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OF THE REPUBLIC OF KAZAKHSTAN

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NAS RK is pleased to announce that Bulletin of NAS RK scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of Bulletin of NAS RK in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential multidiscipline content to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы "ҚР ҰҒА Хабаршысы" ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Web of Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабаршысының Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді мультидисциплинарлы контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Вестник НАН РК» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Вестника НАН РК в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному мультидисциплинарному контенту для нашего сообщества.

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PHYLOGENETIC ANALYSIS OF GENES OF SURFACE PROTEINS OF HIGHLY PATHOGENIC INFLUENZA A SUBTYPE H5N1 VIRUS, ISOLATED FROM GULL IN KAZAKHSTAN

Abstract. The article presents the results of phylogenetic analysis of surface protein hemagglutinin and neuraminidase genes of influenza A virus of H5N1 subtype isolated from gull in the territory of the Republic of Kazakhstan in 2015. Cluster affiliation of Kazakhstan isolate and relationship with other influenza viruses of A/H5 subtype from international database GenBank are presented. It is concluded that it is necessary to continuously monitor the avifauna of Kazakhstan in order to isolate current variants of pathogens.

Key words: influenza virus, bird, hemagglutinin, neuraminidase, H5 subtype, cluster, phylogenesis.

Birds of water and near-water complexes play a major role in the conservation of influenza A viruses in the biosphere. All known for science species of pathogens that caused pandemics and epizootics were isolated from birds, they are a reservoir and a source of new variants of pathogens [1-3].

Influenza A viruses during the evolutionary development and overcoming of interspecies barriers passed and adapted to humans and mammal animals - horses, pigs, dogs. They also cause sporadic infections in other mammals - mink, muskrat, cats, tigers, leopards [4, 5]. The influenza viruses of B genus were isolated from seals and those of C type - from pigs [6, 7]. In 2011, two antigenically and genetically different lines of D viruses were identified that infect cattle [8-11].

The global and uncontrolled spread of influenza is due to the unique variability of the pathogen, which is based on both point mutations characteristic for RNA-containing viruses and reassortment of genes. The most variable structural components of the virus particle are surface glycoproteins - hemagglutinin (HA) and neuraminidase (NA).

Classification of influenza A viruses is based on antigenic differences between HA and NA, detected in serological reactions by means of immune sera, and also in PCR using specific primers; To date, 18 subtypes of HA and 11 - NA have been identified. Combinations of these surface glycoproteins in the composition of the virion determine the subtype of the virus: H1N1, H2N2, H3N2, etc. [12]. The last identified taxonomic groups are influenza A (H17N10) and A (H18N11) viruses isolated from bats in Central America [13, 14]. Due to their lack of haemagglutinating and neuraminidase activity, some

authors propose to designate them as "NA-like" and "NA-like" (or "HL17NL10" and "HL18NL11", respectively) [15].

In the Republic of Kazakhstan in 2014-2016, eight isolates of influenza A/H5 virus were isolated from wild birds [16]. The purpose of this study was to determine the taxonomic affiliation of the Kazakhstani isolate of influenza A (H5N1) virus isolated from wild bird in Western Kazakhstan.

Materials and methods. Viruses. A/black-headed gull/Atyrau/6491/15 (H5N1) influenza virus, isolated from gull in Western Kazakhstan, was cloned and passaged by limiting dilutions on 10-11-day embryonated chicken eggs according to a conventional technique.

Extraction of RNA was performed using the QIAamp Viral RNA Mini kit (Qiagen GmbH, Hilden) in accordance with the manufacturer's recommendations.

Complementary DNA from RNA was obtained by reverse transcription using the universal primer uni-12 for influenza A viruses from the First Strand cDNA Synthesis kit (Fermentas) according to the manufacturer's instructions.

DNA was sequenced in LP "SPC of Microbiology and Virology" using terminating dideoxynucleotides on an automatic 8-capillary sequencer ABI 3500 DNA analyzer (Applied Biosystems).

The alignment of the sequences of the influenza A virus genome with the complete nucleotide sequences of those from the international database was carried out using the BioEdit computer program.

Phylogenetic analysis and building of the trees was carried out with the help of BioEdit and MEGA programs versions 4-6 by the method of "joining neighbors" with bootstrap values based on 1000 replicates [17].

Results and discussion. After sequencing of DNA copies of fragments of HA and NA genes of the Kazakhstan isolate, their alignment with corresponding nucleotide sequences of viruses of this subtype from the international bank GenBank was carried out. The size of the influenza A/black-headed gull/Atyrau/6491/15 (H5N1) virus gene segments and their access numbers in the GenBank international genetic bank are shown in table 1.

Characterization of gene segments and access numbers in GenBank to the Kazakhstani isolate of the influenza virus with haemagglutinin H5

Isolate (Russian and English name)	Gene	Size (pairs of nucleotides)	GenBank №
А/черноголовый хохотун/Атырау/6491/15 (H5N1) [A/black-headed gull/Atyrau/6491/15 (H5N1)]	HA	700	GU953249
	NA	649	GU953250

The phylogenetic tree constructed on the basis of homology of nucleotide the segments of genes of Kazakhstan isolate with similar sequences of influenza subtype H5 viruses from international database GenBank database, is shown in figure 1.

As can be seen from figure 1, virus A/black-headed gull/Atyrau/6491/15 (H5N1) for the HA gene is closest to virus from India A/duck/India/11CA08/2014 (H5N1) and two strains from Nigeria and the Republic of Côte d'Ivoire - A/chicken/Nigeria/15VIR339-1/2015 (H5N1) and A/duck/Ivory_Coast/15VIR2742-2/2015 (H5N1), with which it is included in the 2.3.2.1C clade.

Results of the analysis of phylogenetic relationships of NA genes of A/black-headed gull/Atyrau/6491/15 (H5N1) influenza virus and those of A/H5 viruses circulating in various regions of the world are reflected in the form of a dendrogram in figure 2.

As follows from figure 2, Kazakhstan isolate A/blackhead gull/Atyrau/6491/15 (H5N1) has the greatest relationship with viruses from Niger and India isolated from poultry - A/chicken/Niger/15VIR2060-8/2015 (H5N1), A/duck/India/12TP04/2014 (H5N1). Together with six other viruses from Lebanon, China and Vietnam, they are related to genotypes G, V, Z by the HA gene. It is interesting to note that one of them A/tiger/Jiangsu/01/2013 (H5N1) is isolated from a predatory mammal.

Influenza A viruses of the H5 subtype occupy a special place in modern epidemiology. Previously, it was believed that avian influenza pathogens, as a rule, do not spread among humans. The events that took place at the turn of the 21st century in the countries of Southeast Asia and on the European continent have refuted this view. The "bird flu" H5N1 was released to the epidemic arena, according to WHO data, from

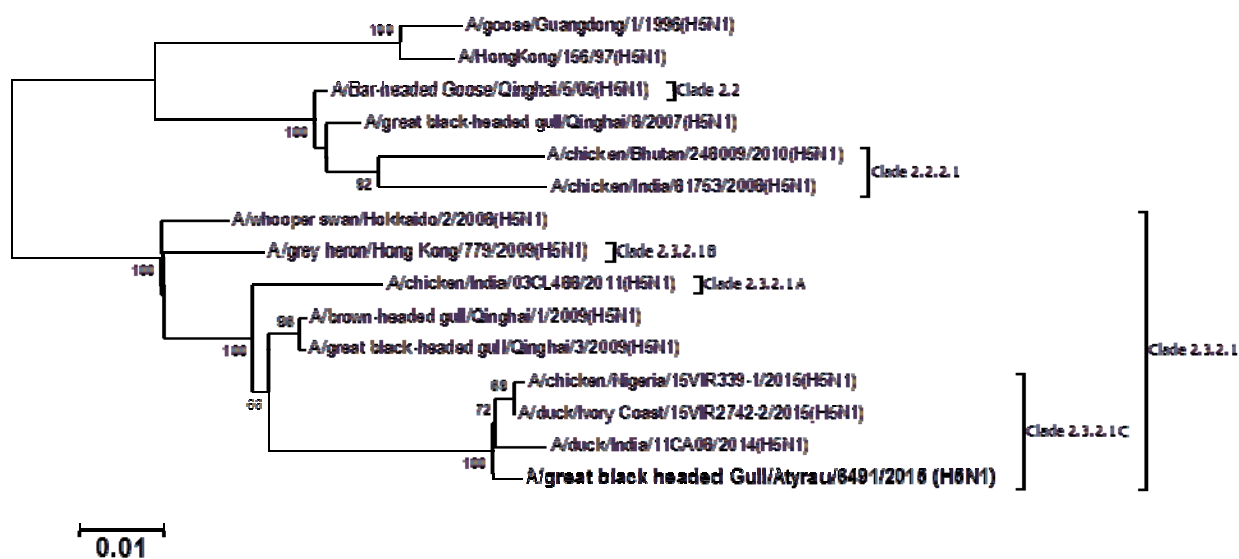


Figure 1 – The phylogenetic relationship between the HA genes of A/black-headed gull/Atyrau/6491/15 (H5N1) virus and viruses of this subtype from GenBank

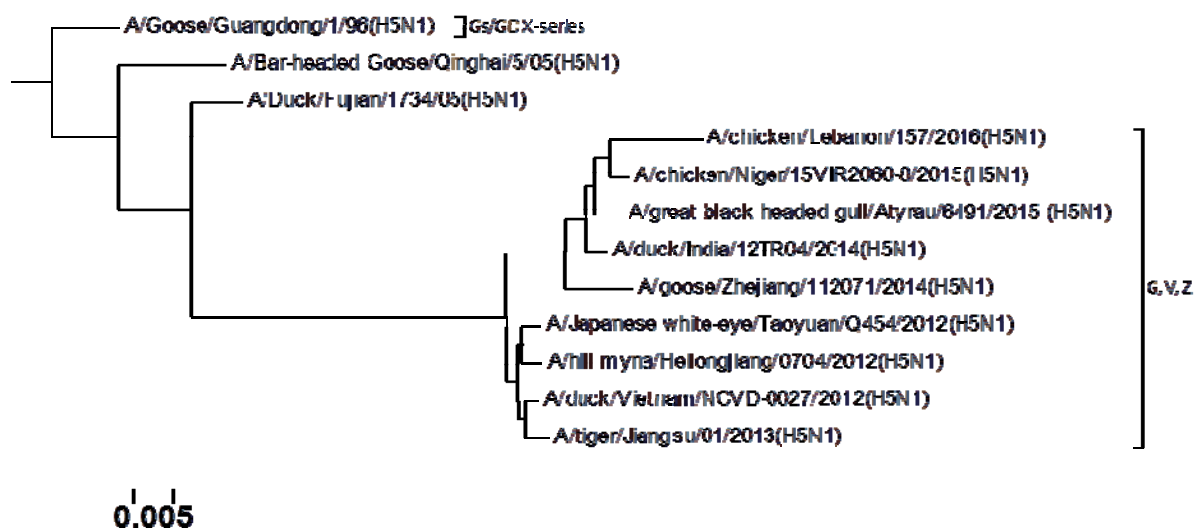


Figure 2 – Phylogenetic relationships between NA genes of A/black-headed gull/Atyrau/6491/15 (H5N1) virus and viruses of this subtype from GenBank.

May 1997 to March 2, 2018, out of 860 cases with officially confirmed diagnosis of influenza A (H5N1) in humans, 454 resulted in death [18]. In 2013, three new avian influenza A (H7N9), A (H6N1), and A (H10N8) viruses appeared that could infect humans. Virus A (H7N9) caused epidemics in 19 Chinese provinces, two other pathogens infected only a few individuals [19].

Since the first detection in humans in Hong Kong in 1997, A/goose/Guangdong/1/96-line viruses of subtype H5 (GDL) have been developed with the help of drift and shift mechanisms. At the present time, on the basis of the phylogeny of HA, GDL viruses are divided into 10 clades, designated 0-9, many of which contain additional subclades [18, 20, 21]. Their initial circulation for about 5 years, was limited to the region of Southeast Asia, later they spread in many countries of Asia, Europe, Africa and subsequently in North America [22].

