



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

Date:
November 19

Beijing, China 2019

上合组织国家的科学研究：协同和一体化
国际会议

参与者的英文报告

International Conference
“Scientific research of the SCO
countries: synergy and integration”

Part 2: Participants' reports in English

2019年11月19日。中国北京
November 19, 2019. Beijing, PRC



Materials of the International Conference
**“Scientific research of the SCO countries: synergy
and integration”**. Part 2 - Reports in English

(November 19, 2019. Beijing, PRC)

ISBN 978-5-905695-74-2

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。

作者对所引用的出版物，事实，数字，引用，统计数据，专有名称和其他信息的准确性负责

These Conference Proceedings combine materials of the conference – research papers and thesis reports of scientific workers. They examines tecnical and sociological issues of research issues. Some articles deal with theoretical and methodological approaches and principles of research questions of personality professionalization.

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



ISBN 978-5-905695-74-2

© Scientific publishing house Infinity, 2019

© Group of authors, 2019

CONTENTS

ECONOMICS

创新成功：市场或技术导向

Innovation success: market or technology orientation

Namitulina Angela Zakhitovna.....12

创建一个基于互联网的平台来实施EEU和中国成员国的商业构想：机遇与威胁
Creating an Internet-based platform for implementing business ideas of the EEU
and PRC member states: opportunities and threats

Urazova Kristina Aleksandrovna, Popova Anna Aleksandrovna,

Shamaev Anton Vyacheslavovich.....21

俄罗斯教育的竞争力：性质和指标

Competitiveness of Russian education: the nature and indicators

Fetisova Olga Vladimirovna.....28

PEDAGOGICAL SCIENCES

体育与体育领域专家与学生交际能力形成水平的分析

Analysis of the level of formation of communicative competence of specialists
and students in the field of physical culture and sports

Glebockaja Janina.....36

关于小学生的外语能力问题

On the issue of foreign language competence of primary schoolmates

Larionova Svetlana Olegovna.....41

学生实践是职业能力发展的一个因素

Student practice as a factor of professional competence development

Degterev Vitaliy Anatolyevich, Larionova Irina Anatolyevna.....47

SOCIOLOGICAL SCIENCES

现代世界中个人意识的信息安全问题

Problems of information security of individual consciousness in the modern world

Kolesnikova Galina Ivanovna.....53

PSYCHOLOGICAL SCIENCES

参加商业学前教育组织的儿童的社会交际能力的特征。

Features of socio-communicative competence of children attending commercial pre-school educational organizations.

Naumenko Marina Vladimirovna.....59

诊断学生的情绪舒适度，作为个人和专业适应的指标

Diagnostics of emotional comfort of students as an indicator of personal and professional adaptation

Avchinnikova Svetlana Olegovna.....70

ART HISTORY

汽车工业趋势对宝骏RM-5的影响

The influence of industrial design trends in the automotive industry on the example of BAOJUN RM-5

Medelets Nikita Aleksandrovich.....76

MEDICAL SCIENCES

儿童复发性支气管肺疾病的血红蛋白指数扩展特征

Features of the expanded hemogram indices for recurrent bronchopulmonary diseases in children

Makhmutov Ravil Fatkulislyamovich, Bobrovitskaya Antonina Ivanovna,

Makhmutova Asiya Ravilevna.....81

BIOLOGICAL SCIENCES

矿区城市化地区土壤污染特征

Features of soil pollution in urbanized territories of the mining region

Suyundukov Yalil Tukhvatovich, Khasanova Rezeda Firgatovna,

Semenova Irina Nikolaevna.....87

关于Zabaykalsky Krai水库中鱼类的生物入侵

About biological invasions of fishes in reservoirs of Zabaykalsky Krai

Gorlacheva Evgenia Pavlovna, Gorlachev Valerii Pavlovich.....93

慢性念珠菌病对Fabricius鸟袋免疫反应的影响

Effect of chronic candidiasis on the immune reactivity of the Fabricius bird bag

Shaihulov Rustem Raisovic, Mannapova Ramsiya Timergaleevna.....101

蜜蜂枯萎病对自然微生物群落的重要性

The importance of bee subpestilence for natural microbiocenosis

Mannapova Ramsiya Timergaleevna, Shaihulov Rustem Raisovic.....109

VETERINARY SCIENCES

羔羊生存力主要指标的动态

Dynamics of the main indicators of viability of lambs

Nekhaichuk Elena Valerievna.....117

GEOLOGICAL AND MINERALOGICAL SCIENCES

关于中黑海盆地和南里海盆地褶皱的成因

About the genesis of folding of the Central Black Sea and South Caspian basins

Pogorelova Elena Yuryevna.....123

关于低库拉凹陷内生产层下部分布的性质及其与油气的关系

About the nature of the distribution of the lower part of the productive stratum within the Low Kura depression and their relationship with oil and gas

Rzayeva Sevinj Makhmud, Abdullayeva Valida Gafar.....128

EARTH SCIENCES

形成用于监控农业土地的数字地图材料（以伊尔库茨克市为例）

The formation of the digital map material for monitoring of agricultural lands (on the example of Irkutsk city)

Ponomarenko Elena Alexandrovna, Sadkova Tatiana Semenovna, Kolomina Tatyana Mihaelovna.....132

AGRICULTURAL SCIENCES

大豆种子的播种质量和生化组成取决于除草剂和天然药物的使用

Sowing qualities and biochemical composition of soybean seeds depending on the use of herbicide and a drug of natural origin

Gretchenko Alina Evgen'evna, Mikhailova Mariya Pavlovna.....140

TECHNICAL SCIENCE

统计检验和Choletsky分解方法在多维实验数据分析中的应用

Application of the method of statistical tests and decomposition of Choletsky for analysis of multidimensional experimental data

Ushanov Sergey Viktorovich, Ogurtsov Dmitrii Alexandrovich.....146

自由容量不受控制地增长的危险

The danger of uncontrolled growth in free capacity

Sosnovy Mikhail Sergeevich, Malinichev Dmitry Mikhailovich153

俄罗斯和国外运输领域中关键信息基础设施对象分类方法的比较

Comparison of approaches to categorization of critical information infrastructure objects in the field of transport in Russia and abroad

Malinichev Dmitry Mikhailovich, Mochalov Vadim Vyacheslavovich157

Foreword

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

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

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

Fan Fukuan,

Chairman of the organizing committee of the conference

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

Full Professor, Doctor of Economic Sciences

前言

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

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

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

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

创新成功: 市场或技术导向
**INNOVATION SUCCESS:
MARKET OR TECHNOLOGY ORIENTATION**

Namitulina Angela Zakhitovna

Candidate of Economic Sciences, Associate Professor

Head of the Department of Economics,

Moscow Institute of Economics, Moscow

注解。除了对技术,经济,政治,社会,自然和文化的影 响外,这种称为工业革命的运动还导致了生产职能的专业化,伴随着专业化的兴起,从而分散和集中了产品和生产知识 新兴行业,例如 使营销人员最了解消费者和市场行为,使制造商最了解生产技术和技术,使产品开发人员最了解产品的成分。 价值是企业创造的。 顾客被认为是商品和服务的消费者,他们“摧毁”了生产者创造的价值 (Ramírez, 1999)。 因此,当时兴起的会计系统在较短或较长的折旧期间内将购置的资产折旧为零。

关键词: 创新, 投资, 营销, 预算收入, 借款。

Annotation. *Aside from the implications this had on technology, economics, politics, society, nature and culture, this movement called the Industrial Revolution also led to specializations in the production function, accompanied by the rise of professionalization, and thus fragmenting and concentrating product and production knowledge to the emerging professions, e.g. making the marketer the most knowledgeable on consumer and market behavior, the manufacturer knowledgeable on production techniques and technology, and the product developer the one who knows best what the product is made of. Value was created by firms. Customers were considered consumers of goods and services and they “destroyed” the value created by the producer (Ramírez, 1999). Accounting systems emerging at that time thus depreciated the value of what was acquired to zero over a shorter or longer depreciation period.*

Keywords: *innovation, investment, marketing, budget revenues, borrowing.*

Defining technology orientation and marketing orientation An innovation or technology philosophy asserts that customers will prefer those products and services that provide the greatest quality, performance and features. Managers in firms that enact a technology philosophy devote their energy towards innovation

– that is inventing and refining superior products, services and communications. In contrast a marketing philosophy contends that identifying the needs and wants of the target market, and delivering products and services that satisfy these is key to the attainment of organizational goals.

Managers in firms that enact a marketing philosophy apply their efforts to listening to, and reacting to customers – that is, the needs and wants of customers are the main focus of the firm’s endeavors. Market philosophy or orientation as an implementation of the marketing concept, that entails learning about customer needs, the influence of technology, competition, and other environmental forces, and acting on that knowledge in order to become competitive. The marketing concept requires that customer satisfaction rather than profit maximization be the goal of an organization. Based on extensive field interviews with managers and executives, Kohli and Jaworski categorized the activities to implement a marketing concept into three groups: organization wide collection of market information, dissemination of the information among functions, and organizational responsiveness to such information. These activities are posited to be prerequisites if the organization is to create superior products and services that respond to customer needs. Narver and Slater suggest that the market orientation of an organization involves three behavioral components of customer orientation – perceived as the most important one in innovation sense, competitor orientation and inter-functional coordination, and two decision criteria-long term focus and profitability. Innovation success requires a market orientation. A central feature of most studies of the industrial innovation process is their emphasis on the role of demand specification in determining success, i.e. the necessity for product characteristics to match the ‘user needs’ profile or ‘need satisfaction’. In defining innovation we’ve also seen that it is the market that determines whether something new is an innovation, or not. Statements such as “75% of successful innovations rise in response to the recognition of a need” are common, which is interpreted as an argument in favor of a ‘market’ rather than an ‘R&D’ bias in would-be innovative firms. Therefore, several scholars argue that a potential benefit of market orientation is that the firm is more likely to develop innovations that are compatible with the needs of customers. Customers may have more knowledge about their needs and a better understanding of relevant product or service requirements than the firm. This finding suggests that market orientation helps to reduce the chances of the firm producing innovations that require major behavioral changes on the part of potential customers for adoption. Because market orientation reduces the degree of incompatibility of the new product with customer needs, it is likely to enhance speedy adoption and success of innovations. Morgan et al. show that firms with high market orientation possess a greater organizational learning capability. Hurley and Hunt propose that market and learning orientation are antecedents to innovativeness. Han

et al. show that market orientation, particularly the component customer orientation, facilitates organizations' innovativeness, which in turn, positively influences performance. Therefore, scholars suggest that market orientation leads to successful innovation and higher organizational performance. A strong market orientation is also consistent with cycle time reduction. The product and service development literature also emphasizes the importance of market orientation; 6 Customer orientation is defined as the sufficient understanding of one's target buyers to be able to create superior value for them.

Research shows that a strong market focus and an effective marketing department are important correlates of powerful innovation performance. To successfully innovate, companies can spend the most money, hire the best engineers, develop the best technology, and conduct the best market research. But unless their research and development efforts are driven by a thorough understanding of what their customers want, their performance may well fall short — at least compared to that of their more customer-driven competitors. Huizenga reports that about 30 to 40% of the innovation's success is determined by listening to the customers. Cooper asserted that despite 25 years of research into why new products fail, product developers have not learned their lessons and continue to make the same mistakes in NPD that lead to failure.

One such mistake is that the Voice of the Customer (VOC) is still missing in new products. A study by Cooper et al. revealed that market research is the missing ingredient in many financial services firms. Malhotra et al. recall that the customer is missing in 30 to 40% of the NPD cases, including the financial services. A study in financial services by shows that the highly successful group follows the problem find-solve approach, where products are developed based on identified market needs and a formal screening process. John and Pavlidis researched the corporate banking market and found that in initiation activities there is strong evidence that leader banks adopt a predominantly market-based approach to identifying product innovation opportunities. They pursue initiation strategies that involve selecting markets on the basis of benefits sought by actual and potential clients. Barraba and Zaltman have expressed the issue well by stressing that such companies "listen first to the voice of the market" and only thereafter "to the voice of the company". The discussion: either market or technology orientation The relationship between market orientation and innovation is, however, a subject of debate. Several conceptual writings suggest that the adoption of the marketing concept philosophy stifles the development and marketing of original new products, and rather encourages the development of product modifications. For example, Hayes and Abernathy assert that market-driven strategies aimed at satisfying customers and reducing risk in the innovation process lead to less superior products in the long run. Atuahene-Gima found that market orientation has a significant negative impact

on product newness to customers in the combined sample and product sample. The rationale behind this argument is that customers are unable to articulate their future needs beyond current consumption experiences. Therefore the adoption of the marketing concept, with its emphasis on customers as sources of new product ideas, is unlikely to lead to breakthrough innovations. However, an empirical study by Lawton found that the adoption of the marketing concept had insignificant effect on innovation activities such as the use of customer-oriented sources of new product ideas and utilization of market research in idea generation and commercialization. Further, they found that it has insignificant influence on the degree of product newness, measured from both the firm and customer's perspectives. A number of researchers, as we have seen, argue the possibility that market orientation contributes to organizational performance through the new products it helps bring to market. In fact, ensuring organizational prosperity can be considered the ultimate goal of new product development efforts. Therefore, of research interest for some time, has been whether market orientation affects product innovativeness, i.e., the degree of a product's newness. Salomo et al.'s findings suggests that market orientation helps to reduce the chances of the firm producing innovations that require major behavioral changes on the part of potential customers for adoption, however, product newness to customers is significantly and negatively related to market success in all the samples.

With an increasing degree of innovativeness, potential customers are increasingly unable to articulate their needs and preferences in sufficient detail. As a consequence, market related risk increases, which again demands stronger customer or market orientation in order to cope with these critical resources. Market orientation is more strongly related to NPD performance when the product is an incremental one rather than a substantial innovation. These findings appear to contradict assertions that increased product newness enhances innovation performance. However, they reinforce the view that innovation success is contingent upon knowledge about customer needs and development of innovations closely related to the current resources of the firm. The links between market orientation and the degree of product innovation are far from being fully explained. The relationship between the three components of Narver's and Slater's conceptualization of market orientation and the development of innovative products, in particular, meets very mixed findings and arguments in the literature. For instance, Macdonald argues that getting close to a small number of the customer-base will reduce the amount of ideas coming from the customers, discouraging innovation. Consequently, Zhou et al. have recently argued that "the central issue of whether market orientation facilitates or impedes breakthrough innovation remains unanswered". The findings extend to what is appreciated about a firm's overall performance in the field of product innovation, the idea that a customer orientation is important to

fuel overall new-to-the-world product innovation. The conditional effect obtained in this study for customer orientation concurs with Lukas and Ferrell. Li and Calantone also observe that customer knowledge⁷ is related with new product advantage. However, these results run against findings and arguments that customer orientation may restrain product innovativeness. Augusto and Coelho also investigate the effects of market orientation in new-to-the world product innovation, but unlike other studies, they also examine how other variables like innovativeness and competitive strength interplay with market orientation to affect product development. Their finding, however, goes against some contentions in extant literature indicating that a competitor focus can lead to the development of me-too, rather than breakthrough, products. In fact, their finding apparently collides with that of Lukas and Ferrell (2000), who observed that competitor orientation negatively affects the introduction of new-to-the-world products. Authors explain this discrepancy by stating that Lukas and Ferrell have only considered the three components of market orientation, whereas they have considered additional explanatory variables, and several moderating effects. Notwithstanding, their approach accommodates the finding from Lukas and Ferrell, as it shows that, under certain circumstances, competitor orientation may have a detrimental effect on product innovation. Their results indicate that firm innovativeness and competitive strength are pure moderators. Implementing and maintaining a market orientation Narver and Slater suggest that the market orientation of an organization involves three behavioral components (customer orientation, competitor orientation and inter-functional coordination), and two decision criteria – long term focus and profitability. All research that has been done on the implementation of a market orientation has served to extend the concept of market orientation from being purely a business philosophy to representing the actions an organization pursues in relation to the marketplace. Several common characteristics are shared by these contributions including: a market orientation results in actions by individuals toward the markets they serve, such actions are guided by information obtained by the marketplace, and such actions cut across functional and divisional boundaries within the organization. A dominant view of organizational functioning suggests that organizational actions such as the degree of market orientation are inextricably linked to the organizational structures, systems and processes created to sustain them. For example, to properly Determine proper 3CI strategy Implement & maintain market/ customer orientation. Obtain thorough knowledge about and from customers. Effective customer contribution control the knowledge traffic from outside the organization, moving boundaries, e.g. multi-functional units, may be a remedy. While structural aspects of the organization may serve to foster or inhibit a market orientation, the existing literature has tended to focus on the processes used by an organization to accomplish organizational goals. This line of reasoning has been

proposed by Kohli and Jaworski, who suggest that organizational processes such as the manner by which employees are compensated and rewarded serve as antecedents to developing a market orientation. These organizational processes can either serve to enhance this development or be a roadblock which prevents such development. Three organizational systems of interest are the recruiting and selection system of personnel employed to carry out the strategic mission, the training system designed to provide employees with the skills necessary to carry out their specific tasks, and the reward and compensation system which serves to direct behavior toward the accomplishment of the business unit's goals and objectives. Certain types of individuals may be more or less prepared to carry out their job responsibilities with a strong sense of customer focus. Prior experience both in terms of education and work experience may permit one individual to assume more of a market orientation than another. Similarly, the training system can also serve to support a market oriented strategy. The desire to improve customer service often requires increasing employee sensitivity to customer needs and is often accomplished through formal employee development programs. In developing a market orientation, compensation and rewards can serve to reinforce the importance of satisfying customer needs and direct individual behaviors toward this goal. For example, compensation systems for production employees based on cost control is relatively less customer oriented than a compensation system designed to reward zero product defects. At the individual level, a strong market focus can provide a number of psychological and social benefits to employees. For example, managers in Kohli and Jaworski's study noted that a market orientation leads to a sense of pride in belonging to an organization in which all departments and individuals work toward a common goal of serving customers. They conclude by proposing that the level of market orientation is positively related to the esprit de corps, job satisfaction, and organizational commitment of employees. Ruekert examines the presence of market orientation in a large corporation with several business units and thus identifies the most important aspects in the development and implementation of a market orientation. He tested 23 items among business unit managers; the 23 items produced a very wide range of agreement from this sample of managers. The item which produced the highest level of agreement was the statement that management listens to the opinions of customers, to which 81 percent of the sample agreed. On the other extreme, only five percent of respondents agreed that the company invests in building market position for its products. Overall, the use of market information items as well as the implementation of market oriented strategy items generally produced higher levels of agreement than the items used to capture the development of a market oriented strategy. It could be argued that this reflects the necessity for interacting with customers either in terms of information or in the delivery of customer satisfaction, whereas the devel-

opment of a formal strategy tends to reflect an internal decision making process, in which alternative viewpoints also compete for management attention and support. For top management, Ruekert's study implies that the challenge of improving the market focus of the firm must be approached at the business level with the role of corporate structures and processes facilitating such an organizational transition. Corporate management may be well advised to conduct assessments of the current degree of market orientation across business units using an approach similar to this study in order to develop the diagnostic information needed to generate corporate level initiatives designed to improve the customer responsiveness at the business unit level. Interestingly, the factors which provided the next highest amount of differentiation between the highest scoring and lowest scoring businesses on the degree of market orientation were the organizational support processes of recruiting customer oriented personnel and the reward and compensation policies used to motivate and control business unit employees. Thus, the institutionalization of the value of customer sovereignty, through organizational processes, may be as important as the specific planning practices used by the business unit. Taken as a whole the findings suggest that the market oriented firm tends to possess a gestalt where different aspects of organizational behavior tend to fit together to provide superior customer responsiveness. One implication for managers interested in developing a market orientation is that changing a single element within this gestalt may have little impact on the organization. We therefore conclude this expose on the implementation of a market orientation in a firm with the proposition that the adoption of a market orientation is an organizational design activity that entails strategy, structure, systems, processes and staff recruitment and training, focused on obtaining and using information from customers; developing a strategy which will meet customer needs; and implementing that strategy by being responsive to customers needs and wants. This conforms to our design proposition that for an effective customer co-creation, a market orientation is imperative, because it provides the effective means to listen to and communicate with customers. Tools and techniques to support the implementation and maintenance of a customer orientation for innovation purposes The design proposition assumes that customer knowledge can be easily obtained. Davenport et al. propose to apply Customer Knowledge Management using one or more of the 5 styles of CKM, which are distinctively different practices, but not mutually exclusive. However, several studies show that knowledge needed from the customer can be difficult to access, reducing the chance for success when involving customers. In order to truly understand the customers, company managers must immerse themselves in the lives of their customers. Other studies teach us that radical and disruptive innovations do not lend themselves to involve the customer from the beginning, because of the fact that customers can't be knowledgeable about things

that do not yet exist, unless companies can find a means to access customers' tacit and latent knowledge or sticky information. It is not an easy task to depict when customers' knowledge is easy or difficult to access remark that this variable cannot be measured in a direct way, and postulate that it is determined by several factors, like the acquisition costs, the difficulty of identifying the customers, IP-sensitivity, speed of access, and such. In Appendix E we discuss CKM and its underlying techniques to access and assess customer knowledge. It is argued that access and assessment can be reached with special techniques that go beyond traditional market research. Based on these findings we propose to assess and customer knowledge with customer interviews, based on metaphors and analogies - using the Zaltman Metaphor Elicitation Technique (ZMETTM), see and outcome based principles. A technique to synthesize both knowledge acquisition approaches can be found in the customer journey approach. For online application the proposed tools can be integrated in netnographic methods (Kozinets, 1999). In several cases we have presented from practice, really novel and radical innovations have been developed due to the use of such CKM methods.

As for new service developments, customer co-creation has received less attention, as observed by recent academic studies, implying either a lesser occurrence of this phenomenon in service innovation than in product innovation, or an implicit assumption that customers already co-create services because of their participation in the production process of services. Whatever the real reason, customer co-creation is not a privilege for product innovations. And both business customers and consumers have proven to be susceptible to customer co-creation in new service development. And, as for governmental products and services, involvement of citizens in their development is becoming more and more common. Even public organizations have succumbed in the act of customer or user involvement in the innovation of new public services. Nevertheless, similar to NSD, research finds it surprising to find little evidence of stakeholder involvement in evaluative design of e-government projects. The role of citizens in policy and infrastructure design processes is mostly confined to commenting or voting on preconceived drafts. Citizens are, in other words, often consulted after the arrow has left the bow. Thus, an important chance for radical innovations is thrown away and the search process remains in a symptom-cure mode. Adopt a market and customer orientation strategy. Obtain thorough customer knowledge Use CKM-methods based on ZMET, OB, CustJourn. Reach latent and unarticulated needs Nevertheless, genuine participation, even at a late phase, can still trigger substantial incremental innovations in governmental or non-profit settings. Typically, we can see that customer involvement has been a kind of tradition in industrial technology settings, like defense, air and space technology, machine tools and equipment, business IT and software development, and such. Involvement in industrial settings has therefore

been an item of attention in several academic studies. Involvement of consumers, in contrast, has been limited for a long time to market research participation in its most passive form, until recent developments in information technology enable the emergence of participation modes like crowdsourcing and user generated content. But, strictly speaking, consumers have been co-creating for a longer time, mainly in marketing campaigns, e.g. “Complete this slogan ...”, “Find a name for this new product ...” Regardless of whether they are consumer products or industrial products, manufacturers normally benefit from customers’ joint innovation in the area of product design. As Prahalad and Ramaswamy put it: “To see and take advantage of these opportunities, we must suspend the traditional distinction between B2B and B2C customers. In the world of co-creation, we have to imagine every individual who interacts with the company as a “consumer,” whether that individual is a forklift operator, a pilot, a design engineer, a beautician, a clinical researcher, an instructor, a contractor, a paralegal or a civic worker. This perspective forces us to discard the artificial distinctions among enterprises and households. Furthermore, historically we have started with “B”—our business—and not the individual consumer. This company-centric view of value creation is deep-rooted, as it has been the very foundation of competition in the industrial . Sector, industry or type of offering seems in this respect irrelevant, but that does not imply that an organization can sit back and wait for its customers to contribute in NPD or NSD, neither to suffice with placing a call for participation and expecting customers to participate just because they feel empowered. Etgar proposes that, in order to achieve effective customer co-creation, the related product or service has to be customizable and important to customers, because these motivate participation. Arakji and Lang posit some limitations to the involvement of users in the creation of, for instance, digital music, video and games. They reason that technological toolkits are only helpful for products such as video-games that are distinguished by their heterogeneous and rapidly evolving consumer demands (von Hippel & Katz). When consumers have stable and comparable tastes, the firm can mass produce its product to benefit from economies of scale, without need for innovation toolkits that allow personalized product development. Furthermore, even if the toolkits are relatively easy to use, consumers must have a significant desire for personalized products for them to have enough incentive to dedicate the time and effort needed for the innovation process. Products or services that are of little interest and very commoditized may pose difficulties in interesting customers to participate. Customers need to see benefits to themselves in order to participate. In this respect, modern companies that have evolved from commodities to services and experience offerings have reached a level on which this does not pose a problem, as exemplified by the Douwe Egberts (a coffee producer) and LEGO (manufacturer of the toy bricks) cases in Chapter 5. This brings us to another aspect: the market characteristics.

创建一个基于互联网的平台来实施EEU和中国成员国的商业构想：机遇与威胁
**CREATING AN INTERNET-BASED PLATFORM
FOR IMPLEMENTING BUSINESS IDEAS OF THE EEU AND PRC
MEMBER STATES: OPPORTUNITIES AND THREATS**

Urazova Kristina Aleksandrovna

Senior Lecturer

*Institute of economics and management of the
Pacific National University*

Popova Anna Aleksandrovna

undergraduate

*Institute of World Economy and International Relations
Baikal State University*

Shamaev Anton Vyacheslavovich

Student

*Institute of World Economy and International Relations
Baikal State University*

抽象。在现代世界经济中，关键角色不是分配给国家，而是分配给超国家结构。从二十三世纪开始，从现代发展趋势的角度出发，实施最佳的宏观经济政策，开展有益的对外经济合作，并进行有能力的政治对话，只有全球化的领先国家才有可能。对于其他国家而言，未来不仅可以实现增长，而且可以实现发展，它与一体化进程和关键外国经济合作伙伴的有效选择完全相关。对于后苏联时代的国家来说，这意味着欧亚经济联盟内部的合作不断深化，与中国的合作进程也在扩大。

考虑到全球经济的后工业化和信息化趋势，以及需要增加EAEU国家的国民经济知识密集度，建议建立一个在线平台，以实施代表的业务理念相关整合协会和中国的国家/地区，可以作为进一步实现经济多元化的一种方式。

关键字。国际经济关系，外国经济自由化，发展中国家，东盟国家，中国，国民经济的高科技，创新，在线合作。

Abstract. In the modern world economy, the key role is assigned not to national, but to supranational structures. To implement the macroeconomic policy that is optimal from the point of view of modern development trends, implement beneficial foreign economic cooperation, and conduct a competent political dialogue independently in the XXI century is possible only to the leading countries of globalization. For other countries, the future, in which it is really possible to

achieve not just growth, but development, becomes exclusively connected with the integration processes and the competent choice of a key foreign economic partner. For the countries of the post-Soviet space, this means the deepening of cooperation within the Eurasian Economic Union, as well as the expansion of the processes of cooperation with China.

Taking into account the trends of post-industrialization and informatization of the global economy, as well as the need to increase the knowledge-intensiveness of national economies for the EAEU countries, a project is proposed to create an online platform for implementing business ideas of representatives of countries of the relevant integration association and China, which can act as a way to further diversify their economies.

Keywords. *International economic relations, foreign economic liberalization, developing countries, the EAEU, China, the high technology of the national economy, innovation, online cooperation.*

The current stage of development of the world economy, like all previous milestones in the evolution of the world economy, naturally has its own characteristics. Among the most significant of them are: globalization, integration, regionalization, transnationalization, post-industrialization, etc. It is becoming increasingly clear that the policy of protectionism, which at one time allowed the leading Western powers to get the most out of themselves is outdated. In the XXI century, the basis for building international economic relations of entities is based solely on processes within and external economic liberalization. The supranational institutions created at the end of the XX century, represented by international organizations and integration associations, do not allow countries to actively and openly defend their domestic producers. In fact, it turns out that at present the borders of countries are opened automatically and they are left face to face with the challenges and threats of the global economic space [4].

The greatest acuteness of this problem has long been experienced by developing countries, which, due to the rigidity of their own national economies and the preservation of the agrarian-industrial type of its development, are not able to independently go to the post-industrial stage of development, which, according to theories of its ideologists, determines the structure of the modern world order and promises the increment of a huge number of utilities. The respective states first fall into commodity dependence on producers of mass demand products, then turn into frank technological recipients and investment debtors, donors of labor resources. Absolutely imperceptibly, a gradual economic desertification begins within their state-territorial borders, resources go under the control of foreign capital, the country shifts to the lower orbits of concentric circles and, ultimately, becomes “replaceable”.

This scenario has already been lived by many commodity economies and, at present, it seems most likely for the countries of the post-Soviet space. Sensibly assessing the most probable dangers and threats, the leaders of the leading ones make a decision in 2014 on the need to combine efforts to preserve national comparative and create competitive advantages within the framework of the Eurasian Economic Union (EAEU). In addition, realizing the non-alternativeness of the processes of foreign economic liberalization, they rely not on the western, but on the eastern partner in the person of the People's Republic of China (PRC). Based on the intersection of not so much economic as political interests, the EAEU countries have a chance that this cooperation can not only deepen the traditional forms of foreign economic relations, but also diversify their economies [3].

In this context, investment ties established between the countries concerned, which could become the basis for the development of new areas of cooperation in the field of foreign economic and humanitarian partnerships, finance, infrastructure within the framework of Eurasian integration, as well as deepening the processes of cooperation of this supranational structure with PRC. The fact that almost all the EAEU countries have colossal experience of cooperation with this East Asian country, a huge joint partner base, and, most importantly, its galloping pace of industrial development, confirming the large capacity of the national economy, high solvent demand and favorable investment climate [2].

In particular, it is known that science in Russia still has significant reserves, that education is evaluated by experts from leading international structures as high-quality, the generated ideas are interesting, original and relevant. However, the commercialization of the results of intellectual activity remains an obvious problem. We propose to try to minimize it by expanding cooperation with China, which poses an increased demand for innovation [6].

We believe it is justified to create an international website for the interaction of youth (EAEU countries and the PRC), which is developing and is constantly looking for monetization options for projects (entrepreneurs) [5], as well as investors (primarily from the PRC) who are ready to provide financial assistance to interesting business ideas.

This cross-platform online platform will contain three sections of the site for entrepreneurs. The first section will be devoted to trainings on sectoral development, regional specifics, business management and the school curriculum. The second section will include two acceleration programs:

- for current entrepreneurs (they undergo an express training program under the guidance of mentors - current entrepreneurs);
- for future entrepreneurs (they undergo a training program under the guidance of mentors - current entrepreneurs).

The third section is a platform for existing entrepreneurs participating in the Community project.

The above sections can also become a platform for the implementation of international academic cooperation projects not only of Russian and foreign universities, but also of business structures, government institutions [1]

For investors, the proposed projects will be posted out on the website taking into account the preliminary assessment. They will be divided into categories and specifics in international languages; accompanied by business analysis, an online project window, investment history. Investors will be offered only the projects of the EAEU and PRC member countries in order to solve the problem of capital, technology and brain leak [8].

The mission of the project we are considering is to enter the leading position of the open online B2B platform for the EAEU and China. He pursues three main objectives:

- protection of national innovation markets of the EAEU and China from fierce competition from Western countries (explicit monopolists);
- deepening cooperation among the youth of the EAEU member countries in solving problems related to project financing;
- creation of a cross-platform online platform for solving international problems and writing business projects aimed at the economic development of the EAEU countries.

Among the main tasks, we considered it reasonable to name:

1. Creation of an international site in the format of a site for investors and entrepreneurs of the EAEU and PRC countries.
2. Conducting trainings for future and current entrepreneurs.
3. Creation of a club for entrepreneurs participating in the project.
4. Cohesion of entrepreneurs of different nationalities.
5. Dissemination of information about the created Internet site among the population of the participating countries.
6. Creation and search of interesting business trainings for site participants.

It is assumed that if the optimistic scenario develops, the project will be able to be launched within one year: by mid-2020, a website will start working that will be constantly improved and updated for more comfortable activities for both entrepreneurs and investors (Table 1), and after six months it will start to generate income.

In the event of a pessimistic scenario, the proposed online site will simply not be able to start work for reasons such as: the collapse of the EAEU and the deterioration of relations with the PRC, increased competition, and lack of access to the PRC's Internet space (Table 2).

Table 1.

Schedule for the implementation of the project "Internet platform for the implementation of business ideas of the EAEU and PRC member countries"

№	Event	Timing (dd.mm.yy)
1	Organizational Team Meeting	15.01.2020
2	Definition of the content of a business project. Drawing up a work plan. Distribution of duties	15.01. 2020-26.01. 2020
3	The study of public opinion and the determination of the relevance of a given problem	26.01. 2020- 30.01. 2020
4	Drafting a framework agreement, introducing representatives of youth associations	30.01. 2020- 7.02. 2020
5	Work on a site project	7.02. 2020- 19.02. 2020
6	Content Preparation	19.02. 2020- 20.03. 2020
7	Sketch Design and Prototyping	20.03. 2020-7.04. 2020
8	Development of layouts for all pages of the site	07.04. 2020-22.04. 2020
9	Layout and programming	22.04. 2020-29.04. 2020
10	Filling and testing of the site. Publication	29.04. 2020-04.06. 2020
11	Control over filling of the site with content	05.07. 2020- 15.01.2025

Note: compiled by the authors

Table 2

The risk matrix of the project "Internet platform for the implementation of business ideas of the EAEU and PRC member countries"

Probability of occurrence			
	0-35%	36-65%	66-100%
Low damage	Distrust on the part of entrepreneurs regarding their intellectual property		
Medium damage	Disinterest of investors in proposed projects	B2B "center" leaving in favor of competitors	
High damage	The collapse of the EAEU and the deterioration of relations with China	We are not the first to enter the market	Closed access to Internet space (China)

Note: compiled by the authors

It is worth noting that the project is quite complex, it has obvious weaknesses and threats (Table 3), however, it is consistent with the UN sustainable development goals: quality education; decent work and economic growth; industrialization, innovation and infrastructure, as well as the objectives of the strategy of innovative development of Russia until 2020: ensuring the openness of the national innovation system and economy, as well as Russia's integration into the global processes of creating and using innovations.

Table 3

SWOT analysis of the project "Internet platform for the implementation of business ideas of the EAEU and PRC member countries"

Strengths	Weaknesses
<ul style="list-style-type: none"> - free access; - the huge potential of business ideas; - the possibility of training for entrepreneurs; - minimum term for the search for an investor, star-taper throughout the territory of the participating countries; - the convenience of the site, etc. 	<ul style="list-style-type: none"> - limited number of participating investors and entrepreneurs; - relative long-term implementation of the project (creating a database); - lack of clear competitive advantages, etc.
Opportunities	Threats
<ul style="list-style-type: none"> - expansion of the geography of distribution; - use of materials of the best speakers; - advertising on federal channels, etc. 	<ul style="list-style-type: none"> - the appearance of competitors; - lack of full control over the relevant market; - collapse of the EAEU and the deterioration of relations with China; - China's reluctance to open its Internet environment for us and others.

Note: compiled by the authors

In addition, it corresponds to the prospects for further cooperation between the EAEU countries and China and, therefore, will be able to become one of the main linking of these re-gions in the scientific, technical and innovative spheres. As was emphasized at the Integration-2019 Eurasian Industrial Congress: "Creating a single digital space in industry and agribusiness, technology localization, as well as effective interaction in the scientific, technical and innovation spheres will become priorities for cooperation between the EAEU countries and China " [nine].

Also, taking into account all of the above, we believe that by expanding Russian-Chinese cooperation in the field of creating new information and innovation ties, Russia will be able to minimize threats and raise the level of its national competitiveness [7].

References

1. Baeva O. N. *Successful practices of academic cooperation as a prerequisite for the launch of joint educational projects* / O. N. Baeva, D. I. Khlebovich // *Eurasian integration project: civilizational identity and global positioning: materials of the Intern. Baikal. Forum, Irkutsk, September 20-21. 2018 / under the scientific. ed. E.R. Meteleva. - Irkutsk, 2018. - P. 7-15*
2. Karaseva V. A. *EAEU: prospects for cooperation with East Asian countries* / V. A. Karaseva, M. A. Balashova // *Actual problems of the development of the EAEU in the context of modern global changes: materials of the 1st All-Russian (national) scientific -Practical Conference, Irkutsk, December 13, 2018. - Irkutsk, 2019. - P. 151-157.*
3. Kozyrskaya I. E. *Conditions for the competitiveness of goods* / I. E. Kozyrskaya // *Formation of an effective economy: foreign experience, lessons for Russia: Coll. of scientific works - Irkutsk, 2005. - P. 149-155.*
4. Meshkova T.A. *Eurasian Economic Integration: Development Prospects and Strategic Tasks for Russia* // *Dokl. by Apr 20 Int. scientific conf. on the problems of economic and social development, Moscow, April 9–12. 2019 / T.V. Bordachev, K.O. Vishnevsky, M.K. Glazatova and others; res. ed. T. A. Meshkova; Nat. researched University "Higher School of Economics". — M.: Publishing. House of the Higher School of Economics, 2019*
5. Solodkov M. V. *Features of the development of small business in the conditions of the global economic system* / M. V. Solodkov, O. A. Chepinoga // *Actual issues of social development in the context of a civilizational approach: coll. of scientific works - Irkutsk, 2016. - P. 38-46.]*
6. Strel'yeva A.E. *The formation of the national innovation system of Russia on the basis of a long-term strategy of clustering the economy* // *Modern problems of science and education. 2014. № 1. URL: www.science-education.ru/115-12011 (28.10.2019)*
7. Tsvigun I. V. *Increasing Russia's national competitiveness in the context of the development of trade and economic cooperation with China* / I. V. Tsvigun, M. A. Balashova, Ya. P. Sukhodolov // *Baikal Research Journal. - 2015. - V. 6, № 5.*
8. Epova N. R. *Development of foreign economic cooperation between Russia and China in the Irkutsk oblast* / N. R. Epova // *Eurasian integration project: civilizational identity and global positioning: materials of the Intern. Baikal. Forum, Irkutsk, September 20-21. 2018 / under the scientific. ed. E.R. Meteleva. - Irkutsk, 2018. - P. 421-429.*
9. *For the industrial breakthrough in the EAEU, production cooperation and innovative projects are necessary* – [Electronic resource]– Access -<http://www.eurasiancommission.org/ru/nae/news/Pages/16-10-2019-2.aspx>

俄罗斯教育的竞争力: 性质和指标

**COMPETITIVENESS OF RUSSIAN EDUCATION:
THE NATURE AND INDICATORS**

Fetisova Olga Vladimirovna

*Doctor of Economic Sciences, Full Professor
Volgograd State University*

抽象。本文讨论并阐明了“教育机构的竞争力”和“教育服务的竞争力”的概念。它证实了俄罗斯教育系统的竞争力由各个教育机构的竞争力组成的立场。通过分析评估教育竞争力指标的各种系统,我们可以得出以下结论:俄罗斯教育的全球竞争力应被理解为国内不同教育水平的教育机构提供符合国际标准并具有国际水准的教育服务的能力。在以下指标方面具有竞争力:提供国家创新发展的教育质量水平;提供教育服务的费用;实施的培训方法和形式,提供教育服务的条件,教育机构的声望等。

关键字:教育机构的竞争力,教育服务的竞争力,教育服务,教育服务的竞争力指标,教育领域的政府战略目标。

Abstract. *The article discusses and clarifies the concepts of "competitiveness of educational institutions" and "competitiveness of educational services." It substantiates the position that the competitiveness of the Russian education system is composed of the competitiveness of individual educational institutions. The analysis of various systems for assessing the indicators of competitiveness of education allows us to conclude that the global competitiveness of Russian education should be understood as the ability of domestic educational institutions of different levels of education, to provide educational services that meet international standards and are competitive in terms of such indicators as: the level of quality of education providing innovative development of the country; the cost of providing educational services; implemented methods and forms of training, conditions for the provision of educational services, prestige of an educational institution, etc.*

Keywords: *competitiveness of educational institutions, competitiveness of educational services, educational services, indicators of competitiveness of educational services, strategic government objectives in the field of education.*

Being a predominantly economic category, the concept of competitiveness is successfully used to characterize any types of activities in those situations that suggest the possibility of comparing them according to certain criteria. So, in the opinion of Arzhanova I.V. it seems quite appropriate to equally judge the competitiveness of industrial products and sports teams, scientific theories and political parties or economic spheres of different states. This term represents only the most general characteristic of a particular object, denoting its most advantageous competitive characteristics, advantages that distinguish them from other “non-competitive” homogeneous objects [1, p. 50].

