year. The increase in cases of visits to veterinary clinics of owners of cats with pathological conditions of the intestines and stomach causes increased professional interest among veterinarians of general practice, as well as the felineological community. The article presents the results of studies proving the important role of food antigens in the early formation of degenerative processes of the intestine and stomach, leading to a significant deterioration in the standard of living of the animal with a subsequent fatal outcome.

Keywords: *domestic cat, atopy, allergy, prevention, food antigens, lactose deficiency.*

To date, the clinical and morphological manifestations of gastrointestinal disorders in case of lactose deficiency have been studied in detail in humanitarian medicine. For felineology, this is not a fully understood topic.

Difficulties of timely effective prevention of the development of degenerative processes of the intestines and stomach of domestic cats are associated with the lack of unified substantiated programs of primary and secondary prevention of conditions.

In the past 20 years, a wide spread of diseases of the gastrointestinal tract has been observed all over the world. A significant contribution to the development of processes is made by such a factor as inadequate feeding of the cat by the owner. At the same time, a high rates of diseases is associated with an increased sense of responsibility of owners for their pets and, as a result, the number of visits to veterinary institutions.

Disorders from the gastrointestinal tract (GIT) - conditions that interfere with proper digestion or alter the rate of passage of food through the gastrointestinal tract.

Avoidance of contact with lactose can be considered as one of the important measures aimed at preventing the development of disease in domestic cats.

Lactose intolerance (hypolactasia) is a pathological condition caused by a decrease in lactase levels.

Some researchers consider it necessary to exclude the product from the diet of all representatives of the species as a preventive measure.

However, a number of scientists are of the opinion that milk should be regarded as a high-calorie treat, and no more than once a month it can be included in the diet of the animal. Scientists consider this justified, because one of the most important substances for cats is taurine, the lack of which in the diet leads to poor health and can cause blindness due to degradation of the central region of the retina. Cow's milk contains taurine to a small extent.

Standard cow's milk contains much more lactose and casein than domestic cats can absorb.

Cats, like many adult mammals, have lactose intolerance. The amount of lactase (an enzyme that digests lactose) in their body decreases after the kittens stop consuming breast milk. Milk feeding in cats ends after 8-10 weeks after the birth of kittens.

After the first year of life in most cats, the enzyme completely ceases to be produced.

As a result, undigested lactose sugars draw water into the intestines, causing diarrhea. Sugars are fermented in the intestines and cause bloating and flatulence

We followed the dynamics of deterioration of condition of domestic cats, who regularly consumed cow's milk for three months.

The study included 181 cats older than one year and younger than the fifth year of life regularly consuming lactose in various foods. Research conducted in the laboratory of the Department of Anatomy, Pathological Anatomy and Animal Surgery of the State Agricultural University.

In the observed domestic cats, an allergic history and diet were carefully analyzed, and food preferences and restrictions imposed by the owners were identified. At the beginning of the study, each individual have already consumed cow's milk daily for at least six months.

Preliminary examination showed that all animals had skin manifestations of allergies (fur was faded, brittle) of varying severity. The anamnesis was burdened in the 41st animal (there were areas of alopecia covered with a crust).

General clinical blood test (processing of this analysis does not require the use of expensive reagents and can be performed in any clinic) showed that all the studied individuals had an increased level of leukocytes in the blood, which is characteristic of a chronic inflammatory process.

The level of monocytes was lowered, which is a sign of the development of various infectious diseases.

In 34 cats of the study group, ultrasound revealed enlarged abdominal lymph nodes and pancreas

All animal groups had problems with bowel movements, regular attacks of vomiting and diarrhea.

It was revealed that cats with a burdened allergic history and skin manifestations of allergies were statistically significantly more likely to have such nutritional preferences as the active use of whole cow's milk and its products (200 g per day).

Lactose intolerance is not a pathology for the feline family; rather, on the contrary, the ability of an adult animal to digest lactose sugars is an exception and needs to be studied.

Due to the regular consumption of lactose, the symptoms of intolerance in cats have worsened. If initially diarrhea and vomiting went away on their own (drug-free) within 8-12 hours, then after a month of daily milk use, cats stopped vomiting, bowel movement began to happen 3-4 times a day.

Constant diarrhea led to dehydration. It was found that the higher the percentage of milk fat, the more clearly and soon degenerative processes develop.

Typical symptoms of GIT disease in a domestic cat: soft crap or diarrhea, vomiting, regurgitation, flatulence, general weakness. Cats are carnivores. The cat's intestines, like many carnivores, are short and do not exceed 1.8 m in length.

With a normal body temperature of a domestic cat of 37.5–39°C, animals receiving lactose exhibit a constantly elevated temperature in the range of 39–41.5°C. Rapid breathing of 25-30 breaths per minute is also observed at a rate of 22-24 breaths.

GIT disorders lead to dehydration. Most often, cats have been diagnosed with the following.

Acute gastroenteritis - inflammation of the digestive tract.

Colitis - inflammation of the colon, accompanied by painful bowel movements, blood in the stool. It is important to note that the pathology was caused precisely by lactose intolerance. Tumors, polyps, formations of a different kind were not found.

Irritable bowel syndrome. As a result of a chronic inflammatory process in the intestines of a cat.

Disruption of the processes of absorption in the small intestine. Inflammation of the small intestine leads to loss of appetite in the animal, vomiting, weight loss and dehydration.

Four cats of the fifth year of life were diagnosed with parenchymal inflammation and hepatic lipidosis (impaired fat metabolism). With characteristic signs in the form of jaundice, conjunctiva of the eyes, dark urine, heart rhythm disturbance as frequent cardiac bigemina. Salivation, the smell of acetone in exhaled air were also noticed.

A change in the psyche caused by various somatic diseases has always been the subject of careful study as an essential component of the clinical picture. Mental factors can adversely affect the somatic state of patients. The attention of all pet owners was focused on the psychological state of pets. As a result of observations, it was recorded that 150 cats showed apathy, lethargy, lost the desire to play. 112 animals showed atypical behavior for them in the form of long sitting in the corner. Three cats showed extremely aggressive behaviors. The behavior of the remaining animals remained unchanged.

During the study, the data of 235 medical records of patients of the veterinary clinic, introduced from January 1, 2017 to December 31, 2018, were retrospectively analyzed. The stages of the analytical study included determining the qualitative and quantitative size of the samples, collecting and processing the necessary information. Similar pathological conditions of cats have been established. 101 animals out of 235 died or were euthanized, which may indirectly indicate aggravated degenerative processes.

After three months of observation, symptomatic treatment was performed. In cats on a lactose-free diet, the general condition began to improve by the third week. By the sixth week of observation, the animals were healthy.

The natural purpose of milk is to feed the offspring of mammals, including domestic cat kittens, one of the most common companion animals in the country.

Due to its dependence on the owner, the domestic cat eats food at its discretion. Due to the erroneously widespread stereotype that a cat needs to be given milk, the vast majority of owners feed it to their animals. This actually leads to a systematic poisoning of the animal over several years of life, which ultimately reduces its standard of living and inevitably leads to dehydration and, as a result, death.

It is important to understand the seriousness of the prolonged degenerative process of an inhibitory GIT. Since the appearance of malignant neoplasms is often preceded by prolonged inflammatory processes and hyperplastic processes. And lead to the deactivation of tumor suppressor genes.

The research results were reported and approved at the Regional Conference of Young Scientists "Actual Issues of Agriculture" (Belgorod, 2019). Practical suggestions.

Before the appointment of therapeutic measures, it is necessary to study the diet of the animal.

It is necessary to give a lecture to the owner of the animal about lactose sugars and the inadmissibility of milk for cat feeding.

General blood test, ultrasound GIT must be included in the comprehensive routine examination of healthy cats.

With standard conservative treatment for GIT diseases and diet, an animal younger than five years old will not require surgical treatment.

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楚科奇自治区人口规模和性别年龄结构变化的后果
CONSEQUENCES OF CHANGES IN THE SIZE AND SEX-AGE
STRUCTURE OF THE POPULATION
IN THE CHUKOTKA AUTONOMOUS DISTRICT

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抽象。考虑了俄罗斯联邦东北部一个重要主题人口的数量和性别 - 年龄结构的动态。展示了其变化的后果,这不仅对楚科奇自治区的人口潜力构成威胁,而且对其社会经济发展构成威胁。苏联时代新来的人口密集增长,以及1990年代国家经济发展变化导致的崩溃,改变了该地区人口的结构,这是一个合乎逻辑的后果。在一种情况下,经济活动增加,另一种情况是 - 生产急剧减少。根据人口预测的平均版本,预计常住人口将进一步减少。

关键词: 人口动态, 迁移流出, 人口年龄 - 性别结构, 人口预测, 楚科奇自治区。

Abstract. *The dynamics of the number and gender-age structure of the population of an important subject of the north-east of the Russian Federation is considered. The consequences of their changes are shown, which pose a threat not only to the demographic potential of the Chukotka Autonomous District, but also to its socio-economic development. Intensive population growth due to new arrivals in the Soviet era, as well as the collapse as a result of a change in the economic paradigm of the country's development in the 1990s, change the structure of the population of the district, which was a logical consequence, in one case, of increased economic activity, in another - sharp curtailment of production. According to the average version of the demographic forecast, a further decrease in the resident population is expected.*

Keywords: *population dynamics, migration outflow, age-sex structure of the population, demographic forecast, Chukotka Autonomous District.*

In the context of the growing geopolitical and economic importance of the Arctic zone for the Russian Federation, it becomes important to strengthen its demographic potential. For the Far Eastern sector of the Arctic zone, this is especially important, both from the point of view of ensuring the country's national security at its strategic northeastern borders and the development of an economy

rich in natural resources. The need to break the negative trends in the reproduction of the population in this vast territory is also noted in the "Strategy for the development of the Arctic zone" [9]. According to this document, the positive changes in the demographic situation here must be based on the natural population growth provided by a decrease in mortality and an increase in the birth rate. Other decisions were made to improve the demographic situation - in the country as a whole, in the Far Eastern Federal District (FEFD), in its Arctic zone - but they turned out to be insufficiently effective. It can be assumed that the measures taken do not adequately solve the problems that have accumulated in this area. And they are based not only on the lack of financial resources in the country to solve them, but also on a lack of understanding of the depth of these problems. Along with the geopolitical prerequisites for updating such studies, it is also important from the standpoint of developing the mineral resources of the northern regions, which in terms of resource supply occupy a leading position in the country [1,3], as well as from the standpoint of ensuring the stable functioning of the Northern Sea Route, the significance of which is gaining serious international value.

The demographic characteristic of the Chukotka Autonomous District (CAD) is defined by the small population and extremely uneven distribution on a vast territory (721.5 thousand sq. Km), which is 10.4% of the total area of the Far East, due to the development and settlement processes. CAD takes the last place among the Far Eastern entities in terms of population (49.7 thousand people as of January 1, 2019).

In the first half of the 1990s. the population of the Chukotka Autonomous District decreased by 39.5%, while the migration peak occurred in 1992, when the district lost 23.3 thousand people, or 14.5%. In the second half of the 1990s the pace of departure decreased to 20%, but remained high. Since the 2000s a marked decrease in population loss is observed (for 2002-2010, the population in the district decreased by 6.1%, in 2010-2017 - by 2.3%). In general, from 1989 to 2017. the population decreased by 114.6 thousand people, or by 69.9% (the largest population loss of the Russian north).

For individual territories of the Chukotka Autonomous District, the losses vary significantly according to the results of the 1990s and the first decades of this century. So, in the Iultinsky and Chaunsky districts, where the newcomers predominated, as a result of the migration outflow between 1990-2002, the population decreased by more than 77% [8], and in 2002-2017 - by 29%.

Migration outflow and liquidation of a number of villages in the 90s led to a reduction in the population of the Bilibino and Anadyr regions by 65% or more. In the Providensky district (Providensky GO), the population decreased by 53.5% until 2002, and only by 20.7% by 2017. The smallest reduction was noted in the city of Anadyr, as the administrative center of the district (37%), and the Chukotsky region - exclusively rural - region (34.7%). Moreover, in Anadyr from 2002 to the present, there has been an increase in the population, which for fifteen years amounted to 4.6 thousand peo-

ple. The flow of migrants is focused on the district center (employment opportunities, education). The outflow of the population out of the Chukotka Autonomous District is not compensated by its natural increase, which is one of the positive regional factors of population reproduction. This is facilitated by the younger age structure of the population, which leads to a lower level of the mortality rate and an increased birth rate, formed due to the peculiarities of the reproductive behavior of the indigenous ethnic groups of the district. The total fertility rate (TFR) in the district in 2017 reached 13,1‰. This is the second result in the FEFD and the fourteenth in the Russian Federation (RF). Special fertility rate (SFR) for 2011-2017 increased from 1.812 to 2.079, which is significantly higher than in the Russian Federation (from 1.582 to 1.621). There are more than two children per woman of reproductive age in CAD. But the forecast gives a decrease in both the absolute number of births and TFR - in 2025 - to 1.932, and by 2035 - to 1.854 [4], which is explained by the generation structure of the 1990s. In urban areas, SFR is much lower than simple reproduction today: the rural population provides an increased birth rate, where expanded reproduction is observed: in 2017, there were 6.081 children per woman! The peak birth rate in rural areas falls on the age of 20-24 years (779.9 births per 1000 women of this age group), while in urban settlements the maximum number of births falls on the age group of 25-29 years (127 births per 1000 population). The average age of the mother for urban areas (28.8 years) and for rural (24.2) confirms the differences in the processes of reproduction of the population in the district. In the future, natural growth will not make it possible to compensate for the loss of population in the volumes necessary for the economy and will only have some effect of slowing the intensity of population loss.