The evolution of GDL viruses is marked by the spread of a number of clades in different geographic regions in which their evolution took place. An example is Egypt and Indonesia, where the virus lines specific to these countries developed. In 1997-2001, in China, a rapid emergence of the genotypic

diversity of these infectious agents in process of reassortment with other viruses from the bird reservoir was noted. Thus, in 2001, during the survey of domestic birds in the southeast of the PRC, up to six genotypes of viruses were revealed [23]. Their differentiation is based on a partial sequences of genomes, in particular, polymerase genes. In 2002, a new genotype Z appeared, spreading in 2004 to Cambodia, Japan, the Lao People's Democratic Republic, the Republic of Korea, Thailand and Vietnam, with the last two countries reporting human cases [24, 25]. Almost all of these genotypes arose as a result of two reassortations; the first generated viruses of genotypes B, Z and W, the second - viruses of the X genotype. All modern genotypes are the result of further reassortment of earlier viruses (for example, genotypes G and V originated from genotype Z). Two main cases of genotype replacement were observed in China - from genotype B to Z in 2002 and from genotype Z to V in 2005. Both replacements are associated with an increase of H5N1 activity in this region. It was found that viruses of clade 2.3.4 (Fujian-like), formerly belonging to genotype Z [26], are now defined as genotype V.

An important event in the evolution of GDL viruses in 2005 was their first advance from Southeast Asia towards the African continent. It began with the mass death of wild birds on Lake Kukunor (Qinghai Province) in China, caused by a virus different from genotype Z, and later classified as clade 2.2 [27, 28], then this pathogen was discovered in Russia, Kazakhstan, some European countries, further on the African continent in Egypt, in a number of West African countries, and also isolated in India and Bangladesh [29, 30].

The next significant change in the epidemiology of GDL occurred also in South-East Asia and consisted in the appearance of two separate lines of the virus. These lines 2.3.2 and 2.3.4, co-circulated for some time, eventually the line 2.3.2 became dominant and subsequently divided into groups during the genetic drift. Like the viruses of group 2.2, several years before, viruses 2.3.2 (2.3.2.1a) spread to the west, in mid-2009 they were found in Russia and then in Europe [31]. They penetrated into India and Bangladesh and completely replaced representatives of line 2.2, which have been endemic in these countries since 2005 [32]. In 2015, clade 2.3.2.1c viruses were isolated in Russia, eventually, they occurred, bypassing Egypt, in western Africa.

The latest event in the evolution of GDL H5 was the unexpected and wide-scale spread of clade 2.3.4.4 viruses. Most of them do not belong to the subtype H5N1 and contains other NA, including N2, N6, N8 [33]. Reports about their isolation came from countries in Asia, Africa, and Europe, at the end of 2014 they infected for the first time bird populations in the American continent. The modern epizootic situation is dynamic, variable and characterized by the spread of representatives of the group 2.3.4.4 in Egypt and in the regions of West Africa, where previously the viruses of other clades were endemic. Soon after the occurrence of H5N8 viruses of 2.3.4.4b clade in Hungary and Poland, they were found among wild birds in Germany, where from November 2016 to September 2017 caused more than 1500 cases of infection of wild birds and 107 outbreaks among poultry [34].

In general, the results obtained indicate that important, highly pathogenic influenza viruses are circulating in the wild ornithofauna of Kazakhstan. Inhabiting a huge number of migratory birds on the territory of the republic and their species diversity explains the need for constant virological monitoring in order to isolate current variants of pathogens.

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ҚАЗАҚСТАНДА ШАҒАЛАДАН БӨЛІП АЛЫНҒАН ТИПТАРМАҒЫ H5N1 ЖОҒАРЫПАТОГЕНДІ ТҰМАУ А ВИРУСЫНЫҢ БЕТКЕЙЛІК АҚУЫЗДАРЫ ГЕНДЕРІН ФИЛОГЕНЕТИКАЛЫҚ ТАЛДАУ

Аннотация. Мақалада 2015 жылы Қазақстан Республикасы аумағында шағаладан бөліп алынған тұмау А вирусының H5N1 типтармағының беткейлік – гемагглютинин және нейраминидаза ақуыздары гендерін филогенетикалық талдау нәтижелері келтірілген. Қазақстандық бөлінінін кластерлік тегі және GenBank халықаралық деректер қорындағы тұмау вирусының басқада А/Н5 типтармақтарының байланысы анықталды. Қоздырушылардың ағымдағы нұсқаларын бөліп алу мақсатында Қазақстан орнитофаунасына үздіксіз мониторинг жүргізу қажет екендігіне қорытынды жасалады.

Түйін сөздер: тұмау вирусы, құс, гемагглютинин, нейраминидаза, H5 типтармағы, кластер, филогенез.

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EFFICIENCY OF BREEDING OF THE ALATAU BREED OF BROWN CATTLE IN THE "ADAL" AGRO-INDUSTRIAL COMPANY JSC

Abstract. Modernization of breeding and technical potential in dairy cattle breeding is a priority condition in increasing the economic efficiency of breeding of the Alatau cattle breed.

It is established that cows of the Alatau breed of the nuclear stock produce 7661±92.8 kg of milk, of the breeding group - 6761±71.3 kg. On average, the cows of the Alatau breed produced milk in the amount of 7268±75.9 kg, with a mass fraction of fat in milk 3.82±0.09%. The yield of milk fat was 277.6±3.2 kg for cows of the Alatau breed with an average live weight of 620±17.5 kg.

In the first lactation, the milk yield averaged 6604±81.4 kg with an average milk fat content of 3.81±0.07%. Cows reaching the third and subsequent lactation on average showed the milk yield of 8235±101.7 kg with a mass fraction of milk fat of 3.84±0.08%. According to the live weight, all the age groups of cows exceeded the requirements of the 1st quality class.

According to the Alatau breed of dairy cattle, there were used the bulls of the Swiss breed with the milk yield of M (mother) and MF (mother of the father) of 10,424-14,784 kg with a fat content of 3.57-3.68%.

During the research, it was found that the live weight increases from birth to 17-18 months of age more than 12-13 times, and the average daily gain from birth to 18 months of age is 700-800 g per day.

Based on the conducted studies in the period of 2015 - 2018, we believe that the aim of growing dairy heifers of the Alatau breed concludes: the age of the heifers at calving is 24 months; the live weight of heifers at calving is from 85% to 90% of the live weight of the adult animal; fatness of heifers at calving is 3 (1-5); age at insemination - 15 months; the live weight of heifers when inseminated is from 55% to 60% of the live weight of the adult animal; fatness of heifers during insemination - 3 (1-5). With the average daily weight gain of 750 g at the age of 2 months, the calves should have a live weight of 75 -90 kg, at a 6-month age - 180-220 kg, at 15-month age - 380-420 kg and at the age of 2 years - 580-620 kg. Heifers with a uniform gain in live weight in all age periods have a high fertility, and at the time of calving can produce offspring with a high live weight at birth, in addition, during the first lactation they produce high-quality milk in a greater volume.

Keywords: brown cattle, milk yield, fat, protein.

Relevance. The focal area in the agro-industrial complex of the Republic of Kazakhstan is livestock, namely dairy cattle. The effectiveness of livestock should not be based on quantity due to an increase in the number of cattle, but on quality, that is, the selection of highly productive herds, the formation criteria of which should be considered the resistance of animals to various diseases, adaptability to changes in conditions of maintenance and feeding. The role of competitive enterprises, resource-saving technologies, production of low-cost products is growing. In this connection, highly productive animals acquire special significance in cattle breeding.

Dairy cattle breeding cannot develop without solving the problems on the formation of an effective herd, taking into account the genetic potential of dairy productivity and reproductive qualities, equipping modern dairy farming technologies and a solid fodder base.

The large-scale use of high-value Holstein breed bulls has made it possible to create the outstanding herds in the Akmola and Almaty regions and other regions with the milking of cows from 6000 to 8,500 kg per year.

Despite the wide variety of milk types of breeds with the genetic potential of 5-6 thousand kg of milk from a cow, it should be noted that anyway, black and motley cattle have the highest genetic potential of productivity.

In the domestic dairy cattle industry, the actual task is to ensure further growth in the productivity of cows. An optimal indicator of the effect of selection for milk yield is 250-300 kilograms, that can provide an increase of 250,000 tons of milk per year.

In Kazakhstan, close attention is paid to improving the technology of growing heifers of highly productive dairy cattle [1]. It is connected with the fact that there have been significant changes in the intensity of the use of cows, when herds with milk yields of 8-10 thousand kg are completed in many farms in the Almaty region. Problems of the longevity of cows, reproduction in these herds and preservation of young animals are noted [2]. There is a tendency when the cow uses 1.8 lactations, and therefore the yield from each cow averages 0.9 head of offspring [3]. Considering the natural mortality and culling, a serious problem of herd repair appears [4, 5]. There is a need for additional purchase of animals, which affects the profitability of milk production [4]. Consequently, the heifers' growing efficiency is directly related to the breeding of highly productive dairy cows and the profitability of milk production.

Growing calves and increasing business output is an important factor in the reproduction of dairy cattle, affecting the profitability of milk production [6, 7]. Despite this loss, there are many calves in dairy units [8, 9].

For the maintenance of calves, there are three principal methods:

1. Maintenance in livestock building with climate conditions appropriate to the season or in boxes with straw bedding with two areas for the regimen.

2. Maintenance in individual boxes with limited regimen capacity or yard for the regimen. These boxes are designed in such a way that they can be installed anywhere. Such boxes are used mainly during calves' feeding with colostrum.

3. Keeping in closed boxes. This type of maintenance is most often a whole complex.

The method of keeping calves depends not only on the size of the enterprise, but also on the technology of their feeding. Methods of keeping calves are planned in such a way as to create comfortable conditions during all periods of growth and development, taking into account the natural and climatic features of the environment, as well as the possibilities of equipment for ventilation of the premises and the reduction of microbial contamination [10, 11].

Crossing the animals of the Swiss breed with the local livestock and further breeding the obtained hybrids "in themselves" led to the creation of large amounts of brown cattle in different zones of the country, differing in terms of productivity and body build. This served as the basis for the separation of several zonal breeds from the common amount of brown cattle, which originate from the Swiss cattle. Five breeds were distinguished: Kostroma (1944), Alatau (1950), Lebedinskaya (1950), Caucasian Brown (1960), and Carpathian brown cattle (1973).

The Alatau brown breed of cattle was obtained as a result of crossing the animals of local breeds with the Swiss ones. Therefore, the use of the Swiss breed on the cattle of the Alatau breed helped to improve the morphological and physiological properties of the udders of cows. The hybrids had a need to improve the uniformity of development of udder shares, the size of the nipples and the rate of milk ejection.

The Alatau brown breed is less suitable for direct economic use in industrial complex conditions, but it serves as an excellent breeding material for the production of useful animals (at the industrial crossing with the Swiss).

In the developing process of a market economy in the Republic of Kazakhstan, the most valuable breeds of dairy cattle of domestic selection are transformed in accordance with the demands of the time. Breeds that do not meet the changing requirements, gradually lose their importance, for example, the

Alulieata breed of dairy cattle, or they are absorbed by other breeds. To replace them, new genotypes are created, with more pronounced useful traits.

It should be noted that the division of breeds into usable and tribal species is very conditional, since not every breed can be reasonably attributed to breeds of breeding or useful purpose. The majority of modern domestic breeds of cattle has both of those purposes.

The annual growth in dairy productivity of cows in many respects depends on the level of the breeding work carried out. At present, up to 40% of the increase in milk yield is due to the improvement of the genotype of the Alatau brown cattle breed, while the remaining 60% is due to the increase in the level and quality of feeding and the improvement of traditional maintenance technology.