The use of the term “competitiveness” in relation to educational institutions involves determining the ability of an educational institution to ensure a higher level of quality and accessibility of education to compete in the educational services market [2].

Molochnikov N.R., Reutova I.V. and Lobovskaya T.A. consider the competitiveness of educational institutions as the superiority and potential ability of an educational organization to provide competitive services in the future without causing financial damage to its condition [3].

Zhdankina I.Yu. and Shamin E.A. they propose to consider the competitiveness of educational organizations through the competitiveness of graduates (namely, the totality of knowledge and skills at their disposal) in the labor market, the degree to which professional competencies obtained in the process of training are realized [4, p. 13-14].

Based on the considered definitions of the competitiveness of educational institutions, this concept can be considered as the organization’s ability to be distinguished among others in the aggregate of such indicators as the level of quality of education, the cost of providing educational services, the methods and forms of training that are being implemented, the conditions for providing educational services, the prestige of an educational institution, etc.

The competitiveness of an educational institution is largely determined by the competitiveness of educational services. The competitiveness of an educational service is understood as its ability to maintain competitive advantages and satisfy the specific needs of consumers of educational services due to a certain combination of the properties of this service [5].

Fishman L.I. indicates the advisability of using this term as a characteristic of the ability of a particular educational product to be selected by the consumer. Based on what, the term “competitiveness” makes sense to apply exclusively in the aspect of consumer behavior, recognizing that the competitiveness of educational services is determined by representatives of consumers and other persons who assist in making their choice [6].

The competitiveness of the Russian education system can be achieved through the implementation of an effective strategy for exporting educational services, which for many countries is a profitable sector of the economy, an important policy area and an indicator of social and cultural development, in the context of the internationalization of Russian education, ensuring an increase in its level and quality [7]. The Concept for the Export of Educational Services of the Russian Federation for the period of 2011 - 2020, developed by the Ministry of Education and Science of the Russian Federation with the support of the National Training Foundation, is aimed at achieving strategic government objectives in the field of education, the essence of which is as follows:

- increasing the availability of quality education, which should meet the requirements of an innovative model for the development of the domestic economy;
- improving the quality level, as well as the degree of attractiveness and increasing the level of competitiveness of the domestic education system, both in the regional and in the global educational space;
- formation of conditions for ensuring effective participation of the domestic education system in the global process of education development, etc. [8].

There are various approaches to the selection of methods and means for assessing the competitiveness of education, based on a combination of quantitative and qualitative indicators. So, Danilova S.V. suggests using the following system of indicators for assessing the competitiveness of educational services (Fig. 1):

Focusing on the future of world education is the main guarantee of the country's success in the development of human resources. It is for this reason that the first national goal presented in the Presidential Decree “On National Goals and Strategic Tasks of the Development of the Russian Federation for the Period until 2024” formulated the need to create conditions for ensuring the global competitiveness of national education, which also necessitates the inclusion of our country among the 10 world countries in terms of the quality of education. The output of this Decree was an incentive for the expert community and the reason for discussions about what to consider “global competitiveness”, as well as how to determine and measure it [10].

Focusing on the analytical materials presented by the Higher School of Economics, we accumulate and present information on the characteristics of the global competitiveness of Russian education in terms of the levels of the domestic education system:

1. Preschool education;
2. General education;
3. Secondary vocational education;
4. Higher education;
5. Continuing adult education [11].

Demand for graduates in the labor market	<ul style="list-style-type: none"> • Number of cooperation agreements concluded • Number of employed • Number of labor market inquiries about graduates of a given university
The level of training of applicants	<ul style="list-style-type: none"> • Level of schooling • Level of preliminary university testing • The number of students expelled from the first year
The level of training of students	<ul style="list-style-type: none"> • The level of general training • The level of study and development of educational services
Material and technical equipment	<ul style="list-style-type: none"> • Provision with equipment and funds • Library fund provision • Availability of social infrastructure
Information and methodological training	<ul style="list-style-type: none"> • The level of accessibility of information resources • Provision of CMD • Educational and methodological support
Human capacity level	<ul style="list-style-type: none"> • Provision of full-time teaching staff • Staff qualification • The degree of research activity of teaching staff
Financial level	<ul style="list-style-type: none"> • The ratio of the shares of paid and free training • The amount of financial resources per student • The amount of funds per teacher
Science level	<ul style="list-style-type: none"> • The volume of research work • Number of own dissertation councils • The level of efficiency of post-graduate and doctoral studies

Fig. 1. *The system of indicators for assessing the competitiveness of educational services*

Source: [9, p. 117 - 118]

Consider the features of the definition and the actual level of global competitiveness of Russian education, according to the materials presented by the Higher School of Economics.

At the first level - pre-school education, despite the fact that at the moment there is no international system of standards for assessing educational results, world experience indicates the importance of assessing and evaluating the performance of educational organizations in this field. One of the significant indicators characterizing the competitiveness level of domestic preschool education on a global scale is its accessibility indicator (Fig. 2).

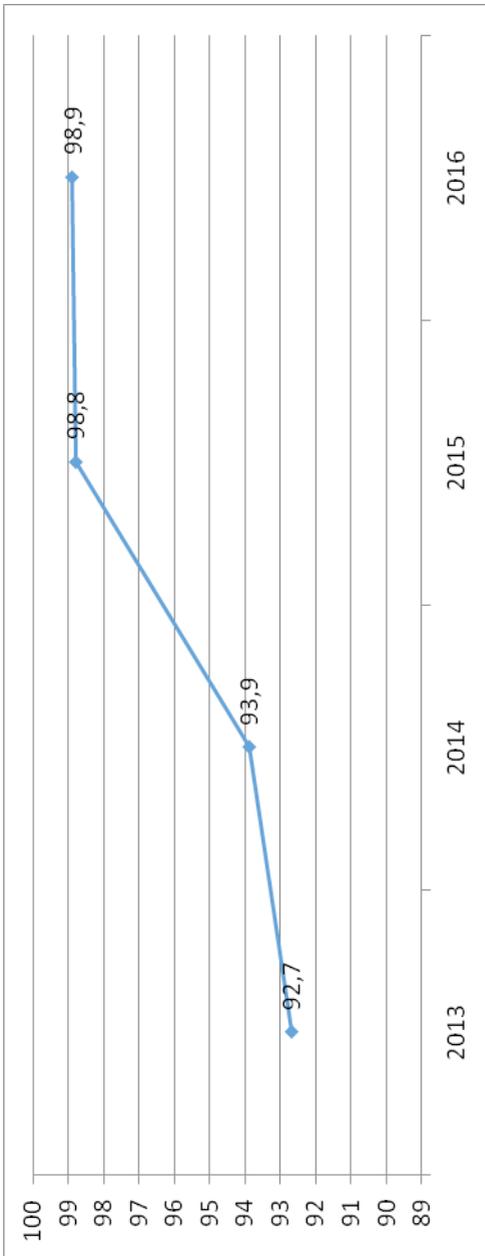


Fig. 2. Dynamics of an indicator characterizing the level of accessibility of preschool education for children aged 3 to 7 years in the Russian Federation

Source: [11, p. 11]

The dynamics of the availability of preschool education presented by scientists at the National University Higher School of Economics has positive dynamics in our country, which indicates that there is an opportunity for children to build up their human capital for a successful life in the future.

In parallel with this indicator, the level of competitiveness assessment of preschool education of countries is conducted using the following set of indicators:

1. Space and decor;
2. The established regime of personal hygiene;
3. Reasoning using language;
4. The structure of training programs;
5. The level of qualification of the staff.

According to the calculations using this methodology, in 2016, the overall quality index of preschool education in Russia was within 3.32, which is lower than the indicators of the countries where similar calculations were performed: Portugal - 5.15; Finland - 5.34; Greece - 5.0; Denmark - 4.82.

If we consider the global level of competitiveness of general education, then in general terms these indicators, as well as their values, can be represented as follows:

1. The first indicator “Universal access to education”, having a compulsory general education duration of about 11 years (from 7 years to 17 years inclusive), Russia looks competitive against the background of developed countries;

2. The second indicator, “Financing education,” according to the share of expenditures allocated from GDP for the development of general education, the Russian Federation is at an average level relative to other countries (according to the OECD, a little less than \$ 5 thousand per student in average in our country, which is 2 times less than the average for the OECD countries, and more than 4 times less than in Luxembourg, which is the leader in this indicator) [Education at glance. - OECD Publishing. Paris, 2017].

3. The third indicator “Planned educational results”, according to this indicator, scientists note the fact that Russian educational standards have fewer tasks than competing countries to develop research skills, social interaction skills, knowledge in the field of modern technologies;

4. The fourth indicator “Qualification of teachers and their working conditions”, according to the calculations of this indicator, the purchasing power of the salaries of domestic teachers is lower than in almost all developed countries, while domestic teachers work more than 46 hours a week, while on average in the camps - 38 hours, at the same time, they spend a significant portion of their time on administrative work, namely, drawing up reports [12].

Considering the global level of competitiveness of secondary vocational education, in general terms these indicators, as well as their values, can be represented as follows:

1. The first group of indicators is “Financing of the ACT system”, according to this indicator, our country, along with Australia, the United Kingdom, and

Hungary, belongs to a narrow circle of countries in which the preparation of one student in the ACT programs is less than the preparation of one schoolkid;

2. The second group of indicators “Salary premium of graduates of open source software”, according to this indicator, Russia shows traditionally low values.

In general, a list of authoritative cross-country ratings, as well as monitoring, on the basis of which it is possible to determine the level of global competitiveness of higher education, can be represented as follows:

1. International ratings of national higher education systems: project of Assessment of Higher Education Learning Outcomes, - project concept - assessment of the added value of higher education; QS rating, - rating concept - presentation of the average picture of national higher education systems; Rating U21 Ranking of National Higher Education Systems, - the concept of rating is the measurement of the achievements of the countries of the world in the field of higher education within the framework of creating an international network of universities

2. International university ratings: Academic rating of world universities (ARWU); Webometric rating; Rating of LeidenRanking et al.

In addition, for our country, the issue of comparing international indicators developed by UNESCO, OESD, and Word Bank remains quite important. A significant part of the indicators from these systems reflect the situation in the tertiary education system, classified by ISCED 2011, which consists of 5-8 levels, where level 5 is the equivalent of open source software. As scientists note, indicators for levels 6, 7 and 8 in a significant part of the cases are not provided by our country [11, p. 76].

Specific objective indicators characterizing the level of competitiveness of continuing domestic education include:

1. A survey of the European Statistical Agency Eurostat of the working population aged 25 years to 64 years on the subject of obtaining various types of formal and additional education;

2. The scale of the costs of enterprises for the education of their employees;

3. The extent of government funding for programs;

4. OECD International Adult Competency Assessment Programx.

Thus, the competitiveness of domestic education is the basis of the country's strategic competitiveness on the world stage. The competitiveness of the domestic education system consists of the competitiveness of individual educational institutions. The global competitiveness of Russian education should be understood as the ability of domestic educational institutions of different levels of education to provide educational services that meet international standards and are competitive in terms of such indicators as: the level of quality of education that ensures the innovative development of the country; the cost of providing educational services; implemented methods and forms of training, conditions for the provision of educational services, prestige of an educational institution, etc.

References

1. Arzhanova, I.V. *Competitiveness of domestic higher education as a priority of its development* / I.V. Arzhanova // *Bulletin of the Russian State Pedagogical University. A.I. Herzen.* – 2012. - №151. – P. 48 – 58.
2. Maysakov, D.L. *Management of entrepreneurial activity of a state university* / D.L. Maysakov // URL: www.natural-science.ru (appeal date: 15.11.19)
3. Molochnikov, N.R., Reutova, I.V., Lobovskaya, T.A. *Competitiveness of educational institutions: key success factors* / N.R. Molochnikov, I.V. Reutova, T.A. Lobovskaya /URL: www.natural-science.ru (appeal date: 17.11.19).
4. Zhdankina, I.Yu., Shamin, E.A. *The essence and concept of competitiveness of educational institutions* / I.Yu. Zhdankina, E.A. Shamin // *Bulletin of NII EI.* – 2014. - №3. – P. 12 – 18.
5. Sennikov, S.G. *Determining the competitiveness of educational services* / URL: www.science.ru (appeal date: 11.11.19).
6. Fishman, L.I. *Quality and competitiveness of educational services: experience in defining and differentiating concepts* / L.I. Fishman // *Science and School.* – 2017. - №4. – P. 9 – 19.
7. *The concept of export of educational services of the Russian Federation for the period 2011 – 2020* /URL: <http://vi.russia.edu.ru/news/discus/concept/3783> (appeal date: 17.11.19).
8. *The concept of competitiveness of educational services* URL: <https://studwood.ru> (appeal date: 09.10.19).
9. Danilova, S.V. *Assessment of the competitiveness of educational services* / S.V. Danilova // *Creative economy.* – 2013. - №7(79). – P. 117 – 127.
10. *Decree of the President “On National Goals and Strategic Tasks of the Development of the Russian Federation for the Period until 2024”* / URL: www.consultant.ru (appeal date: 29.10.19).
11. *Global competitiveness of Russian education. Materials for discussion* / I.V. Abankina, A.A. Belikov, O.S. Gaponov et al.: National Research University “Higher School of Economics”, Institute of Education. – M.: NRU HSE, 2017. – 112P.
12. *Problems of modern education and science. Ways to solve problems at the state level* / URL: www.fb.ru (appeal date: 17.10.19).

体育与体育领域专家与学生交际能力形成水平的分析
**ANALYSIS OF THE LEVEL OF FORMATION OF COMMUNICATIVE
COMPETENCE OF SPECIALISTS AND STUDENTS IN THE FIELD
OF PHYSICAL CULTURE AND SPORTS**

Glembockaja Janin

Senior Lecturer

Moscow State Academy of Physical Education

抽象。 本文专门针对体育大学学生之间沟通能力的形成和发展的当前问题。 现代社会的特点是人与人之间的交流不断增长。 国际体育赛事和会议的增长清楚地表达出来, 这使我们能够解决政治, 社会, 文化问题。 作者分析了体育环境中专家和學生之间的沟通能力水平, 得出的结论是, 有必要以旨在扩大沟通能力的新发展来补充方法库。

关键字: 非语言大学中的外语专业交际能力, 动机, 外语。

Abstract. *The article is devoted to the current problem of the formation and development of communicative competencies among students of physical education universities. Modern society is characterized by the constant growth of communication between people. The growth of international sporting events and meetings is clearly expressed, which allows us to solve political, social, cultural issues. The author analyzes the level of communicative competence among specialists and students in the sports environment and comes to the conclusion that it is necessary to supplement the methodological arsenal with new developments aimed at expanding communicative competence.*

Keywords: *foreign-language professional communicative competence, motivation, foreign language in a non-linguistic university.*

Introduction

Modern world sport is characterized by a high level of Russia's integration into the international sports environment. The growth of international sports determines the constant growth in the need of society for specialists who know the sport professionally and are fluent in foreign languages, and at the same time have a sufficient level of formed professional communicative competencies for high-quality and timely communication problems in various situations (for example, business correspondence, conferences, appeals) arising at specific sporting events. The training of such specialists is mainly carried out in universities of physical education. However, as life practice and a number of special studies show, the quality of foreign language proficiency by graduates of these universities leaves much to be desired.

The object of the study is the educational process in a foreign language at universities of physical education.

The subject of the study is the methodological features of the formation of foreign language communicative competence among students of the university of physical education in the classroom in a foreign language.

Objective: to increase the level of formation of foreign-language professional communicative competence of students of the university of physical education.

To achieve the goal of this study, the task was set:

-analysis of organizational and methodological features of the formation and development of communicative competence among students of non-linguistic universities.

The analysis of special scientific pedagogical literature on the posed problem led us to the conviction of the need to develop foreign language competencies of students of the university of physical education in modern socio-cultural conditions.

Understanding that our study is pedagogical, it should be noted that the basic starting points were:

1. The need for specialist communication in the sports field with many participants in sporting events.
2. The internationalization of physical education and sports events and the educational process determines the knowledge of a foreign language.
3. Knowledge of a foreign language for the modern level of communication (in the sports, scientific, organizational, methodological field) requires an expanded level of knowledge of a foreign language (in the cultural, ethnic, geographical, and technical fields).

Results and its discussion.

The first step of our study was to clarify the initial state of a number of points, allowing us to obtain primary information on issues of interest to us, and we assume that the information received will act as supporting materials for clarifying and concretizing the starting points. At the same time, we assume that this information will act as an additional practical confirmation of the relevance of the chosen research area.

To confirm the noted provisions, we conducted a special study using interviews with specialists, questionnaires and testing of students.

The results of a survey of specialists (trainers, teachers, translators, managers, highly qualified athletes and senior students (4-5 courses)) on the study of a foreign language at a university of physical education (% of the number of respondents) showed the following results: 58% of respondents believe that an athlete needs knowledge of a foreign language. 95% of respondents confirmed the need for an interpreter to be present during international competitions and training camps, while translator assistance is needed in the following cases:

- a) organization of competitions 80%
- b) training 27,8%
- c) refereeing 50%
- d) holding ceremonies 76,5%
- e) controversial issues 77,8%
- f) injury, athlete's disease 44,4%
- g) compiling business documentation 75%
- h) communication with foreign media 75%
- i) corporate events 25%
- j) establishment of interdisciplinary relations 63,2%
- l) sports training with foreign athletes and the work of a trainer abroad 68,4%
- m) name of sports facilities, used inventory, equipment 26,3%
- n) interpretation of judicial symbols and gestures 15,8%

It was revealed that only 47% of respondents could explain themselves to foreign colleagues and only 6% could be a translator at international competitions; 70% of respondents believe that a translator needs to know the basic international refereeing symbols and gestures. Due to the lack of a qualified translator, the following problematic situations were identified: misunderstanding, contentious issues, dissatisfaction, distortion of information, loss, outrage, confusion in dates and terms, malfunctions in the organization of competitions, etc. And as it turned out 53% of respondents feel the need for the constant presence of an interpreter in the team. The vast majority of respondents consider the following educational topics to be the most useful and appropriate: talking about sporting achievements, geography and country studies, communication training in the city, leisure activities, etiquette, interpersonal communication, travel, culture, art, anatomy, psychology, tourism, career, sports for people with disabilities and meals. Of the proposed forms, methods and techniques for learning a foreign language, the respondents identify the most appropriate as follows: the use of modern teaching technologies when listening to audio literature, game forms of training, the use of TSOs and computers, individual lessons, modern intensive teaching methods with the motivation of students, a multimedia presentation learning outcomes, workshops to discuss current issues, project form, situational method.

In parallel with the analysis of literary sources that theoretically assess the state of the problem of teaching a foreign language in higher education, we studied the real state of the language training of students of our university. For this purpose, a survey was conducted in which 190 1-2-year full-time students of the Moscow State Academy of Physical Education took part. An analysis of the answers made it possible not only to find out how students relate to learning a foreign language, but also to find out how they evaluate the process of teaching a foreign language at a university.

The vast majority (90%) of students answered positively to the main question of the questionnaire about the need for knowledge of a foreign language by a specialist in the field of physical education and sports. The answers of 56% of students that they teach a foreign language a week from 6 hours and above inspire confidence in the success of our work. The responses of 44% of students who do not study the language at all speak about the lack of self-study skills of students, which indicates that they learn the language only in the classroom and most likely do not even do homework. The answer of 74% of students (although for some students the reason may be due to lack of free time) shows a certain lack of interest in the subject, which requires a reconsideration of the content of the foreign language course. And 75% of students do not read additional literature on sports topics.

Analysis of the questionnaire of students showed that while realizing the importance of knowing a foreign language as a means of professional communication, students, however, do not make efforts to master the language, as evidenced by the small number of hours per week devoted to students learning the language, unwillingness to study the language additionally and read professionally important sports literature in a foreign language.

Diagnostics of foreign language communicative competence of students of a university of physical education was carried out on the basis of a competency model developed by S.E. Tsvetkova, E.V. Polukeyeva [Tsvetkova, 2015]. This model involves 3 components: motivational, cognitive-active and reflective-evaluative. Within the framework of the cognitive-activity component, these authors distinguish 3 main competencies that are part of this component: linguistic, interactive-speech and discursive.

The motivational component was studied using a questionnaire. Most students (53%) have an average level of motivation to learn a language. For these students, learning English is not something very significant in life, but they are positive about learning and generally have an interest in learning the language and are ready to devote some time during the week to learning the language.

At the same time, it is also possible to distinguish a group with low motivation (23%). These students learn the language by necessity (because it is present in the curriculum), they do not feel interest in learning.

Highly motivated students (24%) express a high degree of interest in learning, actively study at home and use the language in everyday life.

Language (linguistic) competence was evaluated on the basis of 5 types of speech activity. Positive results were achieved by students (31%), who correctly answered 42 - 100% of the questions and received from 25 to 60 points across the entire list of questions, which indicates a weak formation of communicative competencies. At the same time, results of 25–36 points were rated as “satisfactory”, 37–48 points as “good”, 49–60 points were rated “excellent”.

Students have the best reading skills (16% - high, 58% - medium and 26% - low).

The skills of writing are worse (11% - high level, 48% - medium and 41% - low) and translation (9% - high level, 49% - medium and 42% - low).

The listening skills are poorly formed (9% - high level, 48% - medium and 48% - low).

Speaking skills are worst formed (6% - high, 41% - medium and 53% - low).

Conclusions. Experts have confirmed the need for the formation of a foreign language communicative competence (FLCC). The formation of sustainable motivation to learn a foreign language contributes, in our opinion, to the optimization of the process of improving professionally oriented communicative competence of students of a university of physical education in a foreign language. Most students (63%) have a low level of foreign language communicative competence. These students experience significant difficulties in foreign language speech activity, and the most difficult thing for them, as the study showed, is active oral speech. Students experience significant difficulties with the selection of statements, respectively, in the communicative situation and etiquette norms.

The second largest group has an average FLCC level (24%). These students as a whole are active in speech activity, at the same time, they often have difficulty in selecting statements, make mistakes.

High FLCC students make up only 7%. These students are successful in all types of speech activity, understand the communicative situation, easily produce speech, make few mistakes. The results of the study, which are given in the article, in the vast majority of cases state a low level of communicative competence. We believe that the lack of methodological developments aimed at the formation of communicative competence is the reason for the low level of formation of foreign-language communicative competence.

References

1. Glembofskaya Ya. I. Indicators of the levels of development of communicative knowledge, skills of students of physical education universities. // *Scientific notes of the P.F. Lesgaft. University*. 2015. № 5 (123). P. 62-66.

2. Tsvetkova S. E., Polukeeva E. V. Diagnostics of the formation of foreign language communicative competence in future teachers of vocational education // *Bulletin of the Volgograd State Pedagogical University. Ser. "Pedagogical sciences"*. – 2013. – № 7 (82). – P. 88–92.

关于小学生的外语能力问题
**ON THE ISSUE OF FOREIGN LANGUAGE COMPETENCE
OF PRIMARY SCHOOLMATES**

Larionova Svetlana Olegovna
Senior Lecturer
Institute of Social Sciences
Ural State Pedagogical University
Ekaterinburg, Russia

抽象。 本文专门讨论“外语能力”的概念。 重点是构成小学生外语能力的要素。 本文概述了有助于在教育过程中发展外语能力的方法, 方法和技术。

关键词: 能力; 外语能力; 外语能力的组成部分; 外语能力水平; 发展外语能力的方法; 小学生

Abstract. The article is devoted to the consideration of the concept of “foreign language competence”. The focus is on the components that make up the foreign language competence of primary school students. The article outlines approaches, methods, and techniques that contribute to the development of foreign language competence in the educational process.

Keywords: competence; foreign language competence; components of foreign language competence; levels of foreign language competence; methods for the development of foreign language competence; younger schoolchildren.

Currently, the issue of developing foreign language competence among students in an educational organization is becoming more and more relevant.

If we consider the development of the abilities and skills necessary for a person to achieve certain success in personal, professional and public life as the quintessence of education, then one of the most important determinants is his foreign language competence.

In the list of “general educational abilities, skills and methods of cognitive activity” offered by the federal state educational standard, it should be noted that half of them are related to the development of foreign language competence [12]:

- adequately perceive oral speech and be able to convey the contents of the heard text in a compressed or expanded form in accordance with the situation of foreign language communication;

- choose and use language tools in accordance with the speech task and communication situation;
- master a monological and dialogical speech, observing accepted ethical standards of communication;
- possess the skills of a conscious, fluent reading of texts of various styles and genres, conduct their information and semantic analysis;
- create written statements, adequately conveying the contents of the listened or read text with a given degree of specification;
- draw up a plan, abstracts, synopsis;
- speak at least one foreign language at the level of functional literacy.

The aim of teaching foreign languages in primary school is to achieve students' foreign language competence at the threshold level (Council of Europe term), that is, the ability and willingness of students to actualize foreign language communication and to reach mutual understanding with native speakers of a foreign language.

Accordingly, the main goal of training can be achieved only with the adequate development of foreign language competence.

In this regard, it is important to clarify the definitions of such basic concepts as "competence" and "foreign language competence".

Considering the concept of "competence", researchers interpret its definition differently.

So, competence (from the Lat. *Competentis* - capable) is a general characteristic of knowledge, abilities and skills formed in the learning process, and manifested as the ability and readiness of an individual to take independent selective and design actions in solving various behavioral and practical tasks [5, c. 45].

A.V. Khutorsky, in turn, understands competence as "a set of interconnected personality traits (knowledge, skills, methods of activity), defined in relation to a certain circle of objects and processes, and necessary for high-quality productive activity in relation to them" [13, p. 59].

I.A. Zimnyaya defines "competence" "as some internal, potential, hidden psychological neoplasms: knowledge, ideas, programs (algorithms) of actions, value systems and relationships, which are then revealed in the person's competencies" [4].

Competencies include constantly evolving personality traits, the ability to apply knowledge in a new situation.

Let us dwell in more detail on the definition of the concept of "foreign language competence". This term has become the most used recently.

"Foreign language competence is the educational result of mastering the knowledge of students' skills and abilities, embodying the personal component of the educational process and corresponding to professional standards" [7].

According to N.S. Sakharova, foreign language competence is a system of value formation of the personality, integrating foreign language knowledge, skills and value relations [10].

As a rule, foreign language competence includes a number of basic components.

E.G. Nikitina offers the following constituent components of foreign language competence [8, p. 72]:

- language (grammatical, linguistic) provides, first of all, its normativity, i.e. compliance with the norms of the language, which are perceived by its native speakers as an “ideal” or correct;
- speech (pragmatic, strategic, discursive) forms utterance and is used to achieve a specific goal (intercourse, communication, impact);
- sociocultural (sociolinguistic, linguistic and regional) determines the linguistic features of social strata, representatives of different generations, genders, social groups, dialects; lexical units with national-cultural semantics and the ability to apply them in situations of intercultural communication.

The indicated components most fully reflect the content of foreign language competence and correspond to the goals of teaching a foreign language.

In her study, E.I. Baguzina identified such components of foreign language competence as [2, p. 16]:

- linguistic (knowledge of vocabulary, grammar, phonetics, spelling);
- discursive (the logic of the presentation of oral and written texts, the integration of the results of their own research);
- strategic (overcoming communication difficulties, teamwork, clarity of presentation);
- sociocultural (students' knowledge of the national and cultural features of the social and speech behavior of native speakers, the style and vocabulary of situations);
- pragmatic (successful achievement of a communicative goal, understanding by the audience of the message);
- personal (personal contribution to the study of the material, the manifestation of creative potential, personal growth).

According to P.D. Dwayier, the main components of foreign language competence are [3, p. 48]:

- speaking competence (lexical, grammatical, pronunciation);
- competency in writing (lexical, grammar, spelling);
- competence in listening (distinguishing sounding signs, grammatical and lexical);
- reading competency (distinguishing graphic signs, grammatical and lexical).

According to psychological and pedagogical research of E.P. Ostryanina, foreign language competence in primary school age includes the following components [9, p. 34]:

1. Theoretical (system of theoretical foreign language knowledge and practical skills).
2. Practical (mastery of the techniques of creative work with foreign language texts, the basics of monological and dialogical speech).
3. Personal (the presence of positive motivation and cognitive activity in the study of a foreign language).

Next, we consider the main methods, techniques and approaches to the development of foreign language competence.

The methods that are appropriate to use for the development of foreign language competence in the educational process include [11, p. 62]:

- traditional methods;
- project method;
- lesson-excursion method.

Traditional methods are: lectures, practical works, watching educational films, independent work with educational texts, writing exercises. These methods make it possible to demonstrate a sample of monologic and dialogical speech, and allow the development of oral and written speech, the language culture of students.

The project method has recently gained more and more supporters. It is aimed at developing active independent thinking of children and teaching them not only to remember and reproduce the knowledge that the school gives them, but to be able to put it into practice.

Using the method of "lesson-excursion" allows you to develop foreign language competence in children of primary school age. The student should be able to conduct a city tour, tell foreign guests about the features of Russian national culture, which becomes a necessary element in the process of teaching a foreign language [11].

In turn, there are basic techniques for the development of foreign language competence, these are [6; 7]:

- reading teaching techniques;
- vocabulary learning techniques;
- listening training techniques;
- speaking grammar teaching techniques;
- group activities techniques.

F.B. Abaeva in her works identifies the main approaches to the development of foreign language competence [1]:

1. The personal-activity approach. This approach is based on the theory of purposeful activity and the theory of speech activity.

2. Competency-based approach. This approach is defined as a generalized condition for a person's ability to act effectively outside of training subjects and learning situations.

3. Integrative approach. This approach is a systematic organization of the didactic process, which determines the cultural and communicative development of the personality of students.

4. Conscious-oriented approach. This approach is based on an awareness of the form of a linguistic phenomenon - lexical and grammatical, and is based on an inductive way of mastering the language.

Thus, from the foregoing, it follows that competence is a set of interconnected personality traits (knowledge, skills, methods of activity), defined in relation to a certain circle of objects and processes. In turn, foreign language competency is the educational result of the assimilation of foreign language knowledge, skills and value relationships by students, implementing the personal component of the educational process and corresponding to professional standards.

References

1. Abaeva F.B. *Formation and development of foreign language competence of younger students // Modern problems of science and education.* – 2014. – №6. URL: <http://science-education.ru/ru/article/view?id=16567> (appeal date: 07.10.2019).
2. Baguzina E.I. *Formation of foreign language competence in teaching a foreign language. // Innovative projects in professionally-oriented teaching of foreign languages in the context of globalization: materials of an international scientific and practical conference.* – M.: Publishing house of the State University of Management, 2011. – P.15-18.
3. Douai P.D. *Development of foreign language competence.* – M.: Astrel: Poligrafizdat, 2000. – 198 P.
4. Winter I.A. *Key competencies - a new paradigm of the result of modern education // Internet magazine "Eidos".* – 2006. – 5 May. URL: <http://www.eidos.ru/journal/2005/0910-12.htm> (appeal date: 15.10.2018).
5. Kabdolova K.L. *The formation of competencies as a necessary condition for improving the quality of education // Open School.* – 2004. – № 5. – P. 45-47.
6. Mardaeva T.V. *Communicative-speech competence of schoolchildren: methods and techniques of formation.* – M.: Astrel; Tver: ACT, 2006. – 89 P.
7. Matienko A.V. *Foreign language competence: definition of a concept in the logic of formation of a multilingual and multicultural personality // Young scientist.* – 2016. – №10. URL <https://moluch.ru/archive/114/29929/> (appeal date: 15.10.2018).
8. Nikitina E.G. *The development of foreign language competence of university students by means of modular training: the example of economic specialties: dis. ... cand. ped sci.* – Cheboksary, 2010. – 292 P.
9. Ostryanina E.P. *Basic conditions for the formation of cognitive activity of students (for example, teaching a foreign language) // Bulletin of pedagogical innovations.* – 2007. – № 4. – P. 30-41.
10. Sakharova N.S. *The development of foreign language competence among students: monograph.* – M.: Sphere, 2003. – 206 P.
11. Sergeev G.A. *Foreign language competence in education. Vladimir: Publishing House of the Vladimir State Un-ty 2012.* – 143 P.
12. *Federal State Educational Standard for General Education.* URL: <http://минобрнауки.рф/документы/543> (appeal date: 15.10.2018).
13. Khutorskoy A.V. *“Key competencies as a component of a personality-oriented education” // Public Education.* – 2003. – № 2. – P.58-64.

学生实践是职业能力发展的一个因素
**STUDENT PRACTICE AS A FACTOR OF PROFESSIONAL
COMPETENCE DEVELOPMENT**

Degterev Vitaliy Anatolyevich

Doctor of Pedagogic Sciences

*Professor at the Department of Management of Social and Educational Work
of the Ural State Pedagogical University*

Yekaterinburg, Russia

Larionova Irina Anatolyevna

Doctor of Pedagogic Sciences

*Professor at the Department of Management of Social and Educational Work
of the Ural State Pedagogical University, Yekaterinburg, Russia*

抽象。在本文中，作者描述了组织学生实践的经验，这些学生是乌拉尔州立大学（RF. 叶卡捷琳堡）的社会领域未来专家。考虑从第一年到第五年的实践类型及其总结。

关键字：教育发展战略，学生实践，专业精神，能力，养育。

Abstract. *In the article, the authors describe the experience of organizing the practice of students, future specialists in the social sphere, at the Ural State University (RF. Yekaterinburg). Types of practice from the first to fifth year and its summary are considered.*

Keywords: *Education development strategy, student practice, professionalism, competence, upbringing.*

According to the priorities of today, when the task of organizing the educational space as a condition for the quality training of future professionals and the harmonious development of their personality becomes urgent, the most important feature of the implementation of the process of educating students is the shift in emphasis on self-education and self-development. At the same time, education is understood as “the process of identifying a person in culture through the adoption of moral patterns - original cultural symbols that regulate their behavior in society (personality traits, moral and ethical principles)”. Particular attention is paid to those boys and girls who plan their future activities in the field of “person - person.” We can distinguish the personal qualities

of a specialist in the social sphere, allowing them to reveal themselves in a professional sense: a block of worldviews (meaning-based and value orientations, etc.); a block of personal qualities (adequate self-esteem, a high level of self-acceptance and self-esteem, high motivation for achievements, etc.); block of socio-psychological qualities (communicative and socio-perceptual competence, social intelligence, etc.).

In modern society, higher education is becoming one of the main factors ensuring economic growth, social stability, and the development of civil society institutions. The level of education of the population, the quality of educational and scientific infrastructure are indispensable conditions for the development of society and the economy, the leading resources of which are new knowledge, innovative activity, new technologies. In this regard, the main direction of updating the content and forms of vocational education is set by its super-task - to ensure the formation of a future specialist's active position, contributing to the formation of an integrated vision of professional activity, systemic action in it, non-trivial solution of problems and tasks. This means that the modern student is focused on education as a means of achieving significant goals and as a value in itself - a flexible tool for expanding and realizing one's life potential.

The strategy for the development of education in accordance with the fundamental legislative acts of the Russian Federation - the Constitution of the Russian Federation, the Law of the Russian Federation "On Education", the Federal Program for the Development of Education, the Program for the Development of Discipline in the Russian Education System, etc. - is aimed at improving its quality, increasing the role of the state in raising young people, a new level of interaction between governing bodies, children's and youth public organizations. All this fully applies to higher education institutions.

A young person comes to a university with their certain moral views and attitudes, therefore, a university continues to develop the spiritual and moral qualities of the student, their civic formation, conditions are created for self-development and self-assertion of the personality, the activation of its creative potential, the formation of civic consciousness. But the potential of student practice is clearly not sufficiently used in the professional development of specialists, in the formation of their high moral and ethical qualities, which is associated with an underestimation of the possibility of this type of educational work.

Analyzing the results of the final state certification, practical activity occupies a special place. The unity of the educational and disciplinary process, including in universities, does not require proof. However, the continuity of the educational process is more understood as the ability of a teacher to exert an educational effect on students during practical classes.

In our opinion, the potential of student practice in the development of professional competencies is unreasonably poorly used. We will consider in this article the organization of practice at the Institute of Social Education of the Ural State Pedagogical University in the specialties of “Social Work” and “Social Pedagogy”.

Among the basic features of a growing personality, such as professionalism, initiative, competence, citizenship, the role of general cultural, humanistic features of a person is growing. In this regard, the requirements for the training of a modern specialist are radically changing, the most important condition for the formation of whose personality is their spiritual development as a system of higher needs, interests and value orientations, in which their attitude to the world and themselves is embodied. Due to the clearly expressed humanistic orientation of the professional activity of a specialist in the social sphere, they are the bearers and spokesmen of universal human culture, universal spiritual values, they are called upon to be for their fellow citizens, primarily those who have found themselves in difficult life situations, an example of highly moral behavior and a high culture of interpersonal communication

In this regard, the professional training of a modern social educator, social work specialist should not only ensure the assimilation of professional knowledge and skills, but also contribute in every way to their versatile development, the formation of their worldview, their system of humanistic value orientations, general and professional pedagogical culture. This approach corresponds to the general trend of the humanization of higher professional education in general and higher social education in particular.