There are several periods in the dynamics of mortality in the CAD population: 1954-1960 - an increase in mortality to 12 ‰, when the population increased significantly due to visitors who were not adapted to local conditions; 1961-1990, when mortality in the district was reduced to 3.9 ‰ [5], on the one hand, due to improved medical services, and on the other, as a result of a decrease in the proportion of people over working age; from 1991 to the present - an increase in mortality. In 2010-2017, the mortality rate reached 13.8-9.4 ‰. At the same time, the highest mortality rates are observed in areas of primary residence of the indigenous population (Chukotsky, Anadyr districts, Providensky District), and the lowest - in areas of residence of an alien (mainly urban) population (Bilibino district, Pevek Urban Settlement).

The natural and climatic conditions of the North and the Arctic affect the health of the population and its life expectancy. Across the Russian Federation, life expectancy for the period 1992-2017 increased by 4.36 years and amounted to 72.6 years for both sexes. Among the federal districts, FEFD has the lowest life expectancy (70.09 years, 2017), and within the district, the indicators of individual constituent entities of the Federation are highly differentiated: in the Republic of Sakha (Yakutia), Khabarovsk Territory, Amur and Sakhalin Oblasts, and the Jew-

ish Autonomous Oblast growth in life expectancy exceeds the Far East level, and in the Chukotka Autonomous District the indicator was 66.10 years (this is the lowest life expectancy in the Russian Federation). Compared to 1992, life expectancy has increased by 1.4 years here. Therefore, the task of increasing the expected duration of life to 75 years (by 2030 to 80 years), provided for in the Decree of the President “On National Goals and Strategic Tasks of the Development of the Russian Federation for the Period Until 2024” (May 20, 2018 № 204) is difficult to achieve for the northern , especially arctic subjects .

In terms of life expectancy, CAD is significantly behind even outsiders. Especially when it comes to the male population in rural areas, where the average life expectancy is 49.58 years! There is no other place with such life expectancy on the territory of the Russian Federation.

Despite the loss in population, the district’s age structure is still slightly better than it of the country as a whole. Intensive migration processes of the previous decades have formed a population with a predominance of young ages. But in recent years there has been a trend not only in a quantitative reduction in the working-age population, but also in its qualitative deterioration - the aging of the economically active part of the population. This is explained by the exhaustion of the possibilities of its growth due to the transition of the part of the population born to the demographically prosperous part of the population to the category older than working age, but most importantly - by migration outflow.

For several decades, a characteristic feature of population formation for the CAD was the predominant effect of migration growth. Since the 1990s migration remains the main cause of population decline. Analysis of the distribution of migrants in the directions of movement in the Arctic subjects is determined by the specifics of the economic development of the territory, the level and quality of life of the population, and the characteristics of labor activity. For the Chukotka Autonomous District, as well as for the Murmansk Oblast, the Nenets, Yamalo-Nenets Autonomous District, the Komi Republic, where the shift method is widely used, interregional migration is typical, there is the highest rate among the Far Eastern entities (82.2% upon arrival , 84.6% - on departure, 2017). The migration loss coefficient of CAD occupies the last position (-13.2) among 85 constituent entities of the Russian Federation.

Migration losses significantly reduce the population, lowering the demographic potential of the district. Therefore, enterprises located in the Far North and equivalent areas, guided by the principles of economic feasibility, will continue to use shift and shift-expeditionary methods of organizing work. And since it is a rather difficult task to solve the personnel problem at the expense of the local population in the CAD without using modern technologies, it is proposed to use the shift method of work under state control when developing new deposits remote from existing settlements, while taking into account the interests of indigenous peoples.

Until 2013, the share of intraregional migration in the structure of migration flows increased, amounting to 23.1% of the total volume of migration flows; by 2017, it decreased to 14.7% [10]. The most attractive for intraregional migration is the capital of the CAD - the city of Anadyr, at the same time, more people left Anadyr and went to other Russian subjects than arrived for permanent residence. Migration relations of the municipalities of the district in intra-regional exchange have significant differences. International migrations are generally insignificant, below all-Russian and Far Eastern indicators, and tend to decrease. The main share in international migration movements was exchange with the CIS countries. Migration ties between the Chukotka Autonomous District and non-CIS countries are insignificant. Apart from the CAD, other national-territorial entities — the Republic of Sakha (Yakutia) and the Jewish Autonomous District — also have low attractiveness for international migrants. However, the degree of internal Russian migration does not significantly affect the characteristics of the ethnic structure and ethnopolitical processes in the subjects of FEFD. The main migration flow in the FEFD is associated with the implementation of large projects, however, to a greater extent these are one-time “shift” movements characteristic of extractive entities — the Sakhalin Oblast, the Republic of Sakha (Yakutia), and the Chukotka Autonomous District.

Regional differences in the age structure of FEFD are particularly noticeable in the north-south direction. Thus, the northern territories are characterized by a higher proportion of the working-age population - from 60.6% in the Kamchatka Krai to 62.3% in the Chukotka Autonomous District; low specific weight of pensioners - from 14.7% in the Chukotka Autonomous District to 17.0% in the Republic of Sakha (Yakutia), and accordingly, a higher share of children in the total population - from 24.9% in the Republic of Sakha (Yakutia) to 23.0% in the Chukotka Autonomous District [6].

The change in the population structure associated with demographic aging as a result of migration outflow [7] expressed itself in a significant reduction in the proportion of children: in the Republic of Sakha (Yakutia) from 32.1 to 24.9%, in the Magadan Region from 28.0 to 18.6 %, in the Chukotka Autonomous District from 29.6 to 23.0%, as well as an increase in the share in the structure of the population of people over working age: in the Magadan Oblast from 5.1 to 20.3%, in the Chukotka Autonomous District from 2.8 to 14.7%, in Kamchatka Krai from 6.0 to 19.8% [5]. Similar trends in the age structure of the population are characteristic of almost all constituent entities of the Russian Federation, but the scale of these changes in the north of the FEFD is higher than the Far Eastern and average Russian indicators, and the proportion of people over working age is much lower compared to the average Russian level. In the Chukotka Autonomous District, the share of the working age population (62.3%, 2017) is higher than the Russian (6.3%) and Far Eastern (4.5%) levels. The reduction in the size of this age group, together with an increase in the

share of people over working age, represents a serious demographic challenge to providing the district economy with labor resources and an opportunity to improve the standard and quality of life of the population.

What can the current trends in population formation in the geopolitically important Arctic Far Eastern subject and its age structure lead to?

1. With a modern demographic structure, the trend of population decline will continue. The slight stability of the population for almost two decades, a small natural increase (against the background of negative indicators for most other subjects of the federation) gives rise to the illusion that the crisis has passed. According to the calculations of the estimated population up to 2035, made by the Federal State Statistics Service (according to the average version of the development of demographic processes from the base at the beginning of 2018), the tendency of the resident population in the CAD to decline will continue. By 2025, it will amount to 47.3 thousand people, decreasing by 2.0 thousand people compared to 2017 (2035 - 45.4 thousand people) [4]. A steady trend of migration outflow indicates that the current situation has not changed. Therefore, the growth of 6.0 thousand people recorded by the Concept for the Demographic Policy of the Far East for the period until 2025 can be considered very optimistic [2].

2. The decrease in population will occur due to migration outflows that exceed the natural population decline. It is assumed that the natural decline will decrease from 70 people in 2019 to 1 person in 2030, and then the natural increase will begin to grow in the CAD, reaching 70 people by 2035. The annual number of deaths will remain at the level of 444-584 people, and the number of births will decrease every year from 514 people (10.5 births per 1000 population in 2019) to 474 people (10.2 births per 1000 population per 1000 population) in 2030 [4].

3. The reduction in the number of working population, together with an increase in the share of people over working age, represents a serious demographic challenge to providing the district economy with labor resources and the opportunity to improve the standard and quality of life of the population.

In the future, the negative consequences of demographic processes in the Chukotka Autonomous District, the Far Eastern Federal District and in Russia as a whole, if no drastic measures are taken, including in socio-economic policy, will make it impossible not only to develop new territories, but also to retain already developed with great difficulty and high costs territories, and will contribute to the compression of the economic and geopolitical space.

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土库曼人的史诗传统
EPIC TRADITION OF TURKMEN PEOPLE

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抽象。土库曼史诗属于最重要的历史和文化因素，土库曼人民因此保留了他们的身份，独特的民族文化，语言，生活方式和传统道德原则。土库曼史诗贯穿其历史，从分离的游牧部落到民族精神的繁荣时代，承载着人民群众最重要的审美价值观，反映了重大历史事件，成为其精神生活的真实历史。人们采用过去的英雄传说作为他们史诗作品的基础，为他们带来了自己的信仰和信念。土库曼版“戈罗格利”民族史诗是指土库曼民族形成的时代。主角具有真实和奇妙的属性；他是勇敢的骑兵的坚强，不败的领导者，Chandybil堡垒的负责人，熟练的歌手和音乐家的象征。最高的土库曼传说样本进入了世界文化的宝库。土库曼人民的史诗传统在我们的时代积极发挥作用，证明了古代遗产在现代文化框架内有机存在的可能性。

关键词：土库曼伊波斯，德桑，叙事，讲故事，史诗传统，萨满，英雄传奇，民间传说，杜塔，巴西，史诗。

Abstract. *Turkmen epic belongs to the most important historical and cultural factors, due to which the Turkmen people preserved their identity, unique ethnic culture, language, way of life and traditional moral principles. Throughout its history, from the separated nomadic tribes and till the flourishing age of national spirit, Turkmen epic carried most important aesthetic values developed among the people as well as reflected major historical events, becoming the true annals of their spiritual life. People adopted heroic legend of the past as basis for their epic works, bringing to it their own beliefs and convictions. Turkmen version of "Gorogly" national epic refers to the age of the formation of Turkmen nation. The main character is endowed with both real and fantastic properties; he is a symbol of strong, undefeated leader of the brave horsemen, head of Chandybil fortress, skilled singer and musician. Highest samples of Turkmen legends entered into the treasury of world culture. Epic tradition of Turkmen people actively functions in our days, proving the possibility of the organic existence of ancient heritage within the frames of modern culture.*

Keywords: *Turkmen epos, dessan, narration, storyteller, epic tradition, shaman, heroic legend, folklore, dutar, bagshy, epic song.*

The epical branch of folklore refers to a well-developed part of the folk creation Turkmens. Turkmen storytellers are the successors of the creative traditions of *Oguz khans*, the earliest examples of art dating back to the period of *Turkic Hagan*. The first samples of archaic epic genres are its origins to folk art that emerged in the territory of Turkmenistan at the dawn of the fire-worship. Genres of music folklore, laid at that time, accompanied the distant ancestors of the Turkmen people for thousands of years. With the appearance of religion, many genres acquired religious overtones. Folk festivals, rites and customs of the modern Turkmen comprise a plurality of pre-Islamic elements associated with the paganism of ancient Turks and Zoroastrian faiths of the oldest inhabitants of the Central Asian oases. Such genres as song contests, heroic odes, fairy tales, the content and the conditions of existence have been associated with a complex of religious and magical ideas, typical of people who lived before the era of the ancient Turkic. The era of early nomads was the time of the actual epic storytelling origins. Dynamism, the pursuit of the new has been the natural state of nomadic peoples for centuries. The lofty aspiration in perceiving laws of nature, thirst for its discovery, enjoyment of its various images – all this inspired the nameless steppe folklore creators. The man is the center of the boundless world being not a tiny point hidden in it, but its part as boundless and powerful as the eternal skies, the vast desert.