In the conditions of the AIC "Adal" JSC of Enbekshikazakh district of the Almaty region for the last 18 years, a number of activities have been carried out, both structural and scientific and technological, for further development and improvement of breeding programs in the Alatau brown breed.

The identification and registration of animals, assessment of dairy productivity, assessment of breeding qualities of animals, development of programs for artificial insemination and embryo transplantation have been placed at a high level.

From 2012 to 2017, it was possible to achieve extremely high-quality standards of the Alatau brown breed that meet the international ISO requirements. Currently, both Alatau and black and motley breeds of cows are evaluated for fat and protein content, the number of somatic cells in milk, milk yield and some economically useful traits, such as consumption of concentrated fodder, easy calving, reproductive qualities and speed of milk ejection. This broadening of the range of animal productivity has led to the organization of breeding for improving the dairy productivity of cows.

The aim of the research. To study the efficiency of the Alatau cattle breeding, to determine the productive potential of the Alatau cows of different genotypes in the conditions of "Agro-industrial company "Adal" JSC of Enbekshikazakh district of the Almaty region.

On the basis of the aim, the objectives are set to study the current state of dairy cattle breeding in the AIC "Adal" JSC, to determine the potential of dairy cattle of the modern Alatau breed population and the results of using the bull seed - the leaders of the Swiss breed in selective work.

Material and methods of the research. The main research was carried out on purebred animals of the Alatau cattle breed as well as in different genotypes of the Alatau - Swiss breed in the conditions of the "Agro-industrial company "Adal" JSC of Enbekshikazakh district of the Almaty region.

The joint-stock company "Agro-industrial Company "Adal" was established in January 1999 and is an industrial complex of a full cycle of production, processing, and sale of dairy products.

In the studies, the principle of the pair - analogues was applied. The productivity of animals was assessed by such indicators as lactation duration (d.), milk yield for lactation (kg), milk yield for 305 days of lactation (kg), fat mass fraction (FMF, %), milk fat yield (kg), protein mass fraction (PMF, %), milk yield for 100 days of lactation (kg), milk ejection rate (kg/min), lactation stability coefficient (%), live weight of cows (kg), service period (days).

When crossing cows of the Alatau breed with the bulls of the Swiss breed, groups with a blood content of 12.5 to 62.5% were formed according to the Swiss.

All studied animals were in the same conditions of maintenance and on a balanced diet of feeding.

Processing of the obtained data of dairy productivity of cows was carried out through the program "SELEKS - cows". Dairy production is studied by the following indicators: milk yield by the 1st, 3rd, and older lactations for 305 days, the content of the mass fraction of fat (%) and milk fat (kg), the mass fraction of protein (%).

We studied the live weight of calves from birth to the first calving, the indicators of the live weight of first lactation cows according to the zootechnical record of 2-MOL form tribal cards for each cow.

Indicators of the reproductive function of the bred heifers and first-calves were taken from the corresponding sources of primary zootechnical records and were calculated according to the generally accepted methods of zootechnics for the duration of fruit-bearing and the service period, the number of difficult calving, abortions, stillborn calves, the insemination index, and the quality of the offspring.

The account of the dairy productivity was conducted by the method of control milking every ten days [10]. The fat content in milk was determined once a month with the "Laktan-4" automatic device. The technological properties of the first-calves were evaluated by machine milking in terms of the speed of

milk ejection, the uniformity of the quater milking, the development of the udder by taking measurements (length, width, circumference, distance between the nipples, distance from the floor to the bottom of the udder), and visually at the 2-3 rd month of lactation

The received results of the scientific research have been processed by the method of the variational statistics, with the use of the Microsoft Excel 2007 standard package of the statistical analysis on the personal computer [12].

Results of the research. The design capacity of the complex is 100 tons of dairy products per day. Moreover, due to the performance of selective works since 2001, the average milk yield per cow has increased from 2,970 liters to 5,402 liters of milk per year.

As of December 2016, the population of the adult herd of the company was 895 heads, the offspring - 1 232 heads, also 42 horses on the balance sheet. In order to ensure independence from market conditions, the so-called full cycle was introduced in Adal. That is, the farm is provided with its own fodder from nearby fields, and the plant growing department receives fertilizers from the farm in excess.

The total area of the lands belonging to the company is more than 5 thousand hectares, of which 3 thousand are used as arable lands, 1.5 thousand hectares are allocated for pastures, 780 hectares are used for production needs.

AIC "Adal" JSC has the status of a breeding farm for breeding two breeds of cattle Alatau (Swiss) and black and motley (Holstein).

To improve the genetic potential of the herd of the Alatau cows from 2007 to the present time, bioproducts - the seed of the bulls - leaders of the Swiss breed are imported. In the AIC "Adal" JSC there is a large-scale selection both with the Black-Motley and the Alatau breed.

Consecutive intensification and increase in the efficiency of dairy cattle breeding is impossible without increasing the productivity of cows. In turn, the increase in productivity is impossible without special advisory work on improving the economic efficiency of cattle breeding of the Alatau breed.

Dairy productivity is the dominant feature in assessing the economic and useful traits of the Alatau cattle. Thanks to the purposeful breeding work with dairy cattle, the milk yield and the content of the fat mass fraction in milk have increased for the past 8-12 years. All this was achieved by increasing the efficiency of selection and breeding work in dairy cattle. The decisive role was played by the maximum implementation of elements of large-scale selection, a full assessment of the used servicing bulls by the quality of the offspring. Intensive use of bulls - improvers of the Swiss breed in 2008-2014 contributed fully to the manifestation of the effect of using the genetic resources of the Alatau cattle breed. In the following period of 2015 - 2018 Alatau - Swiss crossbred animals occupied a large proportion.

In conditions of AIC "Adal" JSC, the maintenance of animals is year-round stall-walking. It was found that the cows of the breeding core produce 7661 ± 92.8 kg of milk, the selection group - 6761 ± 71.3 kg (table 1).

Table 1 – Productivity of cows of the Alatau breed in AIC "Adal" JSC according to the data of 2016

N	Group	Heads	Milk yield, kg
1	Breeding core	31	7661 ± 92.8
2	Selection group	140	6761 ± 71.3

On average, the cows of the Alatau breed produced milk in the amount of 7268 ± 75.9 kg, with the fat mass fraction in milk $3.82 \pm 0.09\%$. The yield of milk fat was 277.6 ± 3.2 kg for cows of the Alatau breed with an average live weight of 620 ± 17.5 kg (table 2).

Table 2 – Characteristics of the Alatau cows for dairy productivity and live weight for 305 days of the last finished lactation

Lactation	Total, heads	Milk yield, kg	Milk fat		Live weight, kg
			%	kg	
Total number of livestock	366	7268 ± 75.9	3.82 ± 0.09	277.6 ± 3.2	620 ± 17.5
1 lactaion	126	6604 ± 81.4	3.81 ± 0.07	253.0 ± 2.9	608 ± 31.2
3 lactation and further	68	8235 ± 101.7	3.84 ± 0.08	316.2 ± 3.8	740 ± 26.8

In the first lactation, the milk yield averaged 6604 ± 81.4 kg with an average milk fat content of $3.81 \pm 0.07\%$. Cows on reaching third and subsequent lactations on average showed the milk yield of 8235 ± 101.7 kg with the fat mass fraction in the milk of $3.84 \pm 0.08\%$. According to the live weight, all the age groups of cows exceeded the requirements of the 1st appraising class.

In recent decades, in various regions of the Republic of Kazakhstan, selective and breeding work has been purposefully carried out to create new types of brown cattle by crossing domestic breeds with the more specialized Swiss breed. The results of the research on the use of bulls-improvers of breeds in various regions of dairy cattle, due to natural climatic and fodder conditions, the genetic traits of individual herds are contradictory. In particular, the use of the Swiss breed as an improving one significantly changed the economic and biological traits of the improved breed (Alatau) and, as a result, led to a change in the genealogical structures of this unique domestic breed, influenced on their breeding, productive and technological value.

In dairy cattle breeding in the Almaty region, new highly productive types of brown cattle are widely used. Therefore, the study of genetic potential in the same environmental conditions is topical and has practical significance.

According to the Alatau breed of dairy cattle, the bulls of the Swiss breed were used with the milk yield of M (mother) and MF (mother of the father) of 10,424-14,784 kg, with a fat content of 3.57-3.68%. The Davinci, the Escalibur bull along the Concentrate line (table 3).

Table 3 – Servicing bulls of the Swiss breed from 2007 to 2017

N	Name and number of the bull	Years
1	JAG-ET 76BS0907	2007
2	JACK 76BS0908	2007-2008
3	Fame 76BS0909	2008
4	TREVER-ET 76BS0905	2008
5	Teddy 76BS0913	2008
6	Preference 09363006	2009
7	Atway 10/0035033607	2009
8	Event 10/0034216002	2009
9	Alta Joel 011BS00644	2010-2011
10	Alta Persy 011BS00673	2011
11	Payout-DE 000939829089	2012
12	Alta Joel 011BS00644	2013
13	Jubs 10.352050	2014-2015
14	Davinci 9695533. Concentrate line 106157	2016-2017
15	Escalibur 105117458. Concentrate line 106157	2016-2017
16	Wander 151BS00224. Seed of the same sex.	2016-2017

Since July 2016 for insemination of heifers sexed seeds (same sex) are used. For Alatau breed - the Wander bull along the Prestige line.

In highly productive herds, the peculiarity of breeding work is in the difficulty of selecting animals in the population that meet the breeder's requirements simultaneously for the exterior, productivity and a number of other valuable traits.

The breeding and productive qualities of domestic brown cattle are improved by selection: intralinear, when a combination of different branches maintains a genetic similarity with the ancestor, relying on its tribal virtues; linear in complex inbreeding, when animals are selected that are related to each other not by one but by two or more ancestors from different lines and families, in order to secure successful crosses and saturation of genealogies with ancestors of high breeding value; cross line - the combination of a bull of one line with the cows of another line to consolidate and improve the hereditary qualities of the successors of the lines or to enrich them with new valuable qualities.

On the basis of research, we consider that in specialized dairy breeds, selection for milk yields has an advantage. However, the conditions and technology of keeping of animals leads to the stabilization of selection for this feature and orientation to others. The strategy for improving the new priority trait is also connected to related groups, since the indicators of many traits are highly inherited from the best dams. There are exclusively prepotent cows, male and female descendants of whom form a valuable consolidated group, not inferior to the best lines for the expressiveness of type, level of productivity.

In dairy cattle breeding of Kazakhstan, the peculiarity of working with lines is that the type and quality of the line is determined mainly by the quality of the dams. Selection of breeding stock is crucial for the development and improvement of the line. Selection in cattle breeding is carried out mainly through servicing bulls, among which a more rigorous selection is conducted, since from each of them a much larger number of descendants, in particular, heifers and cows are obtained. When using bulls-improvers, the genetic progress of milking in one generation can reach 12%, with the fat content of milk of 0.15%.

In the Republic of Kazakhstan, the traditional method of selecting potential mothers of bulls is the pedigree assessment of cows for the highest lactation, taking into account the productivity of mother and mother of father. In fact, such an evaluation is conducted according to the phenotype, which does not allow to reliably reveal the genotype, which is the basis of the breeding value of the animal. In recent years, in breeding practice, an index score is increasingly used, combining genetic information about the breeding value of the estimated cow (proband) and its parents. The introduction in Kazakhstan of an autonomous system of continuous multi-indicative genetic assessment based on the Animal Model procedure and animal genotyping at the loci of quantitative traits will make it possible to stand on a par with the world's leading selective countries in the short term.

The most accurate estimate of cows of native Alatau breed in terms of milk yield, fat and protein content in milk, the total amount of fat and protein can be obtained for the first three lactations or for the whole life. In earlier studies, we found that the average dairy productivity of cows for all lactations correlates well with milk yield for the highest lactation [1,2]. By the highest lactation, only full-aged cows can be evaluated.