One cannot disagree with L. A. Volovich that one of the priority ways to improve the system of vocational education should be to use its sociocultural potential associated with cultural values and traditions. Being integrated in the lifestyle of the educational institution, it, according to the scientist, significantly enriches the content and process of educational activity, the personal status of students and the teaching staff, gives it a useful innovative character.

Thus, only a consistent worldview, axiological and cultural orientation of professional training of a future specialist in the social sphere can contribute to the full formation of their personality, as well as the formation of their professional activity, constantly associated with a moral, aesthetic, civil law assessment of the actions and events that take place, the choice of the maximum appropriate technologies and techniques in solving the problems of a person who has fallen into difficult life situation.

At the same time, the real practice of social education shows that most universities are mainly limited to arming students with professional knowledge and skills, and, as a rule, almost do not pay enough attention to the formation of the spiritual and semantic sphere of the personality of a future specialist.

In this sense, the educational potential inherent in practice cannot be underestimated in student activities. At the Institute of Social Education in the specialties “Social Pedagogy” and “Social Work”, students begin their practical activities from the 1st year, when the so-called volunteer practice, which is an important stage in the development of the student’s personality, takes place, it helps to gain life experience, expand the circle of communication, and acquire professionally significant skills, establishing professional contacts. The practice takes place in families raising children with disabilities who are registered at the “Talisman” rehabilitation center in Yekaterinburg.

Students receive information in advance about the composition and social status of families, their expectations and needs. They know the age of the child, the degree of impaired development, especially motor and speech functions. Students can choose a family to visit based on their interests and abilities. All of them come to families whose parents expressed a desire to work with students, but most of them during the first meetings experience a strong emotional shock, since they have never communicated with children with such serious disabilities. Communication with specialists, support and assistance of a tutor and a supervisor, and the goodwill of parents and children help students overcome their emotional barrier in a short time.

Most of the volunteers quickly get used to the situation, establish contact with the child and parents, successfully implement the recommendations of the Center's specialists on an individual rehabilitation program.

Students visit the family weekly for 4 months. Basically, they come to the family in pairs - this gives them more confidence, makes it more interesting to organize games and communication with the ward. But there were also requests, from the family, for an individual visit. Volunteers play with sick children, read to them, walk with them, help with their homework.

Analyzing the experience of conducting volunteer practice, we can say that it contributes to the acquisition and development in students, future social educators and social workers, of professional behavioral skills and abilities, promotes the upbringing and development of personal qualities, helps in the final professional self-determination. Families raising children with disabilities receive additional assistance in solving problems of social rehabilitation.

When analyzing the feedback of the Center’s specialists, parents who hosted volunteers in their families, analyzing questionnaires and conversations with student volunteers, it was concluded that volunteer practice is an important stage in the development of the student’s personality, it contributes to the acquisition of life experience, the expansion of the circle of communication, and the acquisition of professional significant skills, establishing professional contacts.

In the first year, in the process of volunteer practice, the student interacts with children and adults (families raising children with disabilities). They learn the "experience of grief", which most students do not know. Learn to establish communication with children with disabilities. In this they are helped by the teachers-organizers of this type of practice, social workers from the institution. The student can conclude at the end of the practice: are they even capable of this type of activity.

In the second year, the practice is organized on the basis of school camps for recreation and health improvement. This is preceded by theoretical training, the basis of which is the course "Organizational Activities in Children's Health Camps." Students work as counselors, educators. This type of practice allows the student to form professional skills in making independent decisions, in fostering a culture of communication, planning, and interaction with superiors and subordinates. Keeping a report diary allows students to develop analytically skills, as well as the ability to combine knowledge of theory and practice.

Students of the 3rd year go to various educational institutions (schools, pre-school educational institutions, institutions of additional education, etc.), where they get acquainted with the regulatory framework of educational institutions, with the guardianship authorities, interact with a maladaptive category of students, orphans, children left without parental care, as well as families of children requiring special attention of the trainee.

For most students, university practice is a criterion for the correctness of the chosen education program.

According to V.V. Bailuka well-organized practice involves not only the performing, reproductive activities of students, but also the creation of conditions for the manifestation of initiative, creative self-realization. The formation of students' creative abilities, in our opinion, should take place in the following processes of their practice:

- in the process of empirical and theoretical comprehension by them of the object of practice and a critical assessment of its state, including the identification of unresolved problems in a particular unit of the enterprise (institution);
- in the process of designing their activities, which involves the formation of several project options and the choice of them based on the normative forecast of the best. The students can also offer their own solution to the unresolved practical problems of the organization or problems identified by them independently. A means of resolving these problems may be to use in their work, for example, knowledge of technological innovations that they acquired at lectures and seminars;
- if keeping a practice diary in which the course of practice is recorded and comprehended, as well as writing a practice report, is carried out on the basis of an objective analysis, including a critical assessment of the results of activities, then they act as forms of manifestation of scientific creativity.

The question of normative and creative in the student's activities during the course of their university studies is a question of the ratio of their duties and rights, the degree of their freedom in this activity. It is clear that, regardless of the type of university practice, this freedom should be sufficient for the student's creative self-realization.

In the process of student participation in public life of the organization where they are practicing, their aesthetic, valueological and patriotic upbringing may also take place. University practice of students as a whole also acts as a factor in their communicative education.

The practice of students of 4, 5 courses creates the conditions for the integrated use by students of knowledge and skills acquired in the study of courses in psychology, social psychology, pedagogy, social pedagogy, etc.

The organization of practice contributes to the self-determination of students in methodological research, makes it possible to conduct a socio-pedagogical experiment on the topic of qualification work in a social institution, prepares students for the practical work of a social teacher and social worker, helps to adapt university graduates to workplaces, consolidate young professionals, and stimulate professional self-improvement and self-development.

As a result of student practice and internships, the student gets an idea of the methodological and theoretical foundations of the activities of the social educator, social work specialist in real practical activities, gets acquainted with the problems of specific institutions in which the practice takes place, organizes technological support for solving the problems of this institution, etc.

The main competencies that 5th year students master as part of the practice are:

1. Self-organization of activities within the framework of collective goals.
2. Skills of logical operations: the selection of essential features, generalization, classification, analogies, systematization of knowledge, transfer of professional skills.
3. Communication: understanding the meaning of the text or simple concepts, the use of speech as an instrument of thinking.
4. The maintenance of satisfactory performance throughout the working day.
5. Stable emotional state.
6. Skills in effective interpersonal communication.

Thus, on the basis of the above, we conclude that a reasonably organized practice of students, future specialists in the social sphere, allows competencies mastered in the process of theoretical training to be converted into professional competence and verify it in the process of practical activity. In addition, during the work of students with various categories of the population, students develop their personal qualities.

现代世界中个人意识的信息安全问题
**PROBLEMS OF INFORMATION SECURITY OF INDIVIDUAL
CONSCIOUSNESS IN THE MODERN WORLD**

Kolesnikova Galina Ivanovna

Doctor of Philosophical Sciences

Full Professor, philologist, psychologist,

independent expert on issues of individual consciousness and impact on it

抽象。确定了对现代世界中个人意识完整性的主要威胁。结论是，信息战争占据了这份清单的领导地位，因为通过分裂个人的意识，他们创造了一种新型的奴隶制，即不知道自己是奴隶的奴隶。在这种情况下，教育系统正在形成新的超级任务：形成能够承受信息影响的人格。

关键词：意识，人格，信息战，教育，社会，安全，未来。

Abstract. *The main threats to the integrity of individual consciousness in the modern world are determined. It is concluded that the leading position in this list is occupied by information wars, since, by splitting the consciousness of the individual, they create a new type of slavery - slaves who do not know that they are slaves. In this context, a new super-task is being formed in the education system: the formation of a personality capable of withstanding informational influences.*

Keywords: *consciousness, personality, information war, education, society, security, future.*

In modern conditions, personal safety is concentrated primarily around the problems of security of consciousness. At the international congress on cybersecurity - the largest industry-specific event in Russia and Eastern Europe, which was held on June 20-21, 2019 at the Congress Center of the World Trade Center, organized by Sberbank with the support of the Digital Economy ANO and the Association of Banks of Russia, and the operator Roscongress Foundation, one of the topics was this. It was revealed through the prism of the role of science in building a global cybersystem designed to ensure, inter alia, the security of the individual's consciousness: "Digital and physical realities are already practically inseparable. This also applies to security: the widespread introduction of IoT devices and the digitalization of various processes significantly expand the landscape of potential risks. Phones, laptops, profiles in social networks, on mail servers and forums, our

environment (office, home, airports, hotels, transport, restaurants) - the number of threats in such a complex system tends to infinity"¹.

However, cybersecurity is only one of the facets of the problem of information security of individual consciousness, which is becoming more and more sophisticated, going beyond the framework of binary oppositions pro et contra inherent in the 20th century.

As individual threats, one can single out the mythologization of mass consciousness used at the beginning of the 21st century as one of the elements in controlling the masses, in particular, when constructing a national ideology: "New political myths... are artificial creations created by skillful and dexterous "masters". (...) ...Methods of suppression and coercion have always been used in political life. But in most cases, these methods focused on "tangible" results. Even the most severe despotic regimes were satisfied only by imposing certain rules of action on a person. They were not interested in the feelings and thoughts of people."² In particular, in the post-Soviet Russian space "as a result of the prevailing socio-economic and political situation, there was a need for myths that justify the importance and necessity of market and democratic transformations, as well as a rejection of the idea of Soviet paternalism in favor of national self-determination of the Russian state. Work on changing the mass consciousness in the new conditions began to be carried out simultaneously in two directions: 1, discrediting the old regime 2, propaganda of the new. ... Among the tricks (techniques) that contribute to the practical implementation of the goal, one can single out myths aimed at discrediting 1, the Soviet government ("the myth of the demonization of the socialist model"); 2, "myths about the criminalization of individual ethnic groups"; 3, "the myth of the enemy" and myths propagating; 4, the new democratic system ("the myth of the free market"); 5, "the myth of the special Russian way of achieving democracy"; 6, "the myth of the personality cult of the national leader as the basis of the national idea"...."³.

As separate techniques actualized in the last five years, one can single out the concepts of "tolerance" and "consumer society" introduced into the consciousness of the individuals.

Thus, "tolerance", a term borrowed from medicine, initially means the body's addiction to harmful effects, the extreme version of which is death. The purposeful and systematic replacement of the term "patience" and "tolerance" with this term semantically incorporates disagreement with something, but does not take action

¹International Congress on Cybersecurity ICC-2019_Report_RU.17_10.SEP. - 2019. - 49 P. P.46.

²Cassirer E. Technique of modern political myths // Tomsk State University Journal. Moscow State University. Ser. 7, Philosophy. 1990. № 2. - M.: Lomonosov MSU. — 92 P. — P. 58—65. - P.65.

³Kolesnikova G.I. Social myth-making and mass consciousness in modern Russia / Problems of modeling social processes: Russia and Asia-Pacific countries: materials of the Second All-Russian News. scientific and practical conf. from the international participation, Vladivostok, December - 8, 2016 / Vladivostok: Far East. federal un-ty 2016., 2016. - 780 P. - P.627-630. - P.629.

against it, is aimed at accepting unacceptable things incompatible with the morality or aesthetics of genuine human being. This mismatch, splitting the consciousness of the individual at a deep level, leads to the destruction of the personality and the creation of puppets on these ruins.

The manipulative concept of “consumer society”, which is actively used by the media and iconic figures in various shows, has the same function. Without using the concept of a “consumer society”, Andre Maurois in his “Open Letter to a Young Man on the Science of Living” actually speaks directly about this: “The danger of our time is not that a handful of immoral people, adventurers, bandits and robbers live on earth. These dregs of society have always existed; it even happened that great people came out of the lower classes. The particular danger of our time is that nowadays writers are sincerely sure that, justifying immoralism, soft-bodiedness, the law of the jungle and ugly art, they act courageously. Meanwhile, there is nothing heroic here; this is the most vulgar conformism. The danger, according to one of your peers, is that instead of philosophical doctrine, we are offered spells, instead of a literary school, punctuation rules, instead of religious rebirth, psychoanalytic abots, absurdity instead of mysticism, comfort instead of happiness”⁴.

I will explain this idea. The masses believe in what they are told. No wonder the respected Vladimir Ilyich said: “Cinema is the most important art form for us...” and for many years it became a guideline: through films they showed what is good and evil, introduced behavior algorithms, beliefs and provided a set of goals for life. But if the goal is to ennoble people, then this is a noble goal.

In our period, the range of possibilities for influencing the consciousness of the personality has expanded significantly due to the total informatization of space. And when iconic people from all sides say that we live in a consumer society, whether we want it or not (for example, I. Khakamada), then they are trusted. But where does this road lead? In my opinion - into the abyss of human dehumanization.

The opposition of Western society to Russian, in which the ability to consume is taken as a criterion, reveals, as many modern authors point out, again “not in favor” of the Russian, because in this far-fetched opposition our society again “loses” to the western. Moreover, both societies are regarded as homogeneous. However, not everyone in the West agrees that mastering the art of consuming is the goal and meaning of human life: “Our entire Western civilization is built on the principle of maximally providing people with master keys for dopamine receptors in the brain, pleasure is considered the highest goal. At the same time, heroin, as the main dopamine master key, is forbidden - since this product destroys competition”⁵ [9, p. 136].

⁴Morua A. Open letter to a young man about the science of living / AST, Moscow, 2016. - 224 P. - P.37.

⁵Alice S. Doors 520 / Sports and Culture -2000, 2016. - 288 P. - P.136.

In addition, in modern Russia, two different value systems coexist - a consumer society and a traditionally oriented one: “the features of the transformation of the social type of personality in modern Russia,“ ... ”consist in the fact that in this period two equivalent vectors formed that affect the transformation of the social type of personality. The transformation of the Russian social type of personality towards the Western social type continues. But in parallel with this process, the formation of a special social type of personality — the creative social type of personality — began in society. It is currently not possible to unequivocally determine the result in the form of the dominance of either of these two social types”⁶. Since people tend to live in the coordinate system of their value system, the logical conclusion that can be drawn is: not everyone lives in a consumer society. But those who are involved in a thoughtless process of consumption are not people with a “transformed consciousness” (M.K. Mamardashvili). And here a good question arises: who benefits from this and why? And the logical answer: this is the easiest way to everyday life of the mass in a short time - to reduce life to biological instincts. Why do people need knowledge, values, improvement, if the imitative reflex aimed at the instinct of consumption is enough. And in a short time, a flock of humanoid “talking tools” is formed from people, as the Greeks called it: “Ambition is a dummy, a deception of sight. We are convinced that happiness is inextricably linked with the possession of more and more fashionable things. They want to distance us from our true human nature in order to prevent us from rebelling against all the injustices that society commits. And of us, they make only consumers who can only chase dreams of things”⁷. Putin V.V. at a press conference he said that we must stop recalling the Soviet Union: as it was there, it will no longer be. But there was a social state: free education, healthcare, culture. By the mid-80s, the Institute of Man developed a comprehensive program for the comprehensive development of man, taking into account his intellectual, aesthetic, ethical and physical development. However, when analyzing the Soviet past, which is customary at the moment to paint in gloomy colors, this aspect is completely not considered. The fact is also hushed up that, the icon of economic thought of the West, Kelly, following Marx, believed that capitalism is a temporary phase in the development of society, necessary only to accumulate resources and, according to his calculations, by 2035, switch to 3 an hour-long working day, giving humanity the opportunity to engage in the true purpose of its life - perfection.

⁶Arkhipenko S.I., Kolesnikova G.I. The social type of personality in Russia: the specifics of transformation / Rostov-on-Don: Antey, 2010. - 115 P. - P.96.

⁷Cohen T. I dreamed about her for so long / Foreign girl, 2014. - 576 P. - P.476.

Thus, one of the characteristic features of modernity is information warfare aimed at the total enslavement of the consciousness of the individual and the formation of a new type of slaves — slaves who do not know that they are slaves. “The scheme of influence on consciousness in the system of conducting network wars includes the following steps. Stage 1. Determination of social space through its saturation with the help of special methods of selected information based on the purpose of the impact. Stage 2. The individual consciousness of the person, perceiving information, affects the social consciousness. Stage 3. Social consciousness, in turn, produces a restructuring of the individual consciousness. As a result of the “perestroika” of individual consciousness, a person finds himself in a rigidly determined social environment, while maintaining confidence that his activities are independent. ...The effectiveness of the impact on consciousness in the network warfare system is determined by two main factors: 1, the fear used as a behavioral regulator; 2, intellectualization or rationalization of knowledge creating the illusion of independence of the choice made”⁸.

Based on the foregoing, it is clear that in the context of the modern situation, the education system has a new super-task: the formation of a personality capable of withstanding informational influences, an ethical and aesthetic personality with critical and reflective thinking, courage and creativity, since it is “creativity, being the basis of being, acts as a metaphor for all life”⁹.

⁸Morua A. Open letter to a young man about the science of living / AST, Moscow, 2016. - 224 P. – P.37.

⁹Alice S. Doors 520 / Sports and Culture -2000, 2016. - 288 P. - P.136.

References

1. Arkhipenko S.I., Kolesnikova G.I. *The social type of personality in Russia: the specifics of transformation* / Rostov-on-Don: Antey, 2010. - 115 P. - ISBN 978-5-91365-113-6.
2. Cassirer E. *Technique of modern political myths* // Tomsk State University Journal. Moscow State University. Ser. 7, Philosophy. 1990. № 2. - M.: Lomonosov MSU — 92 P. — P. 58—65. - ISSN 0130-0091.
3. Kolesnikova G. I. *The social mechanism of manipulation of the consciousness of the personality: dis. ... Doctors of Philosophy: 09.00.11* / [Dissertation place: South Feder. Un-ty]. - Rostov-on-Don, 2010.- 364 P.: Ill. RSL OD, 9 10-5/3668
4. Kolesnikova G.I. *Social myth-making and mass consciousness in modern Russia / Problems of modeling social processes: Russia and Asia-Pacific countries: materials of the Second All-Russian News. scientific and practical conf. from the international participation, Vladivostok, December 7 – 8, 2016 / Vladivostok: Far East. federal un-ty 2016. - 780 P. - P.627-630. - ISBN 978-5-7444-3666-7*
5. Kolesnikova G.I. *Impact on consciousness in the system of conducting network wars: the experience of socio-philosophical understanding* // *International Journal of Applied and Fundamental Research*, 2017. - № 3. - Part.2 2017. - P. 311 -314. I - SSN 1996-3955
6. Cohen T. *I dreamed about her for so long / Foreign girl*, 2014. - 576 P.
7. *International Congress on Cybersecurity ICC-2019_Report_RU.17_10.SEP.* - 2019. - 49 P.
8. Morua A. *An open letter to a young man about the science of living* / AST, Moscow, 2016. - 224 P.
9. Alice S. *Doors 520 / Sports and Culture -2000*, 2016. - 288 P.

参加商业学前教育组织的儿童的社会交际能力的特征。

**FEATURES OF SOCIO-COMMUNICATIVE COMPETENCE
OF CHILDREN ATTENDING COMMERCIAL PRE-SCHOOL
EDUCATIONAL ORGANIZATIONS**

Naumenko Marina Vladimirovna

*Candidate of Sociological Sciences, Associate Professor
Southern Federal University*

抽象。 本文考虑了学龄前社会和交际能力形成的问题。 介绍了使用“着色” (R. Khuzeeva), “映射” (N. Verkasa) 的方法对参加州和商业学前教育组织的孩子的社交能力进行研究的结果。 关于研究对象之间对同伴的态度类型上的差异, 以及其他研究中的社会沟通能力参数没有差异的问题, 得出了结论。

关键词: 适应, 非人际交往, 养育, 学龄前, 学前组织, 交际文化, 言语, 联合活动, 社会化, 社会和交际能力

***Abstract.** The article considers the problem of the formation of social and communicative competence in preschool age. The results of a study of the socially communicative competence of children attending state and commercial preschool educational organizations using the methods: “Coloring” (R. Khuzeeva), “Mapping” (N. Verkasa) are presented. Conclusions are formulated regarding the differences between the studied groups in the type of attitude towards their peers and the absence of differences in other studied parameters of socio-communicative competence.*

***Keywords:** adaptation, non-personal-personal communication, upbringing, preschool age, preschool organization, communicative culture, speech, joint activities, socialization, social and communicative competence*

Social and communicative competence is the basis for all future life. The full mastery of this competency opens the way to communication, which in turn brings satisfaction of social and spiritual needs.

Psychologists A. N. Leontyev and M. I. Lisina believed that a high level of development of communicativeness contributes to the realization of the creative potential of a person and its adaptation in society. Various studies show the need for the timely development of this competency and see in it the key to successful socialization, effective self-realization and success [4,5].

In the studies of Vygotsky L.C. you can find that the beginnings of communication appear in the child as early as 2-3 months. Despite the fact that this communication is devoid of human speech, there is an emotional expression, a transfer of affect, a negative or positive reaction to a changing external situation. An important criterion for children to master social and communication skills is the development of speech. This process is interdependent: communication brings to life speech, the term and the pace of its development depend on how communication activities developed earlier, at preverbal levels [2].

In preschool age, the game comes to replace objective activity, as a leader. In the game, children work out what they have seen and gleaned from the world of adults and thus receive their first experience in solving life situations. The game provides an expansion of knowledge about the world, the creation of its subjective image.

By the end of preschool age (6-7 years), an extra-personal form of communication appears in children. This is the highest form of communication in preschool age. In the framework of this type of communication, an adult does not appear as an abstract image that directs its attention to the child, acquires individuality, specific features and life experience in his eyes. Cooperation with adults in the form of communication is already woven into cognitive activity and the child's attention is directed not at the subject, as at an earlier age, but at the world of people.

An important step in the formation of social and communicative competence of children is communication with peers. At the age of 3-4 years, the need for contacts begins to gain a foothold, and a peer becomes a subject of communication. The adult at this stage retains his authority, however, his peer as a partner in communication and a game becomes more attractive.

The most suitable time for the development of communicative skills is the period of preschool age of the child. The time when the child is open to everything new and is able to effectively absorb the incoming information. Therefore, it is very important how they organize his upbringing. Repina T.A., Ivanovets I.I. studied how the child forms a communicative culture, how communication goals and means of achieving them arise, analyzed how the child gains and hones social and communicative experience during various types of children's activities [3, 6].

Thus, it is necessary to understand what constitutes social and communicative competence, how it is absorbed by a child, and what contributes to the success of this process. Of course, the main role in raising a child is assigned to the family and close circle, but upon reaching a certain age, the child's social circle expands and it is necessary to take into account where and what he receives. The child gains important experience and knowledge in preschool organizations.

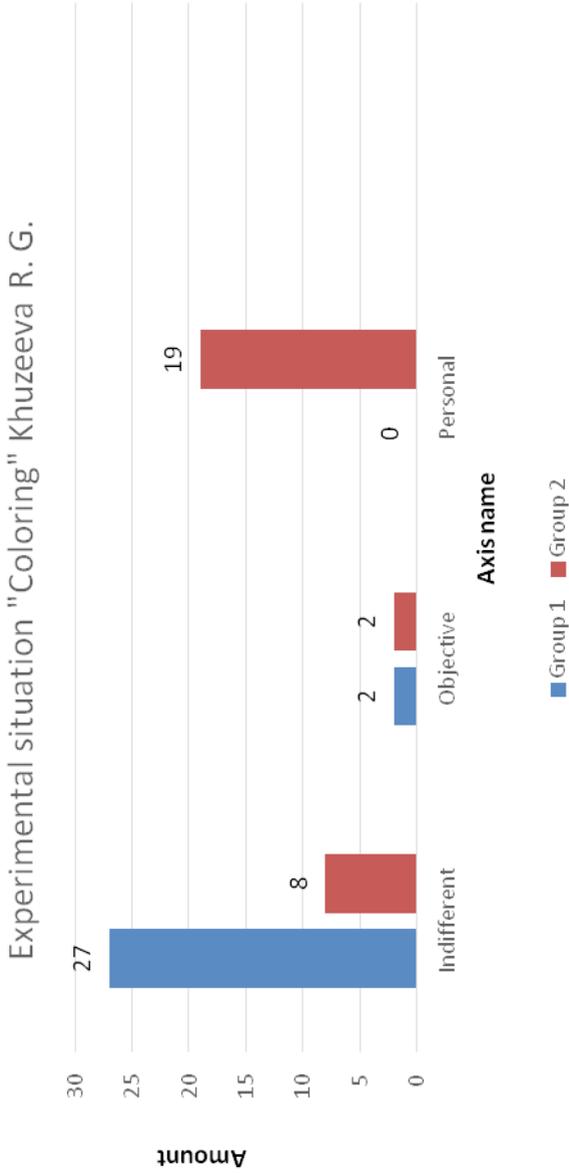


Figure 1. Indicators reflecting the type of attitude towards peers in children attending commercial pre-school organizations (Group 1) and in children attending government organizations (Group 2)

It is children's visit to preschool organizations that usually plays a significant role in the development of socio-communicative competence. The Soviet system of preschool education included kindergartens and leisure facilities. The development issues of these institutions were constantly raised during discussions; the development and functioning of these institutions was monitored. The main task before such institutions was an organic combination of the influence of the family and the public on education.

At present, Russia has formed a developed system of preschool institutions and organizations, along with state preschool institutions, commercial educational, leisure and development centers have appeared. Moreover, many parents choose commercial development centers as additional places for their children to visit.

To assess the development of social and communicative competence of children attending commercial pre-school organizations, the following criteria were identified: type of attitude towards a peer, ability to distinguish between the emotional state of a peer, ability to understand the tasks presented to a child by adults and attitude towards an adult.

The first parameter, investigated using the method of the experimental situation "Coloring" by R. Khuseeva, type of attitude towards a peer [7]. As a result of analysis and data processing using this technique, it was found that children attending commercial organizations are dominated by an indifferent type of relationship, while children attending state preschool organizations have a personality type of relationship (Figure 1). Such a result can be explained by the fact that the experience of communication with such children is less, therefore, in most cases they do not pay attention to the activities of their peers in performing joint activities. Then, as children visiting state organizations, on the contrary, are interested in the activities of their peers, they respond to assessments and comments, while this reaction is adequate and positive.

The results allow us to conclude that children attending state organizations are more adapted in the children's team and their communication skills with peers are more developed.

However, it is necessary to pay attention to the fact that the objective type of relationship is more pronounced in children attending state organizations. It is characterized by a lack of prosocial behavior and an inadequate response to assessments coming from both the peer and the teacher. This can be explained by the fact that in state organizations the level of competition between children is increased, followed by confrontation between children, which leads to an increase in conflict situations in the team.

As a result of a statistical analysis of differences in the types of attitudes toward peers in the two studied groups using the Mann-Whitney U-test method, the differences between the results of groups 1 and 2 are statistically significant $p \leq 0.01$.

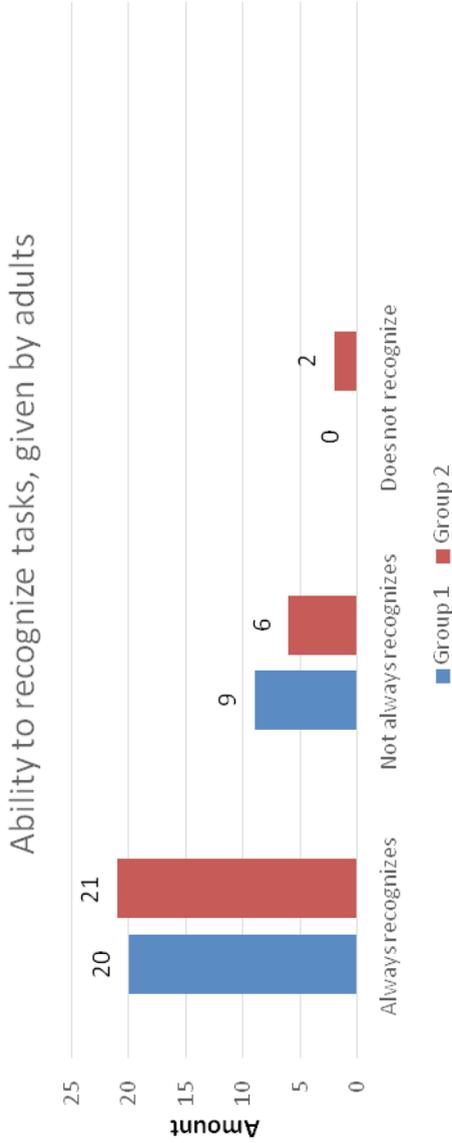


Figure 2. Indicators reflecting the ability of children to recognize the tasks presented by adult children attending commercial preschool organizations (Group 1) and children attending state preschool organizations (Group 2)

Using the methodology of mapping Verkas N.E. were analyzed: the ability of children to recognize the tasks presented by adults, to distinguish the emotional state of their peers, ideas about how to express their attitude to adults and ideas about social norms in communicating with peers [1]. In Figure 2 we can see that children from both groups “always” or “almost always” can distinguish between tasks presented by adults, however, in the group of children attending state organizations, there are answers reflecting the inability to understand the tasks that adults set for them. This may be due to the fact that, as a rule, children attending commercial educational organizations spend more time with adults and thereby gain experience in communicating with them, adopt their manner of behavior, intonation. Thus, we can assume that due to this, children can better perceive tasks.

The following criteria for assessing the socio-communicative competence of children were the ability to recognize the emotional state of their peers. The results showed that children who attend commercial organizations gave all the correct answers, while among children attending state preschool organizations there were children who could not correctly recognize the emotional state of children (Figure 3).

All children coped with tasks to determine the level of ideas about how to express their attitude to an adult successfully. There were no answers that indicated that children ignored adults. The answers “help the adult himself” prevail and make up 79%, which means that children have knowledge of socially acceptable behavior and understand what needs to be done in specific situations. Moreover, this indicator is the same for all children of groups 1 and 2 (Figure 4).

However, it is worth noting that there were situations in which most children found it difficult to answer, for example, a situation in which it was necessary to choose what to do in public transport, which indicates the likelihood that this situation did not have a place to be in their life experience - in as a result, many chose the option of "turn to another adult." Knowing this allows you to recommend to adults, in particular parents, to increase social experience and not to protect them from such situations, as well as demonstrate a pattern with their behavior. Moreover, all these actions can be practiced in the game, which is the leading activity of this age. The same advice can be given to teachers: include in their classes games aimed at training social skills.

The next scale in N. Verkas’s methodology was aimed at determining the presence of ideas in children about how to express their attitude to their peers. The results show that most children have a clear notion (Figure 5). It is also important to note that 60% of children attending commercial pre-school organizations and having an indifferent type of relationship have a clear understanding of how to express their attitude. These ideas are expressed in such manifestations as helping in a difficult situation, the need to resolve a dispute, and the ability to negotiate. From which we can conclude that when possessing these ideas and knowledge, they do not use it, or, it can be assumed that they are not used to showing interest in working together with other peers.

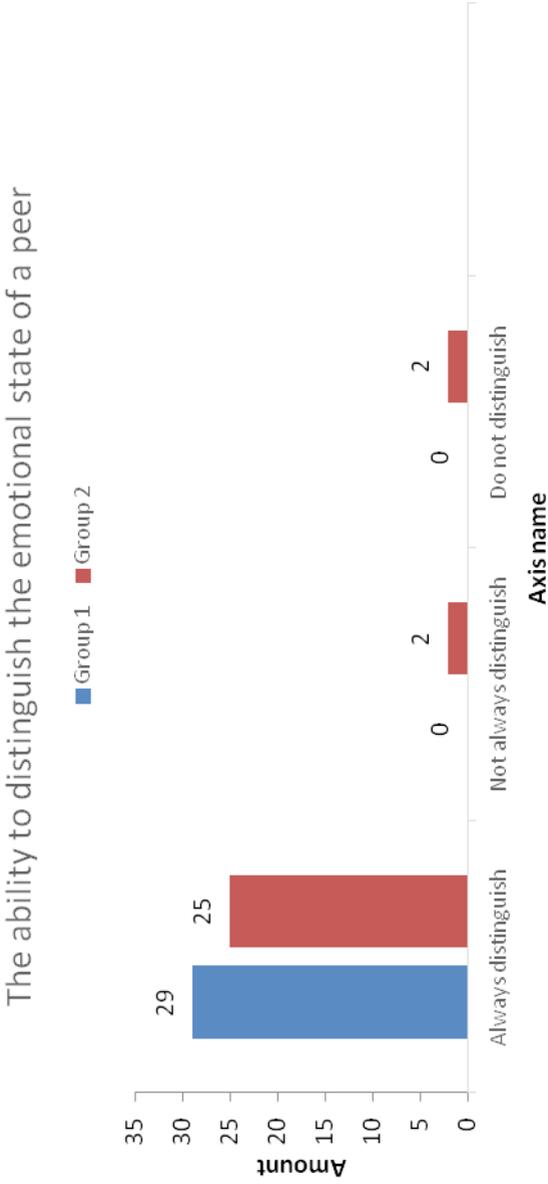


Figure 3. Indicators reflecting the ability of children to distinguish the emotional state of their peers by children attending commercial preschool organizations (Group 1) and children attending state preschool organizations (Group 2)

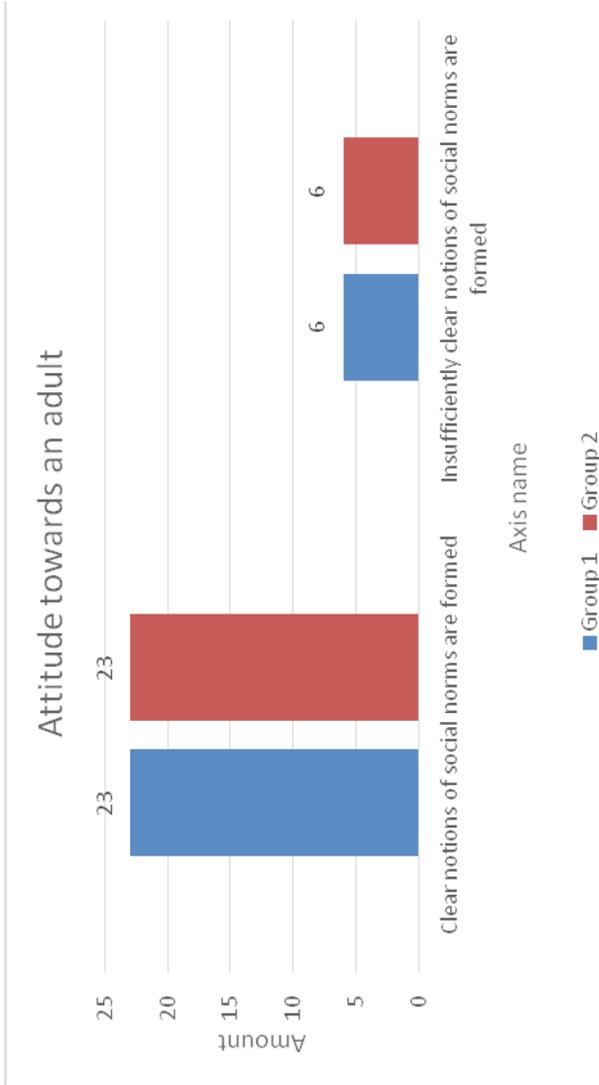


Figure 4. Indicators reflecting the average level of ideas about the ways of expressing one's attitude towards adults by children attending a commercial preschool organization (Group 1) and children attending a state preschool organization (Group 2)

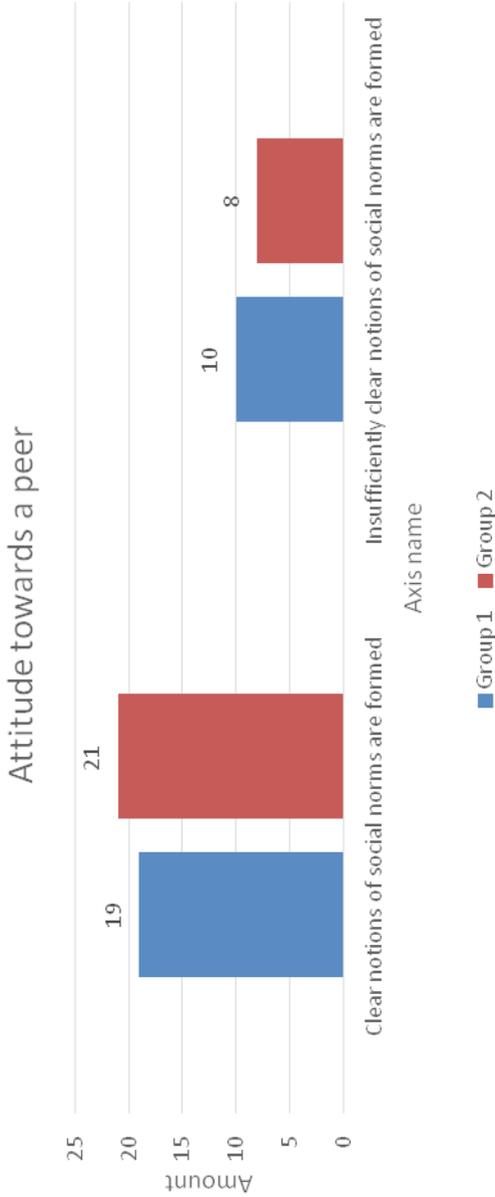


Figure 5. Indicators reflecting the level of perception of social norms in communication with peers by children attending a commercial preschool educational organization (Group 1) and children attending a state preschool organization (Group2)

As recommendations on how to improve practical skills in this area, we can offer both parents and adults more often to let children find a solution themselves in contentious situations, to let them decide for themselves, to come up with joint games with their peers. This is especially true for children who attend commercial organizations. It is especially important for them to give time and opportunities to communicate with other children in a variety of situations. At this age, this serves to prevent further problems, such as adaptation at school, where the presence of friends and the ability to make them is very important. And for this you need to have the skills to communicate with them.

In the statistical analysis of different skills in the framework of the "Methodology of mapping of Verkasa N. E.", which includes the ability to recognize tasks presented by adults, the ability to distinguish the emotional state of their peers, the level of ideas about how to express their attitude to adults and peers, using the U- Mann-Whitney test, there were no significant differences in indicators.

Based on this, we can conclude that, depending on what type of preschool educational organizations children attend, their type of attitude towards their peers varies significantly. In the group of children attending commercial educational organizations, the indifferent type of attitude prevails, in the group of children attending state organizations it is personal, in other respects the social and communicative competence, the differences between the groups under study are not significant.