The Turkmen people keep in memory a great number of legends. The bearer of the epical traditions of the Turkmen people are the singer-tellers *Bagshy-dessanchy*, who is a singer, a taller and an instrumentalist. His tie with the saints makes him a man of another world. The apprehension of their role as a livebearer of the long-made system of spiritual values is an inseparable feature of the self-consciousness of the bagshys, which influences upon all sides of their life. A traditional singer does not regard his activity just as “singing songs” but as a high mission, which he has been called upon [3, 15]. The manner of singing of the epos-tellers differs greatly from that of the rest folk singers. The intonation of the teller is dramatically rich, and very expressive. The musical inflection of voice has its special meaning. Every bagshy has its own individual manner of epos performance. The master of the teller, his intellect and improvisation skill are brightly revealed in the prosaic parts of dessans. In the “word” is the essence of the narration and in their performing manner is the context of the genre, which is the gist of the epic inflection [5, 111].

Epos is the genre that many peoples have. The Turkmen as well as many other Islamic peoples used the term “epos” to indicate large-scale heroic works such as “*Gorogly*”, “*Manas*”, “*Alpamys*”, “*Koblandy batyr*” and others. In the repertoire of Turkmen epic tellers, there have been preserved two ancient monumental epic cycles: “*The book of my grandfather Khorkut*” and “*Gorogly*”. The wise old man *Khorkut* and a warlike *Gorogly* represent the stratification of a number of legendary persons.

Khorkut-ata is a saint esteemed among many Turkic peoples. As legends tell, Khorkut was the first shaman; he opened to the world the greatest and the finest wonder in the world – music. Up to the present day, the Turkmen musicians respect *Khorkut* as well as other patrons of music – *Ashyk Atdyn Peer* and *Baba Gammar* [2, 89]. Khorkut is considered not only the hero of Turkic epos but its founder as well. The image of legendary Khorkut is similar to the image of the popular in the Turkmen folklore *Burkut Baba* (or *Burkut Divana*). Considering *Burkut Baba* the host of the rain the ruler of clouds who had the power over the Reign of Dead and the protector of wild animals, the ancient people nevertheless thought he was possessed and stormy. The myths do not regard *Burkut Divana* a shaman, but the word “*divana*” means possessed by devils, feeble-minded. In the researches of some scholars, one can clearly trace the conception that the “thunder-maker” is the image of some supernatural, mythical creature that rules the rain, the thunder and the lightening and is connected with the shaman’s religions beliefs that thunder is made by the shaman dwelling in the heavens [7, 116-117]. In the folk legends the images of Khorkut and *Baba Gammar* have much in common.

1. *Baba Gammar* is the patron of singers and musicians. Khorkut is the first singer, a shaman and the patron of singers and shamans.

2. *Baba Gammar* invented the first the first *dutar* (musical instrument), Khorkut made the first *kobyz* (musical instrument). Like *Baba Gammar*, Khorkut made use of shaitans’ advices (he listened in to their conversation).

3. Khorkut was presented as immortal. At one time *Baba Gammar* was also considered immortal. According to the legend, on the place on the *Murgab River* which is considered his grave *Baba Gammar* came into the earth (alive), and later he responded *Aly*’s appeal from “*Mekka-Medina*”. That is why many believers think that *Baba Gammar* is a saint, who disappear firm life alive.

4. It is noticed in some legends that trying to save his life Khorkut spread his carpet on the river’s surface and playing a musical instrument did not drown and was not carried by the current. *Baba Gammar* also played the *dutar* in the middle of the *Murgab River* sitting on the spread shawl, robe or rag.

5. *Kobyz* was put on Khorkut’s grave. “Many years after his death, on Fridays Khorkut’s *kobyz* made mournful sounds as if bewailing the loss of its host” [10, 163]. Similarly, on the graves of *Baba Gammar* his musical instrument is present in the form of a tree, which had grown out of the *dutar*’s “ear”.

Baba Gammar is represented in folk religious beliefs only as patron of musicians and singers. It is obvious that before his functions were wider and he was the patron of shamans. To the present day, the Turkmen call folk singers “*bagshy*” (*baksy*), whereas Kazakhs, Uzbeks, Kyrgyzes and Uigurs use this term regarding shamans. Use the same term for a singer and a shaman goes back to the era when singing was considered to have magic power and one person could he singer and

shaman at the same time. In the northern Turkmenistan, the saint Ashyk Atdyn is regarded as a patron of musicians, singers, poets and shamans. Musicians and singers also sing and play music on his grave. According to the legend to the pilgrim who spent a night at the Ashyk Atdyn's grave, the saint appears in his dream and gives the gift of being bagshy, a poet or a shaman [9, 69]. The saint gives the gift of being a musician or a poet to the man he likes, but one whom the saint dislikes can become crazy. That is why the pilgrim, in order to please the saint, must be high-minded and honest.

The epic stories as a rule were entitled after the main character. As the result, different people close in language and culture had heroic epos with the same titles. For example, the epic "Gorogly". In the folklore, the image of Gorogly had been collected for a long time, while national versions were thoroughly revised in different countries according to their social norms and epical traditions. The Turkmen version of Gorogly is an epical memorial of the epoch when the formation of the Turkmen nation was progressing. Gorogly is a symbol of an extremely strong, invincible leader of valiant equestrians, he is the head of the fortress *Chandybil* and at the same time, he is a skilled singer and musician. The image of Gorogly is showered by nature both real and fantastic qualities. His real qualities are connected with febleness and faults of common people. They are clearly seen in his with the fighting men and in the expression of such human feelings as mental suffering (especially in the chapter "*Bezirgen*"), dissatisfaction and annoyance (in the chapter "*Harmandali*"), thirst of revenge ("*Ar alysh*"), feeling of depression ("*Goroglyyn olushi*"). The fantastic trend of the main character is seen from the moment of Gorogly's birth and further accumulates in the course of narration. The blessing got from the saint old men endows the hero with unusual for a common mortal possibilities among which 120 years of life for him and his horse, treating of wounds when the stars appear in the sky, knowledge of 72 foreign languages and others. Thus, the epos "Gorogly" organically synthesizes real and mythical images.

As to the form of the epic stories, it is built on the combination of prose and poetical parts; the action described in prose is recited, whereas poetical insertions are sung. From the point of view of compositional structure, epos consists of a number of chapters, the so called *Boughs* or *Shakha* united by a common idea. Each chapter in its turn is a *dessan*. There is no verge between *dessan* and epos, in course of centuries they both were the complement of one another and were on repertoire of the same bagshy-tellers: *Ata bagshy*, *Palwan bagshy*, *Magtymguly Garliw*, *Nazar Baga*, *Ore bagshy* and others.

The word *dessan* is of Persian origin that means a legend, a story. Very often epos as such is called a *dessan*. As to the volume, epos comes close to novel. There are many characters in it; it takes in a great number of events. Both in the Turkmen

folklore and in classical literature the term *dessan* was used not only for lyrical and epical works but also for poetic works in general. The classical poets *Magtymguly* [6, 100], *Kemine* [1, 118], *Shabende* [8, 15] rather often called their works *dessans*.

The composition of the epical text usually includes some episodes important for the structure of narration such as showing of initial data, episodes of development of events, and the final episode. The principal tunes mostly consist of *cliché*. The epos teller is a kind of an epos creator. An epic singer has always got in readiness a number of separate “*epic formulae*” which he adds in the order corresponding to the course of narration. Each of those formulae – cliché depicts well-known facts and events such as birth of hero, wrestling, description of persons, a *yurta* (a nomad tent), a horse, the praise of the bride’s beauty, etc. Different performers have different in length text episodes and take in different cliché. The total quantity of cliché is of course limited but the teller in any case has a great set of combination opportunities. A singer has no need make tunes “out of emptiness”; they are made of the cliché being kept in his mind, each time more or less anew. Thus, the technique of *dessan* narration of the *bagshies* is based on a new creative reconstruction, not on the repetition of something kept in memory.

Though prosaic texts (*Kyssa*) are the principal structural element of epos, the most important thing in *dessans* is music. It is the epic song (*Dessan aydymy*) that is the basis, which concentrates the style and the manner of performing of an individual *bagshy-dessanchy* as well as the characteristic features of a separate school of epic telling. A song in a *dessan* is a main artistic factor, a kind of a special musical delineation, exposing spiritual world of the heroes. The quantity of songs performed on behalf of this or that personage allows to judge of the role of the hero in the story. However, before starting to perform a *dessan* the epic singer usually sings several introductory songs (*Tirme songs*). These songs are initial level in the folk singer’s performance. *Tirme* songs contain several essential functions. First, they open the concert attracting attention of the audience. Besides, they prepare the listeners getting them into the mood for the following serious, often a very long narration. Finally, the main function of the *tirme* songs is to “warm up” the singer’s throat. The introductory songs open the epos, but they are not connected with the plot [4, 208].

Songs in Turkmen epos are the most stable element of the form. The words of the songs clad in poetic structure are kept unchangeable while the melodic base of the songs depends on individual choice of the epic teller. Each singer has its own store of melodies used by him in the epic songs. In the process of selection of the musical tunes for his songs, the singer takes into account in the first place the number of syllables in a poetic stanza, which ought to be easily put to melodic phrase. Apart from organic co-ordination of music and poetry much significance in the choice of a musical theme is given to the tradition, i.e. the disciples as a rule prefer the melodies taken from their tutor.

Within one epic story, bagshy sings from three to fifty songs. The number of the songs depends on the total scale of the story, and very often on some external aspects (emotional state of the audience, the extent of the enthusiasm of singer). The tunes-themes of the epos songs can be used in different tessitura twice and more times within one story. The melodic basis of the themes remains invariable, only its tessitura standard changes by means of gradual going up the strings of national musical instruments *dutar* and *gyjak*. The most popular melodic tunes in *Dashoguz*, the main epical school on the North of Turkmenistan, are “*Sandyk*”, “*Torgay gushlar*”, “*Yashylbash*”, “*Yylgaylar*”, “*Dushmush*”, “*Heserli*”, “*Tay atym*”, “*Oyanmaz*”, “*Kasym Khan*”, “*Nowgul*”, “*Balsayat*” and others. The choice of melody in song parts also depends on the image of the character on behalf of which the song is sing. For example, the tunes, used in the songs of Gorogly (“*Seytek*”, “*Tay, atym*”, “*Baba Gammar*”, “*Gayip Sakar*”) are remarkable for brave and passionate manner.

The performance of the epic teller is formed up according to the principle of emotional growth. According to the type of the performance, all the repertoire can be divided into 3 register levels: low (*muhannes aydymlar*), middle (*orta aydymlar*) and high (*jemleyjy aydymlar*). Depending on the type, the arrangement of culmination (*shyrwan*) is changes [2, 17]. Therefore, for initial songs the narrow range is typical as well as three-phase construction with the culmination arrangement in the middle part on the highest point of the tone. In the songs of the middle level, there may be several culmination moments like that depending on the number of couplets of the song. In the closing song the principle of “*low culmination*” functions more often, that means that the completely musical material is performed on the highest singing level, and the final turn of the melody in the low tessitura is taken as a culminating point. Thus, in the folk songs the concept of culmination is not the only highest point of melodic development, but whole section opposed to total development of the musical material of the song. Depending on the wish of the listeners and some external factors, the epic singer can reduced or prolong the performed work.

Thus, the originality of Turkmen epos lies in the fact that it developed and was intensified in the process of the development of the people. Mythology for one people became a step for the development of regions while for others forth of arts. The theme of the union with the world, beneficial unity with the nature became leading in the creative work of nomads. They do not devote their works or genres to the nature, as it is not the background or the mere enumeration of scenes of life for them, but an integral and very important part of life. The notion of the world conditions of the steppe inhabitants is realized in legends and songs as well as in narrative literature. Nomadic life as the state of movement and changes is one of the universal states of the history of humanity, and not only past. The problem “man” and “space” has been actual for the present generation. Epos, folklore, songs, music, decorative-applied art and fine arts – all these have the mark of infinite motion and because of it the original attitude towards space and time.