Characteristics of the productive qualities of dairy cattle cannot be complete without determining the correlation between productivity indicators (table 4). In the economy, the selection for increasing the butterfat content was conducted for a certain time, and the protein content in milk was not given due attention, so a negative correlation was observed between the fat content of milk and milk yield for lactation, and the negative correlation of milk yield with the amount of protein in milk. It has been established that phenotypic correlations between the content of milk protein and milk yield for lactation are in most cases slightly negative. The exception was the correlation coefficients of daughters of Atway 10/0035033607, AltaPersy 011BS00673, Preference 09363006 Payout-DE 000939829089, in which they turned out to be more negative.

Table 4 – Coefficients of correlation of milk protein for lactation and fat content in milk in daughters of different bulls

Servicing bulls	Indicator	
	Milk yield for lactation, kg	Fat, %
JACK 76BS0908	-0.045*	0.331*
TREVER-ET 76BS0905	-0.077**	0.496*
Teddy 76BS0913	-0.069**	0.513**
Preference09363006	-0.191**	0.382*
Atway 10/0035033607	-0.227**	0.617*
Event 10/0034216002	-0.092**	0.475*
Alta Persy 011BS00673	-0.261**	0.582**
Payout-DE 000939829089	-0.186***	0.278***
Alta Joel 011BS00644	-0.293*	0.484**

P ≥ 0.95, **P ≥ 0.99, ***P ≥ 0.999.

Thus, simultaneous selection in the direction of high milk yield and high butterfat had a positive effect on the correlation between these features. The coefficients of phenotypic correlations between protein and fat content in milk have average values and are positive, that suggests an increase in the content of milk protein during selection in the direction of increase in butterfat. And vice versa - when conducting selection for milk protein, the probability of increasing and content of protein in milk is high.

It is established that the daughters of the first generation Swiss producers outperformed the purebred herdsmates of the Alatau brown breed by 12.8% ($P < 0.99$) in terms of milk yield for 305 days of lactation. Further increase in bloodiness of the Swiss leads to a decrease in the level of productivity due to a mismatch in the feeding level of the genetic potential of cow productivity. The daughters of the Swiss producers of the second generation differed from herdsmates in milk fat content by 0.02% ($P < 0.99$), and from the purebred Alatau brown breed analogues by 0.05% ($P > 0.99$). At the same time, the daughters of the Swiss bulls of different generations of butterfat content did not differ reliably between themselves ($P < 0.95$).

The products of cattle breeding with high added value can practically be obtained at the feed of own production, without importing them from other regions of the Republic of Kazakhstan. Therefore, the "AIC "Adal" JSC created its solid fodder base.

Experiments have shown that differences in the productivity of cows at high and low levels of their feeding are significant. Thus, in cows with a "rich" genotype, in improved feeding conditions, the productivity increases by 70-80%, while in cows with a "poor" genotype it is insignificant by 10-15% or does not increase. This leads to the most important practical conclusion - favorable conditions of the external environment provide a full manifestation of hereditary deposits and an objective evaluation of the genotype.

Without using the achievements of genetics and selection in breeding work, in combination with traditional methods, it is impossible to provide the rates of genetic improvement necessary under the current conditions and, as a result, to increase the productive qualities and improve the economically useful traits of cattle.

The parameters of the air pool in the autumn and winter period in the maternity ward and the winter period in the dispensary were respectively the following: temperature - 15.4 °C and 15.8 °C, relative humidity 68.1% and 72.5%, air velocity 0.25 and 0.17 m/s, bacterial contamination - 30.0 and 23.0 thousand/m³, ammonia content - 8.3 and 6.5 mg/m³, hydrogen sulfide - 4.5 and 3.0 mg/m³, carbon dioxide - 0.12 and 0.15%, no carbon monoxide was detected, dust - 2.5 and 1.1 mg/m³. The luminous coefficient was 1:14 with the coefficient of natural illumination 0.74%. Zoohygienic standards for the main indicators of the microclimate in cowsheds and premises for growing calves were strictly observed (table 5).

Table 5 – Microclimate in the premises for animals

Indicator	Premise			
	cowshed	maternity ward	dispensary	calf-shed
T, °C	10.6±0.28	15.4±0.29	15.8±0.24	14.1±0.12
R, %	71.5±1.11	68.1±0.81	72.5±0.85	76.4±0.7
v, m/s	0.35±0.03	0.25±0.02	0.17±0.02	0.22±0.01
LC	1:14	1:14	1:14	1:14
CNI, %	0.65±0.03	0.68±0.02	0.75±0.02	0.78±0.02
NH ₃ , mg/m ³	11.9±0.33	8.3±0.37	6.5±0.21	7.2±0.25
H ₂ S, mg/m ³	6.8±0.18	4.5±0.18	3.0±0.19	4.9±0.21
CO ₂ , %	0.18±0.01	0.12±0.01	0.15±0.01	0.19±0.01
BC, thous/m ³	37.4±1.17	30.0±0.97	23.0±0.83	31.8±0.81
Dust, mg/m ³	3.9±0.22	2.5±0.17	1.1±0.10	2.1±0.15

In the winter season of the year, the morphological composition of the blood of the Alatau brown breed was studied, depending on the bloodiness according to the Swiss (table 6). The first-calf heifers of the Alatau brown breed, various bloodiness by the Swiss, were involved in the research objects. Blood sampling was carried out for 2 days and examined on the automatic analyzer.

Table 6 – Morphological composition of the blood of cows of the Alatau brown breed in the winter season of the year

Morphological characteristics	Bloodiness by the Swiss, %			
	62.5	25.0	12.5	norm
n, heads	10	10	10	10
Leucocytes, $\times 10^9/l$	9.11 \pm 0.44	8.78 \pm 0.38	7.33 \pm 0.41	4.5-12.0
Lymphocytes, $\times 10^9/l$	4.69 \pm 0.31	4.91 \pm 0.35	4.46 \pm 0.31	4.0-6.5
Erythrocytes, $\times 10^{12}/l$	5.71 \pm 0.21	5.19 \pm 0.18	6.22 \pm 0.16	5.0-7.5
Hemoglobin, g/%	11.24 \pm 0.14	10.77 \pm 0.19	9.49 \pm 0.21	9.0-12.0
Hematocrit, %	38.88 \pm 0.64	42.63 \pm 0.52	39.91 \pm 0.36	35-45
Absolute thrombocyte level, cells/ μ L	331.8 \pm 21.6	405.5 \pm 17.4	539.2 \pm 25.6	260.0-700.0

The revealed changes in some blood parameters in the heifers of the Alatau brown breed are directly related to bloodiness by the Swiss. The results of the research in practical terms make it possible to determine the expediency of using the seed of the Swiss servicing bulls of foreign breeding in the foothill zone of the Almaty region.

The methodological essence of the research is that on the basis of a comparative study of the main indicators of the morphological composition of the blood, one can judge the conjugation of the organism of each individual and, on average, according to the sample for each group, and for each animal individually.

The results of the research showed that the morphological composition of the blood of the Alatau brown breed in the conditions of the Almaty region during the winter season of the year is within the limits of the physiological norms. The concentration of leukocytes was 7.33-9.11 $\times 10^9/l$ (norm 4.5-12.0), lymphocytes 4.46-4.91 $\times 10^9/l$ (norm 4.0-6.5), erythrocytes 5.19 -6.22 $\times 10^{12}/l$ (norm 5.0-7.5), hemoglobin 9.49-11.24 g/% (norm 9.0-12.0), hematocrit 38.88-42.63% (norm 35-45), thrombocyte level 331.8-539.2 cells/ μ l (norm 260.0-700.0).

To improve the breeding efficiency of the Alatau breed and its hybrids from the Swiss breed, the diet was strictly regulated (tables 7, 8). This allowed to receive calves in the future with the given zootechnical productivity parameters (table 9). The studies were conducted with the aim of increasing the dairy cow's use in the herd by optimizing the duration of the breeding and reproduction cycles.

Table 7 – Rations for cows with a live weight of 650-700 kg

Indicators	Nonmilk. Cows	Cows with daily milk yield, kg			
		16	20	24	28
Bean hay, kg	7.0	6.0	6.0	6.0	6.0
Haylage, kg	10.0	12.0	10.0	10.0	9.0
Maizesilage, kg	15.0	10	13.0	16.0	18.0
Concentrates, kg	4.0	4.8	5.6	7.5	8.2
Including:					
Cattlecake, kg	1.5	–	–	1.0	2.0
Driedbeetchips, kg	1.2	2.0	2.5	3.0	3.0
Molasses, kg	1.2	0.8	1.0	1.2	1.5
Feedingbeet, kg		–	–	–	5
NaCl, g	70.0	89.0	105.0	132.0	143.0
Disodiumphosphate, g	130.0	40.0	50.0	90.0	110.0
The diet contains					
F.u.	15.51	15.30	16.67	19.80	21.52
Change/Energy, MJ	180.71	177.12	191.75	224.68	244.39
D/m, kg	20.00	19.58	20.74	23.79	25.31
Digest. protein, g	1611.61	1407.6	1528.2	2030.5	2387.4
Ca, g	173.91	191.76	201.90	229.14	231.7
F, g	111.88	104.72	116.97	152.14	166.84

Table 8 – Rations for cows with a live weight of 650-700kg

Indicators	Cows with daily milk yield, kg				
	12	28	32	36	40
Beanhay, kg	6.0	6.0	6.0	6.0	6.0
Haylage, kg	13.0	10.0	9.0	9.0	9.0
Maizesilage, kg	10.0	16.0	18.0	18.0	16.0
Concentrates, kg	3.0	7.5	8.2	9.5	11.5
Including:					
Cattlecake, kg	–	1.0	2.0	2.5	3.0
Driedbeetchips, kg	1.5	3.0	3.0	3.5	3.5
Molasses, kg	0.5	1.2	1.5	1.5	1.5
Feedingbeet, kg	–	–	5.0	8.0	10.0
NaCl, g	73.0	132.0	143.0	155.0	167.0
Disodiumphosphate, g	40.0	90.0	110.0	110.0	120.0
The diet contains:					
F.u.	13.20	23.62	25.46	28.02	29.48
Change/Energy, MJ	155.20	267.30	285.94	317.03	332.24
D/m, kg	1773.0	27.28	28.82	31.50	32.43
Digest. protein, g	1183.0	2689.0	3016.5	3467.5	3853.4
Ca, g	166.6	250.95	272.90	287.00	295.60
F, g	80.15	186.4	216.35	235.15	261.99

Table 9 – Analysis of directed heifers breeding for the reproduction of the main herd in the "AIC "Adal" JSC

Item	Years		
	2012	2013	2014
Average live weight of heifers at birth, kg	26.0±0.5	23.7 ±0.4	27.0±0.4
Age of heifers during first insemination, months	25.0±0.8	21.5±0.5	17.5±0.7
Live weight of heifers at the first insemination	355±26.2	370±19.5	373±22.6
Live weight of the heifers at calving, kg	514.2±31.6	508±29.3	560±24.1
Average live weight of the main herd cows, kg	498.6±17.9	498.4±22.6	513.5±12.4
Average live weight of heifers at birth, kg	28.2±0.5	36.8±0.6	38.7±0.4
Age of heifers during the first insemination, months	16.8±0.4	16.0±0.6	14.6±0.4
Live weight of heifers at first insemination, kg	386±18.5	395±21.6	410±27.8
Live weight of bred heifers, at calving, kg	569±18.9	569±27.2	558±27.3
The average live weight of cows of the main herd, kg	580±31.5	647±23.2	680±33.2

Based on the conducted research, summary of literature data and the practices of feeding cows, we have developed a system of feeding high-yielding cows, which includes requirements for the quality of feed, advanced feeding standards, rations, recipes for mixed fodders, and premixes, feeding characteristics for lactation phases, regimen and technique of feeding. Such a feeding system was introduced into practice in the AIC "Adal" JSC in 2014-2017. As a result, the productivity of cows has increased by 20-22%, while the feed consumption per unit of production has decreased by 5-7%, which indicates that proper feeding contributed to a greater disclosure of the genetic potential of the productivity of cows of the Alatau breed.