References

1. Verkasa N.E., Verkasa A.N. *Diagnosis of mental development and the problem of abilities – Modern preschool education. Scientific and practical journal.* – 2007 - №1.
2. Vygotsky L.S. *Psychology of human development.* — M.: Publishing house Meaning; Eksmo Publishing House, 2005. — P. 136.
3. Ivanets I.I. *Art as a Means of Developing Speech Communications in Senior Preschoolers // Electronic Journal "Investigated in Russia".* 2000. № 31. P. 429–437.
4. Leontiev A. A. *Psychology of communication.* – 3rd ed. – M.: Meaning, 1999. – P. 365.
5. Lisina M.I. *Communication, personality and psyche of the child.* / Edited by Ruzskaya A.G. — M.: Publishing house “Institute of Practical Psychology”, Voronezh: NPO “MODEK”, 1997. — P. 384.
6. Repina T.A. *Communication of children in kindergarten and family.* M.: Pedagogy, 1990. – 152P.
7. Khuzeeva G. R. *Diagnosis and development of the communicative competence of a preschooler: psychological and pedagogical support service for a child* – Humanitarian Publishing Center VLADOS, 2014. – P.78.

诊断学生的情绪舒适度, 作为个人和专业适应的指标

DIAGNOSTICS OF EMOTIONAL COMFORT OF STUDENTS AS AN INDICATOR OF PERSONAL AND PROFESSIONAL ADAPTATION

Avchinnikova Svetlana Olegovna

Doctor of Pedagogic Sciences,

Professor at the Department of Social Work

Smolensk State University

抽象。本文对出版物进行了理论分析, 揭示了影响学生情绪状态和适应成功的主要因素。关注的重点是价值驱动的适应过程的确定。使用“价值需求导向的评级”方法对144名学生进行的实证研究数据进行了两次。比较了学生满足个人重要需求的能力所带来的情感上的舒适感。15%的一年级学生被诊断出情绪不适。统计学上证实了学生在学习过程中心理状态的积极变化, 但是, 有15%的受访者记录了3个疗程的情绪舒适度下降。根据研究结果, 提出了在为适应困难的学生制定心理和教学支持个别计划时, 需要诊断情绪舒适程度的建议。

关键词: 高中心理学, 学生, 适应, 个人价值观, 需求, 匮乏, 沮丧, 心理状态, 情绪舒适, 心理和教学支持。

Abstract. *The article provides a theoretical analysis of publications revealing the main factors affecting the emotional state of students and the success of adaptation. Attention is focused on the value-driven determination of adaptation processes. The data of an empirical study of 144 students are carried out twice using the methodology “Rating of value-need orientations”. The characteristics of students' emotional comfort, due to the ability to meet personally significant needs, are compared. 15% of first-year students are diagnosed with a state of emotional discomfort. The positive dynamics of the psychological state of students in the learning process is statistically confirmed, however, 15% of respondents recorded a decrease in the level of emotional comfort by 3 course. Based on the results of the study, recommendations are made about the need to diagnose the level of emotional comfort when developing individual programs of psychological and pedagogical support for students with difficulties in adaptation.*

Keywords: *higher school psychology, students, adaptation, personal values, needs, deprivation, frustration, psychological state, emotional comfort, psychological and pedagogical support.*

Personal and professional adaptation in the system of higher education is controversial, as indicated by both domestic and foreign authors [1; 2]. Difficulties in adaptation lead to poor academic performance, disappointment in the chosen profession, leaving or dropping out of college, a decrease in social activity or its undesirable orientation, and the occurrence of stress disorders. The process of personal and professional adaptation at a university is characterized not only by general patterns that are taken into account when developing university adaptation programs, but also purely individual prerequisites due to the presence of a particular person in a particular situation. This, in turn, requires the definition of new criteria and guidelines when constructing programs of psychological and pedagogical support for students with difficulties in adaptation.

Admission to the university for most of yesterday's schoolchildren means a change in their usual lifestyle, loss or decrease in the intensity of contacts with the previous circle of friends and acquaintances, a change in regimen moments, inclusion in educational and professional activities, and the need to establish contacts with a large number of new people, perception of the flow of heterogeneous information and certain requirements. In this case, many people have a separation from the family; everyday difficulties appear that have not been encountered before. As a result of this, according to A.V. Krylova, noted "a significant change in the goals and needs of yesterday's schoolchildren and related need-emotional states, among which a special place is the experience of deprivation" [3, p.156]. Psychologically, deprivation is a condition that occurs against the background of life circumstances that block the ability to fully or partially satisfy vital needs"[4]. At the same time, students may be subject to two of its varieties: absolute and relative. The first arises in connection with the objective impossibility of gaining access to certain benefits (lack of money affects food and entertainment; lack of registration and living in rented housing does not allow you to seek medical help). Relative deprivation is the result of comparing oneself with others and the mismatch between expectation and reality (being more capable and diligent, they do not have the benefits, connections, prospects available to their classmates). Such states negatively affect the emotional state, cause internal conflicts, lead to the devaluation of previous values.

Along with deprivation, which is relatively stable, lasting, researchers point to the destabilizing effect exerted on the psyche of young people by frustrating situations that arise periodically. Studying the role of various factors and conditions perceived by students as insurmountable obstacles that impede successful study, T.D. Dubovitskaya identified a group of internal and external frustrations and compiled their rating. So, the most common internal are excessive emotionality, anxiety; lack of necessary skills, low organization; diversity of interests; fatigue lack of desire to learn. External frustrations - this is a negative attitude of the teacher; lack of moral and material support from parents, poor conditions of study, living [5, p. 56].

Adaptation difficulties and related crisis experiences do not end with students in the 1st year. In the process of learning, 3 types of biographical crises are possible: unfulfilled, hopelessness and emptiness. When moving from the first course to the second, the feeling of loneliness decreases, but the intensity of the experiences correlated with the formation of professional identity increases [6, p. 78]. A kind of peak crises falls on the 3rd course of study and is determined, according to V.R. Manukyan, by the high saturation of student life and the multiplicity of tasks for the development of this stage [7, p. 115].

In other words, depending on the needs of the person that dominates at one stage or another and the possibilities of satisfying them, including internal resources and external circumstances, as well as value restructuring due to entry into the profession and independent life, students have different degrees of emotional comfort. Emotional comfort is the leading prerequisite for the realization of internal potential and an indicator of the success of adaptation. Hence, the aim of the study was to study the level of emotional comfort of students during their studies at the university.

The study was conducted at two universities in Smolensk. 144 students who studied in the 1st year, and then on the 3rd were tested. The test questionnaire "Rating of value-need orientations" contained in the package of methods for studying the active and communicative qualities of personnel was used as a tool [8]. The stimulus material was a list of 16 items that respondents were asked to rank in the first case, answering the question: "What is the most important thing for me in life? What am I not thinking of my life without?" And then, answering the question: "What am I happy with in my life now? What suits me the most?", "Which of the needs is satisfied more and better?". As a result, we received a rating of the basic life values of students and a rating of the satisfaction of their needs. The difference in ranks for each item indicates the level of satisfaction of needs. The results were analyzed at 4 levels: the level of super-necessary satisfaction, where P (difference in values) < 0 ; high level of compliance - $0 \leq P < 4$; the level of partial satisfaction is $4 \leq P < 11$, deprivation is $11 \leq P < 16$. The level of emotional comfort (mental tension) was calculated by the sum of the differences for each item. The range of values obtained is again divided into 4 categories and the number of cases in each is calculated: a comfortable mental state ($0 \leq CMS < 13$); satisfactory mental state ($13 \leq SMS < 39$); emotional discomfort ($39 \leq ED < 54$); high level of psychological tension ($54 \leq PT$).

As a result of the diagnosis, it was found that for all 16 positions the level of super-necessary satisfaction and high compliance are found much more often than the levels of partial satisfaction and deprivation. The lowest frequency of over-satisfaction is "health" (the proportion is 0.264 of the total number of this need at 4 levels). With a high frequency, the group of super-necessary satisfaction includes "the beauty of nature and the environment" (0.639 share), "entertainment" (0.549 share), "productive active life" and "opportunity for self-improvement and self-realization"

(0.535 each). In the group of high compliance, the leaders in terms of frequency were “love” and “health”, with equal shares - at 0.368. Moreover, all the aspects proposed for ranking are also present in the category of deprivation (table 1).

Table 1 - Levels of partial satisfaction and deprivation of freshmen needs

Name of value-need	Partial satisfaction		Deprivation	
	Share	95% confidence interval NG/VG	Share	95% confidence interval NG/VG
Active productive life	0,167	0,11/0,24	0,028	0,008/0,07
Family well-being	0,257	0,18/0,34	0,028	0,008/0,07
Opportunity for self-improvement	0,139	0,08/0,21	0,014	0,002/0,05
High academic performance	0,236	0,17/0,31	0,049	0,020/0,10
Social Security	0,257	0,18/0,34	0,028	0,008/0,07
Health	0,292	0,22/0,37	0,076	0,038/0,132
Love	0,264	0,19/0,34	0,083	0,044/0,141
The beauty of art, surroundings	0,063	0,03/0,12	0,021	0,004/0,06
Financially secure life	0,347	0,27/0,43	0,035	0,012/0,08
Authority among classmates	0,132	0,08/0,20	0,014	0,002/0,05
Authority among teachers	0,146	0,09/0,21	0,000	0/0,025
Having good friends	0,236	0,17/0,31	0,042	0,016/0,09
Entertainment	0,139	0,08/0,21	0,007	0,0002/0,038
Freedom to manifest your tastes, hobbies	0,208	0,14/0,28	0,035	0,01/0,08
Confidence in the future	0,257	0,18/0,34	0,104	0,06/0,17
Self-confidence	0,299	0,22/0,38	0,049	0,02/0,098

In particular, the fact that deprivation is most susceptible to the needs of "calm and confidence in the future", "love" and "health" draws attention. This combination, in our opinion, testifies to the adaptation difficulties of freshmen. Not a large number of respondents fully satisfy the needs of a “financially secure life”, “self-confidence” and “health”. In these positions, people are generally inclined to desire more, as freshmen demonstrated to us. Meanwhile, in general, the situation is alarming, since only 2.7% of respondents know a high level of compliance for all pairs, while the number of freshmen with problems due to insufficient satisfaction of needs in one or several positions is 44.2%.

Meanwhile, in general, the situation is alarming, since only 2.7% of respondents have a high level of compliance for all pairs, while the number of freshmen with problems due to insufficient satisfaction of needs in one or more positions is 44.2%.

Table 2 - Distribution of students by levels of emotional comfort (in%)

Respondents	Comfortable mental state	Satisfactory mental state	Emotional discomfort	Psychological tension
1 course	3,5	53,5	38,8	4,2
3 course	13,2	82,6	4,2	-

So, the number of students who feel comfortable in terms of meeting their needs has increased by almost 4 times, and those experiencing emotional discomfort has decreased by 9 times, while among third-year students there are no students with a high level of psychological tension.

Since absolute values cannot be considered as unambiguous evidence of positive changes, because individual indicators could deteriorate, we performed an additional analysis to evaluate the dynamics. In particular, excluding cases in which the level remained the same, we established the significance of differences in those groups of subjects where the level changed in an unfavorable direction with those where the indicator was improved (table3). As can be seen, statistically significant changes occurred within each category, i.e. the proportion of those who left a particular category is significantly different from the proportion of those who entered it, and the proportion of those who improved their condition in each category is greater, which ensures an overall positive trend. Meanwhile, in some cases (15%), the level of emotional comfort of students from the first to the third year may decrease, which indicates the unrealized potential of psychological and pedagogical support in the educational process.

Table 3 - the Results of changes in the levels of psychological comfort of students

Migrations	Statistics by the McNimar criterion		
	shares	χ^2	P
From "Comfortable mental condition" to Others	0,15	8.45	0,0037
From others to "Comfortable mental condition"	0,85		
From "Satisfactory mental condition" to others	0,216	22,72	0,00
From others to "Satisfactory mental condition"	0,748		
From "Emotional discomfort " to others	0,946	42,88	0.00
From others to "Emotional discomfort"	0,054		
From "Psychological tension" to others	1,0	4,176	0,041
From others to "Psychological tension"	0		

Based on the results of the study, the following conclusions are made:

1. Among first-year students, a risk group (about 15%) is identified that has several deprivable needs, experiences a high level of psychological tension and needs psychological and pedagogical support in this regard for more successful adaptation.
2. By the third year, the level of emotional comfort for most students is increasing, there are no values at the level of psychological tension among third-year students, which indicates the harmonization of the process of satisfying needs in accordance with their personal significance.
3. In 15% of students who had a high level of emotional comfort, the rate worsens by the 3rd course, which indicates a lack of psychological and pedagogical support provided at the university.
4. In practical terms, it follows from the results of the study that when developing students' adaptation programs, it is advisable to take into account the individual value-need profile and the level of emotional comfort.

References

1. *Eduljee N., Michaud R. Student Perceptions and Levels of Satisfaction About Academic Advising // International Journal of Psychosocial Research. 2014. Vol. 3, Issue. 1. P. 1–12.*
2. *Korolenko IB, Shcherbakova EA Psychological and pedagogical adaptation of students at the university / Innovative technologies in physical education, sports, physical rehabilitation. Materials of the I International scientific-practical conference. 2005. P. 10.*
3. *Krylova A.V. Psychological support of students in overcoming deprivation in a cultural and educational environment // Scientific problems of humanitarian research. 2010. №8. P.154-159.*
4. *Langmeyer J., Matejczyk Z. Mental deprivation in childhood. Prague.1984. 344P.*
5. *Dubovitskaya T.D., Erbegeeva A.R. The problem of frustration among students at the initial stage of study at a university // Higher education today.2008. №9. P. 54-59*
6. *Kurus I.A. The dynamics of experiencing crisis situations in students at the initial stage of training at a university // Vector of science TSU. Series Pedagogy, Psychology. 2016. № 3 (26) P. 78-82.*
7. *Manukyan V.R. Psychological content and factors of the crisis of professional development among university students // Psychological Science and Education. 2011. № 4.P. 109-117.*
8. *Workbook of a practical psychologist. Technology of effective professional activity. M. 1996. 398P.*

汽车工业发展趋势对宝骏RM-5的影响

THE INFLUENCE OF INDUSTRIAL DESIGN TRENDS IN THE AUTOMOTIVE INDUSTRY ON THE EXAMPLE OF BAOJUN RM-5

Medelets Nikita Aleksandrovich

*Candidate of Art Criticism, Leading exterior designer
Baojun Advanced Design Center, SGMW Design,
Shanghai, China*

抽象。本文以量产车为例，考察了工业设计和汽车设计之间的相互作用。拟议材料的基础是N.A. Medelets的论文研究“汽车整形因数（技术方面）”（2013年）。本文以宝骏RM-5样品为研究对象。

关键字：汽车设计，成形，成形因素，汽车

Abstract. *This article examines the interplay of industrial design and automotive design using a production car as an example. The basis of the proposed material is a dissertation research of N.A. Medelets “Car shaping factors (technological aspect)” (2013). The current Baojun RM-5 sample was taken as an object of research for the article.*

Keywords: *car design, shaping, shaping factors, car*

The question of constant updating and searching for new non-standard solutions arises every time for automakers when it is necessary to attract the attention of consumers and conquer new markets, increase sales. Standard styling solutions in car design are no longer popular and more difficult to promote. Among the many current trends in the design of passenger cars, the stylistics borrowed from industrial design, which is characterized by its simplicity, minimalism, utilitarianism, pragmatism and functionality, stands out.

One of the innovators in this direction is the young Chinese brand Baojun, which introduced the concept in 2019, and followed by a full-fledged production car RM-5, made under the influence of ideas of industrial design.

The designers developing this machine had a difficult task. On the one hand, it was necessary to design a family minivan with characteristics close to SUVs, i.e. kind of create a hybrid MPV + SUV. On the other hand, while preserving the engineering, technical, ergonomic and production requirements, to transfer a single theme with closed circuits to the body and interior. I must say that it is not

easy to practically implement such a stylistic language, since many factors have to be taken into account (Medelec, 2013), such as: the ratio of shapes, volumes and large surfaces to the selected graphic element, in this case it is an octagonal figure with rounded corners. Moreover, it is necessary to keep in mind production restrictions, for example: permissible values of the depth and radius of the casting of metal parts.

It is safe to say that the Baojun team successfully coped with the above tasks and the result speaks for itself (Fig. 1).



Fig. 1 General views of Baojun RM-5. 3D rendering of SGMW DESIGN

As mentioned above, the main theme of the design of the RM-5 model is a closed octagonal shape, which is clearly calculated in the side view on the shoulder line of the body (Fig. 2). A similar stylistic language is used not only in the exterior of RM-5, but also in the interior (Fig. 3).



Fig. 2 The rounded shape of the octahedron is the main element of the exterior composition, which is located on the shoulder line and encircles the entire body

Here it should be explained why the designers chose this particular form. Analyzing many industrial design products, the characteristic forms of factors that developers adhere to in most cases were identified. So, designers use a simplified closed-loop geometric pattern, simple surfaces and volumes that do not require sophisticated manufacturing equipment. As a rule, all graphics are logically grounded, organically integrated into the ergonomics of the subject and do not carry only a decorative function. Designers of the new Baojun style decided to use this idea.

Looking at the car in a lateral projection, you can see that the whole body composition is built relatively elongated along the shoulder line of the octagonal stamping, the pattern of which continues in front and behind the car. The same theme is supported by a trapezoidal notch in the area of steps. The designers' super task was to create a non-classical MPV, with a static silhouette, with a non-standard layout. As it turned out in practice, constructing a car, neglecting the existing laws of auto design is extremely difficult. Therefore, it was decided to maintain the wedge-shaped silhouette of the total mass of the body since the car, first of all, is a moving object that embodies dynamics.



Fig. 3 Style unity is also seen in the interior, similar graphic elements are used as in the exterior

Thus, the style of industrial design in the automotive industry has a place to be, as one of the current trends, but its solution must be approached very carefully, taking into account many factors of shaping.

References

1. *Medeleys N.A. Forming factors of a car (technological aspect). M. VNIITE, 2013.*
2. *Stuart Macey, Geoff Wardle. H-point. The fundamentals of car design and packaging. Art Center College of Design. 2009.*
3. *Baojun RM-5. //www.autohome.com.cn*
4. URL: <https://www.autohome.com.cn/5342/#pvareaid=3454436> (appeal date: 16.11.2019).
5. *2020 Baojun RM-5 Debuts Next-Gen MPV. Deivis Centeno. July 22, 2019 // www.gmauthority.com. URL: <http://gmauthority.com/blog/2019/07/2020-baojun-rm-5-debuts-next-gen-mpv/> (appeal date: 16.11.2019).*

儿童复发性支气管肺疾病的血红蛋白指数扩展特征
**FEATURES OF THE EXPANDED HEMOGRAM INDICES FOR
RECURRENT BRONCHOPULMONARY DISEASES IN CHILDREN**

Makhmutov Ravil Fatkulislyamovich

Candidate of Medical Sciences, Associate Professor

Bobrovitskaya Antonina Ivanovna

Doctor of Medical Sciences, Full Professor

Makhmutova Asiya Ravilevna

State Educational Organization of Higher Professional Education

Donetsk National Medical University

抽象。在267名1岁至15岁(含15岁)的经常和长期生病的儿童中研究了一些临床和血液学特征。发现早期,学龄前和小学年龄的儿童患病的几率大致相同,占82.8%。通常患有慢性上呼吸道病理的患病儿童主要患有慢性扁桃腺炎和腺样体炎(占81.1%),表现为细菌起源的炎症过程,需要康复。

在对所有患有上呼吸道感染的慢性患儿进行扩展临床血液检查的基础上研究指数(LII, LII_m, RNR, BLSI, RLES_R, LGI)时,增加了18.7%(LII_m), 52.9%与偶尔生病的儿童相比,百分比(RNR), 17.5%(BLSI), 9.4%(RLES_R)减少了13.3%(LGI),这证实了存在中毒的自身免疫性质,这是细菌的炎症过程在经常患病的儿童获得补偿并侵犯人体免疫活性的阶段。

关键词: 临床和血液学表现, 复发性支气管肺疾病, 儿童。

Abstract. *Some clinical and hematological features were studied in 267 often and long-term ill children aged 1 year to 15 years inclusive. It was found that children of early, preschool and primary school age were sick approximately the same and amounted to 82.8%. Often sick children with chronic upper respiratory tract pathology had mainly chronic tonsillitis and adenoiditis (81.1%) with manifestations of the inflammatory process of bacterial origin and required rehabilitation.*

When studying the indices (LII, LII_m, RNR, BLSI, RLES_R, LGI) on the basis of an extended clinical blood test in all frequently ill children with chronic foci of upper respiratory tract infection, an increase of 18.7% (LII_m), 52.9% (RNR), 17.5% (BLSI), 9.4% (RLES_R) amid a decrease of 13.3% (LGI) compared with children who were sick occasionally, which confirms the presence of an autoimmune nature of intoxication, an inflammatory process of bacterial origin in the stage of compensation and violation of the immunological reactivity of the body in frequently ill children.

Keywords: *clinical and hematological manifestations, recurrent bronchopulmonary diseases, children.*

Every year, according to WHO, about 1.2 million deaths in children aged 10 to 19 years are due to preventable circumstances. In the structure of the general incidence of children, respiratory pathology is 70%. At the same time, the number of diseases increases mainly due to frequent and recurring diseases of the upper respiratory tract. Children prone to frequent and recurrent respiratory diseases of any etiology are the main contingent for the formation of chronic foci of infection. Among these children, an unfavorable premorbid background occurs 2.5 times more often, the level of general morbidity is 3.5 times higher, pathology of ENT organs is detected in up to 90% of cases. This is facilitated by increased microbial contamination of the upper respiratory tract, as well as a decrease in the body's natural resistance and immunological reactivity [4, 5, 6].

Improving the health of children and adolescents determines one of the leading directions in the development of social policy of states, since the health of the nation as a whole, an increase in the active life span and creative longevity depend on the level of health of this population group [1, 2, 3].

The **aim** of the work was to study the expanded hemogram indices in children with recurrent bronchopulmonary diseases.

Materials and research methods.

Clinical and pathogenetic features were studied in 267 often and long-term ill children with recurrent bronchopulmonary diseases. The children were from 1 year to 7 years old 140 (52.4%), 7-14 years old - 85 (31.8%), over 14 years old - 42 (15.8%). To assess the health status of children, as well as the nature of relapses, a number of indices were determined by studying the expanded hemogram: leukocyte intoxication index (LII) according to the Kalf-Kalif formula Y.Ya. (1975); modified leukocyte intoxication index - LII_m (Ostrovsky V.K. et al., 1981); reactive neutrophil response (RNR); blood leukocyte shift index (BLSI); the ratio of leukocytes and ESR (RLESR); lymphocytic granulocyte index (LGI).

Quantitative data were evaluated for normal distribution (Shapiro – Wilk test). We calculated: arithmetic mean (M) and its standard error (m), relative value (P) in% and its representativeness error (m). For comparison of means, the Student's parametric criterion was used, since the data were described by the law of normal distribution, and for comparison of frequencies (in%), the exact Fisher test was used.

Results and discussion.

An assessment of the state of health in 267 children with recurrent bronchopulmonary diseases revealed that in the period of remission, children had various diseases of the upper respiratory tract: chronic tonsillitis in 110 (41.19%) cases; chronic adenoiditis - in 83 (31.08%); recurrent bronchitis - in 42 (15.73%); chronic pharyngitis - 32 (12.00%).

Epidemiological studies revealed that within one year each child had diseases of the upper respiratory tract 6.0 ± 2.1 times. Preschool children suffered diseases 4.8 times more often and school children 2.9 times more often than teenagers. Moreover, the incidence rate was 82.8% and was higher in young children 68 (25.47%), preschoolers 78 (29.21%), primary school children 75 (28.08%) compared with older school children and adolescents 46 (17.23%). Acute respiratory diseases in 102 (38.20%) children were more common than peers - they accounted for 153 (57.30%) of all cases.

The first episode of severe acute respiratory syndrome (SARS) was observed in frequently ill children in 71.91% of cases in the second half of the first year of life. The maximum frequency and duration of severe acute respiratory syndrome and the presence of secondary foci of infection in the form of adenoid vegetation was observed mainly in preschool children (55.4%) with the start of visits to organized children's groups.

Recurrent diseases in all children are caused by the main causes: perinatal burden (67.41%), chronic eating disorders (15.73%), rickets (29.21%), early artificial feeding (52.43%), atopic dermatitis (41, 20%), a low level of material and living conditions (44.20%), attending to preschool organized groups (33.4%), and irrational use of drugs (14.9%).

In all the examined children, micro-polyadenitis and asthenic syndrome were recorded in 56.4% of cases. In 69.6% of children with chronic adenoiditis, the causes of hypertrophy of the nasopharyngeal tonsil were varied: adverse living conditions in 14.2% of cases; allergic processes with persistent rhinitis in 12.00%; the presence in the history of lymphatic-hypoplastic anomaly of the constitution in 8.2%; atopic dermatitis in 16.1%. Adenoids in 46.4% of children were truly hypertrophied (II – III degree) and in 25.8% they were in a state of chronic inflammation. Adenoid vegetation was combined with hypertrophy of the tonsils in 8.6% of cases, adenoiditis with chronic sinusitis in 5.2% of cases.

The clinical manifestations of adenoiditis were: persistent difficulty in nasal breathing, nasal voice, halitosis, maxillofacial anomalies. Hemograms in all children were characterized by the presence of minimal signs of inflammation (12.4%) or their absence (87.6%).

Chronic tonsillitis was recorded in 39.7% of school-age children and was characterized in the period of remission by the presence of subfebrile temperature, discomfort in the throat and caseous masses in the lacunae of the tonsils, painful palpation of the submandibular lymph nodes. When examining the oropharynx - tonsils hypertrophied (I – II degree) with scarring and tightened. At the same time, hyperemia of the mucous membrane of the anterior arch of the tonsils was noted. The hemogram was characterized by leukocytosis (10.3 ± 1.3 G/L), neutrophilic shift ($62.4 \pm 3.7\%$), monocytopenia ($5.7 \pm 1.4\%$), accelerated ESR ($18.3 \pm 1, 7$ mm\hour).

In 39.7% of frequently ill children with adenoid vegetation (11.2%) and chronic tonsillitis (28.5%), when studying the microbiological landscape of the oropharynx, pathogenic flora in the form of staphylococcus (20.3% of cases), streptococcus (18.7% of cases), pneumococcus (0.7% of cases) and fungi of the genus *Candida* (8.7% of cases) was found. The formation of chronic pharyngitis in 34 (6.0%) children was promoted by: tonsillitis, purulent inflammation of the sinuses, rhinitis. The clinical picture of chronic pharyngitis was characterized by a sensation of a foreign body in the throat, moderate pain when swallowing, often a dry cough, and a rapid change in voice. Under pharyngoscopy we noted: thickening and diffuse hyperemia of the pharyngeal mucosa with the presence of a viscous mucous or mucopurulent secretion, swelling and thickening of the tongue and soft palate.

Chronic rhinitis in 28 (5.0%) children developed as a result of prolonged exposure to adverse environmental factors (increased dustiness and gas contamination of atmospheric air), the presence of a chronic inflammatory process in the paranasal sinuses 5 (0.89%) and adenoids 7 (1, 25%). The clinical manifestations of the disease were constant secretion and nasal congestion, headache, and a decrease in smell. When rhinoscopy, the color of the shells is pale pink, with a bluish tint of 6 (1.07%).

Recurrent bronchitis in 45 (7.9%) children developed after acute respiratory viral infections in 27 (4.74%) or after an exacerbation of chronic infection (tonsillitis, adenoiditis, sinusitis) - in 18 (3.16%). The frequency of exacerbations of bronchitis in children of preschool age was 6.2 ± 1.3 times a year, in schoolchildren - 4.7 ± 1.5 . Incomplete remission of recurrent bronchitis in 12 (2.10%) children was accompanied by a short-term increase in body temperature ($37.5 \pm 1.2^\circ\text{C}$), severe headache and catarrhal symptoms against the background of a slightly disturbed general condition, dry and painful cough, sometimes paroxysmal, which then became wet with the release of a small amount of mucus, in some cases sputum.

During auscultation of the lungs, variably localized wet and dry rales of varying sizes were mainly detected, mainly by inhalation. On the roentgenogram of the lungs, changes in the form of reticularity and enhancement of the basal broncho-vascular pattern were observed. In the exacerbation period in 8 children, the hemogram was characterized by mild hypochromic anemia (105.7 ± 2.3 g/l), slight leukocytosis (10.6 ± 1.4 G/l), accelerated ESR (16.0 ± 3.2 mm/h).

When studying the indices (LII, LIIm, RNR, BLSI, RLESr, LGI) on the basis of an extended clinical blood test in all frequently ill children with chronic foci of upper respiratory tract infection, an increase of 18.7% (LIIm), 52.9% (RNR), 17.5% (BLSI), 9.4% (RLESr) against the background of a decrease of 13.3% (LGI) compared to children who were sick occasionally, which confirms the presence of an autoimmune nature of intoxication, an inflammatory process of bacterial origin in the stage of compensation and violation of the immunological reactivity of the body in frequently ill children.

Thus, children of early, preschool and primary school age were sick approximately the same and amounted to 82.8%, that is, 4.9 times more likely to get sick compared to children of high school age and adolescents (17.2%), which is likely associated with the beginning of visits to preschool organized groups and the imperfection of the system of natural resistance of the body. Often sick children with chronic pathology of the upper respiratory tract had mainly chronic tonsillitis and adenoiditis (81.1%) with manifestations of the inflammatory process of the bacterial genesis in the compensation stage, intoxication of an autoimmune nature and require rehabilitation.

References

1. Полунина Н.В., Черкасов С.Н. Особенности состояния здоровья детей Российской Федерации и пути его улучшения. // Приоритетные направления развития здравоохранения Дальнего востока и Байкальского региона: проблемы и перспективы сб. науч. трудов Якутск. 2013; 203-207. Polunina N.V., Cherkasov S.N. Osobennosti sostojanija zdorov'ja detej Rossijskoj Federacii i puti ego uluchshenija. // Prioritetnye napravlenija razvitija zdruvoohranenija Dal'nego vostoka i Bajkal'skogo regiona: problemy i perspektivy sb. nauch. trudov Jakutsk. 2013; 203-207. (in Russian).
2. Полунина Н.В. Состояние здоровья детей в современной России и пути его улучшения. / Н.В.Полунина. //Вестник Росздравнадзора. 2013; №5; 17-24. Polunina N.V. Sostojanie zdorov'ja detej v sovremennoj Rossii i puti ego uluchshenija. / N.V.Polunina. //Vestnik Roszdravnadzora. 2013; №5; 17-24. (in Russian).
3. Заплатников А.Л. Индукторы интерферонов. Противовирусные иммуно- модулирующие эффекты в клинике детских инфекций /А.Л. Заплатников, С.М., Харит, В.А., Петров Б,А. // Поликлиника. 2010; № 5; 25-27. Zaplatnikov A.L. Induktory interferonov. Protivovirusnye immuno- modulirujushhie jeffekty v klinike detskih infekcij /A.L. Zaplatnikov, S.M., Harit, V.A., Petrov B,A. // Poliklinika. 2010; № 5; 25-27. (in Russian).
4. Костинов М.П. Иммунотерапия: механизм действия и клиническое применение иммунокорректирующих препаратов./М.П. Костинов, И.В. Лукачев, В.П.Афиногенова //Лечащий врач. 2010; № 4; 9-13. Kostinov M.P. Immunoterapija: mehanizm dejstvija i klinicheskoe primenenie immunokorrigirujushhijh preparatov./M.P. Kostinov, I.V. Lukachev, V.P.Afinogenova //Lechashhij vrach. 2010; № 4; 9-13. (in Russian).
5. Сапожников В.Г.Избранные главы детских болезней. Монография. Тула: Полиграфинвест, Издание 3-е. Дополненное. 2015; 298. Sapozhnikov V.G.Izbrannye glavy detskih boleznej. Monografija. Tula: Poligrafinvest, Izdanie 3-e. Dopolnenoje. 2015; 298. (in Russian).
6. Сапожников В.Г. Избранные главы детских болезней. Монография. Тула: Полиграфинвест, Издание 4-е. Дополненное. 2016; 292. Sapozhnikov V.G. Izbrannye glavy detskih boleznej. Monografija. Tula: Poligrafinvest, Izdanie 4-e. Dopolnenoje. 2016; 292. (in Russian).

矿区城市化地区土壤污染特征
**FEATURES OF SOIL POLLUTION IN URBANIZED TERRITORIES
OF THE MINING REGION**

Suyundukov Yalil Tukhvatovich

*Doctor of Biological Sciences, Professor, Chief Researcher
Laboratory of Ecology and Environmental Management
of the Sibay Branch of the Institute for Strategic Studies
of the Republic of Bashkortostan; Deputy Director for Science
Sibay Institute (branch) of Bashkir State University*

Khasanova Rezeda Firgatovna

*Doctor of Biological Sciences, Leading Researcher
Laboratory of Ecology and Environmental Management
Sibay Branch of the Institute for Strategic Studies
of the Republic of Bashkortostan
Associate Professor, Department of Natural Sciences
Sibay Institute (branch) of Bashkir State University*

Semenova Irina Nikolaevna

*Doctor of Biological Sciences, Leading Researcher
Laboratory of Ecology and Environmental Management
Sibay Branch of the Institute for Strategic Studies
of the Republic of Bashkortostan
Associate Professor, Professor, Department of Natural Sciences
Sibay Institute (branch) of Bashkir State University*

抽象。 重金属污染土壤是一个世界性的问题。 巴什科尔托斯坦共和国的矿区以采矿业的发展为特征。 研究表明,有毒金属的含量使土壤高度镶嵌。 不同地球化学省的存在,通缩和水蚀导致的含金属成分的移动及其在废物的开发,提取和储存过程中的分散,都促进了这一过程。 对于城市土壤,污染的马赛克是由于车辆,火力发电厂的企业等的存在。为了减少重金属在家庭和花园土壤中的流动性,应采取措施增加其在沿海地区的缓冲能力。 加入天然沸石,石灰和有机肥料会造成“危险”污染。

关键词: 重金属矿区城市化地区

Abstract. *Soil pollution by heavy metals is a worldwide problem. The mining region of the Republic of Bashkortostan is characterized by the development of the mining industry. Studies have revealed a high mosaic of soils by the content of toxic metals. This is facilitated by the presence of different geochemical provinces, the movement of metal-containing components as a result of deflation and water erosion and their dispersion during the development, extraction and storage of waste. For urban soils, the mosaic in the pollution is due to the presence of vehicles, enterprises of thermal power plants, etc. In order to reduce the mobility of heavy metals in household and garden soils, take measures to increase their buffer capacity in areas of "dangerous" pollution by adding natural zeolite, lime and organic fertilizers.*

Key words: *heavy metals, mining region, urban areas*

The quality of the soil not only characterizes an ekologo-hygienic condition of land ecosystems, but also ecological wellbeing of the environment in general. In this regard it is of great interest the analysis of an ecotoxicological condition of a city soils representing one of the main components of urban ecosystems. Pollution of soils by heavy metals is a global problem, many works are aimed at search of the most optimum ways to decrease in toxicity of soils and increase in its buffer abilities.

The mining region of the Republic of Bashkortostan thanks to existence of a large number of chalcopyrite fields is characterized by rapid development of the mining and ore processing industry. Nonferrous metallurgy enterprises act as a powerful source of negative impact on the environment, first of all a soil cover.

The region differs in a variety of climatic and social and economic conditions. In its territory a number of administrative regions and cities is located: Baymasksy (with the cities of Sibay and Baymak), Uchalinsky (with the city of Uchaly), Khaybullinsky, Abzelilovsky, Burzyansky, Zilairsky, Zianchurinsky [Suyundukov et al., 2014].

In geological perspective the region is located on crossing of West-Magnitogorsk volcanic (submeridional) and Baymak-Sibay (subwidth) belts. Pyritic ores are put by rocks of the Pre-Paleozoic and Paleozoic period. Ore material is processed by open and underground methods. In the course of production and enrichment of the ore a huge mass of rocks are excavated and processed, from them only a part is used, and other volume of the processed raw materials is stored in dumps and "tailings dams". Long-term and multiton dumps are sources of mineral dust and drains with the high content of toxic metals. Annually up to 1000 tons of dust which contains about 20 various toxic elements is blown off from dumps into the air. It promotes pollution of a soil cover of the region. Long-term functioning mining enterprises led to form of technogenic provinces which in combination with a high natural geochemical background aggravated an ecological situation of the region. Abnormal concentration of chemical elements are noted as well in the soils of vicinities of more than 40 robbed-out fields.

According to Russian meteorological service data which were provided in the State report "On the status and protection of the environment of the Russian Federation in 2016", cities of the mining region of the Republic of Bashkortostan (Sibay and Baymak) were included in the list of Russian sites with a moderately dangerous category of soil contamination with heavy metals for 2007-2016. Priority technogenic metals include copper, cadmium, zinc and lead. According to the total pollution indicator calculated with consideration of Clark, the soil cover in the one-kilometer zone around pollution sources is classified as hazardous [State Report ..., 2017].

The study of the ecological and geochemical state of the soil cover of cities in the mining region showed that urban soils are dominating in this territory (up to 60-70% of the territory in the cities of Sibay and Uchaly, up to 40% in Baymak). The smallest share (about 15% of the territory) is made up of soils with minimal anthropogenic impact in the recreational zone, represented by leached and ordinary chernozem.

In all zones, a significant excess of the maximum permissible concentrations (MPC) of gross forms for the content of Cu, Zn was detected, in some cases there is a high concentration of Mn, Cd and Co. The maximum concentrations of Cu (9.7 MPC), Mn (1.1 MPC) and Co (1.9 MPC) were found in the soils of the industrial zone of the city of Uchaly, Zn (19.8 MPC) in the industrial zone and Cd (3.6 MPC) in the soils of the residential zone of Sibay. Calculations of the total pollution indicator Zc showed that urban soils of lands of all types of use are classified by the gross content to the permissible category of pollution. The level of soil contamination with heavy metals in all studied cities is higher in the soils of industrial lands. In he Uchaly and Sibay, a high concentration of metals is also noted in the soils of the residential zone of microdistricts located in close proximity to the dumps of open pits: Uchaly-2, Buransy in Uchaly and Zoloto and Gorny in Sibay. In the town of Baymak, contaminated soils were found in the recreational areas of the city, which are located 500 meters from the Baymak Foundry-Mechanical Plant. a The another source of pollution is a 1 million tons of metallurgical slag from the former copper smelter, is stored on the territory of the plant which is on the river bank in the city center.

As a result of research in all studied soil samples, an increased level of mobile forms of Cu, Zn, Mn, Cd was detected. The highest level of mobile Cd (18.9 MPC) is noted in the residential area of Baymak. The calculations of the total indicator Zc allowed us to classify the soils of the residential zone by the content of mobile forms as a moderately dangerous category of pollution, the other studied soils had a permissible category of pollution. In the soils of the industrial zone of the town of Uchaly, high concentrations of mobile forms of Cu (up to 37 MAC) and Zn (up to 43 MAC) are noted, in the city of Sibay there are mobile forms of Cu (up to 28 MAC) near the open pit dumps, where pollution reaches a highly dangerous category.