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土库曼歌曲传统的体裁和结构特征
GENRE AND STRUCTURAL FEATURES
OF TURKMEN SONG HERITAGE

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抽象。本文考虑了土库曼人民歌曲遗产的体裁分类和构成结构问题。这首歌是土库曼民间艺术中最重要的组成部分，有条件地分为音乐民俗和口头传统的专业音乐。专业传统的承担者是bakhshis – 歌手和民间乐器表演者。专业人士的地位迫使他们不断提高自己的表演技巧。音乐类型由任何人执行，不需要专业培训。与音乐民间传说一样，巴赫希的艺术以丰富的体裁品种而著称。所考虑的音乐民间传说类型表现出对各种对联形式的强烈依赖。与此同时，土库曼巴赫希的歌曲令人信服地揭示了民间表演者的音乐和建设性能力，体现在能够利用民间和古典诗歌的独特结构特征来塑造表演歌曲。歌曲的情感表达通过广泛使用各种喉部发声技术，附加单词和惊叹声而得到增强，这与构建独特旋律形式的愿望有关。

关键词：民歌，体裁，构图结构，口头创作，歌曲民俗，舞蹈，音乐节，对联。

Abstract. *The article considers the issues of genre classification and compositional structure of the song heritage of the Turkmen people. The song is the most important component of Turkmen folk art, conditionally classified into musical folklore and professional music of oral tradition. Bearers of professional tradition are bakhshis - singers and performers on folk instruments. The status of a professional obliged them to constantly improve their performing skills. The musical genres are performed by anyone and do not require professional training. The art of bakhshi, like musical folklore, is distinguished by a wealth of genre varieties. The considered genres of musical folklore demonstrate a strong reliance on all kinds of couplet forms. At the same time, songs of Turkmen bakhshis convincingly reveal the musical and constructive abilities of folk performers, manifested in the ability to use the peculiar structural features of folk and classical poetry in the shaping of performed songs. The emotional expression of songs is enhanced by the widespread use of various throat vocalization techniques, additional words and exclamations, which is associated with the desire to construct unique melodic forms.*

Keywords: *folk song, genre, compositional structure, oral creativity, song folklore, dance, musical stanza, couplet.*

An important characteristic of the life of a people is its musical culture. Geographically, Turkmenistan is located at the crossroads of various cultures and religions, which predetermined the spiritual image of the people, whose cultural traditions were handed down from generation to generation and have been preserved for many centuries. Archaeological evidence indicates the existence of foci of human habitation on the territory of Turkmenistan long before our era. Products made of bronze and stone, ceramic vessels decorated with images of animals and plants, are interesting examples of the activities of people who lived here more than 4-5 millennia ago. The musical instruments depicted on the monuments of material culture are diverse. On a vast territory there were outwardly and functionally similar varieties. Common features arose as a result of similar historical and cultural phenomena, constant creative contacts [9, 25]. However, despite the identity of the genres, the art of musical intonation developed in its own, purely original way.

Turkmen folk music can be divided into two branches: musical folklore and professional music of oral tradition. The carriers of the professional tradition among the Turkmens are *bakhshis* and *sazanda* - singers and folk instrument performers. The status of a professional obliged them to create songs of such quality from which the listener would receive aesthetic satisfaction. In pursuit of this, the skill of *bakhshis* was constantly improved. Unlike the art of *bakhshis*, the genres of music endowed with applied functions can be performed by anyone and do not require professional training. There is no division into a performer and a listener; anyone involved in a ritual or ritual action becomes its bearer.

Inextricably interwoven with the history and ethnic origin of the people, the musical folklore of the Turkmens is distinguished by genre diversity. The initial stages of formation belong to the pre-Islamic period, with the advent of Muslim ideology, most folklore genres continued to exist, forming a kind of religious synthesis. The sphere of musical folklore includes genres associated with certain ritual or ceremonial actions. Some genres, such as lullabies, girl and lyrical songs, having undergone minor changes, have retained their functional meaning to the present. Others, for example, the *Kushtdepdi* song-dance rite, having passed a long evolutionary path, transformed and received a new interpretation. Such genres as rain rites, divination, and labor songs almost completely disappeared from living practice and were preserved only thanks to the activity of folklore groups [1, 184].

Studies of leading musicologists, including V. Uspensky, V. Belyaev, N. Abubakirova, Sh. Gulliev, M. Gapurov, are devoted to the systematization of Turkmen folklore genres [14]. From our point of view, the classification of musical folklore genres should be based on the functional purpose of a particular genre. So, among all the genre diversity, two main groups can be distinguished - these are ritual-ceremonial and everyday folklore. Each group in turn is divided into a number of subgroups.

The first group includes genres performed at family-tribal or national holidays, for example, *Novruz*, *Oraza*, *Kurban Bayrams*. All these genres are associated with a certain rite (hence their name), are strictly regulated in time and have a specific set of ritual actions.

Genres performed in everyday life belong to the second group. This includes lullabies, labor, lyric and play songs, which can be performed at any time and are not related to specific circumstances. By the nature and theme, the tunes of everyday songs are close to ritual.

With the exception of Akhal (the central region of Turkmenistan) and Lebab (the southeastern region), where the tradition of female performance on the dep (a kind of tambourine) is popular, most of the folklore genres among Turkmens are performed by young women and girls, not involving musical instruments.

The compositional structure of the genres of folklore is closely connected with the poetic basis of the poems on which they are performed. Most of the folklore songs are based on quatrains, whose equally complex lines are organized in whole with the help of rhyme. Organization of stanzas is carried out both within each stanza and within the limits of the whole poem. "The smallest musical form of Turkmen women's songs is a melodic construction equal to one line of the poem. Then follows a melodic construction equal to a half-stanza (two lines), and, finally, a construction equal to an entire stanza (quatrain)" [11, 91].

Most of the Turkmen songs are separate types of couplet form. As you know, a stanza form is called a couplet if the same musical stanza is repeated with different stanzas of the text [3, 112]. Being one of the most common in vocal music, the couplet form is inextricably linked with folk art. The repetition of the same musical material with different lyrics goes back to the oldest genres of folk music. In Turkmen folk songs, the couplet form can be modified in the form of expansion due to refrains, the words of which are often composed in a different verse size than the main text of the song. In terms of poetic structure, in the records of V. A. Uspensky three basic formulas are revealed - *aaaa*, *abab*, *abcd* - revealing the use of poetic rhyme [10, 28]. In some cases, a changing structure can play the role of a refrain, along with which it is also possible to use insert words - exclamations at the end or middle of individual lines of quatrains.

A vivid example of the song and music of the Turkmen people is the *Kusht-depdi* dance, whose origins go back to the pagan rites of their ancestors. The evolution of the genre originates from dhikr - a sacred ritual that took place among most peoples of Asia and the Caucasus. In contrast to the meditative practice of the Sufis, the Turkmens used dhikr for the purpose of spiritual purification. Nowadays, the ceremony has transformed into a new entertainment genre, characterized by complexity. The impact of the ritual, in which one can find the representations of ancient fire worshippers, is especially evident in collective performance. All

movements had a functional purpose. The act of devotion began with meditative prayer and ended with an ecstatic climax. Modern dance includes several parts (*Bir depim, Uch depim, Divan, Sedrat, Zem-zem, Oturma ghazal*), each of which has its own melodic-rhythmic basis [2, 12]. The main attributes of the cycle are the high emotional tone of performance, trampling and characteristic cries. In terms of structure, a couplet form is also used here, relying on a fourteen-stage poetic line.

Another dance genre has firmly established itself in musical folklore - *Chapak* or *Chapak-Karsak* (which means “hit, clap”). It is known that even before the emergence of musical instruments, people accompanied their songs and dances by clapping, which later served as an incentive to create a number of percussion instruments. The dance of Chapak is performed to the accompaniment of *dep* (a type of tambourine), in which the performers are women. Samples of ancient statues of women dancers can be found on the friezes of Parthian rhytons (II century BC), horn-shaped ritual vessels made of ivory, covered with bas-relief images of musicians and musical instruments. Images of girls dancing and playing the tambourine vividly resemble modern Chapak dance performers, which speaks of the relationship of the Parthian tambourine with the Turkmen *dep*[4, 78].

In modern times, the *Chapak* dance has acquired a cheerful character and is performed at holidays and weddings. It is performed by older women and young girls. However, centuries ago, this ritual symbolized a fierce battle with the enemy. Bouncing and moving, women made a clap over their heads, performing a rite to the point of exhaustion. In the ideas of their ancestors, with their ritual, women helped husbands and brothers to maintain fortitude in a real battle. The dance includes several parts, each of which is based on a specific rhythmic formula.

One of the most common genres of oral folk art is *Khuvdi's* lullaby. The melodies of the songs differ in melodic terms both in individual regions and within the same family. The compositional structure of the lullabies is a verse based on a seven-syllable quatrain, in the last lines of the verse a typical refrain “*khuv*” is introduced. In addition to songs addressed to children, Turkmen have a number of genres performed by children. Among them are melodic counters performed by children during games. In the roll calls *Aiterek-Gunterek* and *Yagysh lagar geldy*, melodious tunes are widely used. The basis of these genres, which are of great educational importance, is also a couplet form.

To this day, the labor songs of *Degirmenchi* and *Hovlum*, performed when working on a manual mill and milking a cow, have been preserved. They also use a couplet form, however, in the melodic and structural respect, these genres are less developed. All songs are smaller in range and are distinguished by unpretentious melodies and ease of performance. *Lyale's* lyric songs are an original genre of everyday folklore, popular in all corners of Turkmenistan. Varieties of the genre (*Damak Lale* (or *Bogaz Lale*), *Dodak Lale*, *Diz Lale*, *Aegin Lale*) are performed solo or by a

group of girls, and contain motor-action elements. Structurally, Lyale is characterized by a couplet form. A feature of the genre is that with the huge variety of poetic texts used, its musical basis remains unchanged [6, 77]. In many samples, the completion is in the nature of a refrain, which is based on the “Lyale, wei Lyale” turn.

An amazing alloy of various ceremonial acts and folklore genres is a Turkmen wedding. Along with ritual activities, wedding ceremonies combine songs, games, jokes, traditional ritual quatrains, proverbs and sayings. Turkmen wedding songs reflected the nomadic life of the Turkmen, their tribal customs [13, 153]. The images of nature appearing in poetic metaphors are a modification of the ideas of the ancestors of the Turkmen about three worlds: the upper, middle and lower. The symbol of the world tree is known to all Turkic peoples as the middle world, the image of the river symbolizes the underworld. An echo of the most ancient beliefs are the categories of fire found in poetic texts. Thus, according to the ideas of the ancient Türks, earth, water, air and fire constitute the four initial essences of the universe. The concept of “Turkmen wedding” combines an incredible number of ethnic variations; each genus is distinguished by local peculiarities peculiar only to it, among which there are main general points of the wedding ritual. Each step of the ceremony, from the time of the matchmaking to the wedding fun, is associated with special honors, in which a deep ethical meaning is put. There are three stages in Turkmen wedding folklore: pre-wedding, the actual wedding and the post-wedding period. On the territory of Turkmenistan, the wedding repertoire is represented by such genres as girl songs “Noi-Noi” and “Ejejan”, comic musical compositions “Yar-yar”, “Olen”, “Donem”, “Yarovjan”. The couplet form is traditionally used as a basis of all these genres.

In general, despite the genre variety of Turkmen folklore, structurally, most varieties are coupled form. The peculiarity is that the quatrains, which form the basis of female songs, in most cases, do not have an internal connection between themselves. Thanks to this, it is possible to play the same quatrain to different melodies. This feature is widely used in the professional art of Turkmen bakhshis.

Unlike the genres of folklore, the art of folk artists is highly developed in terms of content and compositional form. The art of Turkmen bakhshis that has come down to us through the oral route requires high performing skills and is defined as professional music of oral tradition. The concept of *bakhshis* combines a singer (*tirmechi*), an instrumentalist (*sazanda*) and an epic storyteller (*deschanchi*). Each direction characterizes its repertoire and arsenal of performing capabilities.

The specific living conditions in the desert and the isolation of the Turkmen tribes left their mark on their material and spiritual culture. As a result of this, five performing schools were formed in Turkmenistan, each of which has its own style features. Listening to an unfamiliar bakhshis, you can accurately determine which school it belongs to. At the same time, the interaction of the poetic text and the melody, the metro rhythm, the shaping in all local schools have more common features than differences.

The bakhshis repertoire is characterized by a wide variety of genres and forms. This includes instrumental pieces that are complex in compositional and melodic terms, performed on musical instruments (dutar, gijak and tuyduk), as well as numerous folk songs [12, 63].

According to the content of the song, bakhshis can be characterized as lovingly lyrical, edifying, patriotic, historical. A special place in them is occupied by songs of love content written on the verses of the classic poets Mollanepes, Zelili, Sadi, Mätäji (“Owadan gelin”, “Gözleriň”, “Zülpüň”, “Söwdügim”). One of the means of expressing lyrics is to sing the beauty of nature, which is associated with the image of love (“Meñzär bagyň gülüne”, “Saba boldy”, “Torgaý guşlar”, “Seýle gideli”). The songs of this group include those whose titles include female names (“Ogulmeňli”, “Maýagözel”, “Dilber”, “Ak ýüzli Maralym”). In the bakhshis repertoire, a great place is occupied by songs of philosophical content to the words of the poet and thinker Makhtumkuli Fraghi [8]. There are songs of a satirical and comic nature, as well as songs on religious motives, in which words of prayer are used as lyrics (“Ilalladyr”).