Feeding in the AIC "Adal" of Enbekshikazakh district of the Almaty region is mainly based on the production of own fodder.

Feeding base of livestock complexes is built in accordance with the general principles of intensive forage production. Its main feature is full compliance with the requirements of science-based feeding of animals.

At any type of feeding, dairy cows receive the necessary amount of energy, nutrients, and minerals according to their needs and physiological state in the optimal concentration and ratios. The higher the productivity of animals is, the more carefully the diets should be balanced with their needs.

Our experiment shows that the same feeds from different farms differ in their chemical composition, nutritional value, cost price. Therefore, the farms annually make analyses of harvested forages for a more accurate balance of animals feeding.

Feeding of animals corresponds to their potential capacities in each specific lactation period or during the interlactation period, that is, it is carried out in accordance with the nutritional requirements, depending on the physiological state.

Recipes of feed mixtures are different and depend on the milk yield of animals. It is compiled separately for nonmilking cows and cows in the maternity ward and highly productive cows. Improvement of the quality of fodders harvested in the farm is the main way to reduce the consumption of concentrates, improve the health and reproductive function of cows and, ultimately, improve the economic efficiency of dairy cattle.

One of the most important factors contributing to the full realization of the genetic potential of animal productivity is full, balanced feeding. In this process, the nutrients of the feeds affect the animal's organism not in isolation from each other, but in a complex.

Peculiarities of feeding animals in the farm arise taking into account the amount of harvested fodder and its nutritional value with a long enough housing season. In summer, the basis for feeding of milking cows is alfalfa and pasture grass. Good rotation pastures ensure the receipt of high yields with minimal additional feeding with other feeds. The green feed contains all the nutrients the animal needs.

The feeding, which provides good health to the animals, normal reproductive functions, high productivity and good product quality with the lowest feed costs, is considered full-fledged.

It has been established that the necessary condition for normalized feeding in keeping is the labeling of animals, which makes it possible to quickly find the necessary animals and transfer them from one group to another. In practical terms, the most optimal should be considered the division of animals into 6 groups. 1 - newly-calved group (up to 45 days of lactation), 2 - high-productive, 3 - medium-productive, 4 - low-productive, 5 - first 40 days of interlactation period, and 6 - the last 20 days of interlactation period. The distribution practice of animals by physiological groups, without taking into account the level of dairy productivity, is ineffective, due to large differences within the group, especially in young herds.

It should be noted that growing of offspring is one of the most difficult tasks, in view of the problem of keeping calves [13, 14].

In many farms of the Almaty region, various technologies are being used to increase the rate of preservation of newborn animals and further growth of viable animals. The most common is the cold method of growing calves. However, in connection with the construction of the principal buildings with a regulated microclimate, there is a tendency to increase the air humidity and the content of harmful gases, the active development of microorganisms that leads to respiratory, gastrointestinal and other diseases of young animals and their significant mortalities.

The experience of many farms shows that calves can be successfully grown in portable light houses made of plywood or pressed wood boards installed under awnings or in an open area. The greatest effectiveness is achieved when keeping calves in individual cells in the light unheated premises. At the same time it should be noted that calves grow well and are not sick in "cold" conditions, but when they are transferred to a warm premise, they become ill with many diseases characteristic of infantile age.

Directional rearing of young cattle of dairy breeds is focused on the preparation of animals for long-term operation and milk production. With good indicators of the average daily gain in live weight, repair heifers by the first calving should reach 82-86% of the planned live weight of the adult.

At the age of 18 months, the live weight should increase in comparison with the live weight of calves at birth by 11-12 times. This is provided under the condition of the average daily increase from birth to 6 months of age of 650-750 g, from 6 months to 12 months of age of 550-650 g, from 13 months to 24 months of age of 450-550 g.

There are data on the provision of the average daily gain in live weight from birth to 9 months of age within 850-950g, from 9-12 months of age - 750-850g, from 13 months of age and over - 650-750g [25]. At the same time, a number of researchers recommend providing an average level of growth in the period

before puberty and accelerated growth after that, since accelerated growth after puberty has a positive effect on the future dairy productivity of the cow. The increase in live weight in heifers in the optimal regime promotes a clear manifestation of the signs of estrus and fertilization during the insemination period [26].

During the conducted studies it was found that the live weight increases from birth to 17-18 months of age by more than 12-13 times and the average daily gain from birth to 18 months of age is 700-800 g per day.

Modern technology of dairy cattle breeding is aimed at the creation of herds that meet the tough requirements of highly mechanized farms. In this regard, it is necessary to harden the requirements for the in-process sampling of cows for further breeding and selective work. The performance of this work is possible with a reliable assessment of cows by technological and morphofunctional parameters of the udder.

Up to this point, there is no single standard for the average daily live weight gain of heifers by growing periods. In the United Kingdom, heifers before calving should have a uniform increase in live weight up to 26 months of age. In the USA, it is recommended to achieve a live weight in calves by the end of the dairy period not less than 110 kg, and by the age of insemination (14-15 months) - not less than 400 kg.

In Germany it is recommended to achieve a live weight of calves at the age of 6 months - 180 kg, 12 months - 310 kg, 18 months - 420 kg and 24 months - 510 kg. The average daily gain is equal to 800, 700, 600 and 500 g respectively.

The Dutch growing system of repairing heifers provides for a low growth of live weight in the milking period - 620 g, then until the end of the first year of life - 880-900 g and a decrease in growth after insemination of calves in the second year of life up to 700-600 g.

It has been established that heifers with uniform live weight gain in all age periods have a high rate of fertilization, and at the time of calving can produce offspring with a high live weight at birth, in addition, during the first lactation they produce high-quality milk in a greater volume.

A number of researchers recommend providing an average level of growth in the period before puberty and accelerated growth after that, since accelerated growth after puberty has a positive impact on the future dairy productivity of the cow. The increase in live weight of heifers in the optimal regime promotes a clear manifestation of the signs of estrus and fertilization during the insemination period [25]. Thus, the review of the scientific literature and own data confirms the existence of different approaches to determine the most effective technologies for growing repair heifers, as well as determining the optimal rates of growth in different age periods.

Stably high dairy production can be achieved not only by the appropriate genetic material but also by the modern technology for the directed growth of young animals and the optimal way of keeping cows of dairy breeds. Therefore, the development of the scientifically based technology of the directed growth of young animals, the determination of optimal methods for keeping dairy cows is the right choice of the research directions

When assessing the cows for productivity, the influence of environmental factors was taken into account. This is due to the fact that heifers grown in unsatisfactory conditions will never become highly productive cows, even if they come from high-value parents [15-20]. Due to the lack of feed and its poor quality, the genetic potential of animals is often realized in farms only by 40-80% [21-30].

Growing with the moderately cold method can be appropriate only for healthy, well-developed calves. However, the calves were not well prepared for calving in the interlactation period, they were poorly fed and kept in bad conditions, then weak and underdeveloped calves are born from them. They are usually inactive, lie a lot, they hardly rise, a sucking reflex, and their appetite is weakly expressed. Such calves cannot be grown in a "cold" way and they need special care.

In a number of livestock projects, there is a provision for the zero pasture of calves till the age of 3 months in individual narrow-sized cages. This method of keeping calves allows to significantly increase the density of animals accommodation [4].

Thus, the practice of successful growing calves includes the organization of proper feeding, maintenance, sanitation, ventilation, prevention of diseases, constant monitoring of development. Based on the studies conducted in the period 2015 - 2018 we believe that the aim of growing dairy heifers is: the age of

heifers at calving is 24 months; live weight of heifers at calving is from 85% to 90% of the live weight of the adult animal; fatness of heifers at calving is 3 (1-5); age at insemination - 15 months; live weight of heifers when inseminated is from 55% to 60% of the live weight of the adult animal; fatness of heifers at insemination - 3 (1-5).

With the average daily weight gain of 750 g at the age of two months, the heifers should have a live weight of 75 -90 kg, at a six-month age - 180-220 kg, at a 15-month age - 380-420 kg and at the age of 2 years - 580-620 kg (table 10).

Table 10 – Recommended growth for the heifers. The incremental amount of 750 g/day (2017-2020)

Age, months	Live weight, kg
2	75-90
6	180 - 220
15	380 - 420
24	580 - 620

Continuation of table 10

Age, months	Note	Concentrate, kg	Crude protein in the dry matter of the diet, %
0 - 3	Calves - suckers	Plenty of	18-20
3 - 6	Growth of the udder	2.0 – 2.5	16 - 17
6 - 9	The growth of the udder	1.3 – 1.7	15 – 16
9 - 15	Limited feeding	1.0 – 1.5	14 – 15
15 - 24	Bred heifer	0.5 – 1.5	13 -14

The ratio of crude protein in the dry matter of the diet should be 18-20% for calves from birth to 3 months of age. For the replacement heifers it is required a maximum average daily gain in the first 6 months, bringing them up to 900 g/day, then in the period of 7-11 months - at a level of 750-800 g, increasing the nutritional value of the diet solely by introducing the main food in the diet. At the same time, the amount of mixed feed varies depending on the quality of the main feed. At the age of 12-15 months, the average daily gain is kept at a level of no higher than 700 g, carefully making sure that the heifers are not fattened.

Currently, the calves of Alatau brown breed show almost the same gain of live weight as young fattening. This phase of development largely determines the subsequent productivity of the heifers. Successful calf growing at an early age and healthy, with well-developed chewing functions, a more adult calf is a good starting point for growing a heifer. Till the age of three months, when feeding heifers, it is not worth saving on the quality and volume of concentrated food, it is given in plenty. The most problematic period in growing calves - the first months after calving, when they are particularly stress-susceptible when adapting to external conditions. In the first months of life, growth occurs due to enhanced protein synthesis and development of organs and muscle tissue. The rate of fat synthesis during this period is low and practically does not change, regardless of the conditions of feeding and maintenance. With an increase in body weight, the situation changes. The growth of adipose tissue increases. Animals grow quickly and reach the desired live weight.

It was established that the first weeks of calf life are crucial for the development of internal organs. During this period, there is an intensive increase in the number of cells, and their number eventually determines the working capacity of organs in the future by affecting the productivity of the female breast, blood supply and protective function of the liver. To achieve optimal results in growing, everything should be done to ensure that in the first months of life the calves are as intensively developed as possible according to table 9.

Based on the conducted investigations, it can be noted that the basis for the formation of a highly productive dairy herd of Alatau brown cattle breeds is optimally grown bred heifers and their timely

putting into service. With proper feeding and control over development, calving can be successfully performed already at the age of 24-25 months.

Herewith, obesity of the heifers should be avoided, as this leads to complex calving and the birth of non-viable calves.

Table 11 shows the in-process control of growth and development of replacement offspring.

When growing heifers, the main condition is the principle: at the age of 15 months all heifers should be fertilized. Those who are still not pregnant at the age of 18 months should be considered candidates for culling in accordance with the current economic situation (expensive feed and reasonable price of bred heifers). Those heifers who are easily fertilized theoretically have the best genetics in the herd and are almost never sold if they are pregnant. In the future, it is necessary to use the best bulls that they can afford for insemination taking into account the ease of calving their daughters. The availability of the effective breeding program for heifers and their calves at a young age will allow to maintain a smaller herd of heifers to provide repair, or enables the sale of the surplus of heifers.

Table 11 – In-process control of growth and development of replacement offspring

Groups	Key parameters
0-6 weeks	Health. Linear growth in weight gain. Maximum Energy and Protein Consumption.
6-12 weeks	Growth of weight gain. Maximum Starter Consumption.
3-9 weeks	Skeleton development. Measurement.
9-15 weeks	Gain in weight. Fatness.
15-23 weeks	Fatness.