In the area of old-year tailings there is pollution with copper in the amount of 1.2-2.4 EDC (estimated allowable concentration), zinc - 1.6-2.6 EDC, and also arsenic - 1.1-1.8 EDC. Exceeding the maximum permissible concentration (MPC) of mobile forms of zinc 1.4 times, copper 1.3 times recorded at a distance of 100 m in all directions and 500 m east of the pollution source (PS).

Environmental pollution in the location of plants is characterized by the association of lead, cadmium, arsenic, zinc, copper and other elements that can enter the body aerogenically, with food and water, deposited in individual organs and tissues, representing a potential threat to public health [Opekunova et al., 2017].

Surveys of household plots and collective gardens on the territory of cities showed that within a radius of 5 km from the industrial zone of the city, soils contain high concentrations of acid-soluble and mobile forms of copper, zinc, lead, and cadmium [Suyundukov et al., 2013]. The increased amount of metals in soils is reflected in its content in crop production. For most cultivated plants, there is an excessive content of zinc, iron and manganese deficiency. Of the total amount of heavy metals entering the human body with local vegetables, 9% of copper and zinc each, cadmium - 40%, lead - up to 73%, which is many times higher than the recommended norms.

To date, quite a lot of works have been published, showing the peculiarities of environmental-dependent diseases of the population of the mining region [Starova et al., 1998; Teregulova et al., 2009; Rafikova et al., 2017]. They have a high level of general morbidity of the population, an increase of 1.3-2.5 times the frequency of the spread of circulatory, respiratory and digestive diseases, skin and nervous system. There is an increase of 1.5-3.0 times the diseases of the respiratory organs, digestion, endocrine system and metabolism, nervous system and sensory organs among the children's population. Compared with the average indicators in the republic, a high level of primary morbidity of the population, diseases of the endocrine system, blood and blood-forming organs, circulatory system, diseases of the nervous system and cancer diseases was revealed. In the blood of the inhabitants of the region there is an excess of the norm in the content of cadmium and nickel, the deficit in the content of copper, zinc and manganese, in the hair there is a high level of chromium, zinc, lead, copper, arsenic, nickel, manganese. A musculoskeletal system dysfunctions were found in the structure of diseases of workers of mining and mining enterprises.

The particular qualities of the soil cover of the mining region and the specificity of its pollution dictate the necessity of conducting research for hygienic monitoring and the development of preventive measures to reduce pollution.

According to the results of this study and the data presented in the reports of the Territorial Committee of the Ministry of Environment of the Republic of Bashkortostan, the main sources of pollution of the urban environment in the Urals are mining enterprises and vehicles that determine the flow of heavy metals into various environmental objects. The top polluting metals in the soils of cities in the mining region of the Republic of Bashkortostan are Zn, Cu and Cd, in some cases Mn, the level of accumulation, mobility and contrast of areal distribution of which is determined by the functional use of the territory for the production, storage and processing of raw materials and waste.

The soil mosaicity according to the content of toxic metals is determined by a number of other reasons [Usmanov et al., 2014]. First, it is the location of cities in different geochemical provinces, which differ in the elemental composition of the parent rocks. Secondly, the uneven movement of metal-containing components along different landscape components as a result of erosion processes. Thirdly, for urban soils in the region, the mosaic pattern in heavy metal pollution is also due to the presence of vehicles, highways, enterprises of thermal power plants, etc.

For an objective assessment of the state of the soil cover, control and management decisions to reduce the concentration of heavy metals and improve the ecological situation, it is necessary to conduct periodic monitoring of the soil quality of various types of lands. It is obligatory to carry out work on the reclamation of disturbed and contaminated land. When placing children's educational, sports and medical institutions, it is necessary to take into account information on the contamination of the soil cover of the territories with heavy metals. In order to reduce the mobility of heavy metals in household and garden soils, take measures to increase their buffering capacity in the zones of "dangerous" pollution by applying natural zeolite, lime and organic fertilizers.

Financing. The publication was prepared in the framework of a research project supported by the Russian Federal Property Fund and the Government of the Republic of Bashkortostan 18-413-020004 p_a.

References

1. *Suyundukov I.T., Semenova I.N., Zulkarnaev A.B., Khabirov I.K. Anthropogenic transformation of soils in the city of Sibay in the zone of influence of the mining industry [Antropogennaja transformacija pochv goroda Sibaj v zone vlijanija predpriyatij gornorudnoj promyshlennosti]. Ufa: Gilem; 2014. (in Russian)*
2. *State report "On the status and protection of the environment of the Russian Federation in 2016" [Gosudarstvennyj doklad «O sostojanii i ob ohrane okruzhajushhej sredy Rossijskoj Federacii v 2016 godu».] M.: Minprirody Rossii; NIA-Priroda. 2017. (in Russian)*
3. *Suyundukov Ya.T., Yanturin, S.I., Singizova G.Sh. Accumulation and migration of heavy metals in the main components of anthropogenic ecosystems of the Bashkort Transurals in the zone of influence of objects of the mining complex. [Nakoplenie i migracija tyazhelyh metallov v osnovnyh komponentah antropogennyh ekosistem Bashkirskogo Zaural'ja v zone vlijanija obektov gornorudnogo kompleksa]. Ufa: Gilem, 2013. (in Russian)*
4. *Rafikova Yu.S., Semenova I.N., Suyundukov Ya.T., Rafikov S.Sh., Biktimerova G.Ya. Regional ecological and hygienic features of the environment and the health status of the population of the Bashkort Transurals. [Regional'nye ekologo-gigienicheskie osobennosti okruzhajushhej sredy i sostojanie zdorov'ja naselenija Bashkirskogo Zaural'ja]. Sibay: SGT, 2017. (in Russian)*
5. *Teregulova Z.S., Belan L.N., Askarov R.A., Teregulova Z.F., Altynbayeva A.I. Features of environmental pollution and morbidity in the mining region of the Republic of Bashkortostan. [Osobennosti zagryaznenija sredy obitanija i zabol'vaemost naselenija v gornodobyvayushem regione Respubliki Bashkortostan] Medicinskij vestnik Bashkortostana. 2009; 4. (6). 20-25. (in Russian)*
6. *Starova N.B. Teregulova Z.S., Borisova N.A. The complex decision of environmental problems of the Republic of Bashkortostan in the space-time unity: Proceedings: international. [Kompleksnoe reshenie jekologicheskijh problem Bashkortostana v prostranstvenno-vremennom edinstve. Trudy: Mezhdunar. forum po problemam nauki i tehniki]. M. 1998; 115-139. (in Russian)*
7. *Usmanov I.Yu., Semenova I.N., Shcherbakov A.V., Suyundukov Ya.T. Endemic ecological niches of the South (Bashkort) Transurals: a multidimensional and fluctuating modes. [Endemichnie ekologicheskije nishi Yujnogo (bashkirskogo) Zaural'ja: mnogomernost i flukturiruyushie rejimy] Vestnik BGAU, 2014; 1.16-22. (in Russian)*
8. *Opekunova M.G., Somov V.V., Papyan E.E. Soil pollution in the area of impact of mining enterprises of the Bashkort Trans-Urals. [Zagryaznenie pochv v rayone vozdeistviya gornorudnyh predpriyatij Bashkirskogo Zaural'ja] Pochvovedniye, 2017; 6. 744-758. (in Russian)*

关于Zabaykalsky Krai水库中鱼类的生物入侵
**ABOUT BIOLOGICAL INVASIONS OF FISHES IN RESERVOIRS
OF ZABAYKALSKY KRAI**

Gorlacheva Evgenia Pavlovna

Research Officer

*at the Institute of Natural Resources, Ecology and Cryology
of the Siberian Branch of the RAS*

Gorlachev Valerii Pavlovich

Doctor of Pedagogic Sciences, Full Professor

Head of Laboratory of Applied Ecology

Transbaikal State University

抽象。研究表明,在Transbaikalia水体中生活的70种鱼类中,有18种是入侵性的。文章描述了这些鱼的入侵。入侵的一部分有助于提高鱼类的生产力。其他入侵较弱,不会显著影响鱼腥藻的形成。一些入侵,特别是栖息地和阿穆尔河睡眠者的入侵,在功能上对Transbaikalia和邻近地区的水生生态系统构成危险。

关键词: Zabaykalsky边疆区, 上阿穆尔河盆地, 范围, 引入, 入侵, 西伯利亚st鱼, 剥皮, 北极思科, 鲟, 阿穆尔cat鱼, big鱼, 三唇, 栖息, 阿穆尔河睡眠者

Abstract. *It was shown that out of 70 species and varieties of fish that live in the water bodies of Transbaikalia, 18 species are invasive. The article describes the invasion of these fish. Part of the invasion contributes to increased fish productivity. Other invasions are weak and do not significantly affect the formation of ichthyofauna. Some invasions, especially perch and amur sleeper invasions, are functionally dangerous for the aquatic ecosystems of Transbaikalia and adjacent territories.*

Keywords: *Zabaykalsky Krai, Upper Amur basin, range, introduction, invasion, siberian sturgeon, peled, arctic cisco, bream, amur catfish, bighead carp, three-lips, perch, amur sleeper*

Interest in biological invasions in the modern world is steadily increasing, and invasions are of great practical importance. Following Yu. Yu. Dgebuadze, we mean by biological invasion all cases of the penetration of living organisms into ecosystems located outside their original (usually natural) range (Gorlachev, Gorlacheva, 2016). Under global anthropogenic transformations, invasions contribute to the depletion of natural communities, a decrease in the biodiversity and sustainability of natural ecosystems (Alimov et al., 2004; Dgebuadze et al., 2007; Yakovlev, 2001).

Harmful invasive species are considered to be the second most important threat to biodiversity and the sustainability of natural ecosystems, the conservation of biological resources and human health, as reflected in the Convention on Biological Diversity, concluded in Nairobi in 1992.

Based on the Convention, Russia has developed a National Strategy and Action Plan for the conservation of biodiversity, providing for strict control over all types of invasion (National Strategy ... 2001). The strategy determines the current areas of research, including in the field of invasion of fish in inland waters. This fully applies to the reservoirs of the Zabaykalsky krai.

Zabaykalsky Krai - one of the largest regions of Russia, is the eastern part of the vast Central Asian world watershed of the basins of the Pacific and Arctic Oceans. The confluence of the Transbaikal Territory to the global watershed of two oceans has led to the fact that the reservoirs of the Territory belong to four drainage basins - Baikal, Lena, Amur, and the Torey drainage basin. On the territory of the region, the upper reaches of the largest rivers of Siberia and the Far East - the Lena, Yenisei and Amur, are formed, the length of which is 4400, 5075 and 4400 km, respectively.

The great watershed, the large extent of the region's territory, and the complex terrain with a predominance of mountain morphostructures contributed to the hydrographic isolation and faunal isolation of three large foci of ichthyofauna — Siberian, eastern, and inland (Karasev, 1967). Under isolation conditions, fish invasion processes can be more numerous, especially invasions associated with the introduction of certain types of fish undertaken by humans to increase the fish productivity of water bodies or other fish-reclamation goals.

In total, 70 species and varieties of fish were identified in the reservoirs of the Trans-Baikal Territory. Of these, 1/4 part or 18 species are alien or invasive for the aquatic ecosystems of the region. These include siberian sturgeon – *Acipenser baerii baicalensis* A.Nikolski, 1896, baikal whitefish – *Coregonus lavaretus baicalensis* (Dybowski, 1874), vendace – *Coregonus albula* (Linnaeus, 1758), peled – *Coregonus peled*, Gmelin 1789), baikal arctic cisco – *Coregonus autumnalis migratorius* (Georgi, 1775) grass carp - *Ctenopharyngodon idella* (Valenciennes, 1844), three-lips - *Opsariichthys uncirostris amurensis* Berg, hankin gudgeon – *Squalidus chankaensis* (Dybowski), manchurian gudgeon – *Gnathopogon mantschuricus* (Berg, 1914), gudgeon-tench - *Sarcocheilichthys sinensis* Beecker, bream – *Abramis brama* (Linnaeus, 1758), common carp – *Cyprinus carpio* Linnaeus, 1758), Silver carp – *Hypophthalmichthys molitrix* (Valenciennes, 1984), bighead carp – *Aristichthys nobilis* (Richardson, 1846), amur catfish – *Parasilurus asotus* (L), perch - *Perca fluviatilis* Linnaeus, 1758, and amur sleeper *Perccottus glenii* Dybowski, 1877).

The species listed above can be divided into three groups. The first is species that have expanded their range due to the constant stocking of reservoirs with larvae or fry of fish. If the stocking stops, then after a certain time these species fall out of the ichthyocenosis. The second group is the species that began the expansion of the range under the influence of humans, but then continued the expansion of the range independently, naturally. The third group consists of species that have expanded their range in a natural way, without targeted human intervention.

Of the first group of invasive species, a positive result was obtained by introducing peled, arctic cisco, grass carp and bighead carps into the Transbaikal ponds.

Starting from the 70s of the last century, peled and arctic cisco in the form of incubated caviar settled in Ivano-Arakhleysky lakes (Arahle, Shaksha, Dudulino), lakes Kenon, Arey, Balzoy, Khalandu, Karymsky, Krasnokamensky reservoir, brackish lakes in the floodplain Onon River, located in the Russian-Mongolian transboundary area. The results of the introduction were different, but almost everywhere where the recommendations on introduction were observed or the growth of larvae was organized in shallow, separate water bodies or bays freezing in winter, devoid of predatory fish species, positive results were obtained.

The increase in fish productivity due to the introduction of these fish species increased in the eutrophic reservoirs of Transbaikalia by 1.5-2 times with the initial fish productivity in the range of 20-25 kg/ha.

Of particular note is the positive result from the introduction of arctic cisco and peled into the brackish lakes of the Onon River floodplain. Due to the rich food supply of these lakes, the growth rates of peled and arctic cisco in them were much higher than in the eutrophic reservoirs of Transbaikalia. So, for example, already in the first year of peled cultivation in these reservoirs, its weight reached 50-80 g, and three-year-olds - 440 g.

According to LLC "Nuklus", which was involved in the introduction of arctic cisco and peled into brackish water bodies in 2002 from Lake Ukshinda (area 2.34 sq. Km) 4.8 tons of peled and arctic cisco were caught. The catch from 5 water bodies of this group in 2003 amounted to 30 tons, in 2004 - 15.6 tons, in 2005 from 6 water bodies with a total area of 10.7 square meters. km - 29.5 tons.

Considering that in the transboundary territory of the south of Transbaikalia and the north of Mongolia alone there are more than 300 salt lakes of different sizes and depths, and there are thousands of them in the Transbaikal-Mongol limnic country (Shishkin, 1993), the introduction of peled and arctic cisco into such reservoirs can have clearly expressed fishery effect.

A positive fish-breeding and reclamation effect was obtained from the introduction of grass carp, silver and bighead carps into the cooling ponds of the Chita and Kharanorsk State District Power Plants. The introduction of these fish contributed to a decrease in macrophytes in the zones of thermal pollution of water bodies and an increase in their fish productivity. The invasion of Siberian sturgeon, baikal whitefish and European vendace in Ivano-Arakhleysky lakes did not bring the expected results.

Despite the positive results from the introduction of peled, arctic cisco, herbivorous fish, these works have been stopped in recent decades due to the lack and high cost of planting material following the collapse of the Soviet Union.

The results of the invasion of the second group - amur catfish, common carp, bream and perch are different. Amur catfish is widespread in rivers and lakes of the Amur system. On the territory of Zabaykalsky Krai, its natural range captures the Amur, Onon, Shilka, Ingoda rivers and their floodplain lakes. Neither to the west nor to the north of the Amur basin is noted.

In 1932 and 1938, 22 adult catfish from Onon and 400 catfish of different ages from Borzi were transported to Shaksha. These two catfish transplants were enough for its successful acclimatization and naturalization. Catfish in lakes Arahlei and Shashka was not numerous, although it reached a high number in lakes Undugun and Irgen. Of these lakes, catfish spread throughout the Baikal basin, becoming a common commercial species in Gusinoozerskie lakes, Selenga, Southern Baikal, Angara, and the Bratsk reservoir.

Amur carp was also imported several times from Argun to Lake Kenon and Ivan. From Lake Ivan, it spread throughout all the lakes of the Ivano-Arakhleya group, from where it settled throughout the Baikal basin, and in some places reached commercial density. On Baikal, in the areas of the Selenga delta, the Posolsky sor, the Gulf of Proval, a stable commercial herd has formed. This allowed in some years to produce over 100 tons of this fish (Demin, 2001; Sobolev, Soboleva, 1979).

A similar pattern was observed with the resettlement of bream, which was introduced into Lake Ivan in 1964 from Lake Ubinskoe (Novosibirsk oblast). From Ivano-Arakhleya lakes, bream spread along the East coast of Lake Baikal, to the lakes Gusinoe, Shchuchye, Yervinsky and others. High growth rates, high fecundity and fatness of bream testify to the effectiveness of its introduction (Kupchinsky, 1987). In general, we can conclude that the invasions of amur catfish, carp, bream had a positive fishery effect.

River perch is widely distributed in fresh water bodies of Europe and North Asia, brought to Australia and New Zealand. Despite such a wide distribution in the Amur basin, it was absent until the beginning of the 20th century, although according to paleontological data it previously lived there (Atlas, 2002).

The introduction of perch in the Amur basin was carried out by peasant A. Afanasyev, who in December 1919 transported 160 specimens of different age perch in barrels from Lake Ivan (Lena basin) to Lake Kenon (Amur basin). This event can be considered as an example of the first alien species acclimatization in the region with the aim of increasing fish productivity, but also as a deliberate trans-basin bioinvasion from the Arctic Ocean basin in the Pacific Ocean basin (Gorlacheva, Afonin, 2007).

The introduction of perch into Lake Kenon ended with its naturalization, and perch in the lake became the dominant species. After the introduction of perch from the ichthyofauna of the lake, the minnow of Lagovsky, the minnow of Chekanovsky, the common minnow, and plucking gradually disappeared, the number of pike and catfish sharply decreased.

Although Lake Kenon is located in the Upper Amur basin, it does not have direct links with the Ingoda River, so there was hope that perch would not fall into the water bodies of the Upper Amur basin. The inadmissibility of further resettlement of perch into the Amur basin was indicated by G.V. Nikolsky (1956).

However, in 1968, dozens of mature perch were imported by amateur fishermen with the permission of the Chita Fish Protection Inspectorate, from where its resettlement began. In fact, over the years, perch has spread widely across the water bodies of the Upper Amur basin.

It was noted in the Nercha and Shilke rivers, in the estuarine sections of the Onon and Aga rivers, in the lower and middle reaches of the Ingoda and Chitinka rivers, in the floodplain quarry ponds of these rivers (Gorlacheva, Afonin, 2007; Karasev, 1987).

There is no information on the progress of perch invasion to the east, in the middle course of the Amur River. The latest summary of the Amur fish (Antonov, Drummers, etc., 2019) states that perch naturalized and settled on the rivers Ingoda, Chita, Onon, Shilka, and that it is absent in the middle and lower reaches of the Amur.

However, there is reason to believe that the situation is changing. Floods of recent years in the territory of Transbaikalia, especially the largest flood in 2018 over the past 80 years, have led to the fact that all the waters of the floodplain reservoirs have turned into a single powerful stream, which carried some of the inhabitants of these reservoirs far downstream. This is convinced by the absence of perch after a flood in the floodplain ponds of Shilka, in which it was previously common. If the perch carried over succeeds in gaining a foothold in new habitats, then one should expect a sharp increase in the invasion of perch in the middle and lower reaches of the Amur. This can cause significant damage to the biological diversity of Amur, especially valuable species.

The third group of invasive species that expand their range without any visible human intervention include hankin and manchurian gudgeons, gudgeon-tench, three-lips and amur sleeper.

The natural range of these species covers the central and southern parts of the Amur basin, Korea, and Northern China (Nikolsky, 1956; Reshetnikov, 1998). All these species appeared in the Upper Amur basin relatively recently - at the end of the last or the beginning of this century and have a clearly defined direction of invasion to the west and north-west of the region.

Single specimens of hankin gudgeon appeared in Shilka, Argun, Onon. In the Krasnokamensky reservoir, it was first recorded in 2006, but already 10 years later it took a dominant position there, crowding out the Amur sabachok, which was previously dominant in the reservoir.

Manchurian gudgeon was found in the middle reaches of the Shilka River and the lower reaches of the Argun River, was recorded in small quantities in the Krasnokamensky and Urulyungusky reservoirs, and began to be found in Lake Kenon in 2009 (Gorlacheva, Afonin, 2012).

Information on the presence of gudgeon-tench in the water bodies of Transbaikalia is scarce. Some individuals of this species were recorded in the Shilka River and Onon in the area of the reservoir-cooler of the Kharanorskaya TPP. In 2001, gudgeon-tench was recorded in the Ingoda and Chitinka rivers near the city of Chita. In general, the values of invasion of the aforementioned fish of the third group are small due to their small numbers.

Amur invasion by three-lips has a slightly different character. For the first time 2 specimens of three-lips were noted in 1997 on Onon, in the area of Kharanorskaya TPP. However, after 15 years (in 2003), the situation radically changed. Three-lips became the dominant species in the reservoir-cooler of the Kharanorskaya TPP and its catches accounted for 23% of the total number of fish caught. This was accompanied by a fundamental restructuring of the ichthyofauna. The share of the chebak in the catches decreased from 55% to 28%, the Amur flat-headed asp from 9.1% to 0.5%, and the whitefish, which accounted for 2.4% of the catches, disappeared completely. Three-lips took a dominant position not only in the reservoir itself, but also appeared in the tributaries of the Onon, which indicates the rapid pace of its invasion. And since three-lips in an adult state eats juveniles and fish larvae, its invasion should be considered a negative phenomenon.

At the fastest pace in the territory of Zabaykalsky Krai, the invasion of amur sleeper is developing. Despite the fact that the native amur sleeper range is located in the south of the Amur River basin and the adjacent territory (Reshetnikov, 2009), it was absent in the water bodies of the Upper Amur basin until the end of the last century. It was first discovered by us in 1996 in the estuary of the Middle Borzya River. In the future, his resettlement was rapid. To date, he has settled in the channel and floodplain water bodies of Argun, Shilka, Onon, Aga, Ingoda, Chitinka, Nerchinsky, Urulyungusky and Krasnokamensky reservoirs, even appeared in the ponds of the ash dump of the Chita TPP.

The development of new reservoirs is accompanied by a rapid increase in the number of amur sleeper, increased pressure on the native ichthyofauna, a noticeable restructuring of the ichthyofauna, which was observed on the Argun River, in the Krasnokamensky reservoir.

The expansion of the amur sleeper range in the territory of Zabaykalsky Krai proceeded in parallel with the formation of the invasive range in the Baikal region, but these areas did not overlap. Recently, however, amur sleeper appeared in the middle reaches of the Ingoda River, in the waters of the Khilok River, in Lake Tasey, which allows us to conclude that these areas are connected and the formation of single East Siberian range of amur sleeper (Gorlachev, Gorlacheva, 2019). Due to the significant expansion of the range and increase in the number of amur sleeper, similarity of the food spectra with valuable fish species, and consumption of the eggs of the juvenile fish of these fish, amur sleeper becomes a functionally dangerous species for the water systems of the Upper Amur basin and adjacent territories.

References

1. Alimov A.F. *Biological invasions in aquatic and terrestrial ecosystems* / Alimov et al. // *M.: Partnership of Scientific Publishing. KVM 2004. - 436 P.*
2. Dgebuadze Yu.Yu. *Acclimatization of aquatic organisms and invasive processes* / Yu.Yu. Dgebuadze, D.S. Pavlov // *Research on ichthyology and mixed disciplines in inland waters at the beginning of the XXI century (on the 80th anniversary of Prof. L. A. Kudersky). SPb.: M.: 2007. - Issue.337. - P.71-82.*
3. Yakovlev V.N. *Biological invasions in continental reservoirs as a result of global climatic transformation of ecosystems* / V.N. Yakovlev // *American-Russian symposium on invasive species. - 27-31 august of 2001. - Yaroslavl, 2001. - P.252-253.*
4. Panov V.E. *Biological pollution as a global environmental problem: International law and cooperation* / V.E. Panov // *Ecological safety and invasions of alien organisms. - Moscow: IUCN - All-Union Union for the Conservation of Nature. Representation for Russia and the CIS, 2002. - P.22-40.*
5. *National Biodiversity Strategy. - Moscow: RAS: Ministry of Natural Resources of the Russian Federation, 2001. - 76 P.*
6. Gorlachev V.P., Gorlacheva E.P. *Invasions of fish of Zabaykalsky Krai: monograph* / Gorlachev V.P., Gorlacheva E.P. // *Transbaikal. st. un-ty. - Chita, TBSU, 2016. - 176 P.*
7. Karasev G.L. *Ivano-Arakhleya lakes and their fish* / G.L. Karasev // - Chita: East.- Siberian publishing house 1967. - 46 P.

8. Shishkin B.A. *Regional features of lake ecosystems of Transbaikalia* / B.A. Shishkin // *Abstract. diss. ... Doctor of Biological Sciences. St. Petersburg, 1993.* – 113 P.
9. Demin A.M. *Introduction of new species of flora and fauna in the Baikal basin: consequences and lessons* / Demin A.I. // *Wave.* – 2001. - № 3. – P. 10-24.
10. Sobolev V.I. *On the biology of the Amur carp of Lake Baikal* / V.I. Sobolev, L.A. Soboleva // *Ecological problem of the Transbaikalia.* - Irkutsk, 1979. – P.224-225.
11. Kupchinsky B.S. *Bream reservoirs of the Baikal-Angarsk basin* / B.S. Kupchinsky // – Irkutsk. Publishing House of Irkutsk University 1987. – 143 P.
12. *Atlas of freshwater fish in Russia: in 2 volumes* / ed. Yu.S. Reshetnikova // – Moscow: Science, 2002. – V.2. – 253 P.
13. Gorlacheva E.P. *Perch *Perca fluviatilis* Linnaeus, 1975 - alien species in the Upper Amur basin* / E.P. Gorlacheva, A.V. Afonin // *Marine Ecology – Vladivostok: Publishing House of the Maritime State University, 2007.* – P.181-185.
14. Nikolsky G.V. *Fish of the Amur basin* / G.V. Nikolsky // *Moscow: Publishing House of the USSR Academy of Sciences, 1956.* – 550 P.
15. Karasev G.L. *Fishes of Transbaikalia* / G.L. Karasev // - *Novosibirsk: Science, 1987.* – 292 P.
16. Antonov A.L. *Amur Pisces* / A.L. Antonov, E.I. Barabanshchikov, S.F. Zolotukhin, I.E. Mikheev, M.E. Shapovalov // *World Wide Fund for Nature (WWF). Vladivostok, 2019.* – 318 P.
17. Reshetnikov Yu.S. *Annotated catalog of cyclostomes and fishes of continental waters of Russia* / Yu.S. Reshetnikov // *Moscow: Science, 1998.* – 220 P.
18. Gorlacheva E.P. *On the location of manchurian gudgeon manchurian gudgeon *Cnathopogon mantschuricus* (Cypriniformes: Cyprinidae) in the basin of Lake Kenon* / E.P. Gorlacheva, A.V. Afonin // *Issues of ichthyology.* – 2012. – V.52, № 5. – P.604-606.
19. Reshetnikov A.N. *The modern range of amur sleeper *Perccottus glenii* Dybovski, 1877 (Odoitobutidae, Pisces) in Eurasia* / A.N. Reshetnikov // *Russian Journal of biological invasions* – 2009. - № 1. – P.22-35.
20. Gorlachev V.P. *Formation of unified Eastsiberian region of the invasive range of rotan. – *Perccottus glenii* Dybowski* / V.P. Gorlachev, E.P. Gorlacheva // *International Conference «Scientific research of the SCO countries : synergy and integration. April 9. Beijing, China, 2019. Pp. 134-138.*

慢性念珠菌病对Fabricius鸟袋免疫反应的影响

EFFECT OF CHRONIC CANDIDIASIS ON THE IMMUNE REACTIVITY OF THE BURSA OF FABRICIUS IN BIRDS

Shaihulov Rustem Raisovic

Doctor of Biological Sciences

Professor at the Department of Microbiology and Immunology

Mannapova Ramsiya Timergaleevna

Candidate of Biological Sciences

Applicant at the Department of Microbiology and Immunology

Russian Timiryazev State Agrarian University

抽象。鹅的念珠菌病对鹅育种的发展造成了重大的经济损失[1, 2, 3]。念珠菌病导致严重的继发性免疫缺陷，其特征是在淋巴结中，Fabricius滑囊的免疫活性结构发生破坏性变化，形式为严重器官耗竭并加速其退化过程。它表现为Fabricius滑囊的皮质区和大脑区所占面积的减少。进行抗真菌治疗有助于使鹅念珠菌病患者的器官的形态学参数得到一定程度的恢复，但还不够。在用药物固溶酶进行酶治疗的背景下，记录了器官功能形态学恢复的重要形态变化。蜂胶和益生菌疗法与酶疗法的结合有助于快速恢复具有免疫功能的器官结构，以及Fabricius滑囊的长度，宽度和厚度以及该器官功能活动的形态学指标。有助于鸟类免疫的体液联系。

关键字：鹅，念珠菌病，白色念珠菌，硅酸盐酶，益生菌，蜂胶，法氏囊，形态学，结构成分，免疫形态学

Abstract. *Significant economic damage to the development of goose breeding is caused by candidiasis of geese [1, 2, 3]. Candidamycosis leads to severe secondary immunodeficiencies, which are characterized by the development of destructive changes in the immunocompetent structures of bursa of Fabricius - in the lymph nodes, in the form of severe organ depletion and acceleration of its involution processes. It manifests itself in a decrease in the area occupied by the cortical and brain zones of bursa of Fabricius. Conducting antimycotic therapy contributes to some restoration of the morphological parameters of the organ, patients with goose candidiasis, but is not sufficient. Significant morphological changes towards the restoration of the functional morphology of the organ are recorded against the background of enzyme therapy with the drug lithase. The use of enzyme therapy with propolis and probiotic therapy contributes to the rapid restoration of immunocompetent organ structures, as well as morphometric indicators of the length, width and thickness of bursa of Fabricius and the functional activity of this organ, which is responsible for the humoral link of bird immunity.*

Keywords: *geese, candidamycosis, Candida albicans, lithicase, probiotic, propolis, bursa of Fabricius, morphometry, structural components, immune morphology*

Materials and research methods

The work was carried out in the conditions of goose-breeding farms of the republics of Tatarstan and Bashkortostan on birds of the Linda breed, from 7 days to 90 days of age. The material for the studies was taken before the start of the experiment — the background (7 daily), and then on the 14th, 30th, 60th and 90th days from the beginning of the drug administration. Birds, according to the principle of analogues, were divided into 7 groups. The first group was the control - healthy birds, 2 - 7 patients with candidomycosis. No treatment manipulations were performed with the birds of group 2. Goose of group 3 was subjected to traditional antibiotic therapy with nystatin, group 4 - enzyme therapy with lithase, group 5 — enzyme therapy with probiotic therapy with lactobifid, group 6 — enzyme therapy with propolisotherapy, group 7 — complex enzyme therapy with probiotic co- and propolis therapy.

Morphological and morphometric studies were conducted in the laboratory of the departments of microbiology and immunology; aquaculture and beekeeping of the Russian State Agrarian University. Pieces of organs were fixed in 10% neutral formalin. Paraffin sections were stained with hematoxylin-eosin, azure II eosin.

Histograms were photographed using a micro-photographing apparatus consisting of a Carl Zeiss Axiostar Plus microscope and a photographic attachment with a CANON PowerShot A640 camera.

The area of the zones of lymphoid organs was determined by the method of point counting of A.A. Verb-leva, using the ocular mesh under the stereoscopic magnifier MBS-9 (Avtandilov G.G., 1990).

Research results and discussion

Chronic candidiasis contributed to the development of marked changes in the immunocompetent structural components of bursa of Fabricius in geese.

Data on the study of the dynamics of morphometric measurements in the lymph nodes of bursa of Fabricius with goose candidiasis are presented in table 1.

The area occupied by the cortical zone of the lymph node of the bursa of Fabricius of healthy geese 1 of the control group, in terms of experience, changed upward to 60 days of research. On days 30 and 60, the area of the cortical zone of the bursa of birds in the control group increased, compared with the index of 14 days from the start of the experiment, by 1.09 and 1.29 times. Subsequently, a decrease in this indicator was recorded, which is associated with the physiological involution of the organ. By the 90th day of the experiment, this indicator was lower compared to its value in the previous research period (60 days) - 1.07 times.

The area of the brain zone of the lymph node of the birds of the 1st control group during the research also changed towards a significant increase. Their maximum value recorded on the 60th day of the experiment exceeded the data by 14, 30 days of research by 1.12 and 1.15 times. By day 90, the area of the brain zone of the lymph node of the birds of group 1 decreased by 1.02 times compared with its value by day 60.

Significant immunomorphological changes in the immunocompetent structures of the lymph node bursa of Fabricius were observed in the organ of patients with severe candidiasis of group 2 geese who were not subjected to therapeutic manipulations. By the 14th day from the beginning of the experiments, the area of the cortical and brain zones of the lymph node of bursa of Fabricius of group 2 birds was 1.28 and 1.29 times lower than that of geese 1 of the control group. In the subsequent periods of the experiment, pronounced dynamic depletion of lymph nodes in the bursa of Fabricius birds of group 2 was recorded.

Table 1 Morphometric changes in the lymph nodes of bursa of Fabricius with candidiasis, in microns

Group	Lymph node structure	Stat. indicator	Study time (days)			
			14	30	60	90
1	Cortical zone	M	42,0	45,7	54,2	50,7
		±m	1,28	1,54	2,56	1,60
		day, %	6,80	7,53	10,55	7,04
	Brain zone	M	122,4	136,7	140,4	137,0
		±m	3,57	2,48	3,46	2,67
		day, %	6,52	4,05	5,51	4,35
2	Cortical zone	M	32,8**	30,5***	24,2***	18,0***
		±m	1,84	2,39	3,19	2,80
		day, %	12,53	17,53	29,50	34,76
	Brain zone	M	94,6***	82,3***	70,1***	62,7***
		±m	3,95	5,77	3,37	2,4
		day, %	9,33	15,66	10,74	8,55
3	Cortical zone	M	34,0**	35,2***	36,7***	35,0**
		±m	0,97	0,72	1,68	2,81
		day, %	6,41	4,55	10,21	17,96
	Brain zone	M	99,3**	104,0***	115,2***	105,0***
		±m	3,34	5,88	2,00	3,94
		day, %	7,53	12,59	3,89	8,39

4	Cortical zone	M	37,2	38,9*	41,4**	46,0
		±m	1,82	1,76	1,95	1,73
		day, %	10,92	10,10	10,51	8,43
	Brain zone	M	107,6**	119,7***	127,8*	120,2*
		±m	1,72	2,26	3,03	3,94
		day, %	3,57	4,23	5,31	8,38
7	Cortical zone	M	39,6	41,7	50,8	48,6
		±m	2,13	1,02	1,70	0,87
		day, %	12,02	5,48	7,50	4,00
	Brain zone	M	118,0	124,7**	135,6	130,7
		±m	2,14	1,72	3,00	1,85
		day, %	4,06	3,09	4,95	3,17

Note: * - $P \geq 0,95$, ** - $P \geq 0,99$, *** - $P \geq 0,999$

The area occupied by the cortical zone of the lymph node of bursa of Fabricius of birds of the 2nd group, on the 30th, 60th and 90th days of the experiment, was lower than the index of geese of the 1st group in 1.49; 2.24 and 2.82 times. In a similar way, the area of the brain zone of the lymph node of the bursa changed. This indicator for the described periods of test was lower than in the control, at 1.66; 2.0 and 2.18 times.

The data obtained in group 2 indicate a pronounced functional immunological depletion of the B-system of immunity in goose candidiasis.

Different methods of treating geese with candidiasis had a different effect on the processes of restoration of immunomorphological structures of the organ.

In the lymph nodes of the bursa of Fabricius of the geese of group 3, subjected to anti-cathotherapy, compared with indicators in the immunocompetent structures of birds of group 2, there were changes in the direction of an increase in the areas of these structures. On the 14th, 30th, 60th and 90th days of the experiment, the area of the cortical zone increased, compared with the data for the 2nd group, by 1.04; 1.15; 1.52 and 1.94 times. The indicator of the area of the brain zone exceeded their values in birds of the 2nd group at 1.05; 1.26; 1.64 and 1.67 times. But at the same time, the studied indicators were significantly inferior to the data of birds of the 1st control group: in the cortical zone - in 1.23; 1.29; 1.47 and 1.45 times, in the brain zone - 1.23; 1.31; 1.22 and 1.3 times. Therefore, therapy with the antimycotic nystatin is not sufficient to restore the immuno-morphological activity of geese bursa of Fabricius.

Significant immunomorphological rearrangements in the lymph nodes of the bursa of Fabricius were recorded during therapy with geese with the enzyme drug lyticase (group 4). The area index of the cortical zone of the lymph node of the bursa of birds of the 4th group, on the 14th, 30th, 60th and 90th days of the research, was higher than its value in the bursa of geese of the 2nd group at 1.13;

1.27; 1.71 and 2.55 times, the cerebral zone - 1.14; 1.45; 1.82 and 1.92 times, which indicates a significant morphological and functional restoration of the organ against the background of lithotherapy with enzyme therapy.

A more active restoration of the morphofunctional activity of the lymph nodes of bursa of Fabricius was observed in group 7, in which sick birds with candidiasis were subjected to lithium enzymotherapy in combination with propolis-therapy and probiotic therapy. The indicators of birds of group 7 maximally exceeded the parameters of the area of the cortical zone in group 2 at 14, 30, 60 and 90 days — 1.2; 1.37; 2.09 and 2.7 times, the brain zone - 1.25; 1.51; 1.93 and 2.08 times. At the same time, the studied morphometric indicators in the bursa of geese of group 7 significantly approached the control figures of birds of group 1, which confirms the effective effect on the organism of geese with candidiasis of complex enzyme-propolis-probiotic therapy, which was also established by other research methods that we carried out when performing this work.

Changes in the immunocompetent structures of the bursa of Fabricius geese during candidiasis and various methods of their therapy were reflected in changes in the size of the organ: length, width and thickness. The results of studies of the dynamics of changes in indicators of the size of the body are presented in table 2.

The length of the bursa of Fabricius geese of the 1st control group by 14 days from the start of the experiments was 1.86 cm. At 30 and 60 days of the experiment, this indicator increased 1.04 and 1.06 times.