In terms of structure, most of the songs of Turkmen bakhshis are various versions of the couplet form. The bakhshis songs are distinguished by the close connection of poetry and music, the use of two versification systems - *Barmak* and *Aruz*, as well as a rich metro-rhythmic and intonational structure. Turkmen poetry is replete with a variety of types of structure of the verse, from the couplet to the tenth, the main ones are *mesnewi*, *ghazal*, *rubayi*, *goshg*, *murapbag*. “Judging by the songs, the people musically thought not with separate sounds, but with separate intonation complexes, rhythmic cells, chants, turns, phrases, all of which complexes are remembered, transmitted and applied from memory in the folk tradition exclusively by word of mouth. The accuracy of the transmission of each sound in such a context is not only impossible, but also not necessary” [7, 43].

Another feature of the structure of the verse in the songs of Turkmen bakhshis is the repetition of the second line in the fourth line of the quatrain. This repetition is called “refrain” and is typical of most Turkmen songs. The couplet form in the repertoire of folk artists is represented by two varieties: with and without chorus. The contrast between the verse and the chorus is achieved by such means as tempo, fret, rhythm, melody. The difference is most pronounced if the chorus is an independent section with equal verse. In their songs, bakhshis usually use 2-4 stanzas of a poetic text, which, depending on the form of the poem, can consist of two, four, five or more poetic lines. Melodic stanzas are always delimited from each other and form independent parts of the work - couplets. The whole song is composed of sequential, relatively equal in length verses.

Therefore, the basis of the formation of bakhshis songs is couplet. An indispensable attribute is instrumental accompaniment, which plays a special role in

the shaping of songs. Often there are moments of purely instrumental sound or in combination with traditional throat technics *juk-juk* and *humlemek* [5, 105]. Often, along with the main verses, there are extensive vocal and instrumental additions that form an independent section in the form.

Thus, the folk song is the most important component of the folklore and oral-professional work of the Turkmen people. The genres of musical folklore that we examined and the varieties of bakhshis songs demonstrate their strong support for all sorts of verses. With a simplified version of folklore genres, Turkmen bakhshis convincingly reveal their musical and constructive abilities, manifested in the ability to use the peculiar structural features of folklore and classical poetry in the shaping of performed songs. The widespread use of various techniques of vocalizations, additional words and exclamations associated with the desire for independence of melodic development, contribute to enhancing the emotional expressiveness of songs and the formation of peculiar forms.

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提高农业组织粮食生产的经济效益

**IMPROVING THE ECONOMIC EFFICIENCY
OF GRAIN PRODUCTION IN AGRICULTURAL ORGANIZATIONS**

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抽象。 生产成本的计算是农业生产经济效率的关键指标。 它综合了各方经济活动，积累了所有生产资源的使用成果。 降低成本是任何社会，每个行业，企业的主要和重要任务之一。 生产成本水平取决于利润额和盈利水平，公司的财务状况和偿付能力，扩大再生产的速度，采购水平和农产品零售价格。

关键词：组织，生产，成本，收入，利润，盈利能力。

Abstract. *The calculation of production costs is a key indicator of economic efficiency of agricultural production. It synthesized all parties of economic activities, accumulate the results of the use of all production resources. Cost reduction is one of the primary and important tasks of any society, every industry, businesses. The level of cost of production depends on the amount of profit and level of profitability, the financial condition of the company and its solvency, the pace of expanded reproduction, the level of procurement and retail prices for agricultural products.*

Keywords: *organization, production, cost, revenue, profit, profitability.*

Introduction

Crop is the most important branch of agriculture. It provides the population with food and some raw materials industries. Grain production is one of the main directions in the development of the crop. Grain farming is the basis of agricultural production. The state grain economy has a decisive influence on the development of agriculture and increasing national economic welfare. The level of grain

production depends on the needs of the population in the raw materials, and also creation of necessary state resources. In addition, highly developed agriculture plays a large role in the rise of beef and dairy cattle, swine and poultry. The volume of grain production depend on the level of its cost, the amount of profit, level of profitability, the financial position of the company, solvency of farms and other economic indicators [2].

Material and Methods

Agricultural specialization of the organization is focusing its activities on the production of one or more types of competitive commodity production, the production of which there are better conditions [3] (Fig. 1).

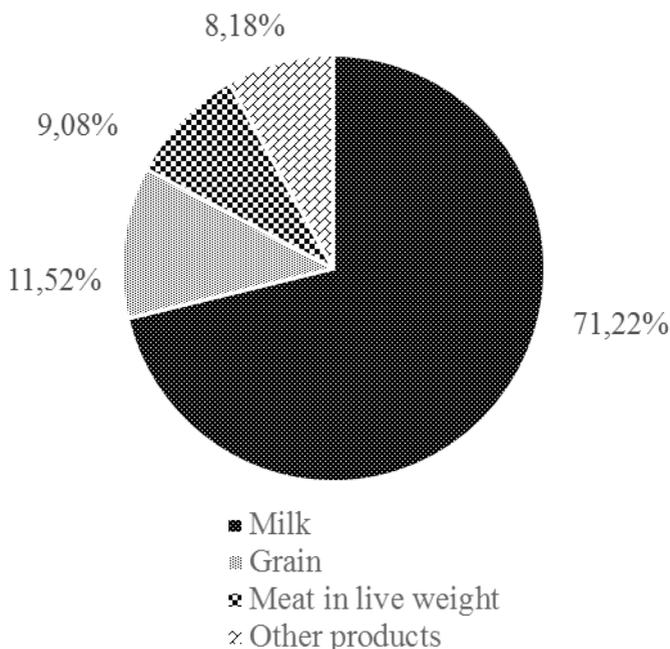


Figure 1 – Structure of commodity production for cash proceeds in the limited liability company the tribal plant «Bolshemurashkinsky» in 2018

Accordinging figure 1 shows that the share of revenue from the sale of milk in the structure in 2018, made up of 71,22 %, grains of 11,52 %, meat in live weight of 9,08 %, other products 8,18 %.

The cost of production is a key indicator of economic efficiency of agricultural production. It synthesized all parties of economic activities; accumulate the results of the use of all production resources (table. 1).

Table 1 – Analysis of production costs in the limited liability company the tribal plant «Bolshemurashkiy»

Index	2014		2015		2016		2017		2018		Deviation (+, -)
	thou. rub.	%									
Costs, including wages with deductions for social needs	45850	100	53934	100	57963	100	101355	100	115736	100	69886
seeds and planting material	3895	8,5	4250	7,88	3021	5,21	5104	5,04	5646	4,88	1751
fertilizer	9796	21,37	8956	16,61	8286	14,30	9045	8,92	10180	8,80	384
chemical means of plant protection	6945	15,15	3201	5,94	5705	9,84	6792	6,70	5476	4,73	-1469
Oil products	1132	2,47	2131	3,95	5396	9,31	6962	6,87	3885	3,36	2753
insurance	2700	5,89	6171	11,44	5716	9,86	12502	12,33	18766	16,21	16066
Main means	411	0,9	394	0,73	0	0,00	443	0,44	0	0,00	-411
Other costs	4957	10,81	8159	15,13	4147	7,15	5899	5,82	7447	6,43	2490
	16014	34,93	20672	38,33	25692	44,32	54608	53,88	64336	55,59	48322

Table 2 – Financial results of grain selling in the limited liability company the tribal plant «Bolshemurashkinsky»

Index	2014	2015	2016	2017	2018	Deviation (+, -)
Gross grain production, hundredweight	74316	73897	98373	94617	107322	33006
Volume of realization, hundredweight	35825	27963	30789	50735	35447	-378
Product level, %	48,21	37,84	31,30	53,62	33,03	-15,18
The total cost of sold products, thou rub.	21569	20934	17734	31098	31396	9827
The cost of 1 quintal of sold grain, rub.	602,07	748,63	575,98	612,95	885,72	283,65
The price of realization 1 hundredweight, rub.	701,74	862,43	904,25	801,44	772,08	70,34
Revenue – total, thou rub.	25140	24116	27841	40661	27368	2228
Profit (+) loss (-), thou rub	3571	3182	10107	9563	-4028	-
Profit (+), loss (-) 1 hundredweight, rub.	99,68	113,79	328,27	188,49	-113,63	-
Rentability (+), loss (-) of selling, %	14,2	13,19	36,30	23,52	-14,72	-

From table 1 it is seen that in the limited liability company the tribal plant «Bolshemurashkinsky» the sum of the costs of production of grain increased by 69886 thousand RUB. It happened as a result of increased costs of labor deductions on social needs on 1751 thousand RUB., seeds and planting material 384 thousand RUB., chemical means of plant protection in 2753 thousand RUB., the oil at 16066 thousand RUB., the contents of the main funds in 2490 thousand RUB., other costs 48322 thousand RUB. Should be noted that the decreased amount of fertilizer in 1496 thousand RUB., insurance 411 thousand RUB. The cost structure for the analyzed period is slightly changed. In 2018, the largest share in the structure of costs in the limited liability company the tribal plant «Bolshemurashkinsky» took the other cost of 55,59 %, the lowest chemical means of plant protection of 3,36 %.

The financial results of the organization's activities are characterized by the amount of the profit and level of profitability. Profit represents the difference between revenues and total cost of goods sold. So, the more the organization implements value-added products, the more profit you will get, the better its financial condition. Therefore, financial results of activities should be explored in close connection with the use and sale of products (table. 2).

According to the table 2 shows that the volume of sales of grain production in the limited liability company the tribal plant «Bolshemurashkinsky» for the period from 2014 to 2018 fell to 378 thousand RUB. The level of marketability for the same period decreased by 15.18 %, however, its value is 33,03% in 2018 suggests that 33,03 % is commodity, and 66,97 % is used in agriculture to other on-farm goals.

In 2018 the organization received a negative financial result from the sale of grain. The level of loss stood at 4028 thousand RUB. per 1 hundredweight 113,63 RUB. The level of loss of sales in the amount of 14.72 % indicates that 1 RUB. of revenue from sales of grain accounted for 15 kopecks loss from the sale.

Results and Discussion

Efficiency of grain production is characterized by a system of natural indicators: yield, grain production per unit area of arable land and others. To improve the efficiency of grain production are the search for unused potential opportunities for improvement of end results of production (increasing agricultural production).

Identification of reserves increase of crop production should be carried out in the following directions: expansion of acreage, improvement of their structure and increase crop yields. Potential and unused reserves of the acreage determined in the analysis of land use (including agricultural use of the land occupied by shrub, reservoirs, wetlands, roads and driveways, etc.).

A significant reserve of increasing production in crop production is to improve the structure of sowing areas, which is, increasing the share of higher yielding crops in the total sown area. To calculate the impact of this reserve is first necessary to develop a more optimal structure of crops, and then compare the actual amount of product possible, which will be obtained with the same total the actual area, the actual crop yields, but improved the structure of crops (table. 3).

Table 3 – Reserve of increase of grain production by improving the structure of crops in the limited liability company the tribal plant «Bolshemurashkinsky»

Crop culture	Structure crops, %		Area, ha		Harvst for 5 years, hundred weight	Production volume, hundredweight, with structure crops	
	Fact	Possible	Fact	Possible		Fact.	Possible
Winter crops	57,14	51,43	2000	1800	17,18	34360	30924
Spring cereals	38,57	41,43	1350	1450	24,82	33507	35989
Bean	4,29	7,14	150	250	25,30	3795	6325
Total	100	100	3500	3500	22,40	71662	73238

The data in table 3 show that the increase in the share of spring cereals to 41,43 % and bean to 7,14 % of the total sown area of grain crops will allow to increase grain production and to the reserve due to the improvement of cropping pattern in size 1576 hundredweight.

Significantly improve the financial results of grain production organization will reduce the cost of production. Calculate the reduction in the cost of grain by increasing production (table. 4).

Table 4 – Reserve cost reduction by increasing grain production in the limited liability company the tribal plant «Bolshemurashkinsky»

Type of product	The reserve increase production, hundredweight	Actual cost of 1 hundredweight, RUB.	The reserve increase production in terms of cost, thousand RUB.	Share of conditionally fixed costs in the cost structure, %	Amount of additional production costs, thousand RUB.	Reserve cost reduction, thousand RUB.
Grain	1576	671,96	1059,01	40	635,40	423,61

In table 4 it is seen that a reserve increase of grain production in hundredweight 1576 will allow the organization to lower the total amount of the cost of grain 423,61 thousand RUB. over the reserves to reduce the cost of 1 hundredweight of grain will amount to RUB. 268,79. Given the fact that the level of marketability of grain in the studied organization is to 33.03 %, with the increase in grain production in hundredweight 1576 will increase the volume of sales on 520,55 hundredweight.