In most regions of Russia, the predominant in terms of numbers of dairy cattle remains black and motley (55.7%), as the most highly productive with good product payment for fodder [31]. Mass breed of dairy cattle is also brown. As a result of selection, brown cattle, both in the Russian Federation and in the Republic of Kazakhstan, has acquired features inherent in the dairy type, but with good signs of meat, and has a great potential for productivity, which exceeds many of the breeds by zootechnical and economic indicators. The obtained data will serve as the basis for updating the breeding and selection program with domestic brown cattle, namely the Alatau breed of different genotypes.

Analysis of the economic situation in the farms of the AIC "Adal" JSC in terms of dairy cattle for the last period of 2014-2018 shows that the cost of repairing the herd, currently account for 16% to 23% of the total costs of the enterprise for milk production, ranking second after the cost of feed. When entering the heifers in the amount of 22-32% of the main herd, as a rule, in the household, there are still about 10% of the heifers. They can be used for sale and additional income.

In other farms of the Almaty region, the live weight of calves before calving is only 450-500 kg at a rate of 580-620 kg. It is inappropriate to grow such heifers - it is impossible to get a lot of milk from them. In most farms of the Almaty region, the average calving age of the calves is more than 30 months. As our observations showed, the delay in insemination is usually associated with a low live weight of heifers. The main reasons for this are: the use of all heifers for repairing the herd without proper selection and breeding work, the lack of starter mixed fodders; unbalanced diets; poor conditions of detention; non-compliance of microclimate parameters with veterinary requirements. Low average daily gain, late introduction of heifers into the herd - all this directly affects the profitability of milk production.

Discussion of the results of the research. As a result of selective and breeding work, improved herds of the Alatau brown cattle breed of different genotypes, differing in their level of productivity and fitness for industrial technology, have been formed in the AIC Adal JSC of Enbekshikazakh district of the Almaty region. In the development of the Alatau brown breed, the strategic direction is to obtain cows-champions, to create a large array of highly productive herds. Classical methods of selection - selection, assortment, breeding by lines and families, inbreeding, index selection, etc., - allow to assess the status of the main breeding features in herds, to conduct highly reliable genetic monitoring of breeding processes occurring in populations, and to develop methods for increasing selection efficiency as in individual herds, and in the breed as a whole.

The high genetic potential of the dairy productivity of the brown cattle in the conditions of the AIC "Adal" JSC was achieved as a result of breeding by two main features: milk yield taking into consideration the overall yield of milk fat and the type of body build, as well as intensive selection and use of bulls, preservation of health, longevity and reproductive capacity of valuable servicing bulls and high-yielding cows, intensive level of rejection of animals, evaluation of cows in terms of feeding speed and payment for their products, udder shape and milking speed, behavior pattern in the herd.

A decisive role in the improvement of brown cattle was played by a solid fodder base, abundant high-grade and highly concentrated type of dairy cattle feeding.

The peculiarity of breeding the Alatau brown cattle is the rapid change of generations. Lines in the herd exist as long as servicing bulls give offsprings that exceed the breeding value of descendants of bulls of other lines, bulls-leaders of the breed and are subordinated to the requirements of the economy of dairy cattle breeding. The main lines of brown cattle include the lines of Concentrate and Prestige.

In the creation and improvement of the Alatau brown breed, a certain value belongs to the families. When they were brought to the "AIC "Adal" JSC, the maximum use of eminent animals, using in a number of generations both crosses and intensive inbreeding. The results of crossing with brown Swiss cattle served as the basis for creating highly productive populations of the Adal domestic brown dairy cattle. The use of Swiss breed allowed for several years to achieve significant progress in dairy cattle breeding.

The results of crossing with the use of the Swiss bulls, conducted in the conditions of AIC "Adal" JSC of Enbekshikazakh district of the Almaty region, allow to consider this method effective for increasing the genetic potential of the Alatau breed.

Achievements in selection and breeding work with the Alatau breed of cattle using bulls evaluated on the quality of offspring, combined with extensive use of artificial insemination and new biotechnological methods in dairy cattle breeding, allowed to increase breeding qualities and genetic potential of livestock productivity. The special role of using the best world gene pool of the Swiss breed should be noted.

The experience gained over many years of crossing the Alatau and Swiss breeds has shown that with the increase of bloodiness in the Swiss breed, the milk of first-calves and full-aged cows increases, while the qualitative composition of milk, the reproductive capacity of cows deteriorate and the period of their economic use is shortened. The further use of the gene pool of the Swiss breed for the improvement of livestock should be strictly coordinated with a view to preserving the unique economically useful traits of the Alatau and Swiss breeds of brown cattle.

In breeding practice, the global gene pool is widely used to increase the abundance of cows of domestic breeds. The results of the conducted studies showed that an increase in the share of blood in the improving breed, in this case - the Swiss breed, leads to a population that is more demanding of the conditions of feeding and maintenance.

In the future, it is expected to optimize the breed composition of cattle in the Republic of Kazakhstan. However, optimizing the breed composition, we should not forget about the preservation of the gene pool of the most valuable local native breeds - the bearers of unique traits, which belong to the Alatau brown breed.

Breeding in each region of the Republic of Kazakhstan of several dairy breeds of livestock creates the need for their comparative evaluation and substantiation of a rational numerical ratio. Preservation of the genetic diversity of animals is a guarantee of the survival of the breeds, as well as their further progress. Preserved and improved genetic resources will be required both for breeding and for increasing the resistance of animals to extreme environmental conditions in the extreme continental climate of Kazakhstan.

Specificity of breeding work in cattle breeding is associated with relatively slow reproduction due to low fertility, while the number of calves (considering the waste) hardly provides extended, and sometimes simple reproduction of the herd, even with low intensity of selection (rejection) of replacement heifers.

In addition, cattle is late ripening. With a good organization of growing from the first-calf, products are obtained in the form of milk and litter after 27-28 months of life, and almost from this time it begins to pay back the funds spent on its growing process.

The results of the research showed that the morphological composition of the blood of the Alatau brown breed in the conditions of the Almaty region during the winter season is within the limits of the physiological norm. The concentration of leukocytes was 7.33-9.11 $\times 10^9/l$ (norm 4.5-12.0), lymphocytes 4.46-4.91 $\times 10^9/l$ (norm 4.0-6.5), erythrocytes 5.19-6.22 $\times 10^{12}/l$ (norm 5.0-7.5), hemoglobin 9.49-

11.24 g/% (norm 9.0-12.0), hematocrit 38.88-42.63% (norm 35-45), thrombocyte 331.8-539.2 cells/ μ l (norm - 260.0-700.0).

Highly productive cows of the Alatau brown breed react more not to low temperatures, but to a combination of cold and high humidity. Excess of solar radiation and cold rainy weather reduce the milk yield by 8-10%.

The optimal way to maintain in-calf nonmilking cows in winter is primarily to keep in warm, light, dry, well-ventilated drafts, with enough dry bedding. The optimal parameters of the microclimate in the room are the following: air temperature - 10-15⁰C, relative humidity - 55-70%, air exchange for 1 centner of live weight - 17 m³/h, air speed - 0.5 m/s. When the temperature in the room is lowered, the water heating-up to 20-25⁰ C is provided.

In winter, the temperature in the cowsheds is 8-10 °C, in the maternity ward - 16 °C. Relative humidity in the premises is 70%. The speed of air movement is 0.3-1.0 m/s. The concentration of ammonia is 20 mg/m³. Concentration of hydrogen sulfide is 10 mg/m³. The dust content is 1-2 mg/m³. natural light factor is 0.4 W/m². The coefficient of artificial illumination is 4.5 W/m². The luminous coefficient is 1:10. The area for keeping one cow is 1.2-1.8 m². In the maternity ward - 1.2-2.0 m².

In-calf nonmilking cows should be kept in separate groups with the number of 15-20 heads, but not more than 25 heads, which are formed depending on the expected calving time. With an increase in the number of animals in groups, they relax less and spend more time eating food. The floor area per head should be at least 5 m².

It has been established that in the case of yard housing of cows, sterile cows gain better weight due to more intensive development of the fetus, in comparison with the in-calf cows with a tie-up content.

Long-term stay of in-calf animals in unfavorable micro-climatic conditions in winter (low temperature and high air humidity, lack of light, excessive concentration of harmful gases, dustiness, poor premise ventilation, drafts, etc.), repetitive other stressful stresses can lead to a breakdown in their physiological processes.

A positive effect of the active regimen of the in-calf cows on the growth of the fetal tissues was established. Training helps to strengthen the health of cows and fetus, increase metabolism, facilitate calving. Cows are much less likely to have ancestral and postpartum complications.

In winter, the in-calf cows and bred heifers are released for walks in accordance with the optimal mode of maintenance and the activity is achieved without compulsion by mechanical devices or whips. Walking cease 10 days before calving. In walking cows the disease of calves is 8-15 times less than in young animals obtained from dams without the use of regimen.

Therefore, it is necessary to ensure the optimal temperature regime in all objects where animals are kept.

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АЛАТАУ ТҰҚЫМЫ ҚОҢЫР МАЛЫН «АДАЛ» АГРОӨНЕРКӘСІПТІК КОМПАНИЯСЫ» АКЦИОНЕРЛІК ҚОҒАМЫНДА ӨСІРУДІҢ ТИІМДІЛІГІ

Мазмұндама. Сүтті ірі қара мал шаруашылығының селекциялық техникалық әлеуетін жаңарту - ірі қара малдың алатау тұқымын өсірудің экономикалық тиімділігін арттыруда басты шарт болып табылады.

Алатау тұқымының асыл тұқымды аналық малының, яғни сиырларының сүт өнімділігінің көрсеткіші 6761±71,3 кг болатын селекциялық топта 7661±92,8 кг екені анықталған. Алатау тұқымы сиырларының табын бойынша сүт өнімділігінің орташа көрсеткіші 7268±75,9 кг, сүттегі майдың массалық үлесі 3,82±0,09 %. Орташа салмағы 620±17,5 кг болатын алатау тұқымы сиырларының сүт майының шығымы 277,6±3,2 кг.

Үшінші және одан кейінгі лактациядағы сиырлардың орташа сүт сауымының деңгейі 8235±101,7 кг, ал сүт майының үлесі 3,84±0,08 %. Әр жастағы сиырлар тобының тірілей салмағының көрсеткіші бонитировкада көрсетілген бірінші кластың талаптарымен салыстырғанда анағұрлым жоғары екені дәлелденген.

Сүтті ірі қара малдың алатау тұқымында шешесінің және әкесінің шешесінің сүт өнімділігі 10424-14784 кг, сүт майлығы 3,57-3,68 % болатын швиц тұқымы бұқаларының ұрығы пайданалынды.

Атқарылған зерттеулер негізінде төлдердің тірілей салмақ көрсеткіші туғаннан бастап 17-18 айлық жасқа дейін 12-13 рет өсетіні, ал осы мерзім ішінде тәуліктік салмақ қосуы 700-800 г болатыны анықталды.

2015-2018 жылдары атқарылған зерттеулер барысында алатау тұқымының сүт өнімділікті қашарларын өсіріп-бағуда анықталған негізгі мақсаттар: төлдеген кезіндегі қашарлардың жасы 24 ай, ал тірі салмағы ересек малдың салмағының 85-90 пайызы болу керек, төлдеген уақыттағы қашарлардың қондылығы -3 (1,5), ұрықтанған кезіндегі жасы – 15 ай, қашарлардың ұрықтандыру кезіндегі тірі салмағы ересек малдың салмағының 55-60 пайызын құрап, қондылығы - 3 (1,5) болуы тиіс. Ұрғашы бұзаулардың екі айлық жасындағы салмағы, тәуліктік салмақ қосуы 750 г болған жағдайда, 75-90 кг, алты айлығында 180-220 кг, 15 айлығында 380-420 кг және екі жасында 580-620 кг болуы қажет. Қашарлар біркелкі салмақ қосу негізінде жоғары ұрықтану көрсеткішіне жетеді, ал одан туатын төлдің салмағы жоғары болып, бірінші сауым маусымында сапалы сүт беріп, сүт өнімділігі артады.