Table 2 Morphometric indicators of changes in the size of bursa of Fabricius with goose candidiasis (cm)

Indicators	Stat. indicator	Groups				
		1	2	3	4	7
14 days from the start of the experiment						
Length	M	1,86	1,62***	1,98	2,12**	2,27***
	±m	0,03	0,02	0,06	0,06	0,05
	day, %	3,67	3,41	6,67	6,17	5,04
Width	M	1,20	1,05*	1,30	1,42**	1,77***
	±m	0,04	0,04	0,04	0,04	0,07
	day, %	8,46	8,46	6,71	6,97	9,55
Thickness	M	1,13	0,90***	1,18	1,27**	1,36**
	±m	0,02	0,03	0,03	0,02	0,05
	day, %	4,00	6,94	6,86	3,57	7,94
30 days from the start of the experiment						
Length	M	1,94	1,56*	2,15**	2,39**	2,43***
	±m	0,02	0,13	0,06	0,12	0,04
	day, %	2,22	19,16	5,95	10,87	3,73

Indicators	Stat. indi-cator	Groups				
		1	2	3	4	7
Width	M	1,32	0,80***	1,42	1,54*	1,83***
	±m	0,04	0,04	0,02	0,06	0,08
	day, %	6,58	10,50	4,20	9,21	9,37
Thickness	M	1,25	0,56***	1,28	1,30	1,39
	±m	0,08	0,05	0,04	0,03	0,03
	day, %	14,37	21,83	6,32	5,98	5,41
60 days from the start of the experiment						
Length	M	1,98	1,20***	2,29***	2,40***	2,52***
	±m	0,04	0,04	0,04	0,05	0,06
	day, %	4,26	6,48	3,79	4,41	5,14
Width	M	1,39	0,62***	1,45	1,49	1,62**
	±m	0,04	0,08	0,04	0,04	0,05
	day, %	6,92	28,76	6,86	6,33	7,07
Thickness	M	1,28	0,49***	1,33	1,37	1,46**
	±m	0,04	0,07	0,03	0,06	0,02
	day, %	7,05	34,18	6,31	9,89	3,66
90 days from the start of the experiment						
Length	M	1,67	0,94	1,90	2,16	2,28
	±m	0,04	0,05	0,07	0,11	0,05
	day, %	5,17	12,48	8,41	11,88	4,78
Width	M	1,21	0,40***	1,22	1,34	1,55**
	±m	0,04	0,06	0,04	0,09	0,07
	day, %	7,88	33,63	7,17	14,74	10,29
Thickness	M	1,09	0,33***	1,19	1,22*	1,29*
	±m	0,04	0,04	0,05	0,03	0,04
	day, %	8,97	26,42	10,00	4,88	7,27

Note: * - $P \geq 0,95$, ** - $P \geq 0,99$, *** - $P \geq 0,999$

By 90 days a decrease in this indicator to 1.09 cm was recorded. The width of the bursa of Fabricius geese of the 1st group changed in a similar way. At 30.60 days, it exceeded the data at 14 days of the experiment by 1.1 and 1.16 times. By 90 days, the width indicator of bursa of Fabricius tended to decrease, amounting to 1.21 cm. The thickness of bursa of Fabricius of geese of 1 group on the 30th and 60th days of the experiment increased compared to its value by 14 days - by 1.1 and 1.13 times. By 90 days, the thickness of the bursa of Fabricius of the geese of group 1 decreased, compared with its value on the 14th, 30th and 60th days - by 1.04; 1.15 and 1.17 times.

The data on the length, width and thickness of the bursa of Fabricius of birds of group 2 in the course of the experiment tended to decrease dynamically. On the 14th, 30th, 60th and 90th days of the experiment, the indicator of the length of the bursa of Fabricius of birds of the 2nd group was lower than that of the control birds of the 1st group, 1.15; 1.24; 1.65 and 1.77 times; widths - 1.14; 1.65; 2.24 and 3.02 times, thickness - 1.25; 2.23; 2.61 and 3.3 times.

Morphometric indicators of the length, width and thickness of the bursa of Fabricius of the geese of groups 3, 4 and 7 on the 14th, 30th and 60th days of the experiment tended to increase. This process had a different degree of manifestation and severity, depending on the chosen method of therapy. The length of bursa of Fabricius of the geese 3, 4 and 7 groups on the 14th day of the study exceeded the rate of birds of the 2nd group in 1.2; 1.3 and 1.4 times, for 30 days - 1.38; 1.53 and 1.55 times; at 60 days - at 1.9; 2.0 and 2.1 times. By 90 days, despite the overall decrease in the length indicator of bursa of Fabricius in all groups, due to the process of its involution, the data of geese 3, 4 and 7 of the group exceeded the rate of birds of the 2nd group by 2.02; 2.29; 2.42 times.

Similar to the dynamics of the length of the bursa of Fabricius, the data on the width and thickness of the organ changed. By 14 days from the start of the experiment, the width of bursa of Fabricius of geese of groups 3, 4, and 7 exceeded the data of birds of the 2nd group by 1.24; 1.35 and 1.68 times, by 30 days - 1.77; 1.92 and 2.28 times, by 60 days - 2.34; 2.4 and 2.61 times; by 90 days - at 3.05; 3.35 and 3.87 times.

The thickness of the bursa of Fabricius of the geese of the 3rd, 4th and 7th groups on the 14th day from the beginning of the experiments exceeded the indicator of birds of the 2nd group at 1.31; 1.41 and 1.51 times; for 30 days - at 2.28; 2.32 and 2.48 times; for 60 days, 2.71; 2.79 and 2.98 times; on 90 days, in 3.6; 3.69 and 3.9 times.

Conclusion. Candidamycolosis causes immunodeficiency in the body of geese. Against the background of candidiasis, a more rapid development of the processes of involution of bursa of Fabricius and its immunomorphological depletion is recorded. Traditional therapy with the use of mycomycotics of nystatin is not effective and not sufficient to restore the immune morphology of the organ. The use of enzyme therapy against the background of liso- and probiotic co-therapy helps to restore the immunocompetent structures of the organ, as well as morphometric indicators of the length, width and thickness of bursa of Fabricius and its functional activity.

References

1. Ivanov A.A. *The effect of bee subpestilence extract on morphofunctional reactions in bursa of Fabricius* / A.A. Ivanov, R.T. Mannapova, Isse Mohamed Yassin // *Modern problems of bee-keeping and apitherapy. - Fish. - 2019. - P.215-218.*

2. Shaikhulov R.R. *Immunocompetent structures of the thymus and spleen in goose candidiasis and against the background of enzyme therapy* / Shaykhulov R.R., Mannapova R.T., Sachivkina N.P. // *Materials of the Ush congress of the NSE of the AGE, Voronezh, May 23-26, 2019 // Morphology V.155, № 2, 2019.-P. 320. Scopus.*

3. Shajhulow R. R. *Water- soluble vitamins in the liver with geese candidiasis* / R.R. Shajhulow, R.T. Mannapova // *Minzu University of China. Materialis of the International Conference "Sci-entific research of the SCO countries: Synergy and integration – Reports in English. – 12 No-vember. - 2018.- Beijing, PRC.- P. 253-257.*

蜜蜂枯萎病对自然微生物群落的重要性
**THE IMPORTANCE OF BEE SUBPESTILENCE
FOR NATURAL MICROBIOCENOSIS**

Mannapova Ramsiya Timergaleevna

Candidate of Biological Sciences

Applicant at the Department of Microbiology and Immunology

Shaihulov Rustem Raisovic

Doctor of Biological Sciences

Professor at the Department of Microbiology and Immunology;

Russian Timiryazev State Agrarian University

抽象。研究人员引起了人们对潜伏性的极大关注。它包含蜂蜜，蜂王浆，花粉，蜂毒，蜂胶，蜡的成分，这决定了其丰富的化学成分和生物活性。在几丁质覆盖物的壳聚糖复合物中存在：肝素，葡糖胺，黑色素，蜂毒，乙酸。水溶性聚合物黑色素吸收各种自由基，并作为最强的抗氧化剂，基因和光保护剂，抗诱变剂。在蜜蜂的亚湿化中，发现了27种微量元素（包括Ca, Cr, Al, Cu, Mg, P, Zn, Si, Ag, Mo, Fe），维生素E, K, D, P, C, 蛋白质，氨基酸，膳食纤维，脂肪。 [1, 2, 3, 4, 5]描述了蜂的化学组成，生物学特性和活性。在这方面，已经进行了研究以研究不同剂量的蜜蜂枯萎病提取物对鹌鹑的天然微生物群落的形成和发展的影响。发现低剂量和中等剂量的BSE有助于显性益生菌：双歧杆菌属。和乳杆菌属。牛海绵状脑病的使用有助于恢复相关的微共生体的含量平衡；大肠杆菌，粪便，粪便，大肠杆菌，金黄色葡萄球菌，大大抑制了它们在消化道中的生长和繁殖。疯牛病有助于预防鹌鹑在胃肠道中的发展。

Abstract. *Researchers draw much attention to subpestilence. It contains components of honey, royal jelly, pollen, bee venom, propolis, wax, which determines its diverse rich chemical composition and biological activity. In the chitosan complex of the chitinous cover are present: heparin, glucosamines, melanin, bee venom, acetic acid. The water-soluble polymer melanin absorbs various radicals and serves as the strongest antioxidant, gene and photoprotector, antimutagen. In bee subpestilence, 27 trace elements were found (including Ca, Cr, Al, Cu, Mg, P, Zn, Si, Ag, Mo, Fe), vitamins E, K, D, P, C, proteins, amino acids, dietary fiber, fat. The chemical composition, biological properties and activity of bee subpestilence are described in [1, 2, 3, 4, 5]. In this regard, studies have been conducted to study the effect on the formation and development of the natural microbiocenosis of quail of different doses of bee subpestilence extract. It was found that low and medium*

doses of BSE contribute to the activation of dominant probiotic bacteria: *Bifidobacterium spp.* and *Lactobacillus spp.* The use of BSE contributed to the restoration of the balance of the content of associative microsymbionts: *E. fae-calis*, *E. faecium*, *E. coli*, *S. aureus*, significantly inhibiting their growth and reproduction in the digestive tract. BSE helped prevent the development of quail candidiasis in the gastrointestinal tract.

Material and research methods

Research was conducted in the laboratories of the departments of microbiology and immunology; aqua culture and beekeeping of FSBEI HE "Russian Timiryazev State Agrarian University" The experiments were carried out in the conditions of the poultry house of the Department of Private Zootechnics on quail meat French breed, in the amount of 140 pieces, which were hatched by incubation. Birds were kept in BVM-F-4C cell batteries for young animals. Illumination, T°C, room humidity, planting density, type of feeding corresponded to the recommendations of VNITIP. Slaughter of birds was carried out on 7, 14, 30, 45, 60, 90 and 210 days of the experiment. Birds, according to the principle of analogues, were divided into 4 groups. The first was a control. For them, the conditions of containment and feeding were the same with the experimental groups. PK-5 feed and water were included in the diet of birds. Different doses of bee subpestilence extract (BSE) were fed to the birds of the experimental groups from 15 days of age with water for 30 days. With an average live weight of 55-57 g, the low dose was 0.05 ml/head (1 drop per bird; 10 drops per 10 birds per 100 ml of water). The average dose was 0.1 ml/ head (2 drops per bird, 20 drops per 10 birds per 100 ml of water). The high dose was 0.3 ml /head (6 drops per bird, 60 drops per 10 birds per 100 ml of water).

S. aureus was isolated on blood salt MPA. From a pure culture, reactions to fibrinolysin, lecithinase, and latent hemolytic activity were performed. *E. coli* was isolated on MPA, MPB, and Endo and Levin media. A pure culture of *E. coli* was typed in an agglutination reaction. *E. faecalis* and *E. faecium* were cultivated on Slate and Bertley selective agar and on kanamycin esculin azide agar. Isolation of *Bifidobacterium spp.* carried out on Blaurock medium, *Lactobacillus spp.* - on the medium of IFAs. *C. albicans* was isolated on Saburo, wort-agar media and reacted to fermentation of glucose and maltose.

Research results

The results of microbiological studies on the dynamics of changes in the content in the glandular and muscle sections of the stomach of *Bifidobacterium spp.* Are presented in Table 1. Different doses of BSE had a beneficial effect on the growth and reproduction of *Bifidobacterium spp.* not only in the stomach of quail, but also in the thin and thick sections of the intestine, but in different digital values.

Table 1. The effect of different doses of BSE on the dynamics of *Bifidobacterium spp.* in the glandular and muscle parts of the stomach of quail

Duration of the test (day/age)	Stat. indicators	Groups			
		1, control	2	3	4
Glandular Stomach					
7/22	M ±m	6,4±0,64x10 ²	7,6±0,76x10 ^{2**}	8,8±1,4x10 ³	8,9±1,83x10 ^{2**}
14/30	M ±m	3,9±0,59x10 ⁴	7,5±0,10x10 ⁴	7,6±0,86x10 ⁵	4,2±0,56x10 ^{4***}
30/45	M ±m	4,0±0,79x10 ⁵	6,9±1,3x10 ⁵	8,7±0,92x10 ⁶	2,9±0,90x10 ^{5**}
45/60	M ±m	7,8±0,75x10 ⁵	12,4±3,4x10 ⁵	9,2±2,6x10 ⁶	9,3±3,0x10 ^{5***}
60/75	M ±m	10,2±2,8x10 ⁵	7,0±0,79x10 ⁶	13,0±2,9x10 ⁶	14,3±0,97x10 ⁵
210/225	M ±m	8,3±0,82x10 ⁴	4,2±0,73x10 ⁵	7,6±0,37x10 ⁵	2,2±0,19x10 ⁵
Muscular stomach					
7/22	M ±m	3,7±0,5x10 ²	7,2±0,6x10 ²	7,7±1,7x10 ³	7,0±2,0x10 ²
14/30	M ±m	3,7±1,2x10 ³	6,2±1,1x10 ³	7,3±2,0x10 ⁴	4,9±0,93x10 ^{3***}
30/45	M ±m	4,3±1,3x10 ⁴	7,8±0,81x10 ⁴	9,0±2,0x10 ⁵	5,3±1,5x10 ^{4***}
45/60	M ±m	7,7±0,72x10 ⁴	9,0±1,5x10 ⁵	11,0±3,4x10 ⁶	10,1±2,2x10 ^{4**}
60/75	M ±m	4,5±0,72x10 ⁴	3,6±1,0x10 ⁵	4,5±1,3x10 ⁶	5,2±0,83x10 ⁵
210/225	M ±m	16,2±1,2x10 ³	8,9±1,1x10 ⁵	10,5±1,4x10 ⁵	1,8±0,43x10 ^{4***}

Note: hereinafter in the tables, group 1 – control, group 2 – low doses, group 3 – medium doses, group 4 – high doses. * - P≤0.01, ** - P≤0.05, *** - P> 0.05

Similar to the dynamics of *Bifidobacterium spp.*, The dynamics of *Lactobacillus spp.* changed in the stomach and intestines of quail. (fig. 1).

Under the influence of BSE in the stomach and intestines of quail, a balance was established between normoflora and opportunistic microorganisms. With a significant increase in the glandular and muscle sections of the stomach and in the thin and thick intestines of the birds intestine of the control group of *E. faecium* (Fig. 2), (as well as *E. faecalis*, *E. coli*, *S. aureus* in the same way), BSE contributed to varying degrees of activity, depending on the dose, reducing the activity of opportunistic microorganisms and restoring their level in the direction of physiological values.

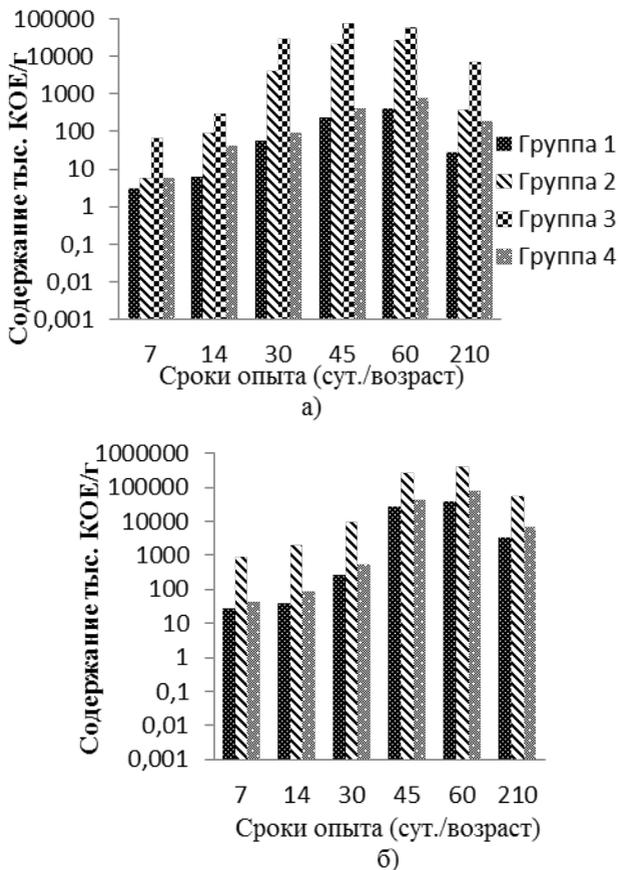


Fig. 1. The effect of different doses of BSE on the dynamics of *Lactobacillus* spp. in the intestines of quail: a) in the thin section and b) in the thick section. Designations: the same as in fig. one

S. aureus in the glandular stomach of quail of the 1st control group was allocated from the beginning of the experiments and increased up to 45 days, followed by a decrease and excretion until the end of the experiment. In the experimental groups, *S. aureus* appeared from the 30th day of the experiment, increasing slightly up to 60 days, but significantly inferior to the control figures. Its minimum value was recorded in the glandular stomach of birds of group 3. In the muscle stomach, *S. aureus* was isolated only in birds of the 1st control group with a maximum increase of up to 30 days.

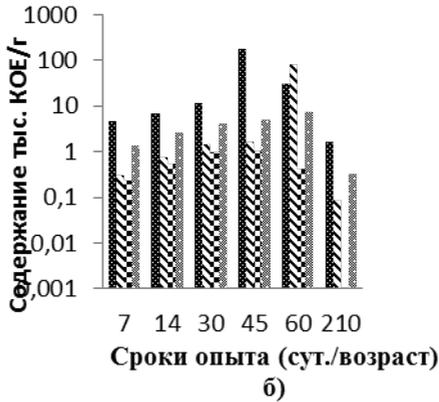
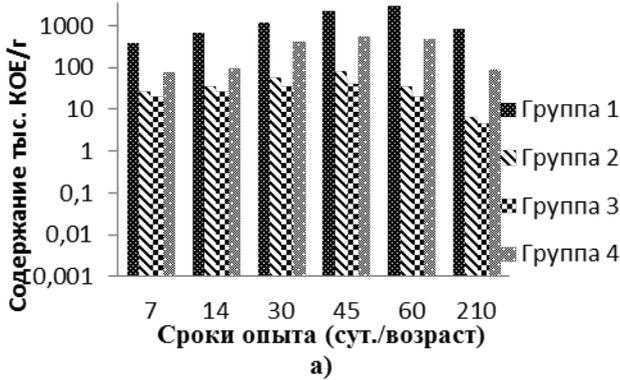


Fig. 2. The effect of different doses of BSE on the dynamics of *Enterococcus faecium* in the stomach of quail: a) in the glandular section, b) in the muscle section. Designations: the same as in fig. one

The dynamics of *E. coli* in the stomach of quail is presented in Fig. 3.

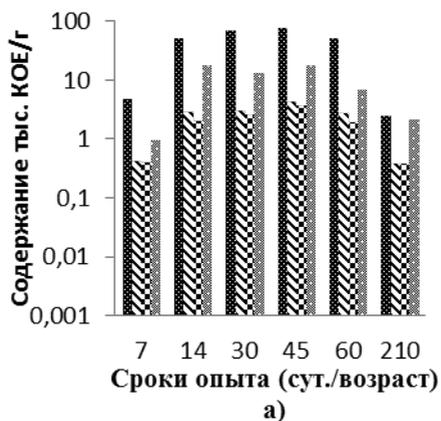
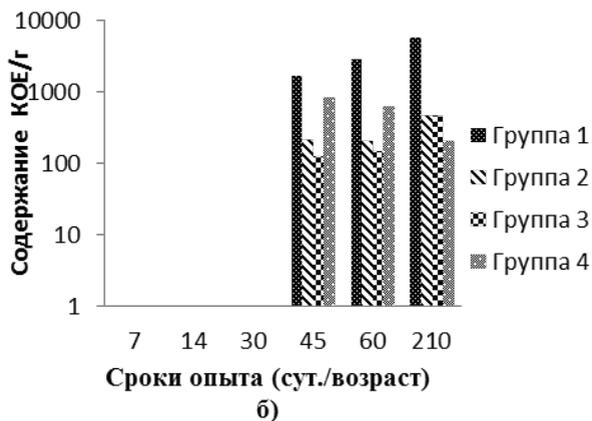


Fig. 3. The effect of different doses of BSE on the dynamics of *Escherichiae coli* in the stomach of quail: a) in the glandular section, b) in the muscle section

Under the influence of BSE, a significant decrease in the activity and micro fungi of *C. albicans* was observed (Fig. 4).

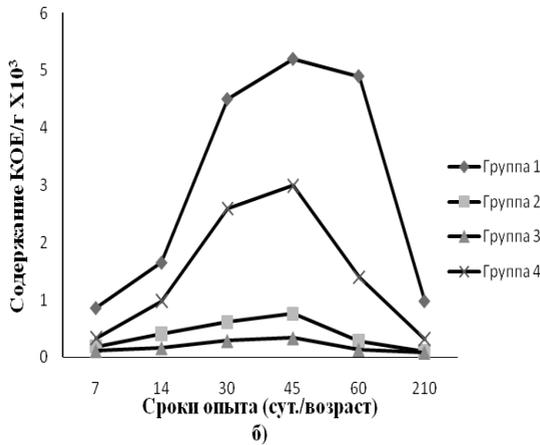
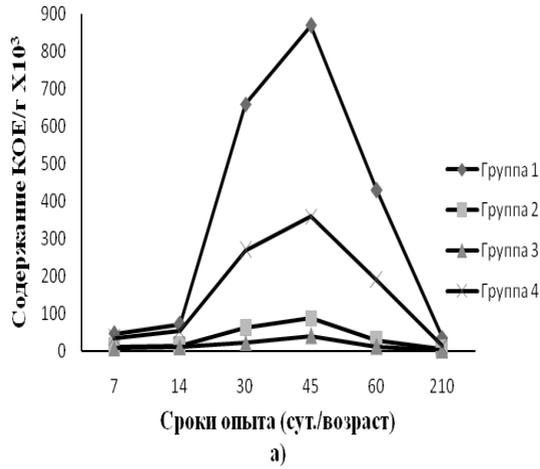


Fig. 4. The effect of different doses of BSE on the dynamics of *Candida albicans* in the stomach of quail: a) in the glandular section, b) in the muscle section. Designations: the same as in Fig. 1

Conclusions

1. Low and medium doses of BSE contribute to the activation of dominant probiotic bacteria: a) *Bifidobacterium spp.* in the glandular part of the stomach, the control in the 2nd and 3rd groups was maximally exceeded by 5.83 and 10.8 times, in the muscle - by 11.7; 142.8 times; in the small intestine - 63.1 and 189.5 times, in the large - 6.8 and 29.1 times; b) *Lactobacillus spp.* in the gizzardous stomach, the controls in the 2nd and 3rd groups were maximally exceeded by 3.54 and 13.1 times, in the muscle - by 49.2 and 375 times; in the small intestine - 95.8 and 329.2 times, in the large - 9.3 and 23.8 times;

2. BSE helps to restore the balance of the content of associative microsymbionts: *E. faecalis*, *E. faecium*, *E. coli*, *S. aureus*, significantly inhibiting their growth and reproduction in the glandular and muscle sections of the stomach, small and large intestines

3. BSE helps prevent the development of quail of candidiasis in the gastrointestinal tract by inhibiting the growth and reproduction activity of *C. albicans* to their physiological values.

References

1. Isse, M.Ya. The biological activity of the extract of bee subpestilence / M.Ya. Isse, R.T. Mannapova // *Beekeeping*. – 2016. – № 6. – P. 50-52.

2. Mannapova, R.T. The effect of bee subpestilence on hematopoiesis and productivity of quail / R.T. Mannapova, G.D. Afanasyev, M.Ya. Isse, A.S. Komarchev // *Beekeeping*. – 2018. – № 4. – P. 53–55.

3. Mannapova, R.T. Erythropoiesis of quail under the influence of bee subpestilence // R.T. Mannapova, M.Ya. Isse // *Morphology V.153, № 3, 2018.-P.177-178. Scopus*

4. Mannapova, R.T. The quail myelogram under the influence of bee subpestilence extract // R.T. Mannapova, G.D. Afanasyev, M.Ya. Isse, A.S. Komarchev. - *Materials of the Ush Congress of the Non-profit Partnership AGE, Voronezh, May, 2019 // Morphology V.155, № 2, 2019.-P.187.*

5. Isse, M.Ya. The effect of bee subpestilence on a quail blood leukogram - *Materials of the Ush congress of the National Academy of Medical Sciences, Voronezh, May, 2019 // Morphology V.155, № 2, 2019.-P.136.*

羔羊生存力主要指标的动态

DYNAMICS OF THE MAIN INDICATORS OF VIABILITY OF LAMBS

Nekhaichuk Elena Valerievna

Candidate of Veterinary Sciences, Assistant

V.I. Vernadsky Crimean Federal University

抽象。研究了动态体重，肝脏，肺和肝脏的绝对重量以及1、5、10、15、20天的雪茄羔羊的体重。在1天大的羔羊中，最高的指标是肩ers，胸部和腹部的身高。22天大的羔羊的活体重量和肝脏，肺脏和肾脏的绝对重量最高，乳房深度，乳房宽度和腹部围长的显著增加是最大的指标。在胸腔和腹腔活动增加的背景下，这与胸腔和腹腔内部器官的增加有关。

关键词：羔羊，身体制品，活重，绝对重量，肝，肺，肾脏。

Abstract. *Were studied dynamics of live weight, absolute weight of liver, lungs and liver, as well as body weight of cigai lambs 1-, 5-, 10-, 15-, 20-days. In 1-day-old lambs, the highest indicators are characterized by height at the withers, chest and abdomen girth. The lambs of 22-day-old have the highest indicators of live weight and absolute weight of the liver, lungs and kidneys, a significant increase in the depth of the breast, the width of the breast and the girth of the abdomen, which is associated with an increase in internal organs in the chest and abdominal cavities against the background of increased activity of the latter.*

Keywords: *lambs, body articles, live weight, absolute weight, liver, lungs, kidneys.*

The future health of an adult animal depends on the degree of its intrauterine maturity and completeness at the time of birth, one of the indicators of which is live weight [5, p. 186]. Live weight determines the level of development of newborns, reflecting the intensity of growth and development of the organism in the future, and makes up 7-9% of the live weight of the mother in farm animals [3, p. sixteen; 4, p. 335]. The relative mass of the various parenchymal organs involved in the metabolism of the body is from 1 to 6% of live weight. However, changes in their relative mass are directly related to changes in live weight [1, p. 85]. It should be noted that for a more reliable determination of the intrauterine completeness of the body of newborns, it is necessary to find out the parameters of the articles of the body [2, p. 36].

The aim of the study – was to establish the dynamics of live weight, parameters of body articles and masses of lungs, liver and kidneys in lambs up to 20 days of age.

Materials and research methods. A study was carried out on lambs of the Tsigai breed at the age of 1-, 5-, 10-, 15- and 20-days ($n = 4$), which were selected from ewes aged 2 to 3 years. The live weight of lambs of the newborn period was determined by weighing individually on an electronic scale UNS HGZ = 15 kg. The absolute mass of the lungs, liver, and kidneys was determined by a macromorphometric method using TBE-0.5-0.01 electronic techno balance, and then organs were fixed in a 10% formalin solution. The relative mass of organs was calculated by the formula:

$$Mo = \frac{m_n \cdot 100\%}{M}, \quad (1)$$

where Mo – relative mass of an organ,

m_n – absolute mass of an organ,

M – live weight.

To determine the body articles in lambs of the newborn period, using zootechnical tools (compass, measuring stick and tape), the following indicators were established: the height of the body at the withers, the depth of the chest, the width of the chest, the circumference of the chest behind the shoulder blades, the oblique length of the trunk, the circumference of the abdomen, and also the length of the last rib. The statistical method was used to process the obtained data (Microsoft Excel 2003).

As a result of the study, it was found that in lambs of 1 day of life, the live weight is 3213.50 ± 56.44 g, the absolute weight of the liver is 75.09 ± 2.81 g, its relative weight is 2.30%. The absolute mass of the lungs and kidneys is 67.15 ± 1.99 g and 31.81 ± 2.64 g (Fig. 1.), and the relative mass, respectively, is 2.09% and 0.99%. The height at the withers of the lambs of 1 day is 36.71 ± 1.21 cm, and the depth of the chest is 14.23 ± 0.23 cm (Table 1). The width of the breasts of lambs reaches 9.00 ± 0.00 cm, the circumference of the chest behind the shoulder blades is 35.28 ± 0.51 cm. The oblique body length of the lambs is 28.01 ± 1.77 cm, and the oblique length of the pelvis is 9.40 ± 0.59 cm.

With such parameters of the body, the circumference of the abdomen in lambs reaches 35.52 ± 0.39 cm, and the length of the last rib is 9.40 ± 1.39 cm.

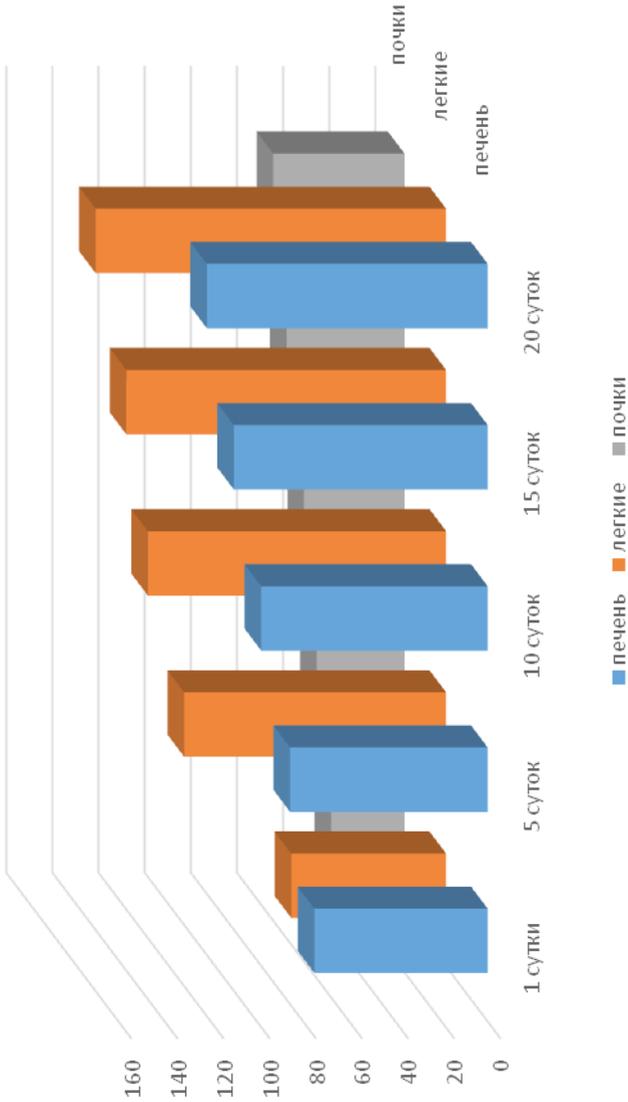


Figure 1. Dynamics of the absolute mass of the liver, lungs and kidneys in lambs

Table 1.

The dynamics of the parameters of body articles in lambs

Indicators, cm	Age, days				
	Height at the withers	36,71±1,21	37,15±0,59	36,93±0,98	36,47±1,04
Oblique body length	28,01±1,77	28,13±1,15	30,51±1,01	31,96±0,59	32,12±1,12
Oblique length of the pelvis	9,40±0,59	7,53±0,71	9,15±1,05	9,74±0,70	11,85±1,47
Chest width	9,00±0,00	10,47±1,21	10,86±1,01	11,27±0,84	11,76±0,68
Chest depth	14,23±0,23	14,46±0,77	15,03±0,36	16,31±1,21	17,98±1,32
Chest circumference behind the shoulder blades	35,28±0,51	35,59±0,51	37,12±1,11	38,69±1,92	40,58±0,79
Girth of the abdomen	35,52±0,39	36,18±0,75	38,14±1,07	38,96±1,17	42,21±0,96
The length of the last rib	9,40±1,39	8,56±0,69	8,81±1,15	9,50±1,07	9,48±0,84

By the age of 5 days, the lambs live weight increases by 11.07%, the absolute weight of the liver, lungs and kidneys increases by 14.03%, 69.17% and 19.84%. By this time, the height at the withers is increased by 4.22%, the width of the chest and the circumference of the chest behind the shoulder blades by 16.71% and 1.09%, and the depth of the chest, on the contrary, decreases by 0.85%. In this case, the oblique length of the pelvis and girth of the abdomen in lambs increases by 17.82% and 3.19%, while the oblique length of the trunk and the length of the last rib, on the contrary, decrease by 1.80% and 10.59%, respectively.

At 10 days of age, the lambs show an increase in body weight by 11.98%, with an increase in the absolute weight of the liver, lungs and kidneys - by 14.68%, 13.87% and 14.29%. The parameters of body articles are also increasing: the depth of the chest, the circumference of the chest behind the shoulder blades, the oblique length of the pelvis becomes 5.25%, 4.76%, 13.58% more. The girth of the abdomen, the oblique length of the trunk, the length of the last rib and the width of the chest increase by 5.79%, 13.61%, 7.36 and 5.40%, while the height at the withers, on the contrary, decreases by 1.83%.

In 15-day-old lambs, live weight increases by 13.58%, against the background of an increase in the absolute mass of the liver, lungs and kidneys by 12.12%, 7.22% and 11.49%. The parameters of body articles such as chest depth by 4.21%, chest circumference behind the shoulder blades by 4.79%, oblique length of the pelvis and girth of the abdomen by 0.39% and 0.60%, oblique body length by 4.36% are also increasing. and the length of the last rib by 8.39%, however, there is a decrease in chest width and height at the withers by 1.54% and 1.40%, respectively.

By the age of 20 days, the lambs live weight, the absolute mass of the liver, lungs and kidneys increases by 7.12%, 10.61%, 9.58% and 11.17%. The parameters of depth and width of the chest increase by 20.03% and 20.11%, the oblique length of the pelvis and girth of the abdomen by 37.86% and 10.18%, the girth of the chest behind the shoulder blades and the oblique length of the body by 5.61%, and 0.10%. The height at the withers and the length of the last rib are reduced by 1.26% and 0.34%.

Conclusion. Thus, in lambs of the newborn period, asynchronous dynamics of increase in live body weight and absolute weight of the liver, lungs and kidneys is observed against the background of an increase in the parameters of body articles, except for the height at the withers and the length of the last rib. The highest indices are observed in lambs at the age of 20 days, which is associated with an increase in internal organs in the chest and abdominal cavities amid increased activity of the latter.

References

1. Erokhin A.I. Live weight of lambs in early postnatal ontogenesis as a predictive indicator of growth, fattening and meat qualities of sheep / A.I. Erokhin, V.V. Aboneev, S.A. Erokhin, A.N. Sokolov, A.I. Surov // "Sheep, goats, woolen work". – 2008. – № 2. – P. 85-90.
2. Mechanisms and patterns of individual development of humans and animals: materials of the International scientific-practical conference dedicated to the 75th anniversary of Teltsov Leonid Petrovich. Saransk, October 12–13, 2012 / Editorial: T. A. Romanova, V. A. Stolyarova, V. S. Temlyakova. – Saransk: Publishing House of Mordov University, LLC "Ladimir", 2013. – 316 P.
3. Nekhaychuk E. V. Morphology of the kidneys and their intraorgan blood vessels in lambs up to 22 days of age [Manuscript]: dis. ... cand. Veterinary Sciences: 16.00.02 - pathology, oncology and morphology of animals / E.V. Nekhaychuk. – Book, 2013. – 226 P.
4. Nekhaychuk E.V. Method for predicting the adaptive dynamics of morphometric parameters of the kidneys in lambs. Collection of articles of the I International scientific-practical conference "Modern environmental problems and ways to solve them" dedicated to the anniversary of the Lugansk National Agrarian University (LPR, Lugansk, November 22-23, 2016). – Lugansk: GOU LNR LNAU, 2016. – P. 335-338.
5. Nekhaichuk E.V. Features of the stromal components of the kidneys in diurnal lambs / E.V. Nekhaichuk, V.V. Lemeshenko // Modern bioengineering and nuclear-physical technologies in medicine: a collection of materials from the International Youth Scientific School in the framework of event 2.1 "Organization and holding All-Russian and International Youth Scientific Conferences and Schools" of the federal target program "Scientific and scientific-pedagogical personnel of innovative Russia" for 2009-2013 (state contract 14.741.11.0367 dated 08.28.2012). – Saratov: "Scientific Book Publishing House" LLC, 2012. – P. 186-187.

关于中黑海盆地和南里海盆地褶皱的成因
**ABOUT THE GENESIS OF FOLDING
OF THE CENTRAL BLACK SEA AND SOUTH CASPIAN BASINS**

Pogorelova Elena Yuryevna

Ph.D by Geology, Associate Professor

Azerbaijan State Oil and Industry University

抽象。 本文从黑海—里海地区发展的地球动力学特征出发,探讨了南里海和黑海盆地褶皱形成的比较特征。 折叠的成因取决于山地建筑的阶段和特定沉积盆地的特征。

关键词: 黑海—里海地区, 全同形, 褶皱, Persilisik岩浆作用, 沉积层

Abstract. *The article discusses the comparative characteristics of folding formation in the South Caspian and Black Sea basins, starting from the geodynamic features of the development of the Black Sea-Caspian region. The genesis of folding depends on the staging of mountain building and the characteristics of a particular sedimentation basin.*

Key words: *Black Sea-Caspian region, holomorphic, folding, persilisik magmatism, sedimentary layer*

Within the study area, both linear or geosynclinal or holomorphic folding and discontinuous folding are manifested. In folded systems, an increase in the thickness of the granite layer is associated with a decrease in the sedimentary layer. Discontinuous folding is not only the folding of platforms, but also of geosynclines, in which this folding is not yet destroyed by orogenesis. Folding holomorphic, or linear, or geosynclinal is the folding of orogenic belts.