Reducing the identified reserves to reduce the cost of 1 hundredweight of grain to the possible sales volume in the organization under study we define the reserves to reduce the amount of loss on sales at the expense of reducing the cost of grain ((table. 5).

Table 5 – Reserve for increasing the amount of profit due to reduction the cost of grain in the limited liability company the tribal plant «Bolshemurashkinsky»

Type of product	Reserve reduction cost of 1 hundredweight of grain, RUB.	Possible volume of grain sales, hundredweight	The reserve reduction of the amount of loss, thousand RUB.
Grain	268,79	520,55	139,92

From table 5 it follows that the potential for increasing grain production and reduce the cost of grain will allow the organization under study to reduce the amount of the loss from the sale of grain on 139,92 thousand RUB.

Conclusion

Grain production has been and remains the basis for the development of the total agricultural production of Russia. The grain problem has always been one of the main in the national economy of Russia. Russia has historically been one of the world's largest producers and exporters of grain, and now it occupies a prominent place in the market of grain crops. In modern Russia the grain industry remains high in the agricultural sector on the strategic and socio-economic significance. Russia needs a national grain policy, which should be economically interested state and all entities of the grain market [1].

Over a five year period of specialization in the limited liability company the tribal plant «Bolshemurashkinsky» can be described as a dairy and grain. in the limited liability company the tribal plant «Bolshemurashkinsky» the sum of the costs of production of grain increased by 69886 thousand RUB. In 2018, the largest share in the structure of costs in the limited liability company the tribal plant «Bolshemurashkinsky» took the other cost of 55,59 %, the lowest chemical means of plant protection of 3,36 %. In 2018 the organization received a negative financial result from the sale of grain.

In conclusion, the study was defined growth reserves of grain production and reduce its cost, and increasing the amount of profit from the sale of grain. Improving the structure of grain crops will allow the organization to obtain an additional 1576 hundredweight of grain. The total amount of the cost of grain can be reduced to a 139,92 thousand RUB. and to reduce the amount of the loss from the sale of grain on 139,92 thousand RUB.

Acknowledgements:

Necessary information for research is taken from the annual accounting (financial) statements for 2014-2018, production and financial plans, primary documents, accounting registers, used by the special economic literature.

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利用池塘生态系统生物量的饲料生长澳大利亚小龙虾的经验
**EXPERIENCE OF GROWING AUSTRALIAN CRAYFISH USING
FEEDS FROM THE BIOMASS OF POND ECOSYSTEMS**

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抽象。开发了用于喂养澳大利亚红色小龙虾 *Cherax quadricarinatus* 的饲料（起始饲料和生产饲料）的实验配方。开发配方的独特性是由于当地原料的添加剂根据幼虫和幼鱼的营养需求（复杂的后期幼虫期 - 在蜕皮和快速形成几丁质的时候）和育种者（同时开发生殖）系统产生可行的后代）。在制剂中更换矿物质自来水时的实验批次饲料符合以下特征：物品的高质量，营养饲料活性 - 100%，饲料适口性 - 100%，饲料颗粒不被侵蚀和沉积，负浮力。基于当地原料的饲料比市场上出售的澳大利亚小龙虾饲料便宜几十倍。

关键词：澳大利亚小龙虾，饲养，繁殖，配方，饲料，盆地，池塘。

Abstract. *The experimental formulas of feed (starter feed and productive feed) intended for feeding Australian red crayfish *Cherax quadricarinatus* are developed. The uniqueness of the developed formulations is provided due to additives from local raw materials according to the nutritional needs of larvae and juveniles (a complex post-larval period – at the moment of molting and rapid formation of chitin) and breeders (while developing the reproductive system to produce a viable offspring). Experimental batches of feed when replacing the tap water for mineral one in the preparation meet the following characteristics: high quality, nutritional feed activity of the objects – 100 %, palatability of feed – 100 %, feed pellets are not eroded and deposited, negative buoyancy. Feed based on the local raw materials in tens times cheaper than the feed for the Australian crayfish, presented on the market.*

Keywords: *Australian crayfish, feeding, breeding, formulas, feed, basins, ponds.*

Introduction. At present, the feeding of Australian crayfish *Cherax quadricarinatus* is carried out using expensive universal feeds, and there are no specialized feeds of Russian manufacturers at all. As a result of this, in the transition of mass production of crustaceans to various cultivation systems, including intensive ones, one of the main problems was the small assortment of compound feeds and their high cost, which naturally entails a rise in the cost of marketable products of Russian aquaculture enterprises.

This problem, which occurs in the cultivation of red-clawed Australian crayfish *Cherax quadricarinatus*, defined the main emphasis in this work - to develop effective formulations and feeding technologies and, in addition, to create a line of starting and production feeds based on them that are more effective than “universal” formulations.

The development of the feed formulation is based on the physiological characteristics of the cultivated object — Australian red-claw crayfish *Cherax quadricarinatus* — a promising, economically viable freshwater aquaculture object with excellent consumer qualities [1].

Material and methods. The high effect of the developed TechSA feeds with the addition of components of the local raw material base for Australian crayfish was morphometrically confirmed and evaluated by the main indicator of the average daily growth rate of Australian crayfish:

$$A = [(M_f / M_i)^{1/t} - 1] * 100,$$

where A - average daily growth rate, %; M_f and M_i – final and initial mass, g; t - duration of the experiment, in days.

For data processing, standard descriptive statistics methods were used, as well as analysis of variance - the most common parametric statistical method for comparing means. In the process of data processing, the software was used by Microsoft Excel 2016 and STATISTICA 13.2. We used the one-factor and two-factor versions of the analysis of variance, confidence intervals for the average values, and also the significance of the differences between the means in the samples were calculated for the significance level $p < 0.05$.

Testing and development of TechSA feeds for Australian crayfish was carried out in the innovation center of the Astrakhan State Technical University "Bioaquapark - Scientific and Technical Center for Aquaculture". Australian crayfish of various masses served as the object of research; it should be noted that larvae and juveniles were obtained on our own. The biomaterial was contained in 400 liter containers. with artificial aeration and filtration, as well as heated water and separate cages in them, equipped with shelters for houses. Dry food composition technology included the processes of preparation, grinding, production of granules and grits. The completely dried granules after applying fat to them, according to the recipe, were a finished product that was fed to crayfish after preparation or storage in a special container [2]. The control groups were grown on branded Tetra feeds with a content of protein of 43%, fat - 8%, fiber - 2-4%, enriched with vitamins and minerals and Sera Crabs Natural with a protein content of 25%, fat - 5%, fiber - 5%, JBL - a universal food suitable for growing euryhaline crustaceans with a high content of algae and wood fiber. The qualitative composition of these feeds (components of animal

and vegetable origin), as well as literature data, served as the basis for the creation of experimental formulations of starter and production feeds for Australian crayfish. Instead of water, a mineral solution with a high calcium content was used in the preparation of the feed; an additive based on biomass of zooplankton of plant and animal origin of pond ecosystems was included in the composition of the starting feed [1].

Table 1 - Formulations of TechSA feed for Australian crayfish

Components	TechSA Crayfish Start	TechSA Crayfish Pro
Fish Processing Waste	+	+
Meat and bone meal	+	-
Gammarus	+	+
Daphnia	+	+
Wheat flour	+	+
Vitgrass	+	+
Parsley	+	-
Tarragon	+	-
Celery	+	
Carrot	+	-
Garlic	+	-
Wood fiber	+	+
Calcium	+	+
Fish fat	+	+
Yeast	+	+
Mineral premix	+	+
Biomass	+	+
Probiotic	-	+
Crude protein	45	50
Fat	8	8
Cellulose	5	7

Results. To maintain the stability of the conversion of Australian crayfish from pond conditions to winter conditions for artificial conditions, TechSA Crayfish Pro food was developed with the introduction of a probiotic preparation that normalizes the physiological functions of resident microflora, establishes the dominant group of bacteria, thereby providing additional digestive enzymes, and places a microbial barrier against pathogenic organisms [3]. As a result of the study, it was found that the average daily growth rate for growing animals on the appropriate TechSA Crayfish Pro feed was 6 times faster than for counterpart.

For a detailed analysis of the differences between the averaged growth rates for breeders, a two-way analysis of variance was performed. In this case, the type of food (JBL and E2 - TechSA Crayfish Pro) and sex (code 1 - males, 2 - females) were considered as influencing factors (Fig. 1)

In accordance with the data presented, it can be easily seen that individuals grown on the appropriate TechSA Cryfish Pro feed are characterized by a relatively higher growth rate compared to using the common winter feed for pond fish JBL.

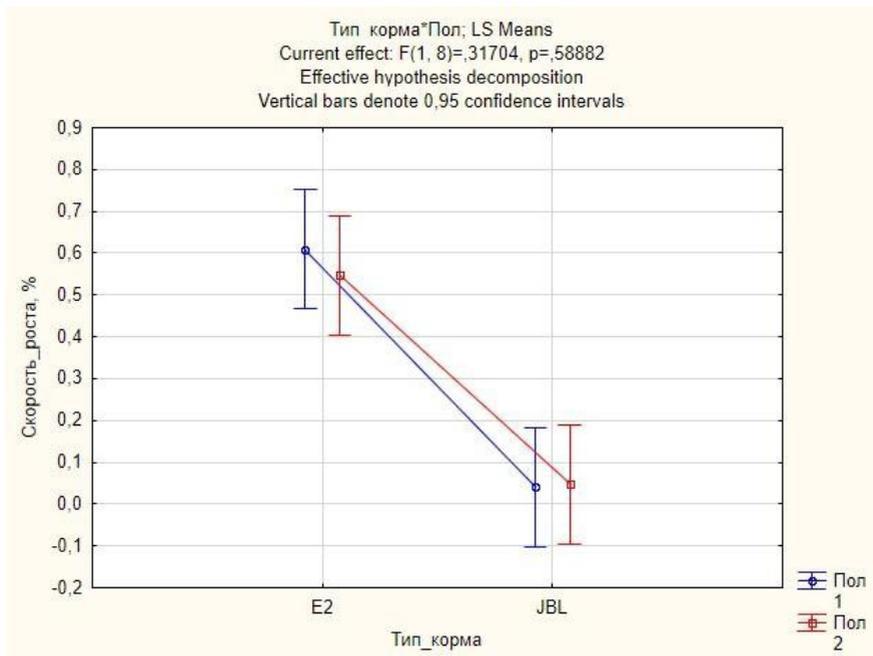


Figure 1 - Visualized results on the growth rate (1 - males, 2 - females)

From the above figure, demonstrating the results of the analysis, we can conclude that there is a significant difference in the means between the samples. The content of producers in the experimental feed (E2) provides a statistically significant excess of the growth rate over the same indicator when using JBL brand food, with respect to the sex factor, no statistically significant differences in the growth rate were identified.

Table 1 - Analysis of the significance of differences in a posteriori comparison of the studied groups (E2 – TechSA Cryfish Pro)*

Feed type	Sex	0,04	0,4667	0,61	0,54667
JBL	♂		1,000000	0,001148	0,002534
JBL	♀	1,000000		0,001244	0,002765
E2	♂	0,001148	0,001244		1,000000
E2	♀	0,002534	0,002765	1,000000	

* – significant differences are shown in bold

The observed effects in the case of each type of food are not statistically significantly different for males and females, information on the detected statistically significant differences for all studied groups is given in the table below (Table 1).

According to the results of a statistical analysis of the growth rate of Australian crayfish individuals, we can draw a reliable conclusion about the significant advantage of the TechSA Cryfish Pro experimental feed over the counterpart, since the developed feeds provided a significantly higher growth rate, statistically significantly different from the indicators for individuals grown using the JBL brand.

In the course of studies, it was also found that the introduction of TechSA Cryfish Pro additional feeding had a positive effect on growth rates, increase in the number of juveniles for 4 months of growing in ponds when using production feed, respectively, in relation to the control (without additional feeding) was 127%, survival amounted to 90%. A significant influence on the growth of Australian crayfish had the fact that small areas of the pond on the western side were overgrown with higher aquatic vegetation, various macrophytes, which were represented by species of cattail and sedge.

A distinctive feature of the post-lacquer period of crustaceans is characterized by the rapid formation of chitin and the deposition of inorganic salts, first of all, the oral appendages harden, which allows the crayfish to immediately begin to eat feed- sources of calcium nutrition. That is why TechSA based on natural dietary supplements with a high content of polysaccharides and calcium, necessary for the exoskeleton, had a positive effect, significantly exceeding the growth rate of individuals.

Young, raised on TechSA Cryfish Start and its counterpart had a high growth rate, unlike other age groups. The results of comparing sample average growth rates of juveniles using analysis of variance did not reveal significant differences in growth rate between groups of juveniles grown on Tetra branded feed and TechSA Cryfish Start.