Түйін сөздер: қоңыр мал, сүт сауымы, сүт майы, белок (ақуыз).

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ЭФФЕКТИВНОСТЬ РАЗВЕДЕНИЯ АЛАТАУСКОЙ ПОРОДЫ БУРОГО СКОТАВ АО АПК «АГРОПРОМЫШЛЕННАЯ КОМПАНИЯ «АДАЛ»

Аннотация. Модернизация селекционного и технического потенциала в молочном скотоводстве является приоритетным условием в повышении экономической эффективности разведения крупного рогатого скота алатауской породы.

Установлено, что коровы алатауской породы племенного ядра продуцируют 7661±92,8 кг молока, селекционной группы 6761±71,3 кг. В среднем по стаду коровы алатауской породы продуцировали молоко в

количестве $7268 \pm 75,9$ кг, с массовой долей жира в молоке $3,82 \pm 0,09\%$. Выход молочного жира составил у коров алатауской породы $277,6 \pm 3,2$ кг при средней живой массе $620 \pm 17,5$ кг.

В первую лактацию удой в среднем составил $6604 \pm 81,4$ кг при средней жирности молока $3,81 \pm 0,07\%$. Коровы при достижении третьей и последующей лактации в среднем показали удой молока на уровне $8235 \pm 101,7$ кг при массовой доле жира в молоке $3,84 \pm 0,08\%$. По живой массе все возрастные группы коров превосходили требования I бонитировочного класса.

По алатауской породе молочного скота использовали семя быков швицкой породы с удоём М (матери) и МО (мать отца) 10424-14784 кг, с жирностью $3,57-3,68\%$.

В проведенных исследованиях установлено, что живая масса увеличивается от рождения до 17-18 месячном возрасте более чем в 12-13 раз, а средний суточный прирост от рождения до 18 месячного возраста составляет 700-800 г в сутки.

На основании проведенных исследований в период 2015-2018 гг. считаем, что цель при выращивании молочных телок алатауской породы это: возраст телок при отеле - 24 мес; живая масса телок при отеле от 85% до 90% от живой массы взрослого животного; упитанность телок при отеле 3 (1-5); возраст при осеменении - 15 мес.; живая масса телок при осеменении от 55% до 60% от живой массы взрослого животного; упитанность телок при осеменении - 3 (1-5). При среднесуточном приросте живой массы 750 г в двухмесячном возрасте телочки должны иметь живую массу 75-90 кг, в шестимесячном возрасте 180-220 кг, в 15 месячном возрасте 380-420 кг и в двухлетнем возрасте 580-620 кг. Телки с равномерным приростом живой массы во все возрастные периоды имеют высокую оплодотворяемость, а в момент отела способны давать потомство с высокой живой массой при рождении, кроме того в период первой лактации производят молоко высокого качества и в большем объеме.

Ключевые слова: бурый скот, удой молока, жир, белок.

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MARE'S MILK AS A FUNCTIONAL FOOD

Abstract. The article is devoted to topical issues of the application of functional nutrition and its role in preserving and improving the health of the population. A literature review on the creation, production and improvement of functional food products, as well as their further development using modern innovative technologies, was conducted. The development of functional nutrition in Kazakhstan with the use of the freeze-dried form of mare's milk is shown with the aim of increasing the average life expectancy and active longevity.

Key words: functional nutrition, life expectancy, mare's milk.

Year by year, the desire of most people for a healthy lifestyle and nutritious products is gaining higher popularity and recognition in the world. In order to maintain health and stay always in shape, it is necessary to have an active lifestyle, do exercise and monitor diet, and it should be as functional as possible.

Functional nutrition (FF) is a food that serves not only to meet human needs in proteins, fats, carbohydrates, micro- and macroelements, but also to realize other goals such as improving immunity and the functioning of the intestine, heart, reducing or increasing the body mass etc. [1, 2].

Serious changes in our diet have been requested for a long time. Functional nutrition is defined as a nutrition, which contributes to the improvement of the functioning of individual organs, as a result of the whole organism. It has a regulating effect on physiological functions, biochemical reactions and psychosocial behavior of a person.

FN is a new enriched natural special-purpose product with predetermined properties, which, with daily use, maintains physical health and reduces the risk of various diseases [3-6].

We again return to the old entrenched postulates that "food should be medicine, and medicines food," as Hippocrates said [7].

The end of the twentieth century was marked by a large number of scientific discoveries and developments, including the creation of a scientific concept of functional nutrition. The concept of functional nutrition includes:

- Functional food - healthy food, positive nutrition, nutrition with healthy effects.
- Functional nutrition products (FNP) - natural or artificial products, additionally enriched with any biologically active component.
- Functional nutrition ingredients (FNI) - essential food components, ingredients with protective properties, regulatory food substances.

The idea of functional nutrition initially arose in Japan. There, along with existing specific products for pregnant, lactating, infants, and elderly, the concept of "Nutrition for specified health use" (NFSHU) was introduced at the legislative level [8-11].

This concept involves the inclusion in the composition of traditional diets of special functional nutrition that, in addition to satisfying their energy and plastic needs, are able to modulate (optimize) specific physiological functions, biochemical and behavioral reactions of a person, as well as its symbiotic microflora [3].

Throughout the entire period of human civilization, food was considered primarily as a means designed to satisfy feelings of hunger, appetite and taste. Correspondingly, inadequate eating habits became rooted, the diet of the main layer of the modern population became unbalanced, excessively fat, mainly due to saturated solid fats (40% of the ration at a rate of 25%), carbohydrate (over the last 100 years, sugar consumption increased 100 times), mainly due to liquid sugars, products made from fine flour, carbohydrate "dummies", purified, homogenized products [12]. Ecological problems of the twentieth century, "fascination" with pesticides, antibiotics and hormones in agriculture and animal husbandry, preservatives, nitrates in the production of products - all this led to a change in the properties of food. As a result, the epidemic began not infectious, but exchange-alimentary diseases. During the foreseeable past, the frequency of cardiovascular pathologies increased 10-12 times, endocrine disorders 5 times, autoimmune, allergic diseases, diabetes mellitus, atherosclerosis, arterial hypertension and other diseases of civilization began to occur. It has become quite obvious that official medicine and pharmacological science can not create effective methods for curing these diseases. Moreover, they can not even stop their growth. One of the pioneers who offered food and some of their components to replace pharmaceuticals is the Nobel Prize winner Linus Pauling, who in the middle of the last century founded the theory and practice that physical illness and mental illness can be cured not by medication, but by careful selection, constant use of optimal quantities of certain macro-microelements not synthesized by man [13].

The leader in the development of functional nutrition is Japan. This is the only country that legally defined the list of functional products, and the Japanese market of functional products is now one of the most advanced in the world. Therefore, the achievements of this country are often taken as a basis in Europe and the United States. This is the direction of preventive medicine and food biotechnology, which in the 21st century will create real prerequisites for an increase in the average life expectancy, long-term preservation of physical health, social and moral satisfaction, active life and the birth of a healthy generation.

The Japanese government established a certification system for functional food products in 1991. The new system was aimed at helping to promote the production of food products aimed at addressing serious health problems. The Japanese government recognizes functional nutrition as an alternative to drug therapy and defines it as a product of special use for maintaining health (NFSHU) and food products of special use for maintaining health [8-11]. Functional nutrition product is a food product with a purposefully changed chemical composition, which has a positive effect on one or several physiological functions of the body from the position of evidence-based medicine in the systematic daily use. The chemical composition of the food product is altered by additional enrichment determined by the functional food ingredient or by the removal (substitution) of the product component of the beneficial effect product on the body [12].

According to the Scientific Concept of Functional Nutrition in Europe, developed in 1995-1998, food products can only be assigned to FN if it is possible to demonstrate their positive effect on one or another key function human (in addition to traditional nutritional effects) and obtain strong objective evidence supporting these relationships [8-11, 14, 15].

In this respect, the products of FN should also be distinguished from biologically active supplements (dietary supplements) to food. The fundamental difference between FN from dietary supplements to food is the form in which the human body lacks functional ingredients and is delivered to human organs. If in the form of a drug or an additive similar to a drug for oral administration (tablets, capsules, powders, etc.), then it should be said about dietary supplements. If the functional ingredient enters the body in the form of a traditional nutritional product, then it is an FN. In addition, the concentration of the active functional principle in dietary supplements can generally be absent or significantly (sometimes tens of times) higher than the physiological requirements required, so they are usually administered by courses and taken for a certain time.

The concentrations of functional ingredients present in the products of FN and having a regulating effect on human functions and reactions are close to optimal, physiological, and therefore such products can be taken indefinitely, by all age groups of a healthy population [16].

A component of a product, a biologically active substance or a complex of biologically active substances derived from a food source or an identical live culture of probiotic microorganisms with a proven beneficial effect on one or more functions of the human body is defined as a food functional ingredient [17].

Enrichment of a food product with a functional nutrition ingredient should provide the claimed beneficial effect, and make up at least 15%, but not exceed the physiological requirement, with the manufacturer's recommended daily intake of this product. If the manufacturer positions the product as a health product, the content of the functional ingredient must match the declared parameters. To produce the product of FN, high-tech production, ecological clean and genetically unmodified material is used [18]. Cereals represent another alternative for the production of FN products. They can be used as enzymatic substrates for the growth of probiotic microorganisms as a source of non-digestible carbohydrates, contributing to the selective stimulation of the growth of lactobacilli and bifidobacteria. Cereals contain a water-soluble fiber, such as β -glucan and arabinoxylan, as well as oligosaccharides such as galacto- and fructo-oligosaccharides, and resistant starch. Starch can be used as a material for encapsulating probiotics in order to improve their storage stability and increase their viability when passing through unfavorable conditions of the gastrointestinal tract. Thus, cereals actually fulfill the function of prebiotics [19].

Recommendations for the use of FN products include the following list: regulation of immunity, lipid and carbohydrate metabolism, blood pressure, preventing the development of senile syndrome, improving sleep, memory, growth, development and sexual activity, as well as preventing and improving anemic conditions associated with nutritional deficiencies, protection of the liver from chemical damage, protection from radiation and mutagenic effects in order to enhance antitumor protection, etc.

Positive results from the use of enriched food products activated and created an entire industry of "healthy" FN in Japan and the United States. In the European Union each person can choose products not only to taste, but also specialized, aimed at solving certain health problems, such as juices for hypertensive people, chocolate for diabetics, cookies for myopic, etc. [20.3].

The development of this direction should be a priority task of modern preventive and restorative medicine, the implementation of which will allow to increase the average duration of active life in the 21st century with minimal economic costs, with a high level of physical and spiritual health. Already, 40% of North Americans and almost 32% of Western Europeans use the products of FN instead of traditional medicines. Although, currently, FN products constitute no more than 5% of all known food products, but according to forecasts, in the next 15 years their share will reach 30% of the total product market. At the same time, according to calculations of Japanese analysts in the most developed countries, they are replacing many official medications by 35-50% [21].

Probably the most probable part of the FN is probiotics. WHO defines probiotics as safe for humans live bacteria that inhibit the activity of pathogenic microorganisms and ensure the restoration of normal intestinal microflora. Normal human microflora - normoflora (symbiotic, resident, saprophytic, obligate anaerobes) performs a number of important functions in maintaining the vital activity of the body. The protective function is carried out primarily by bifido- and lactobacilli, due to their ability to suppress pathogenic bacteria and compete with them [22].