The absence of a granite layer in the basins of the Southern Caspian and the Central Black Sea is explained by the fact that with an increase in the thickness of the sedimentary stratum, the thickness of the consolidated crust complex decreases. Within the Black Sea basin, the total thickness of the sedimentary stratum and “granite” layer varies within small limits (from 15 to 20 km) regardless of changes in any component of the earth's crust. And the larger the sedimentary layer, the less “granite”, i.e. their power is inversely proportional. Since the increase in the sedimentary layer is associated with

an increase in the deflection of a particular section of the earth's crust, on this basis it is concluded that the process is real, leading to a decrease or complete disappearance of the granite layer as the deflection increases. During the basification process, if at all possible, since the light crust should be immersed in the heavy crust (Kropotkin, 1962), the "basalt" layer grows due to a decrease in the "granite" layer. But, if the "granite" layer disappears to the areas of immersion, i.e. due to an increase in the sedimentary layer, and the basalt thickness remains almost unchanged, it is necessary to say here that the "granite" layer will form as a certain complex is involved in the orogenic process with the manifestation of persilik magmatism. If the folding process occurs on the background of deflection, then, naturally, the sedimentary layer will increase, and the granite layer will decrease in thickness in the areas of greater deflection. This position is well illustrated by the example of Mountain Crimea and the deep sea zone of the Black Sea. Naturally, the coastal zone adjacent to Mountain Crimea, where the Early Cimmerian folding was manifested, has a greater thickness of the granite layer than the more southern regions, where this process was not so intense. B.K. Balavazde et al. (1973) cite the fact that according to the RWM (reflected wave method), in the deepwater part of the Black Sea, the upper part of the section is represented by a thickness of almost completely intact sediments with a thickness of 4-5 km [1] [2]. The data from the DSS (deep seismic sounding) and RDPM (reflected depth point method) (Neprochnov, Elnikov, 1969; Arkhipov et al., 1970; Tugolesov et al., 1985) [3] indicate that the sedimentary layer in the central part of the Black Sea with a thickness of 10-15 km lies horizontally. Naturally, in this case the process did not occur, leading to the formation of a granite layer, and therefore, here the sedimentary layer lies immediately on the basalt layer. The same thing happens in the basin of the South Caspian, where sediments over 25 km of thickness were not drawn into the orogenic process, and, therefore, a granite layer did not form here. The fact that the linear folding of the Greater Caucasus, when approaching the Caspian Sea, turns into a discontinuous one, and here we have typically cosedimentary folds (Shurabad, Kesh, Tegchay, etc.) can indicate a stable bowing of the Caspian basin. This immersion zone of the Greater Caucasus at the orogenic stage of development did not turn into part of the Caucasian orogen, but continued to flex in the inherited state. The same picture on the Absheron Peninsula. The disappearance of flysch near the Caspian Sea is most likely due to the same trend; in the coastal and marine parts, the basin continued to bend steadily in the Late Cretaceous, as a result of which the late geosynclinal developmental stage, which is characterized by the formation of the flysch formation, did not

appear here.

The same precedent is associated with the Black Sea. The Bontine Synclorium of West Pontus is filled with the Upper Cretaceous flysch with packs of tuffs and andesites. Within the shelf, the Upper Cretaceous flysch is replaced by carbonate-marl rocks. Apparently, the same picture was within the Kopetdag myogeosynclines along with the zone of the southwestern virgations of Kopetdag and the West Turkmen depression in the Mesozoic; this time is characterized by the geotectonic regime of the shelf. In this regard, the author considers it necessary to quote the words of M. M. Tetyaev (1948): “There can be no doubt that dome-shaped forms of the same type develop in geosynclines, and if we do not observe them, it is only because they are there masked by subsequent folding ... Primary dome-shaped forms are sometimes directly visible through the folded structure when it is weakly expressed, as was the case in the peripheral parts of the folded zones, for example, on the western slope of the Urals, on the Absheron Peninsula and in a number of other places”.

It was mentioned above that the Mesozoic history of the Somkhety-Agdam zone and the central part of the Kura Depression are similar, however, folding in the Lesser Caucasus is much more intense than in the Kura Depression. But the fact is that the Lesser Caucasus is currently a mountain structure, i.e. passed the stage of orogenic development, while the region of the central part of the Kura Depression did not pass it. This should be understood so that in Cenozoic times their paths diverged. In the latter of them, the consolidation development of folds continued, inherited from the geosynclinal stage. All of the above leads to the idea that discontinuous folding is inherent in the preorogenic stage of the development of geosynclinal complexes and is the primary, initial folding of the geosynclinal. Typical geosynclinal, major folding, i.e. in areas not affected by orogenesis K.V. Bogolepov (1973), understands orogenesis as a destructive process with respect to geosynclinal or platform structures[4]. Within the Kura Depression, linear folding is characteristic of areas such as the Ajinour, Alat ridge, and the Kura and Gabyrry interfluves, where positive late-orogenic structures arose in the Quaternary.

The late Orogenic process with the formation of linearly elongated folding occurred in the post-Baku time within the Lower Kura Depression (anticlinal zone of the Kyurovdag-Neftchala). The phenomenon is that intermittent rock-like folds of the lower horizons are combined into a single fold according to the structure of the Quaternary formations (for example, Kyurovdag-Karabagly-Babazanan, Hilli-Neftchala).

Typically linear folds are the folds of the narrow Pre-Talyshian trough Agdash, Badzhirovan, Tumarkhanly. Here, the rocks of Karagan, Konka, Sarmatia have the same angle of incidence, they are intensely deformed. Folds expressed

in rocks of a specified age are post-sedimentary, i.e. their collapse occurred as a result of lateral compression already in the post-Sarmatian time. The indicated folding in the Pre-Talyshian trough occurred as a result of the Talysh fold system being pushed onto the Kura depression, as a result of which only the narrow northern part of the Pre-Talyshian trough remained uncovered. In all likelihood, the Talysh block is bounded from the south by the south from the Bilasuvar-Karadonli faults, which separates Talysh from the Bilasuvar-Karadonli transverse uplift. This uplift ceases to exist within the Kura Depression in the Miocene, and in Iran it, as well as the system of Bilasuvar-Karadonli deep faults that limits it, also develops in the Miocene. The southern of these faults has the character of a shift along which Talysh extends to the north, creating the indicated folding of the Pre-Talyshian trough. It is interesting to note that the folds of the Jalilabad trough, located to the north (Novogolovka, Yardimli) within the Kura Depression, developed by sedimentation, and folding is typically intermittent [5].

The central part of the Kura Depression is characterized by the absence of a folded structure in the Pliocene-anthropogenic stage. This reflects the manifestation of the late orogenic stage, when a mountain-forming process manifests itself in the folded belts. Synchronously with the latter in the central part of the Kura Depression, the opposite process of undifferentiated deflection of the region occurs in sign.

All this is emphasized by the contrast that is observed in the development trends of the Kura-South Caspian Depression, on the one hand, and the Central Black Sea, on the other.

The Varna Depression, which is embedded in the Cenozoic in the body of the Mysian Epibaikal Plate and separated by a transverse deep fault from the North Bulgarian Arch, has a pronounced superimposed character. Since the sedimentary complex of the Central Black Sea Depression is composed of Molassian Cenozoic sediments lying on the basalts of the Late Cretaceous rift, the author proposes to consider the modern Central Black Sea Depression to be an epyrift molassic trough.

References

1. Gonchar V.V., Kozlenko Yu.V. *The lithosphere of the West Black Sea basin along the DSS-25 profile according to isostatic and gravitational modeling data Geologiya i poleznie iskopayemie mirovogo okeana [Geology and minerals of the oceans]*, 2008, pp.5-21
2. Astakhov S.M. *Ocenka uglevodorodnogo potentsiala Tuapsinskogo progiba na osnove metodik bassejnovogo modelirovaniya* Kand. Diss.[*Evaluation of the hydrocarbon potential of the Tuapse Trough based on basin modeling techniques, PhD diss.*]. Rostov-on-Don, 2011. 237 p.
3. Schreider A.A. *Formirovanie glubokovodnoj kotloviny Chernogo morya* Kand. Diss.[*Formation of the deep sea basin of the Black Sea, PhD diss.*]. Moscow, 2008. 147 p.
4. *Strukturnie elementi zemnoi kori i ikh evolyuciya [Structural elements of the earth's crust and their evolution]*. Novosibirsk, Science Publ, issn 588. 1983. 186 p.
5. Khain V.E., Popkov V.I., Yudin V.V. et al. *Tectonics of the southern border of the East European platform: Explanatory note to the tectonic map of the Black Sea-Caspian region. Scale 1: 2 500 000, Editors Khain V.E., V.I. Popkov. Tektonika yujnogo obramleniya Vostochno-Evropeyskoy platformi: Obyasnitelnaya zapiska k tektonicheskoy karte Chernomorsko-Kaspiyskogo regiona. Mashtab 1:2 500 000, Pod redakciey V.E.Khaina, V.I.Popkova, Krasnodar, Kuban State University, 2009.-213 p.*

关于低库拉凹陷内生产层下部分布的性质及其与油气的关系
**ABOUT THE NATURE OF THE DISTRIBUTION OF THE LOWER
PART OF THE PRODUCTIVE STRATUM WITHIN THE LOW KURA
DEPRESSION AND THEIR RELATIONSHIP WITH OIL AND GAS**

Rzayeva Sevinj Makhmud

Associate Professor

Azerbaijan State Oil Academy

Abdullayeva Valida Gafar

Assistant

Azerbaijan State Oil Academy

摘要。 本文专门介绍了低库拉depression陷内生产层下部储层的分布特征。特别是,对深层勘探钻井的材料进行了分析,从而有可能确定整个库拉ura陷东部正在考虑的地层岩性和相特征的主要变化模式,并确定最有前途的构造。 石油和天然气勘探。

关键词: 油气饱和度, sub-Kirmaki套间, 生产层, 南里海, Jeyrankechmez凹陷, 地层楔入, 阿布歇隆半岛。

Abstract. *This article is devoted to the nature of the distribution of reservoirs of the lower part of the productive stratum within the Low Kura depression. In particular, the materials of deep exploratory drilling were analyzed, which made it possible to determine the main patterns of changes in the lithological and facies features of the horizons under consideration throughout the eastern part of the Kura Depression and to identify the most promising structures for prospecting for oil and gas.*

Keywords: *oil and gas saturation, sub-Kirmaki suite, productive stratum, South Caspian, Jeyrankechmez depression, wedging out stratigraphically, Absheron peninsula.*

The study of the latest geological and production and geophysical materials on the areas of the Low Kura depression allows us to identify the most promising structures for prospecting and exploration for oil and gas.

And here the V, VI and VII horizons of the productive stratum are of the greatest interest. Within the Absheron Peninsula, these horizons are associated with industrial reserves of oil and gas. They are the main exploration sites in the Baku archipelago and are industrially oil and gas bearing in a number of structures of the Jeyrankechmez depression located in the transitional zone from the Absheron oil and gas bearing region to the Kura.

This served as the basis for considering these horizons to be regionally oil and gas bearing and within the Kura Depression.

A detailed analysis of deep drilling materials made it possible to determine the main patterns of changes in the lithological and facies features of the horizons under consideration throughout the eastern part of the Low Depression. Thus, it was found that in the direction of the South Caspian, the bottoms of the productive stratum become more sandy and more suitable for the accumulation of oil and gas. Within the Kyurovdag-Garabagly section of the studied depression, the bottoms of the productive stratum are composed of clay rocks devoid of collectors.

On the Mishovdag square, in the bottom of the productive stratum, analogues of the sub-Kirmaki (SK) appear, which are represented by coarse-grained rocks of the conglomerate type (wells № 59 and 61), which shows that the distribution of sand formations in the section of the bottoms of the productive stratum is zonal in nature.

In the west, the boundary of the zone of sand formations in the lower productive stratum is determined by the axis of the Mugan-Salyan trough, and in the north - somewhat south of the Mishovdag uplift. The best physical properties are acquired here by collectors of the V, VI and VII horizons of the productive stratum.

It is noteworthy that the lower horizons of the productive stratum (Over-Kirmaky sandy (OKS), Kirmaky - (KS) and Sub-Kirmaki (SK) suites) are represented in the clay facies from the Kyurovdag-Babazanan section of the depression to the Durovag square, and only starting from Hilli In the section of the Neftcala section, interlayers of sandy rocks appear, the number of which is noticeably increasing towards the Baku archipelago. The exception in this regard is only the PK suite, which is represented by gravelites in the Mishovdag and Kalmaz squares, which are replaced by clayey rocks towards the Agzybir and Hamamdag squares. Considering the pattern in the distribution of lithofacies of other horizons in the lower reaches of the PT, we can conclude that in the strip of the Kursangi and Khidirlinsky uplifts the SK suite is more sandy and has better reservoir properties.

Given the above, the Kursangi buried anticline should attract attention from the point of view of setting up and conducting prospecting and exploration for oil and gas. This conclusion also follows from the fact that the indicated structure in the Early Pliocene and at the beginning of the Lower Pliocene significantly outstripped the adjacent uplifts of the region in terms of growth rate and, as a result, should have a greater capacity for accumulating industrial hydrocarbon reserves. The forecast will become even more convincing if we take into account the established by us pattern on the inherited nature of the distribution in the context of the productive strata of sand reservoirs. It is noteworthy that a comparison of reservoir parameters such as effective oil and gas saturated power and saturation coefficient, the values of which at the tops of PT in the Kursangi area is noticeably higher than in the areas of Kurovdag, Garabagly and Kalmaz.

An analysis of the results of previous studies, taking into account the data of a comprehensive interpretation of seismic and deep drilling materials in the Kursangi area, allows us to conclude that in the area of well. № 75, the sole of the PT lies at a depth of not more than 5400m. This figure is much smaller than that given in the work of most researchers and gives reason to reconsider existing ideas about the distribution of PT capacities in SE Shirvan in general and in Kursangi in particular.

Based on these data, taking into account the amount of erosion of the upper part of PT in the Kursangi, Garabagly, and Babazanan regions, it is possible to more correctly correlate sediments in the Low Kura depression.

The analysis of field geophysics materials has shown that packs of clay rocks can serve as the most reliable logging reference points.

The correlation of the Kyursanga fold section with the adjacent uplifts of the region made it possible to establish that a pack of sandy rocks with industrial oil and gas reserves, opened by wells № 48, 68, 80, 78, 75, and 87 in the intervals, respectively, 4370–4485; 4,461–4,572; 4,535–4643; 4,494 – 4,606; 4300 – 4412 and 4600 – 4700 m, by their logging characteristics, fully corresponds to the analogues of the V PT horizon along the Garadagh breakdown. And if this interval of the PT section is taken as the initial stratigraphic level, then the determination of the nomenclature of the underlying sandy objects will not present great difficulties for workers of geological services.

Oil-saturated intervals of 4870 – 4030 m in a well. № 80 and 4616 – 4670 m in the well № 78 on Kursangi area is an analogue of the VI PT horizon (Lokbatan fault). According to their logging characteristics, these intervals in well sections № 80 and 75 correlate quite clearly with a pack of oil-saturated rocks exposed by well № 53 on Garabagly area (in the range of 4380 – 5530) and also attributable to the VI PT horizon.

Based on this principle, in determining the stratigraphic affiliation of sandy objects of PT and its lower layers, it was possible to establish that a pack of sandy beds discovered on Kursangi so far with only one well № 75 in the depth interval 4800–5000 m can be more reliably identified for VII horizon of PT along Garadagly fault. The validity of this conclusion is also confirmed by comparing the complex of logging characteristics of this section interval with those of the Kalmaz and Neftchala areas.

The foregoing makes it possible to recommend that the main volume of exploratory drilling in Kursangi area be directed to exploration of the oil and gas potential of the V and VI horizons of the PT (according to the Lokbatan breakdown), as well as to the search for deposits in analogues of the VII horizon and SK suite of the lower part of the PT. The high prospects of the latter are evidenced by the fact that in the early Lower Pliocene, the paleogeographic conditions for the accumulation of precipitation in the Kursangi area and in the Absheron region were similar. This section was not completely isolated from the South Caspian basin, which could, and most

likely served as one of the main sources of hydrocarbon generation.

Given the rather high rate of lifting of the Kursangi fault in the Early and Lower Pliocene, it is more correct to assume that hydrocarbon deposits in the lower productive strata here are likely to be confined to stratigraphically wedged out formations. Therefore, it is advisable to conduct reconnaissance at a certain distance from the arched part of the fold.

References

1. Bagir-zade F.M., Kerimov K.M. "Oil and gas", 1973, №3
2. Gadzhiev R.M. *The deep structure of Azerbaijan. Baku, Azerneshr, 1965.*
3. Kerimov K.M. "Geology of oil and gas", 1970, №1.
4. Kerimov K.M., Kerimov A.A., Jafarov H.D. "Oil and gas", 1973, №7.
5. Kerimov K.M. et al. "Oil and gas geology and geophysics", 1973, №4.
6. Mamedov T.A., Kerimov K.M. *On erosion of deposits of the productive stratum in the Low Kura Depression. "Scientific notes" AzINEFTECHIMA, IX ser., 1973, №7.*
7. Shikhlinsky A.Sh. *Geology and oil and gas prospects of the Pliocene sediments of the Low Kura depression. Baku, Azerneshr, 1967.*

UDC 528.94:004.92/93

形成用于监控农业土地的数字地图材料 (以伊尔库茨克市为例)

**THE FORMATION OF THE DIGITAL MAP MATERIAL FOR
MONITORING OF AGRICULTURAL LANDS (ON THE EXAMPLE
OF IRKUTSK CITY)**

Ponomarenko Elena Alexandrovna

*Candidate of Biological Sciences, Associate Professor
Irkutsk State Agrarian University named after A.A. Ezhevsky*

Sadkova Tatiana Semenovna

*Undergraduate
Irkutsk State Agrarian University named after A.A. Ezhevsky*

Kolomina Tatyana Mihaelovna

*Senior Lecturer
Irkutsk State Agrarian University named after A.A. Ezhevsky*

抽象。 本文介绍了农业用地状态监测的过程。 其中包括监测农业用地。 描述了在土地状态监视期间要解决的任务。 以及在农用土地上使用机载激光扫描和航拍来创建数字地图产品的实用方法。 给出了工作材料的示例。 介绍了所应用技术的描述, 主要过程的精度控制结果。 介绍了在农业土地监测期间接收到的所有信息的进一步发布和存储的说明。 以及其制备和进一步使用的方法。

关键词: 农业用地监测, 数字制图材料, 休闲潜力分析。

Abstract. *This paper describes the process of state monitoring of agricultural land. Which includes monitoring agricultural land. The tasks that are solved during the state monitoring of land are described. As well as a practical method for creating digital cartographic products using airborne laser scanning and aerial photography on agricultural lands. An example of working material is given. The description of the applied technique, the results of the accuracy control of the main processes are presented. The description of further publication and storage of all information received during the monitoring of agricultural land is presented. As well as methods for its preparation and further use.*

Keywords: *monitoring of agricultural land, digital cartographic material, analysis of recreational potential.*

State monitoring of agricultural land— a system of operational, periodic and initial monitoring of changes in the qualitative and quantitative condition of agricultural land and land used or provided for agriculture as part of lands of other categories, such as natural and industrial facilities for agriculture, their economic use, and surveys of these lands, soils and their vegetation cover, carried out with a certain periodicity [3].

State monitoring of agricultural land includes systematic observations:

- of the state and use of crop rotation fields, agricultural landfills and contours, as well as the parameters of soil fertility and the development of processes of their degradation;

- of the changes in the state of vegetation on arable land, fallow lands, hay and pasture lands.

- When conducting state monitoring of agricultural lands, the following tasks are solved:

- timely identification of changes in the state of agricultural lands;
- obtaining data based on a systematic survey of soil fertility;
- monitoring the state of vegetation of agricultural land;
- maintaining a register of soil fertility of agricultural lands and recording their condition;
- formation of state information resources on agricultural land for the purpose of analysis;
- ensuring access of legal entities and individuals to information on the state of agricultural lands;
- participation in international programs [2].

To solve these and similar problems, modern methods and means of obtaining, storing, processing and presenting a variety of information, as well as means of exchanging information, are required. These include methods for collecting a significant amount of data on a variety of indicators from very significant areas.

The advantage of monitoring as an integrated tracking system is quite obvious, since soil and agrochemical studies are often carried out on the basis of one-sided programs involving a limited set of parameters studied and the use of different methodical and methodological approaches [1].

Thus, at present, the study of the state of agricultural land is of particular importance, since the indicators of their qualitative condition are low.

State regulation of such complex processes makes it possible to resolve many contradictions in a crisis of socio-economic, scientific, technical, intellectual and informational potentials of society, especially in the field of organization and management of agricultural production [5].

For the efficient use of agricultural land, it is necessary to know the real size of the cultivated areas available to the agricultural enterprise, as well as their qualitative and quantitative characteristics. These characteristics can be used for precision farming. The scientific concept of precision farming is based on ideas about the existence of heterogeneity within one field. Modern technologies, such as global positioning systems, special sensors, remote sensing data, and also special programs for agronomic management are used to monitor, evaluate and detect these heterogeneities. The collected data is used to plan sowing work, calculate fertilizer rates and plant protection products, and calculate yield indicators using field maps. The main task that needs to be solved when mapping the fields is the formation of work sites with a homogeneous soil composition.

This paper discusses the experience of creating digital cartographic products for a large area array of agricultural land with cadastral number 38: 15: 130501: 2008 according to aerial laser location and aerial photography. This land plot has been allocated for growing grain and fodder crops of a land plot from agricultural land, with an area of 318,504 sq. M, located at: Irkutsk oblast, Tulunsky district, permitted use: for agricultural production. Aerial photography was carried out with a VexcelUltraCamD wide-format digital camera from a height of 1000 m. Aerial survey laser-location complex ALTM 3100 was installed on board the aircraft. A total of 6,650 images were obtained. Flight planning is usually done at the office and is adjusted on the spot according to the situation. Below (Fig. 1) the interface of the VexcelUltraCamD planning program is shown.

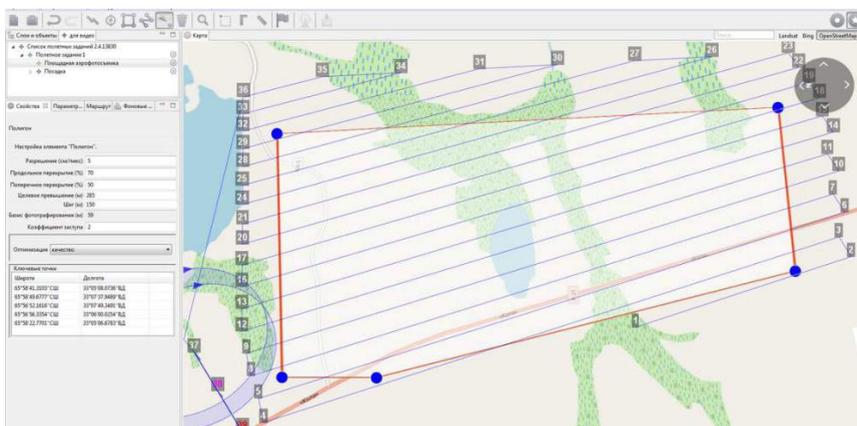


Figure 1 - "Flight Mission"

Thus, the following processes took place simultaneously in flight: aerial photography, determination of the coordinates of the centers of photographing of each image, and laser scanning of the terrain. Since the coordinates of the centers of photographing each image were determined during aerial photography, the mutual orientation of the images was simplified. To control the accuracy of phototriangulation and control the construction of the orthomosaic, 46 control points were selected. The accuracy of phototriangulation was evaluated, its data are presented in table 1.

Table 1 – Differences of photogrammetric and geodetic coordinates

Discrepancies of photogrammetric and geodetic coordinates			
	ΔX , m	ΔY , m	ΔZ , m
Max	0,47	0,40	-0,77
Min	-0,13	0,02	0,08
Average	0,24	0,31	0,47

Then a digital terrain model and a digital elevation model were built. For this, laser reflection points obtained as a result of laser scanning were used. The digital elevation model (hereinafter referred to as the DEM) was built in the form of a regular network of triangles in the Microstation software based on the ground-class laser reflection points.

Further (Fig. 2) from the obtained digital terrain model (elevation map), the import of surface elevation points in txt format into AutoCad format occurs.

Next, the process of orthophototransformation and control of the accuracy of orthophototransformation by the same 46 control points were performed. According to the "Instructions for photogrammetric work when creating digital topographic maps and plans GKINP (GNTA) -02-036-02" for a scale of 1: 2000, the values of errors at the control points allow:

- for flat and hilly territories 1 m;
- for mountainous areas 1.4 m.

As a result of the work performed, there are no unacceptable errors at the control points. The calculated discrepancies at the control points were:

- maximum divergence of 0.93 m;
- average divergence of 0.49 m;
- mean square error of 0.53 m.

The obtained results confirm the published data on the possibility of using the coordinates of photographing centers for phototriangulation with a limited number of reference points. At the end of field monitoring and surveying of elements that are not visible on aerial photographs, the cartographer performs a "fine" rendering of the materials obtained according to the standards for the delivery of topographic plans (Fig. 3).

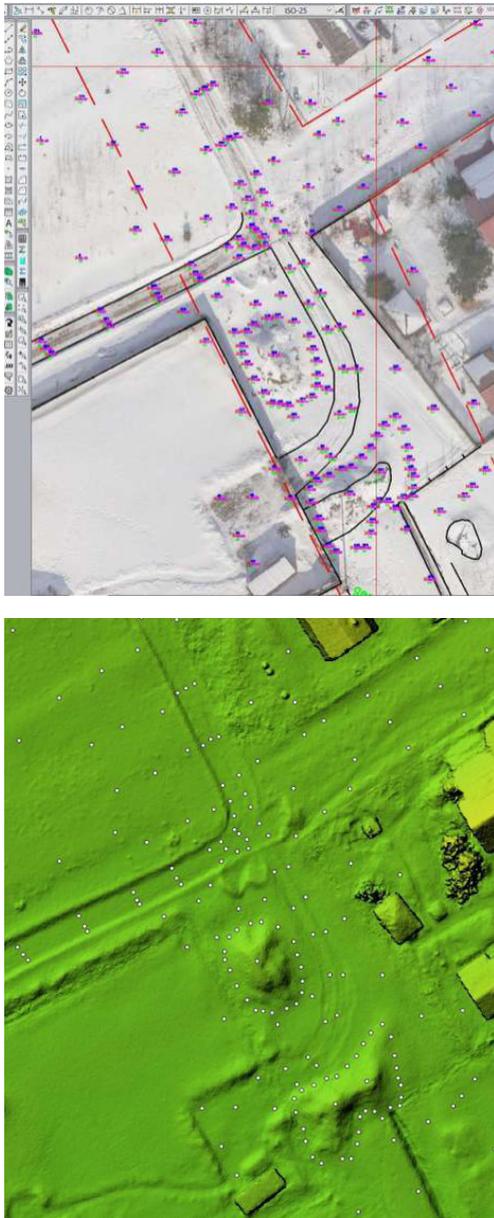


Figure 2 - "Import of elevation points"

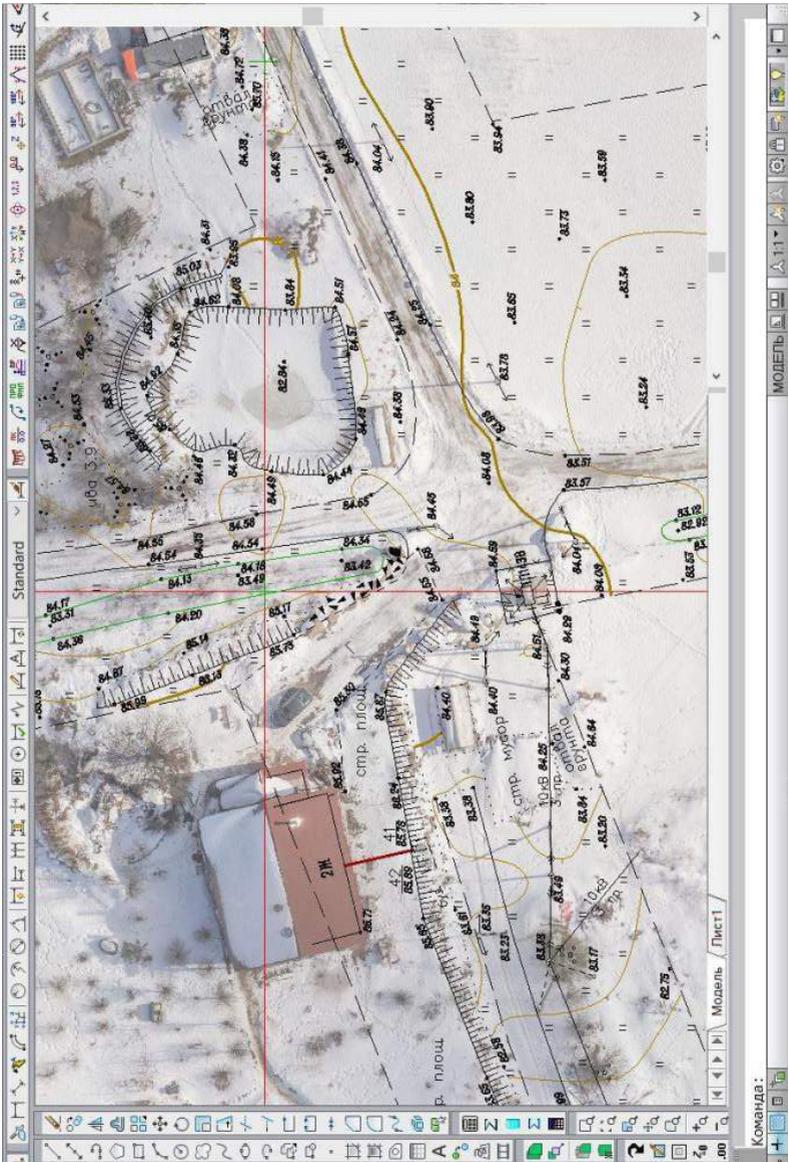


Figure 3 - "Drawing of the received materials"

The digital orthophotomaps created on a scale of 1: 2000 comply with the requirements of the “Instructions for Photogrammetric Work in Creating Digital Topographic Maps and Plans GKINP (GNTA) -02-036-02”. To create topographic products, desk decoding of orthophotomaps was performed [4].

Actual and accurate data on the processing area for each field is the fundamental basis of modern agriculture. The accuracy of the information on the area of the field directly affects the accuracy of calculating the costs of processing it. For example, the difference between the areas between the map of the 70-80s and the current state can reach 20%, which means that the same error will be present when calculating the cost of purchasing seeds and pesticides, the yield data will be just as inaccurate. A land inventory using VexcelUltraCamD is much more accurate and more productive than the currently widely used methods of detouring a field along a path or drawing using satellite data. This technology allows you to accurately determine the boundaries and areas of fields, the actual use of land and the type of vegetation cover.

Information acquired in the course of state monitoring of agricultural land is transferred to the state fund containing state environmental monitoring data, in accordance with the requirements of the RF Government Decree dated 09.08.2013 №681 “On state environmental monitoring and the state fund of state environmental monitoring data” [6].

Citizens and various organizations can use generalized information about the results of state monitoring of sites using the Internet. If you need to familiarize yourself with this kind of information, refer to the official website of the Ministry.

The transfer of data obtained as a result of these measures in respect of agricultural holdings that are in limited access occurs in accordance with the provisions of existing legal acts regulating issues relating to state secrets, trade secrets or other secrets, which are protected by the provisions of the law in the Russian Federation [2].

References

1. *The Land Code of the Russian Federation of November 25, 2001 № 136-FL (as amended on 12.31.2017) [Electronic resource] // Consultant Plus: legal reference system.*
2. *Decree of the Government of the Russian Federation of July 30, 2010 № 1292-r "On approval of the concept of development of state monitoring of agricultural lands and lands used or provided for farming as part of lands of other categories, and the formation of state information resources about these lands on period until 2020."*
3. *Osennyaya A.V. Real estate cadastre guide/ A.V. Osennyaya, I.S. Gribkova., M.A. Pastukhov – Krasnodar, 2015, 212P.*
4. *Rosreestr – official site [Electronic resource] – Access: <https://rosreestr.ru/site/> – 12.10.2019.*
5. *Reference information legal system ConsultantPlus [Electronic resource] – Access: <http://www.consultant.ru> – 11.10.19.*
6. *Reference and legal system Garant [Electronic resource] – Access: <http://www.garant.ru> – 11.10.2019.*

UDC 633.853.52:632.9:581.19

大豆种子的播种质量和生化组成取决于除草剂和天然药物的使用
**SOWING QUALITIES AND BIOCHEMICAL COMPOSITION
OF SOYBEAN SEEDS DEPENDING ON THE USE OF HERBICIDE AND
A DRUG OF NATURAL ORIGIN**

Gretchenko Alina Evgen'evna

*Research Assistant of the laboratory
of primary seed cultivation and seed science*

Mikhailova Mariya Pavlovna

*Senior Research Officer of the laboratory
of primary seed cultivation and seed science
All-Russian Soybean Research Institute*

抽象。这篇文章介绍了脉冲星除草剂和天然药物ExtraCor（二氢槲皮素+原花青素+对羟基苯甲酸）对大豆种子播种质量和生化组成的影响的数据。研究的对象是全季大豆Kitross，是全俄大豆研究所的精选产品。该研究是在阿穆尔州坦波夫地区的草甸黑钙土样土壤上进行的。已确定在第三张第三叶阶段以0.8 l / ha的剂量施用Pulsar除草剂会对发芽能产生负面影响，并导致种子中蛋白质和脂肪的定量和定性组成发生变化。使用天然来源的药物有助于增加总蛋白含量，增加某些氨基酸的含量，并对中熟大豆基特罗斯品种的播种质量产生积极影响。

关键词：大豆除草剂发芽能量实验室发芽生化成分

Abstract. *The article presents data on the effect of the Pulsar herbicide and a drug of natural origin ExtraCor (dihydroquercetin + proanthocyanidins + parahydroxybenzoic acid) on the sowing qualities and biochemical composition of soybean seeds. The object of research is a mid-season variety of soybean Kitross, selection of the All-Russian Research Institute of Soybean. The studies were carried out on meadow chernozem-like soil of the Tambov district of the Amur oblast. It was established that the Pulsar herbicide at a dose of 0.8 l/ha in the phase of the third ternate leaf had a negative effect on the germination energy and led to a change in the quantitative and qualitative composition of protein and fat in seeds. The use of a drug of natural origin contributed to an increase in the content of total protein, an increase in the content of certain amino acids, and had a positive effect on the sowing quality of seeds of a mid-ripening soybean variety of Kitross.*

Keywords: *soybean, herbicide, germination energy, laboratory germination, biochemical composition.*

Introduction

The beginning of the XXI century is characterized by an active search for fundamentally new approaches to solving the food security of the population on earth. The intensification of crop cultivation inevitably leads to an increase in the use of chemical plant protection products. Numerous studies indicate that with untimely application, violations of the processing regulations, adverse weather conditions, and in sensitive varieties, herbicides cause a stress state of soy plants. Those, in turn, bear energy costs for the implementation of protective biochemical reactions aimed at reducing the stress impact of herbicides. However, this inevitably leads to a deterioration in the quality of seeds, technological properties of the obtained crop, and, as a consequence, a decrease in their biological productivity [1-3].

In recent years, the share of imazamox-based herbicides, which was first registered in the USA in 1997, has increased in most regions of Russia. The active substance of this herbicide, penetrating plant cells, leads to inhibition of the synthesis of a number of amino acids [4]. However, reducing the toxic effects of herbicides on growth, plant productivity and grain quality is an urgent task. One of the ways to solve this issue is the use of biologically active substances with antidote activity. The peculiarity of the action of these drugs is that when they enter the body, they are included in the metabolism or have an indirect effect on it, changing the metabolism, contributing to a change in the level of plant metabolism. The use of natural preparations with anti-stress action for pre-sowing seed treatment allows to increase germination, intergrowth energy, growth rate and development of soybean seedlings, increase plant resistance to adverse environmental factors and, thereby, improve the quality of the crop [5-9].

Recently, the drug of natural origin ExtraCor, which is obtained from Daurian larch (*Larix gmelinii*), has gained the greatest interest in this area. It is a highly effective antidote that increases the resistance of plants to the toxic effects of herbicides.

The purpose of the research was to study the combined effect of the Pulsar herbicide and ExtraCor on the sowing qualities and biochemical composition of the seeds of the mid-ripening soybean variety of Kitross.

Material and methods

The studies were carried out on soybean mid-season varieties of Kitross breeding of the All-Russian Scientific Research Institute of Soybean, cultivated on the experimental field of the All-Russian Research Institute of Soybean (village of Sadovoy, Tambov District, Amur oblast). This soybean variety was included in the State Register of Breeding Achievements in 2016 and is in great demand among agricultural producers of the Amur Region.

The seeds were treated with the ExtraCor biological preparation (dihydroquercetin + proanthocyanidins + para-hydroxybenzoic acid) produced by Ametis CJSC on the day of sowing at the recommended dose. Spraying vegetative plants with the Pulsar herbicide (AI imazamox) at a dose of 0.8 l/ha was carried out in the phase of the third ternary leaf. The quantitative content and qualitative composition of protein and fat in soybean seeds were determined on an Foss Nirsystem 5000 IR analyzer (Sweden) according to GOST R 32749-2014 [10]. The experiment was repeated three times. The mass of the selected samples is 250 g, the weight of sample selection is 5–7 g. The method is based on recording the reflection spectra of the analyzed samples in the near infrared region and determining in them the mass fractions of crude protein and amino acids: valine, lysine, histidine, arginine, phenylalanine, leucine, isoleucine, threonine, methionine + cystine, aspartic acid, serine, alanine + glycine, proline, tyrosine, glutamic acid. The calculation of the values of the indicators was carried out according to previously created calibration models. Germination energy and laboratory germination were determined according to GOST 12038-84 [11], growth force - GOST 12040-60 [12].

Results and discussions

As a result of the studies, it was found that the use of the Pulsar herbicide and the ExtraCor preparation had an effect on the sowing quality of Kitrossa soybean seeds. The indicators of germination energy of the obtained seeds ranged from 84.3 to 94.7% (table 1). The lowest rates were obtained under the influence of the herbicide, where the germination energy was 8.4% lower than the control. Presowing seed treatment with a drug of natural origin contributed to the strengthening of metabolic processes and the reduction of the toxic effects of the Pulsar herbicide on soybean plants, which had a positive effect on the sowing quality of the seeds obtained. The germination energy when using ExtraCor was 6% higher relative to the control and 4% higher relative to the application of the herbicide. Indicators of laboratory germination of the treated seeds with a biological product were 0.6 ... 1.3% higher than the control.

Table 1 - Effect of ExtraCor and Pulsar herbicide on the sowing quality of Kitrossa soybean seeds, %

Treatment	Seed germination energy, %	Laboratory germination, %
Control	92,7	96,7
Pulsar (0.8 l/ha)	84,3	95,0
ExtraCor (20 g/t)	94,7	97,3
ExtraCor (20 g/t) + Pulsar (0,8 l/ha)	93,3	98,0

At the initial stage of ontogenesis of soybean plants of the Kitrossa variety, no effect of the use of biologically active substances and herbicide on the seed growth rate was noted (table 2).