The first special starting feed TechSA Cryfish Start was developed based on the biomass of pond ecosystems, which had a positive effect during active molting, which made it possible to consider it interchangeable with counterparts.

To get an accurate idea of the effect of TechSA Cryfish feed on growth rate, juvenile measurements were subjected to analysis of variance. In this case, one-way analysis of variance was used, so the influence of the factor "Feed Type" was studied. The results of a variance analysis of the effect of feed type on the growth rate of juvenile Australian crayfish are presented in Figure 2.

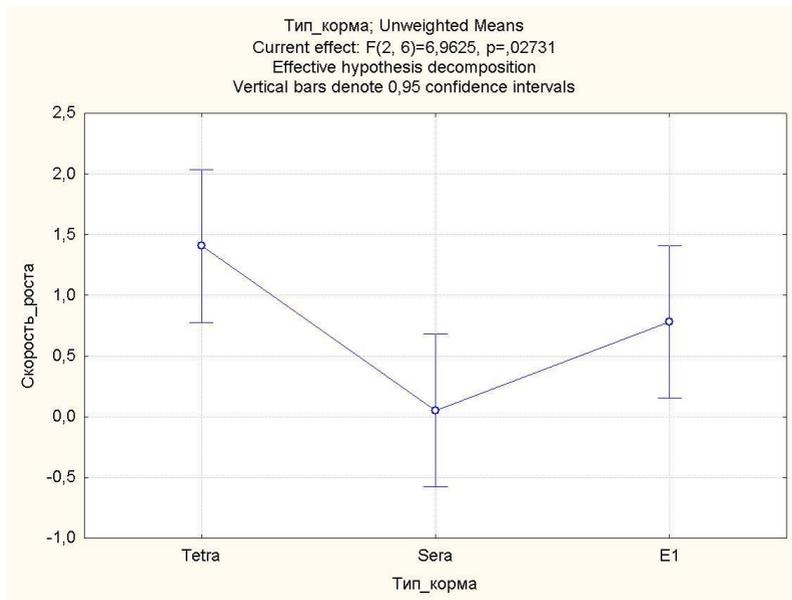


Figure 2 - Results of the growth rate of juveniles. E1 - TechSA Cryfish Start

The results of a posteriori comparison of the analyzed groups are shown in table 2.

Table 2 - Analysis of the significance of differences in posterior comparison of juveniles*

Feed type	1,41	0,05	0,78
Tetra		0,03	0,41
Sera	0,03		0,27
E1	0,41	0,27	

* - significant differences are shown in bold

The data in this table clarify the visual representation of the differences, it is obvious that in the case of juveniles significant differences in growth rate are observed between individuals grown on Tetra and Sera feeds, while for individuals grown using Tetra feeds, a higher growth rate is clearly observed.

The juveniles grown on the Tetra control feed had a growth rate slightly higher, unlike other age groups, however, the comparison of sample average growth rates of the juveniles using ANOVA did not reveal significant differences between the groups of juveniles grown on the Tetra feed and TechSA Cryfish - Start. analogues of Tetra and Sera crabs natur are significantly different, brand producers recommend additional feeding from time to time to the second feed, and this is an additional cost.

Thus, the results of using the TechSA Cryfish Start formulation of starter feed for juveniles during the active molting period make it possible to consider it interchangeable with feed counterpart, it is fundamentally permissible to completely switch to feed from local raw materials. Such substitution will significantly reduce the cost of feeding, not only not affecting survival, but in most cases not slowing down the growth rate. Consequently, this study can become the theoretical basis for the widespread use of technologies for the use of production and starting feed of the TechSA Cryfish line.

Characteristics of the TechSA brand feed for Australian crayfish:

– TechSA Cryfish Start is intended for feeding in early ontogenesis - a starting feed of directed action during active molting for larvae and juvenile crustaceans, granule size up to 3 mm. The main components are of animal and vegetable origin. Nutritional properties: protein content - 45%, fat content - 8%, fiber content - 5%. TechSA Cryfish Start feed meets the needs of the body of larvae, juveniles in a difficult post-larval period at the time of molting and the rapid formation of chitin.

– TechSA Cryfish Pro is intended for feeding individuals during the transfer from pond conditions in basin conditions for the further formation of broodstock and obtaining viable offspring, granule size > 3 mm, feeding is done by eating. Nutritional properties: protein content - 50%, fat content - 8%, fiber content - 7%. Adequacy of the quality and properties of the feed is confirmed by microbiological analysis. TechSA Cryfish Pro provides a high degree of adaptation to artificial conditions.

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在热采矿中打击蒸汽突破

FIGHTING STEAM BREAKTHROUGHS IN THERMAL MINING

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Engineer

Oil Titanium Production Center "LUKOIL-Engineering" LLC

抽象。考虑了一种在热采矿过程中对抗蒸汽突破到活跃矿井工作的方法。

当切断未使用的矿井工作时，不可能从注入区域控制其中的蒸汽突破。通过它们的坍塌消除了工作，产生了高度可渗透的蒸汽运动区域。从清算或隔离开口到现有开口的突破比注入区域的突破更具灾难性。

描述了用于分离保守地雷的现有方法。

分析了现有绝缘系统的缺点。

提出了一种通过产生强制冷凝区来对抗蒸汽突破的系统。

关键词：热矿开发；蒸汽爆发；强制冷凝水蒸气；采矿隔离。

Abstract. *A method for combating steam breakthroughs into active mine workings during thermal mining is considered.*

When cutting off unused mine workings, it is impossible to control steam breakthroughs in them from injection areas. The elimination of the workings by their collapse creates highly permeable zones of steam movement. A breakthrough from liquidated or isolated openings to existing ones is more catastrophic than a breakthrough from injection zones.

Existing methods for isolating conserved mines are described.

The analysis of the shortcomings of existing insulation systems is carried out.

A system for combating steam breakthroughs through the creation of forced condensation zones is presented.

Keywords: *thermal mine development; steam breakouts; forced condensation of water vapor; mining isolation.*

Currently, the development of the areas of the production blocks of the Yaregskaya area of the Yaregskoye oil field is carried out using the technology of steam and thermal impact on the formation. From the surface, to a depth of 140 to 180 meters, vertical shaft barrels were made to a network of mine workings on a tuffite horizon. Production blocks descend into the oil reservoir, where an open collection of oil is carried out, draining the reservoir in the gravity flow regime.

Rock transportation from the place of mining operations on rail tracks, the transport of oily liquid to the points of delivery to the surface, the removal of outgoing contaminated heated volumes of air, the movement of personnel and the movement of equipment and tools is carried out through a network of mine workings.

So, the introduction of new areas of the oil reservoir adjacent to the exploited production blocks into heating leads to a significant increase in steam breakthroughs in auxiliary workings on the tuffite horizon. These heat sources negatively affect the quality of the mine atmosphere, worsening it in terms of thermo-physical parameters.

In a fractured rock mass, isolation from breakthroughs of steam into the mine atmosphere is an expensive measure, since the zones of mass unloading from rock pressure, the zones of erecting insulating seals are not an obstacle to the spread of water vapor, and measures to isolate the entire surface of workings are expensive and are applicable only in stable rocks, since the displacement of the rocks during thermal expansion in the region of the voids of the workings has a destructive effect on the stubborn support. The use of insulating compositions in the oil-bearing formation did not have a positive experience due to insufficient adhesion of sandstone with an oil film. Also, one cannot ignore the presence of expansion of the rocks during the absorption of water, which, as the experience of mine development shows, can destroy concrete seals several meters thick. In addition, one should take into account the fact of the presence of gas in the oil reservoir, which will be actively released into the space behind the insulation, which can lead to the formation of explosive gas concentrations, which, when carrying out repairs on underground wells or fasteners, will create additional risks for workers and the production facility.

Considering that the experience of thermal mine development is widest only at the Yaregskoye field in the Middle Devonian stratum, where sandstone interbedded with clays acts as a reservoir, it is necessary to find a way to combat steam phenomena that takes into account the specifics of the issue listed above. As a solution to the problem, one can consider the option of forced condensation of water vapor by reducing its internal energy by heat removal.

To determine the amount of energy needed for diversion, it is necessary to estimate the amount of water vapor erupting from the steam chamber of the formation. This calculation can be done by analyzing the indicators of humidity and temperature of the air supplied to the mine workings and emanating from them, which can also be done at the place of steam breakthrough, measuring the temperature and humidity characteristics of the air stream before and after the breakthrough.

After analyzing the amount of heat that comes with steam breakthroughs, one can apply an increase in the volume of air supplied to mine ventilation, which is a measure suitable only if there is a significant supply of ventilation system resources.

As a means of heat dissipation, one can consider industrial water circulating through the technological water supply systems. Ordinary water at a standard temperature is able to condense seven times smaller by weight the amount of dry water vapor. To use this property, the following solution is proposed.

When isolating the mine workings for the purpose of conservation or cutting off from the mine shaft ventilation network, an insulating seal is erected (position 1).

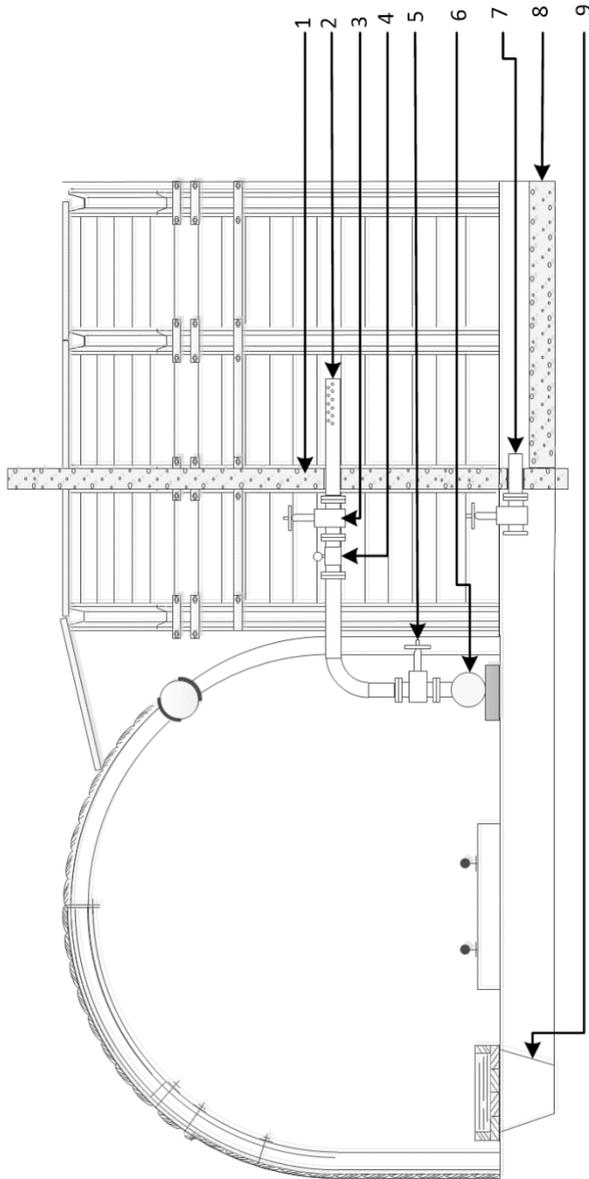
The seal is left during construction or a hole is drilled after construction. A pipe is installed in this hole (position 2), perforated from one end, this end from the side of the unused mine. A control device (item 3) is connected to the pipe, which is connected to the pipeline (item 6) through the flow meter (item 4) and the shut-off device (item 5). A hole is also made in the lower part of the seal below the level of the bottom of the mine, which is also equipped with a pipe without perforation and a control device (item 7).

Upon receipt of steam in an isolated mine, water is supplied to the perforated pipe and water is sprayed in the area of steam accumulation. Steam condensation occurs due to the transfer of phase transition energy to the sprayed water and, as a result, a decrease in pressure in the spray area. As a result of a decrease in pressure, non-condensed vapor begins to tend into the spray zone. In this way, steam breakthrough is prevented into the used mine through the rocks in which the insulating seal is mounted.

Condensate and sprayed water will accumulate on the sole of the isolated mine near the lintel and will enter the drainage ditch, the level of which should be higher than the drainage ditch behind the seal. This can be achieved by filling it with slurry or concrete. The accumulated liquid is removed through a pipe or hole mounted in the lower part of the lintel to the drainage system (item 9).

The calculation of the amount of steam, as well as its degree of dryness, is carried out by automatically or manually measuring the temperature and flow rate of the liquid flowing through the lower tube, as a result of which data are obtained for calculating the required amount of injected water.

The efficiency of water use depends on the quality of the spray, which is regulated by the geometry of the perforations. If it is necessary to replace the perforated pipe (item 2), it is possible to both lower the nozzle (item 7) of the sprayer analog to condense the steam for the repair period and stop the steam injection to this development section. The need for automation of this system is determined based on the volume of incoming steam and the financial capabilities of the enterprise.



构建最简单的六边形晶格的立方体发生器矩阵
**BUILDING THE MATRIX OF CUBE-GENERATOR
OF THE SIMPLEST HEXAGONAL CRYSTAL LATTICE**

Fomin Denis Vasilyevich

Postgraduate

Eremin Ilya Evgenievich

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抽象。考虑形成简单六边形晶格的立方体发生器的三维矩阵描述的问题。提出了一种方法，该方法基于使用该晶格的双组分立方或四面体模型用粒子填充立方体发生器的空间，并应用均匀的三维网格。在分析双组分立方模型的基础上，确定了网格参数。

关键词：晶格参数，紧致矩阵法，六方晶格，六角形合成元，六角形金刚石，立方体发生器。

Abstract. *The problem of forming a three-dimensional matrix description of a cube generator of a simple hexagonal crystal lattice is considered. An approach is proposed based on filling the space of the cube-generator with particles using two-component cubic or tetrahedral models of this crystal lattice, and applying a uniform three-dimensional grid. Based on the analysis of the two-component cubic model, the grid parameters are determined.*

Keywords: *crystal lattice parameters, compact matrix method, hexagonal crystal lattice, hexagonal syngony, hexagonal diamond, cube generator.*

Introduction

An important aspect of research and development of substances in a condensed state is the determination of the structural parameters of these substances, allowing to predict the properties of the obtained compounds. One of these parameters is the crystal lattice compactness coefficient [1-6].

When calculating the structural parameters of the crystal lattices of cubic syngony, in particular, the Madelung constant and compactness coefficient, the compact matrix description method proved itself well. This method allows to repeatedly reduce the amount of source data needed to perform the corresponding calculations, significantly simplify the calculation process itself. Which, in turn,

allows to process large fragments of the crystal lattice of the test substance in the same or less time, and therefore - to obtain more accurate data than other methods for describing the crystal structure [7-8].

But this method of description is based on the symmetry properties of the unit cell of cubic syngony. To apply it to the crystal lattices of other syngonies, it is necessary to identify counterparts of a unit cell of a cubic shape - cubes-generators for them.

A cube generator is a fragment of a crystal lattice that simultaneously has the following properties: 1) has the shape of a cube, 2) allows to restore an crystal of arbitrarily large size by translating itself into vectors collinear to its edges and equal in magnitude to them [9-10]. At the same time, for crystalline structures belonging to non-cubic syngonies, the cube generator can be much larger than their real unit cells.

In works [10–13], two-component tetrahedral and two-component cubic crystal lattice patterns of hexagonal diamond belonging to the wurtzite structural type are developed and analyzed. On their basis, the existence of a cube generator of a given crystal lattice is shown in works [14–15] and its parameters are determined. Thus, it becomes possible to apply the method of compact matrix description to the crystal lattice of hexagonal syngony.

Definition of parameters of a three-dimensional grid

It is important to note that the basis for the application of the compact matrix method is a three-dimensional matrix that describes the arrangement of particles in the cube-generator. The three-dimensional matrix describing the position of particles in the cube-generator will be a direct and equivalent mapping of the cube-generator. Three-dimensional matrices can be compared with a grid: rows and columns of a matrix are grid strings. Accordingly, if there is a particle at the intersection of the grid strings in the space of the cube-generator, then information about this particle should be at the intersection of the corresponding rows and columns of the three-dimensional matrix. Naturally, the distance between the strings of the grid should be such that, on the one hand, all the particles present in the space of the cube-generator fall exactly on the intersection of these strings, and on the other, so that the matrix size is minimal.

Considering that the crystal structure of hexagonal diamond consists only of carbon atoms [16-17], the three-dimensional matrix of the cube-generator will be filled with the symbols “0” and “1”. The symbol “0” will indicate the absence of a particle, and “1” will indicate the presence of a particle in the corresponding nodes of the grid. We will use a uniform grid, that is, the distance between its strings is always the same everywhere. This will allow us to always easily and unequivocally switch from an element of a three-dimensional matrix to a point in three-dimensional space. So, for example, if we consider the coordinate sys-

tem used by us, the location of the cube-generator in it, and accordingly number the matrix elements, then the element located in the l -layer, i -row, and g -column will correspond to a point in three-dimensional Cartesian space with coordinates $(gk; lk; ik)$, where k is the grid step.

Thus, in order to obtain a three-dimensional matrix describing the cube-generator, it is necessary to superimpose a grid on this cube with a certain step. Then - go through all the nodes of the grid and write down information about the presence and absence of particles in them in the form of a matrix. In this case, the grid should be oriented in the same way as the cube-generator and the axis of the coordinate system (see Fig. 1); and the grid step should be such that all particles of the cube-generator fall into its nodes.

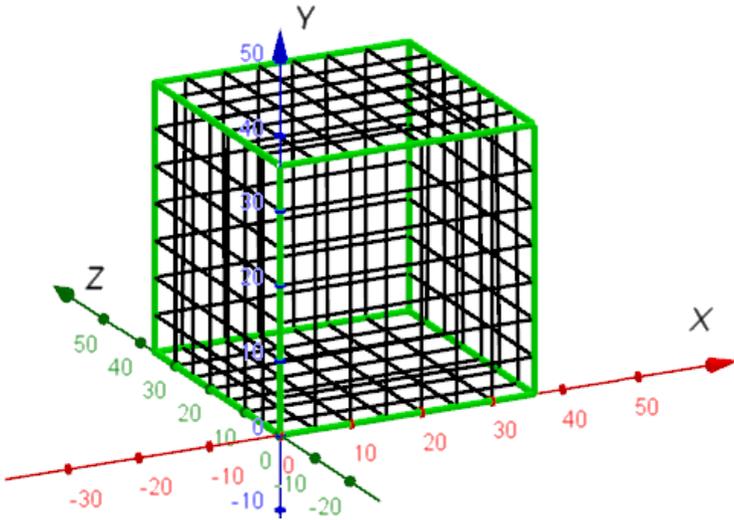


Figure 1. Diagram of the mutual arrangement of the cube-generator and the grid in the selected coordinate system

To determine the grid step, it is necessary to consider the arrangement of particles in C - and K -cubes, which are the basic elements of the two-component cubic model described in work[11]. Let the *TFPAERGO* C -cube be located as shown in Fig. 2. Carbon atoms are located at the vertices F, E, A, G and at point J . The coordinates of these points are as follows: $F(0; 3; 3)$, $E(0; 0; 0)$, $A(3; 3; 0)$, $G(3; 0; 3)$. Let a be the edge length of a given cube, then the coordinates of the point J can be calculated using expression (1):

$$J = F + \frac{\vec{FO}}{|\vec{FO}|} \cdot \frac{a\sqrt{3}}{2} = (0; 3; 3) + \frac{(3; -3; -3)}{3\sqrt{3}} \cdot \frac{3\sqrt{3}}{2},$$

$$J = (0; 3; 3) + (1,5; -1,5; -1,5) = (1,5; 1,5; 1,5).$$
(1)

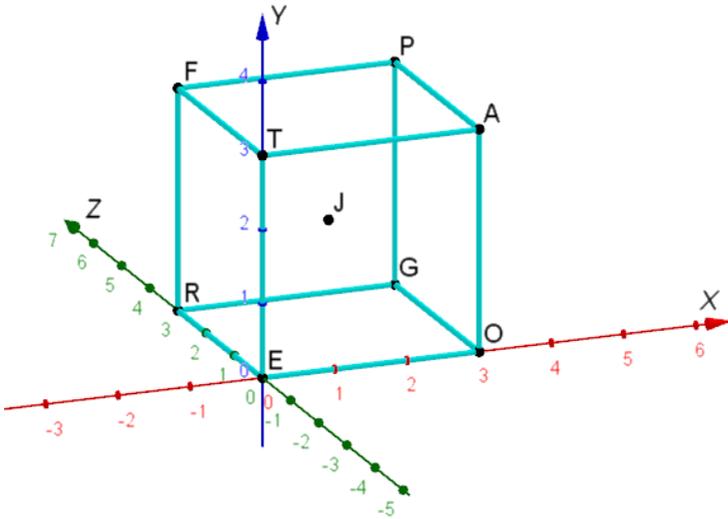


Figure 2. TFPAERGO C-cube in the selected coordinate system

Consider a K -type cube. Let the cube $W'G'Z'DWGZV'$ be located as shown in Fig. 3. Carbon atoms are located at points A, B, C, D, J' . The coordinates of these points are as follows: $A(0; 3; 1)$, $B(3; 3; 4)$, $C(3; 0; 1)$, $D(4; 4; 0)$. Calculate the coordinates of the point J' according to the expression (2) [11]:

$$J' = D + \frac{\vec{DG}}{|\vec{DG}|} \cdot \frac{a\sqrt{3}}{2} = (4; 4; 0) + \frac{(-4; -4; 4)}{4\sqrt{3}} \cdot \frac{3\sqrt{3}}{2},$$

$$J' = (4; 4; 0) + (-1,5; -1,5; 1,5) = (2,5; 2,5; 1,5).$$
(2)

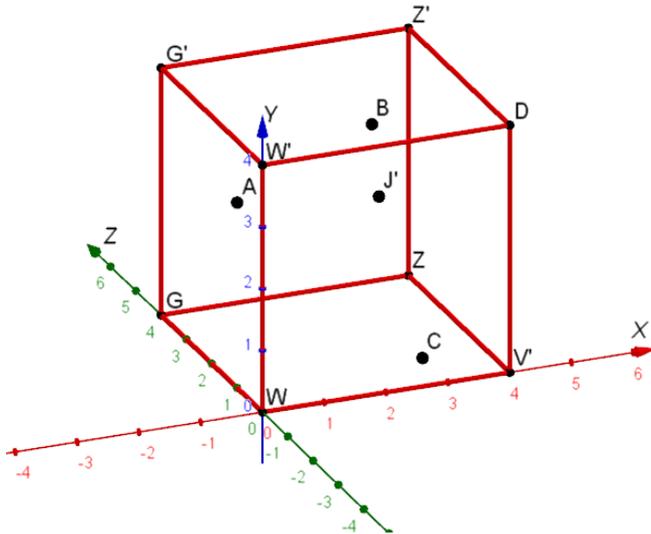


Figure 3. $W'G'Z'DWGZV'$ K-cube in the selected coordinate system

Thus, it becomes obvious that the grid spacing should be half that of the conventional unit used, taken as the length of a unit segment. Then, due to the orientation of the cube-generator and the grid in space, all particles of the crystal lattice will exactly fall into the nodes of the grid, whatever type of cube we take and wherever it is located.

Now the task of obtaining a three-dimensional matrix describing the cube-generator will be to check for the presence of particles at points with coordinates from (0; 0; 0) to (36; 36; 36) in increments of 0.5 along each coordinate axis. This problem can be solved by filling the cube-generator space with the help of the developed two-component cubic or tetrahedral crystal lattice model described in work[12].

Conclusion

The method of compact matrix description of the crystal structure has established itself as an effective means of description, allowing the use of productive computational methods for calculating the structural and energy parameters of crystal lattices [1-6, 18-19]. Since this method is based on the symmetry of a cubic elementary lattice, its application to crystal lattices of a non-cubic syngony was considered impossible. However, works [14–15] showed the presence of an counterpart of a unit cell of a cubic shape for a hexagonal diamond lattice, which belongs to the wurtzite structure of hexagonal syngony. This means that it is possible in principle to apply the compact matrix description method to it and the numerical methods for calculating the structural and energy parameters of a crystal constructed on its basis.

The initial data for the compact matrix method is not the unit cell itself, but a three-dimensional matrix that describes it. A number of requirements are imposed on the formation of such a matrix, the main of which are: the possibility of a simple and unambiguous transition between the matrix and stereometric representations of the corresponding fragment of the structure, the inclusion in the matrix elements of all particles that are part of the described crystal fragment.

During the study, an approach was proposed to form a three-dimensional matrix of a cube-generator of a hexagonal diamond crystal lattice, the essence of which is to fill the cube-generator with particles using cubic or tetrahedral crystal lattice models and to apply a uniform spatial grid to the cube-generator. Based on the analysis of the two-component cubic model described in [11], the spatial grid parameters were calculated. In particular, its spatial orientation and cell size were determined.

The results obtained make it possible to directly proceed to the formation of a compact matrix representation of the simplest hexagonal crystal lattice and the development of methods for the numerical calculation of its structural and energy parameters. That will allow performing these calculations on the basis of larger fragments of crystals, as well as increasing the accuracy and speed of these calculations.

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