Table 2 - Initial growth of Kitross soybean seeds after treatment with biologically active substances and Pulsar herbicide

Treatment	Abnormally developed seedlings, %	Seedlings length		
		Average value, cm	Variation range, %	Coefficient of variation %
Control	6	34,9	11	6
Pulsar (0.8 l/ha)	7	34,9	21	11
ExtraCor (20 g/t)	3	34,3	15	8
ExtraCor (20 g/t)+ Pulsar (0,8 l/ha)	6	31,7	21	13
HCP ₀₅ , cm Ffact =2,063		2,5		

And only in the variant with pre-sowing seed treatment with ExtraCor and vegetative plants by Pulsar, the length of the seedlings was 3.2 cm less than the control with HCP₀₅ - 2.5 cm. The variation range was 21% and the coefficient of variation was 13%, in the control - 11 and 6 % respectively.

Our studies found that the treatment of Kitross soybean seeds with the Pulsar herbicide in the third ternary leaf phase led to a decrease in the total protein content by 1.24% compared to the control (table 3).

Table 3 - Amino acid composition of the protein in the seeds of soybean varieties Kitrossa, after processing biologically active substances

Treatment	Total protein, %	Amino acids			
		lysine	histidine	valine	methyl histidine
Treatment	39,65	5,90	5,59	5,30	1,38
Pulsar (0.8 l/ha)	38,41	5,94	5,57	5,51	1,37
ExtraCor (20 g/t)	39,19	5,99	5,66	5,59	1,38
ExtraCor (20 g/t)+ Pulsar (0,8 l/ha)	39,95	5,90	6,23	5,24	1,36

The use of a preparation of natural origin for pre-sowing treatment of soybean seeds improved the quality of seeds and led to an increase in the total protein content by 0.3%, and also had an effect on the amino acid composition of the protein. The content of the amount of histidine when using ExtraCor increased by 0.07 ... 0.64%, compared with the control.

The herbicidal treatment also had an effect on the fat content in Kitross seeds. This indicator decreased by 1.07% and amounted to 17.11%, in the control - 18.18% (table 4). Some fluctuations were noted in the number of individual fatty acids. An increase in the amount of linolenic acid in the seeds is highly undesirable, because it leads to the rapid oxidation of the oil and the appearance of an unpleasant odor in it. Under the action of the herbicide, its content increased by 1.07% relative to the control. The content of oleic acid when using the drug ExtraCor increased by 0.29 ... 1.68%, compared with the control.

Table 4 - Aftereffect of biologically active substances on the quantitative and qualitative composition of fat in the seeds of soybean varieties Kitrossa, %

Treatment	Fat, %	Unsaturated fatty acids, %			
		Linolenic	Linoleic	Oleic	Stearin
Treatment	18,18	8,60	52,84	16,19	3,83
Pulsar (0.8 l/ha)	17,11	9,36	52,66	16,48	3,83
ExtraCor (20 g/t)	17,83	8,52	52,73	17,22	3,88
ExtraCor (20 g/t)+ Pulsar (0,8 l/ha)	18,26	8,31	52,78	17,87	3,86

Our studies have established that the pulsar herbicide at a dose of 0.8 l / ha, affecting soybean plants of the Kitrossa variety, has a negative effect on the sowing quality of the seeds obtained and leads to a change in the quantitative and qualitative composition of protein and fat in soybean seeds. The use of a drug of natural origin contributed to an increase in the content of total protein, an increase in the content of certain amino acids, and had a positive effect on the sowing quality of seeds of a mid-ripening soybean variety of Kitross.

References

1. *Sinegovskaya V.T. Study of the resistance of soybean plants to herbicides based on the use of modern physiological and biochemical methods / V.T. Sinegovskaya, O.S. Dushko, L.E. Ivachenko // Bulletin of DalGAU. – Blagoveshchensk. – 2012. – №4. – P.13–17.*
2. *Mikhailova M.P., Kamanina L.A., Sinegovskaya V.T. Change in the enzymatic activity and biochemical composition of soybean seeds under the influence of a herbicide / M.P. Mikhailova, L.A. Kamanina, V.T. Sinegovskaya // Bulletin of the Kamchatka State Technical University. – 2019. – № 49. – P. 76-80.*
3. *Rafalsky S.V. The effect of protective agricultural complexes on weediness and productivity of soybean crops / S.V. Rafalsky, D.A. Malyshev, N.N. Lysenko // Results of coordination of research on soybeans for 2011-2014: Coll. scientific Art. Based on the materials of the coordination meeting on the soybean zone of the Far East and Siberia (with international participation), September 09–10, 2015. – Blagoveshchensk, Publishing House: “IPK ODEON” LLC, 2015 – P.97–102.*
4. *Mikhailova M.P. The role of peroxidase in increasing the resistance of soybean plants to adverse factors / M.P. Mikhailova // Vestnik of FEB RAS. – 2019. – № 3. – P. 139-144.*
5. *Chekurov V.M. New plant growth regulators / V.M. Chekurov, S.I. Sergeeva L.D. Zhalieva, V.E. Kozlov, V.V. Vakulenko // Protection and quarantine of plants. – 2003. – № 9. – P. 20–21.*
6. *Shapoval O.A. The influence of plant growth regulators of a new generation on the growth and productivity of soybean plants / O.A. Shapoval, I.P. Mozharova, M.T. Mukhina // Fertility. – 2015. – № 5 (86). – P. 32–34.*
7. *Romanova E.V., Maslov M.I. Regulators of growth and development of plants with fungicidal properties / E.V. Romanova, M.I. Maslov // Protection and quarantine of plants. – 2006. – № 5. – P. 26–27.*
8. *Trusevich A.V. Inductors of immunity as an element of protection of vegetables from diseases / A.V. Trusevich, O.M. Konova // Bulletin of the RAAS. – 2000. – №6. – P.47-49.*
9. *Avdeeva V.N., Molchanov A.G., Bezgina Yu.A. Ecological method of processing wheat seeds in order to increase their sowing qualities / V.N. Avdeeva, A.G. Molchanov, Yu.A. Bezgina // Modern problems of science and education. – 2012. – № 2. – P. 390.*
10. *GOST R 32749-2014. Oilseeds, oilcake and grist. Determination of moisture, fat, protein and fiber by near infrared spectroscopy. – M.: Standartinform, 2015. – 6 P.*
11. *Seeds of crops. Methods of analysis. – M.: IPK publishing house of standards, 2004. – 550P.*
12. *GOST 12040-66. Seeds of crops. Method for determining the strength of growth. – Intr. 1966-01.07. – M.: Publishing house of standards. 1977. – P. 311–313.*

UDC 519.23+519.245

统计检验和Choletsky分解方法在多维实验数据分析中的应用
**APPLICATION OF THE METHOD OF STATISTICAL TESTS AND
DECOMPOSITION OF CHOLETSKY FOR ANALYSIS
OF MULTIDIMENSIONAL EXPERIMENTAL DATA**

Ushanov Sergey Viktorovich

Candidate of Technical Sciences, Professor

Ogurtsov Dmitrii Alexandrovich

Student

Reshetnev Siberian State University of Science and Technology

注解。考虑了统计检验方法和相关的随机多维变量生成器在多维实验数据分析中的应用。经验和理论分布函数的对应关系通过Frozini协议的统计标准进行评估。该标准的统计量通过统计检验的方法进行评估。给出了一个实验数据分析的例子。

关键词：随机变量，Cholesky分解，Frozini准则，统计检验方法。

Annotation. *The application of the method of statistical tests and generators of correlated random multidimensional variables for the analysis of multidimensional experimental data is considered. The correspondence of the empirical and theoretical distribution functions was evaluated by the statistical criterion of Frozini's agreement. The statistics of the criterion was evaluated by the method of statistical tests. An example of the analysis of experimental data is given.*

Keywords: *random variables, Cholesky decomposition, Frozini criterion, statistical test method.*

One of the methods for generating multidimensional random variables is based on the Cholesky decomposition [1 – 4]. Multidimensional experimental data correspond to the correlation matrix R_{AA} and the Cholesky matrix $R^{1/2}$, for which $R_{AA} = (R^{1/2}) \times (R^{1/2})^T$.

If the random vector Z has zero expectation and the unit covariance matrix, then the random vector $Q = (R^{1/2}) \times Z$ corresponds to zero expectation and the matrix R_{AA} , and the distribution of its elements corresponds to the distribution of elements of the vector Z .

If z is a random vector whose distribution of elements corresponds to the distribution of empirical data, then $Z = \left(\frac{z_i - Mz_i}{Sz_i} \right)_{n \times 1}$, where Mz , Sz – are the estimates of the mathematical expectations and standard deviations of the elements of the random variable z .

The distributions of the elements of the vector $q = (Q_i \times Sz_i + Mz_i)_{n \times 1}$ coincide with the distributions of the corresponding elements of the multidimensional random variable z .

Two methods were used to form the vector z .

The first method is based on the selection of distribution functions that approximate the available experimental material with acceptable accuracy. The parameters of the approximating function were determined by the maximum likelihood method.

The hypothesis of correspondence between theoretical and empirical distribution functions was tested by the Frozini criterion. The statistics of the consent criterion were evaluated based on the results of 100000 statistical experiments, taking into account the specifics of the experiment, the accuracy of the experimental data, the method of estimating distribution parameters [5 - 10].

The second method is based on bootstrap sample propagation [11].

Figure 1 shows the empirical and theoretical (normal) distribution functions of four biometric indicators (height, m; trunk diameter at a height of 1.3 m, see; crown diameter, m; needles length, cm) 28 Siberian pine trees of pine age 49 years (Leninogorsk timber industry farm, Kuznetsk - North - Altai region) [12]. The accuracy of the experimental data is one decimal place.

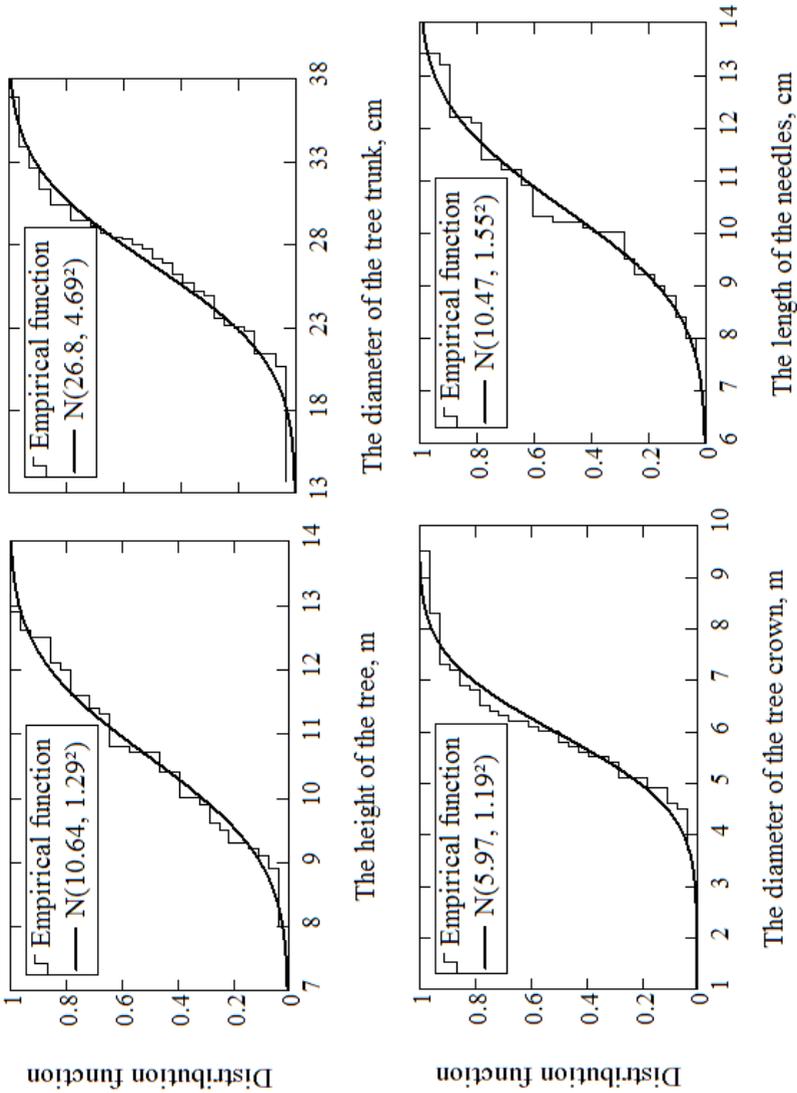


Fig. 1. Distribution functions of biometric indicators of Siberian pine trees

Application of the Frocini criterion showed that the hypothesis of normality of distributions of the considered biometric indicators of trees does not deviate at a 5% significance level (fig. 2).

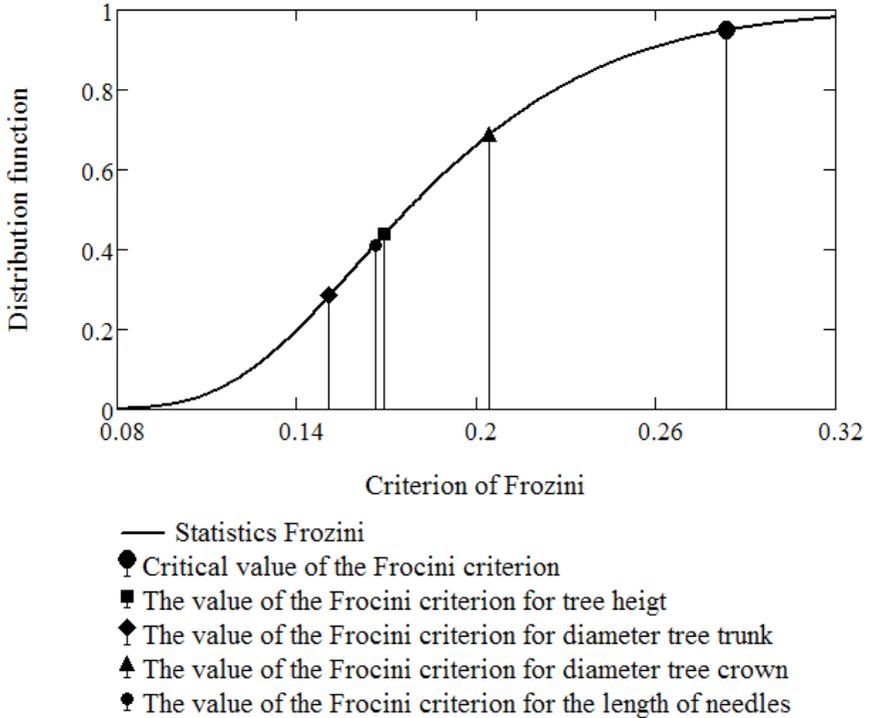


Fig. 2. Visualization of the results of testing the hypothesis of the normality of the distributions of biometric indicators of Siberian pine pine trees according to the Frocini criterion by the method of statistical tests

Multidimensional experimental data corresponds to the correlation matrix

$$R_{AA} = \begin{pmatrix} 1.000 & 0.572 & 0.680 & 0.275 \\ 0.572 & 1.000 & 0.677 & 0.618 \\ 0.680 & 0.677 & 1.000 & 0.328 \\ 0.275 & 0.618 & 0.328 & 1.000 \end{pmatrix}$$

and Cholesky matrix

$$R^{1/2} = \begin{pmatrix} 1.000 & 0.000 & 0.000 & 0.000 \\ 0.572 & 0.820 & 0.000 & 0.000 \\ 0.680 & 0.351 & 0.644 & 0.000 \\ 0.275 & 0.562 & -0.087 & 0.775 \end{pmatrix}$$

Figures 3-4 show the results of the generation of the considered biometric indicators of virtual trees, their values for the experimental trees and the boundaries of 95% confidence areas of change in biometric indicators.

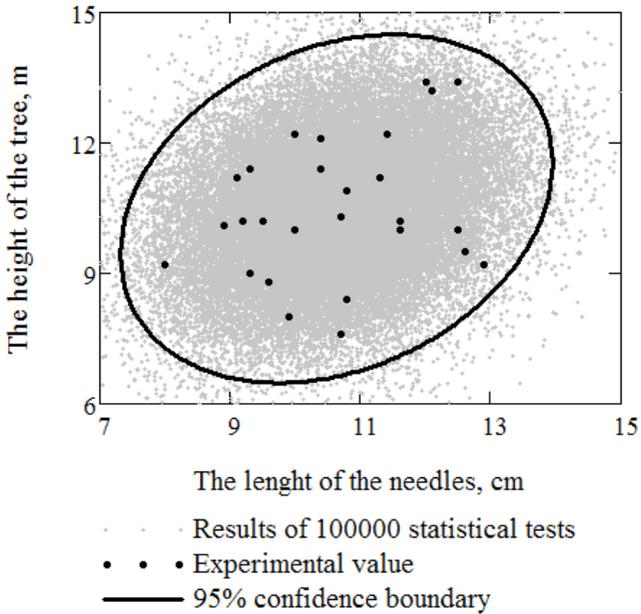


Fig. 3. The values of the indicators the length of the needles - the height of the tree for 100000 virtual trees, experimental trees [12] and 95% confidence area of change of the considered biometric indicators

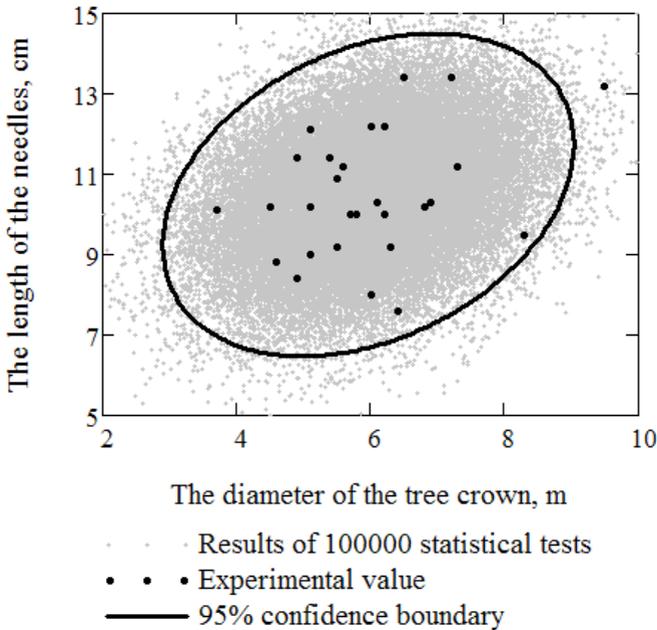


Fig. 4. The values of the indicators the length of the needles - the diameter of the crown for 100,000 virtual trees, experimental trees [12] and 95% confidence area of change of the considered biometric indicators

The values of the indicators needles length - tree height for all experimental trees correspond to 95% of the range of variation of these indicators (fig. 3).

Values of indicators needles length - crown diameter for 96.6% of experimental trees correspond to 95% of the range of variation of these indicators. For one experimental tree, the relationship between these indicators goes beyond 95% of the change area (Fig. 4). Calculations by the method of statistical tests showed that only 1% of the trees correspond to the performance of this tree.

The results may be used in scientific research and the educational process in the study of disciplines “Computational mathematics”, “Mathematical engineering methods”, “Mathematical modeling of energy and resource-saving processes of chemical technology, petrochemistry and bio-technologies” [13-14].

References

1. K.K. Vasiliev, M.N. Serving Mathematical modeling of communication systems. / Ulyanovsk. 2008. 170 p. (In Russ.)
2. S.V. Ushanov Parametric model identification in MathCad. Part 1. Computational experiments (multidimensional normal distributed values and linear models). /Krasnoyarsk. 2015. 87 p. (In Russ.)
3. S.M. Prigarin Models of Random Processes and Fields in Monte Carlo Methods/ Palmarium Academic Publishing/ 2014. 160 p.
4. D.A. Ogurtsov, S.V. Ushanov Analysis of multidimensional experimental data by methods of statistical tests and generation of random variables / Conf. "Reshetnev readings". 2019. Vol. 2. P. 200 - 201. (In Russ.)
5. S.V. Ushanov, D.A. Ogurtsov Estimation of the Frozini criteria and omega square criteria statistics by the statistical tests method for a mixture of normal distributions //Siberian Journal of Science and Technology. 2019. Vol. 20, № 1. P. 28-34.
6. D.A. Ogurtsov. Estimation of the distribution mixture parameters by the maximum likelihood method and minimizing the calculated values of the Frozini, omega-square, Kolmogorov-Smirnov agreement criteria / Conf. "Mathematical models of engineering, technology and economics." / 2019. P. 51-53. (In Russ.)
7. S.V. Ushanov, D.A. Ogurtsov Assessment of statistics of criteria for normality of the Frozini distribution method of statistical tests in MathCad / Conf. "Reshetnev readings". 2018. Vol. 2. P. 171 - 173. (In Russ.)
8. B.Y. Lemeshko, S.B. Lemeshko, S.N. Postovalov, E.V. Chimitova Statistical data analysis, modeling, probabilistic regularities research. /Computer approach: Monography /Novosibirsk: NGTU Publishing house, 2011. – 888p. (In Russ.)
9. B.Y. Lemeshko, Nonparametric criteria of consent. Application manual/ Moscow: INFRA-M, 2014. - 163 p. (In Russ.)
10. S.V. Ushanov, D.A. Ogurtsov Check of the hypothesis for normality of distribution of random values obtained with a round, by the criteria of Frozini and omega-square //Int. Conf. "Process Management and Scientific Developments". Birmingham, United Kingdom. 2019. - P. 175 – 181.
11. Efron B. Bootstrap methods: another look at the jackknife //Ann. Stat. 1979. V. 7. P. 1 – 26.
12. R.N. Matveeva, O.F. Butorova, E.Yu. Sokolova Selection of Siberian cedar pine trees by phenotype and general combining ability. Krasnoyarsk. 2015. 200 p. (In Russ.)
13. S.V. Ushanov, R.A. Stepen, V.M. Ushanova Modeling the content of essential oil in green wood and bark of *Abies sibirica* of various ages // Systems. Methods Technologies. 2017, №3 (35). P. 127-130. (In Russ.)
14. S.V. Ushanov, R.A. Stepen, V.M. Ushanova Age-related dynamics of the content of fir oil in green wood *Abies sibirica*. Theoretical aspects // Khimija Rastitel'nogo Syr'ja. 2017, №1. P. 129-136. (In Russ.)

自由容量不受控制地增长的危险

THE DANGER OF UNCONTROLLED GROWTH IN FREE CAPACITY

Sosnovy Mikhail Sergeevich

undergraduate

National Research Nuclear University MEPhI

Malinichev Dmitry Mikhailovich

Candidate of Technical Sciences, Associate Professor

at the Department of "Information Security"

Russian State Social University

Moscow, Russia

抽象。考虑了使用GPU容量的可能方式，哈希函数的脆弱性以及采矿的急剧增长和兴衰的问题。

关键词：哈希函数，挖掘，蛮力，信息安全。

Abstract. *The possible ways of using GPU capacity, the vulnerability of hash functions and the problems of sharp growth and falling interest in mining are considered.*

Keywords: *hash function, mining, brute force, information security.*

Keeping user passwords has always been a difficult issue for service creators. To find the value in gradation from safety to convenient operation is not a trivial task. Authentication for the user should not cause any difficulties or take a long time, but it should provide sufficient security for user data. Especially critical are the systems when using which there is a potential threat of personal data leakage [1]. For violators of the law on personal data, an implemented attack may lead to administrative, criminal, civil and even disciplinary liability. In world practice, there are many precedents for punishing leaks of personal data of users, one of the most recent decisions is the case against the well-known company Facebook [5]. The company was ordered to pay a record fine of \$ 5 billion. This example should have been demonstrative for other companies. In the case considered by us, Facebook deliberately transmitted data to third parties, but there are times when the data becomes public due to problems with the security of the service.

One of the possible attack vectors is an attack on the authorization form. Often, databases (hereinafter referred to as the DB) are used to store the login-password pair. DBs allow you to quickly find data, even if they are not structured or are in different tables and without the cost of large computational and time resources. To maintain the system in a state that ensures data security, DB encryption and/or addition with modifiers have to be used, but this requires additional server capacities, especially with a large number of requests. These methods do not guarantee data protection when information is leaked from the DB, but complicate the process of unauthorized access and enable service owners to warn their users (often owners try to hide the leak from their users in order not to infringe on their reputation and try to bargain with hackers) and prevent the spread of more valuable information that attackers could get along with access.

To minimize attacks on DBs with passwords, many protection methods are used, however, the most common is the use of a convolution function (hereinafter referred to as hashing), which convert the input data into a bit string using a specific algorithm that can uniquely convert input data. Hashing will allow passwords for authentication in a secure manner. The entered password and the pre-generated modifier are transmitted as a hash function, calculated and transmitted to the server. On the server, this hash is compared with data from the DB, and in case of a match, the user is authorized and the necessary access is provided. This method protects data from simple rainbow tables, as well as DB leakage. [2]

However, in modern realities, it becomes possible to calculate hash functions by renting server equipment, or by using special services that provide for an extremely small fee or even free access to a DB with more than 8TB of information containing previously read password-hash pairs. This method takes a lot of time for a potential criminal and does not always lead to the desired result for the required resources, but does not exclude the possibility of selecting a hash from the password and modifier by brute force.

In 2017, there was a boom in crypto mining. People started feverishly buying GPUs and collecting clusters from them (hereinafter referred to as the mining farm) for calculating cryptocurrency chains through services for sharing computing tasks (hereinafter referred to as the mining pool). Dividing the general task into smaller ones allows the mining farms to combine to increase the likelihood of finding a block, and as a result, profit, which is divided into all participants in the pool. To date, the power available to pools began to fall, since by mid-2018, mining became unprofitable. The entire volume of computer hardware poured into the secondary market or remained a dead weight in the hands of cryptocurrency miners (hereinafter referred to as miners). [3]

People with unused, idle equipment are ready to re-provide their devices as soon as the market begins to offer profitable conditions. With such moods in the community of miners, there is a threat in which free mods will be used for hacking by brute force and creating rainbow tables, which will be integrated or disguised as mining. Given the current capacities used for cryptocurrency chains (see Figure 1), the selection will be carried out in real time or will be very close to this. To attract people with unused mining power, it will only be necessary to give a slightly larger reward. Expensive facilities [4] previously available only to large corporations and states will become available to ordinary enthusiasts who can rent and use for their purposes ≤ 200 TH/s (200,000,000,000,000 hashes per second).

In the event of the collapse of cryptocurrencies, free capacities in the hands of the population can increase significantly. This can affect not only the previously described types of attacks, but also cryptographic methods of protection. Hackers will have new tools for hacking ciphers, which casts doubt on modern methods of protecting information not only at the company level, but also threatens the sovereignty of many countries. In the case of the implementation of what is described in the article, there is a chance of a change in the world's attitude to the Internet, when from an endless source of information, it will be considered exclusively as the main threat. The problem considered requires a resolution at the state level and taking measures to strengthen the protection of critical information systems.

References

- [1] *Federal Law N 152-FL "On Personal Data", 27.07.2006.*
- [2] "Ethereum Difficulty Mining Chart," [Online]. Available: <https://bitinfocharts.com/ru/comparison/ethereum-difficulty.html>. [Appeal date: 10 03 2019].
- [3] "On storing passwords in DB," 04 06 2018. [Online]. Available: <https://habr.com/ru/company/acribia/blog/413157/>. [Appeal date: 10 03 2019].
- [4] K. J. O'Dwyer, «Bitcoin Mining and its Energy Footprint,» Limerick, 2014.
- [5] *Federal Trade Commission, «https://www.ftc.gov,» Federal trade commission, 24 07 2019. [Online]. Available: https://www.ftc.gov/news-events/press-releases/2019/07/ftc-imposes-5-billion-penalty-sweeping-new-privacy-restrictions. [Appeal date: 10 11 2019].*



Figure 1 The complexity of the bitcoin network according to bitinfocharts.com

俄罗斯和国外运输领域中关键信息基础设施对象分类方法的比较
**COMPARISON OF APPROACHES TO CATEGORIZATION
OF CRITICAL INFORMATION INFRASTRUCTURE OBJECTS
IN THE FIELD OF TRANSPORT IN RUSSIA AND ABROAD**

Malinichev Dmitry Mikhailovich

*Candidate of Technical Sciences, Associate Professor
Russian State Social University*

Mochalov Vadim Vyacheslavovich

*Engineer
National Research Nuclear University MEPhI*

抽象。 本文介绍了对关键信息基础结构对象分类领域的国际经验。 考虑将关键信息基础结构对象分类为重要的分类过程和功能。 揭示了所考虑方法的一些积极和消极方面。 确定了交通领域中关键信息基础架构的对象分类的异同。

关键字。 关键信息基础架构, 信息安全性, 信息保护。

Abstract. *The article presents an analysis of international experience in the field of categorization of critical information infrastructure objects. The categorization procedures and features of classifying critical information infrastructure objects as significant are considered. Some positive and negative aspects of the considered approaches are revealed. The similarities and differences in categorizing objects of critical information infrastructure in the field of transport are determined.*

Keywords. *Critical information infrastructure, information security, information protection.*

People first talked about critical information infrastructure in the United States in 1996. At the same time, the Commission for the Protection of Critical Infrastructure was formed. The first document to protect critical infrastructure was adopted in the United States in 1997 under the name PDD-63, also known as “White Paper”. It noted the rapid development of information technology and communication networks, the integration of isolated networks into a single Internet network. September 11, 2001, when a terrorist act occurred in the United States, the question was raised about the further development of a critical information infrastructure protection system. Therefore, in 2002 the “USA Patriot Act” was adopted, which in part 1016 of the Critical Infrastructures Protection lays the foundation and regulates the procedure for protecting critical information infrastructure.

A security feature of CII in the USA is risk management with a retrospective approach i.e. assessment of the criticality of CII objects in terms of incidents that have already occurred. There is also a division into CII and the main elements. The basic elements are understood as equipment, the disruption of which does not lead to damage to the economy, but can cause a threat to the life and health of citizens, as well as damage to public order and reputation. In the USA, critical infrastructure and main sources are divided into 16 sectors [1].

It should be noted that the USA also includes vehicles in the transport infrastructure, and their approach to the problems is closer to KIIS than to CII [2, 3].

In the NIST Framework for Improving Critical Infrastructure Cybersecurity, categorization is determined by the “identify” section. 4 levels of security are defined. It consists of 5 stages [3]:

a. Priority identification. The organization determines the goal for its business, and on this basis makes strategic decisions for the implementation of information security.

b. Building the foundation. After the scope of IS has been determined, the standard steps are followed: TK, identification and assessment of the value of assets, vulnerabilities, risks.

c. Creation of a current security profile. The organization conducts a self-assessment, which determines the current level of security.

d. Risk assessment. Conducting a risk assessment.

e. Creation of a target profile of the organization’s security level. The features of the organization are analyzed, additional risk categories are identified..

Categorization in accordance with the specified document is made by subjects of CII and is voluntary.

The European Union raised the topic of critical information infrastructure in 1999 with the opening of the UK Coordination Center for National Infrastructure Security. On November 17, 2005, the European Commission adopted the Green Paper on the European Critical Infrastructure Protection Program (EPCIP). The document is based on the thesis of the interconnectedness of critical information infrastructure objects and the possibility of influencing one object by influencing another. The importance of interaction and coordination of all entities of critical information infrastructure in order to protect their facilities is noted. In 2008, Council of Europe Directive 2008/114 / EC of December 8, 2008, on the definition and designation of European critical infrastructure and on the assessment of the need to strengthen its protection, was issued. This directive defines the subjects and objects of critical information infrastructure responsible for ensuring their security and lays the foundation for categorizing CII objects. In particular, in the field of transport, the following areas are distinguished [4]:

- motor transport;
- railway transport;
- air transport;
- river shipping;
- maritime and coastal shipping;
- postal services.

In the European Union, CII of member states and CII of European Union are distinguished. This is due to the integration processes within the European Union due to which the disruption of the functioning of the national CII in one member state can affect others. Within Europe, “levels of regions” (sectors) and “levels of products and services” (elements) are applied. As a rule, their total number in individual European states ranges from 8 to 10.

Of the countries belonging to the European Union, the Republic of Cyprus does not consider transport a critical information infrastructure [5].

The European Union has not developed a unified approach to the categorization of national CII objects and varies from country to country. Both the scope of the CII and the categorization order are distinguished. In some countries, categorization is done by authorities, in others by CII.

In Singapore, the main subject of the CII facility identification mechanism is the Commissioner of Cybersecurity in the Government of Singapore, who is also the director of the Cybersecurity Agency. The categorization of objects as CII objects occurs through the issuance by the Commissioner of a prescription to classify an object as a CII object and notify the subject to which the object belongs. The prescription contains basic information about the object and subject of CII.

Subject of CII, if there is reason to do so, has the right to require the Commissioner to revise the requirement to classify the object as CII. The Commissioner also has the right to request from the subject of CII additional information if it is necessary for him to make a decision.

The Commissioner's authority to initiate the procedure for identifying a specific CII object, as well as the possibility of appealing against its decisions and actions to a higher authority with the possibility of attracting qualified specialists to clarify contentious issues of identification, can be considered as advantages of the Singapore CII identification mechanism [6].

In Russia, people first started talking about critical information infrastructure in 1998 [7]. The first document aimed at protecting critical information infrastructure was adopted in 2005 - Decree of the Government of the Russian Federation of August 27, 2005 № 1314-r “On approval of the Concept of the federal monitoring system for critical facilities and (or) potentially dangerous infrastructure of the Russian Federation and dangerous cargo”. In 2016, a new Information Security Doctrine was adopted, which emphasized the importance of providing critical in-

formation infrastructure. In 2017, the Federal Law “On the Security of Critical Information Infrastructure of the Russian Federation” was adopted [8].

One cannot talk about the security of critical information infrastructure without determining what it is. Different countries use different concepts. Here are some examples of critical information infrastructure definitions:

United States of America [9]:

- a material and virtual system and equipment that is vital to the United States, the destruction or incapacitation of which could have an impact on security, national economic security, public health or public order, or any combination thereof.

Euro-Atlantic Partnership Council [9]:

- critical infrastructure includes physical and cybernetic systems for providing important and necessary activities of the economy and public administration.

European Union [9]:

- critical information infrastructure - property, system or part thereof located in the Member States that is essential for maintaining vital social functions, health, safety, economic or social well-being of people and the violation or destruction of which would have a significant impact in the member state as a result of failure to perform these functions;

- European Critical Infrastructure - Critical infrastructure located in Member States, the violation or destruction of which will have a significant impact on at least two Member States. The significance of the impact is evaluated in terms of intersectoral criteria. This includes the effects of intersectoral dependence on other types of infrastructure.

Singapore [6]:

- a computer or computer system that is wholly or partly located in Singapore is necessary for the continued operation of material services, and the loss of control or harm to them will adversely affect the availability of the material service.

Russia [8]:

- objects of critical information infrastructure, as well as telecommunication networks used to organize the interaction of such objects.

Summary table for the areas related to the transport sector in different countries is presented in table 1.

The issue of protecting critical information infrastructure has been on the agenda for almost a quarter of a century. It is regularly rethought and refined. We have gone from KIIS to CII. The same process has taken place in some other countries. Legislation in the field of CII is only being formed and therefore has some gaps and conflicts. This is especially noticeable when categorizing CII objects. In general, the Russian Federation is keeping up with foreign countries in the field of ensuring the security of critical information infrastructure.

Table 1 - Summary table by region of the transport sector for different countries

Country	Transport Related Areas								
	Air transport	Water transport		Railway transport	Motor transport	Post	Logistics	Pipeline	
Great Britain	+	+		+	+				
Finland	Transport						+		
Germany	+	River shipping	Maritime shipping	+	+	+			
Romania	+	+		+	+				
Hungary	+	+		+	+		+		
Slovakia	+	+		+	+				
Czech Republic	+	Inland shipping		+	+				
Poland		Transport							+
USA	+	Maritime shipping		+	+	+		+	
Singapore	Civil aviation	Sea and port transport		Ground transport					

In general, it can be noted that each approach has its own strengths and weaknesses. The analysis of foreign experience and the borrowing of best practices from international experience, as well as the reception of legislation in the field of ensuring the security of critical information infrastructure should have a positive impact on the situation.

References

1. *Homeland Security Critical Infrastructure Sectors [Electronic resource]*. URL: <https://www.dhs.gov/cisa/critical-infrastructure-sectors> (appeal date: 14.05.2019)
2. *Executive Order 13636 of February 12, 2013 Improving Critical Infrastructure Cybersecurity [Electronic resource]*. 2013. URL: <https://www.govinfo.gov/content/pkg/CFR-2014-title3-vol1/pdf/CFR-2014-title3-vol1-eo13636.pdf> (appeal date: 14.05.2019)
3. *Framework for Improving Critical Infrastructure Cybersecurity ver 1.1 [Electronic resource]*. 2018. URL: <https://nvlpubs.nist.gov/nistpubs/CSWP/NIST.CSWP.04162018.pdf> (appeal date: 14.05.2019)
4. *Mattioli R. Methodologies for the identification of Critical Information Infrastructure assets and services: Guidelines for charting electronic data communication networks / R. Mattioli, C. Levy-Bencheton. – Heraklion: European Union Agency for Network and Information Security (ENISA), 2014. – 43 P.* URL: <https://www.enisa.europa.eu/publications/methodologies-for-the-identification-of-ciis> (appeal date: 14.05.2019)
5. *Dimitra L. Critical Information Infrastructures Protection approaches in EU / L. Dimitra, A. Sarry. – Heraklion: European Union Agency for Network and Information Security (ENISA), 2015. – 19 p.* URL: <https://resilience.enisa.europa.eu/enisas-ncss-project/CIIPApproachesNCSS.pdf> (appeal date: 14.05.2019)
6. *Goryan E.V. Identification of critical information infrastructure objects in the Russian Federation and Singapore: comparative legal aspect // Administrative and municipal law. 2018. № 11(131). P. 44-56.* URL: <https://elibrary.ru/item.asp?id=36633580> (appeal date: 14.05.2019)
7. *Emelyanov G.V., Streltsov A.A. Problems of ensuring information security of the constituent entities of the Russian Federation // Information Society. 1998. № 6. P. 38-41.* URL: <https://elibrary.ru/item.asp?id=9117881> (appeal date: 14.05.2019)
8. *On the security of critical information infrastructure of the Russian Federation: Federal law of the Russian Federation of July 26, 2017 № 187-FL // Russian newspaper; № 167, 31.07.2017.*
9. *Marek Smetana, Protecting critical infrastructure. Approaches of the European Union to identifying elements of critical infrastructure [Electronic resource]*. 2014. URL: https://fbiweb.vsb.cz/moldavia/files/_KI_Smetana.pdf (appeal date: 14.05.2019)

科学出版物

上合组织国家的科学研究：协同和一体化

国际科学大会的材料

2019年11月19日。中国北京

编辑A. A. Siliverstova

校正A. I. 尼古拉耶夫

2019年11月19日。中国北京。
USL。沸点：98.7。 订单289. 流通450份。

在编辑和出版中心印制
无限出版社