One of the most important functions of microorganisms of human normoflora is stimulation of the immune system. The most convincing evidence of the effectiveness of probiotics is related specifically to their use to improve bowel function and affect the immune system [23]. More than 80% of the functioning immune system is located in the human abdominal cavity in the form of an intestinal microflora. It forms the "second brain" of the body, having the competence to organize and confirm its comprehensive protection, including from pathogenic origins. It has been established that probiotic bacteria stimulate the immune system by increasing the number and increasing the activity of phagocytes, lymphocytes, production of immunoglobulins, interferon and bacteriocins. They increase the production of cytokines that unite the human immune system into a single whole. The totality of all populations of microorganisms inhabiting different biotopes of the body number about 10^{14} cells more than 1000 (thousand) trillions of symbiotic bacteria. This is 10-20 times more than the number of cells of the human body itself and weighs

about 3 kilograms. A significant part (more than 60%) of microflora inhabits different parts of the gastrointestinal tract (GIT): oropharyngeal 15-16%, skin-12%, vagina-9%, urogenital tract-2% [24].

Microecological aspects of the etiopathogenesis of modern diseases are based on the recognition that the symbiotic microflora is an integral part of the organism, its peculiar extracorporeal organ, which includes billions of microorganisms and fulfills a regulatory function [25, 3].

An analysis of the literature indicates that under natural habitats there is not a single biochemical process, not a single function of living organisms that would be carried out without direct or indirect involvement of symbiotic microorganisms, bacteria possessing the properties of probiotics [26, 27].

Probiotic from Greek - "pro" - "facilitating" and "bios" - "life" - "for life" or this concept was defined as an antonym of antibiotics, i.e. "Promoter of life."

Various kinds of bifidobacteria (*Bifidobacterium longum*, *B. breve*, *B. infantis*, *B. bifidum*, *B. adolescentis*, *B. animalis*), lactobacilli (*L. acidophilus*, *L. casei*, *L. bulgaricus*, *L. gasseri*) are used as probiotics. and other microorganisms (*Lactococcus cremoris*, *L. lactis*, *Streptococcus thermophilus*, *Enterococcus faecium*, *Saccharomyces boulardi* - yeast antibiotic) [25, 28].

The mechanisms of action of probiotics are manifested on three levels of the organism: at the first level, probiotic bacteria inhibit the vital activity of pathogenic strains as a result of competition for nutrients.

On the second, probiotic bacteria interfere with adhesion or displace pathogenic microflora from adhesion receptors, preventing the translocation of intestinal pathogenic bacteria to the internal environment of the macroorganism.

An extremely important mechanism of action of probiotics is the third level involved in the activation of local and general immune responses [20, 28, 30].

Bifidobacteria and lactobacilli are the basic parietal and luminal intestinal microflora, they lining the intestinal mucosa in the form of a protective biofilm. This polysaccharide skeleton consists of polysaccharides of microbial cells and mucin. The thickness of the biofilm is 0.1-0.5 mm. It contains from several hundred to several thousand microcolonies.

Probiotics are most commonly used in gastroenterology, since intestinal microflora disorders are primarily associated with diseases of the digestive system.

Along with probiotics, there are two more terms - "symbiotics" and "prebiotics."

Symbiotics are combinations of several probiotics. It is considered effective at the expense of the total effect of the components.

Prebiotics are substrates stimulating the natural microflora that enter the body as part of the diet. They are not digested and not absorbed in the stomach and small intestine, and getting into the thick intestine are used as a nutrient medium for normoflora, contribute to the improvement of human normoflora due to selective stimulation of growth or active life of probiotic intestinal microflora [28, 31]. Biological effects of prebiotics are an increase in the number of useful anaerobic bacteria, an increase in calcium absorption, fecal volume, a decrease in the time of intestinal transit, and, probably, a decrease in the level of blood lipids.

The main prebiotics are: lactose of breast milk, inulin - polysaccharide contained in flower beds of dahlias, artichokes, dandelions, elements of cell membranes of plants of beets, carrots, pectins, bran, dietary fiber. Jerusalem artichoke flour contains fructooligosaccharides, which are not digested by digestive tract enzymes. In addition, prebiotics include monosaccharides (xylitol, sorbitol, raffinose), oligosaccharides (lactulose, soy oligosaccharide, fructo-oligosaccharide) and polysaccharides (pectins, dextrin, insulin).

Recently in Europe and Kazakhstan special attention is paid to mare's milk as a food product with therapeutic and prophylactic activity. In Europe, many farms have been created for the production of mare's milk. The leading of them is the German horse farm "Kurgestüt Hoher Odenwald" (Hans Zollmann), where not only sublimated (dried) milk is produced, but also various food products (milk porridge, drinks, baby food, ice cream, etc.) based on mare's milk. These food products are essentially functional, as mare's milk has a variety of therapeutic and prophylactic properties. The uniqueness of this product lies in the chemical composition of mare's milk. It contains about 40 biologically active components, the most important of them are vitamins A, C, B1, B2, B6, B12, amino acids, enzymes and trace elements [32], there are low molecular weight peptides, lactoalbumins and globulins. The mare's milk contains a high

level of polyunsaturated fatty acids and linolenic acid of the omega-3 family and has an immunostimulating effect [33].

Milk is recommended as a medical and dietary product, normalizing metabolism and improving health, slowing down the aging process. Milk is recommended for diseases of the immune system, the entire digestive system, including liver and peptic ulcer diseases, as well as oncological pathologies [34-36]. The therapeutic and dietary potential of mare's milk is not exhausted, and is being studied by our national scientists.

The main disadvantage of mare's milk was its instability, as it is rapidly oxidized under the influence of the environment and becomes unsuitable for use 2-3 hours after milking. It can not be boiled, but it loses all useful properties. Therefore, the mare's milk could not be used as a functional food, although in terms of its chemical composition and therapeutic and prophylactic properties it exceeds all other functional foods based on cow's milk.

Thankfully, because of modern high technology in the production of dairy products by the method of freeze-drying at a low temperature (down to -35 °C), it has become possible to store mare's milk for a long time without any preservatives. At the same time, all its useful therapeutic and dietary properties are preserved, repeating up to 80-85% the quality of freshly harvested mare's milk. In addition, the milk is simultaneously subjected to pasteurization and such mare's milk becomes safe for consumption.

Now in Kazakhstan, with the participation of the German company Kurgestüt Hoher Odenwald, a large-scale program for the production of freeze-dried mare's milk by entrepreneurs of Eurasia Invest Ltd LLP with a design capacity of up to 10 tons of freeze-dried mare's milk per year is being implemented. This fact is the main driver of development of production of functional food products in Kazakhstan with therapeutic and dietary and preventive properties.

Thus, at present, using modern innovative technologies, we can use the therapeutic and dietary potentials of mare's milk in the production of functional foods for the purpose of treating and preventing various diseases of internal organs. This direction can contribute to an increase in the average life expectancy, long-term preservation of physical health, active longevity and the birth of a healthy generation, as it was introduced in Japan at the end of the twentieth century - in a country that occupies a leading position on life expectancy in the world.

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БИЕ СҮТІ – ФУНКЦИОНАЛДЫҚ ТАҒАМ

Аннотация. Мақала функционалдық тағамды пайдаланудың негізгі мәселелері мен оның адам денсаулығын сақтау мен жақсартудағы ролі жайында жазылған. Функционалдық тағамдарды жасап шығару, оны өнеркәсіптік жолға қою және заманауи технологияларды пайдалана отырып одан әрі өркендету мақсатында әдеби шолу жасалған. Қазақстанда орта жасты және белсенді өмір сүру ұзақтығын ұзарту мақсатында бие сүтінің сублимацияланған ұнтақ түрін пайдалана отырып функционалдық тағам өндіруді дамыту жолдары көрсетілген.

Түйін сөздер: функционалдық тағам, өмір сүру ұзақтығы, бие сүті.

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КОБЫЛЬЕ МОЛОКО КАК ФУНКЦИОНАЛЬНОЕ ПИТАНИЕ

Аннотация. Статья посвящена актуальным вопросам применения функционального питания и его роли в сохранении и улучшении здоровья населения. Проведен литературный обзор по вопросам создания, производства и совершенствования функциональных продуктов питания, а также их дальнейшего развития с использованием современных инновационных технологий. Показано развитие функционального питания в Казахстане с использованием сублимированной формы кобыльего молока с целью увеличения средней продолжительности жизни и активного долголетия.

Ключевые слова: функциональное питание, продолжительность жизни, кобылье молоко.

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THERMAL-CONTAINING MATERIALS BASED ON PHASE TRANSITION IN THE CONSTRUCTION INDUSTRY

Abstract. The article presents a brief analytical review and possible ways of obtaining heat-accumulating materials with an optimal specific heat. The resulting heat-accumulating materials are characterized by the following properties: high enthalpy of phase transition and density; the required operating melting temperature; high heat capacity, both in solid and liquid phases; absence of stratification of heat-accumulating material and temperature stability; low thermal expansion and low shrinkage upon melting; weak chemical activity (inertness) to structural materials. The technical and scientific novelty of the work is the production of heat-accumulating materials, with a reduction in heat losses, increased heat storage capacity due to an increase in enthalpy of phase transition, protecting buildings from overheating in the summer and overcooling in winter.

Keywords: thermal-accumulating materials, constructions, temperature, heat capacity, crystallization.

The impact of energy on the economy can be safely attributed to the number of determinants of modern social development. The energy problem is one of the key technical, economic and social problems facing humanity. Ensuring energy demand entails not only the development of the energy complex, but also rational consumption, energy saving, the involvement of new renewable energy sources in the energy balance, construction and reconstruction of energy efficient and energy-active buildings.

One of the promising areas of energy conservation in power buildings is the use of heat storage. The process of heat accumulation is associated with providing comfortable conditions in the premises of residential and public buildings using various heat-storage materials (TAM), the accumulation of heat in which is produced through the use of thermal properties [1-4].

As passive TAM, building materials such as concrete, brick, stone, and wood are traditionally used, which have high heat capacity. These materials directly absorb and radiate absorbed energy upon heating and subsequent cooling.

In the expanded version, various compositional mixtures are widely used as TAM of the passive type [5-7]. However, it should be noted the low heat capacity of such materials, and, consequently, the low (thermal) heat-accumulating capacity of the structure.

Undoubtedly, the development of heat-accumulating materials in the form of polymer composites with additives of industrial waste to produce materials with the optimum specific heat is of great interest.

In materials with the latent heat of accumulation, heat transfer occurs during a phase transition when the material passes from solid to liquid state. These materials are called phase-transfer TAMs. The property of such TAMs to increase the heat capacity during the phase transition is used in the development of effective wall panels, multi-layered enclosing structures with a layer of heat-accumulating material, and also in heat accumulators. A classic example of the use of phase-transfer TAMs is to maintain the room temperature by periodically absorbing and releasing the heat of the phase transition during the day and night.

At present, multilayered wall panels of the building with phase-transition TAM have been applied [8-10]. Such panels provide a reduction of heat losses, increase thermal-accumulating ability due to an increase of enthalpy of phase transition, protect buildings from overheating in summer and supercooling in winter.

To increase the accumulating capacity and to ensure the regulation of the thermal conditions of the rooms, it is recommended to use wall panels with a special layer of phase-transfer thermal-accumulating material.

The thermal efficiency of application of thermal-accumulating material on the basis of paraffins with the solid-liquid phase transition in the enclosing structures of the building was investigated in [11]. The aim of the study was to study the dynamics of cooling of a room with thermal (heat)-accumulating material in wall constructions.

The thermal-accumulating material is adopted with the following characteristics: melting point $T_{\phi} = 20,12^{\circ}C$; density of liquid phase $\rho_{ж} = 770 \text{ кг/м}^3$; density of solid phase $\rho_{тв} = 900 \text{ кг/м}^3$; heat capacity of liquid phase $c_{ж} = 3,04 \text{ кДж/(кг}\cdot^{\circ}C)$; heat capacity of solid phase $c_{тв} = 2,91 \text{ кДж/(кг}\cdot^{\circ}C)$; thermal conductivity of the liquid phase $\lambda_{ж} = 0,21 \text{ Вт/(м}\cdot K)$; thermal conductivity of the solid phase $\lambda_{тв} = 0,3 \text{ Вт/(м}\cdot K)$.

External wall - three-layer: the first layer (internal) - from heat-accumulating material; second layer - insulation thickness 250 mm; thermal conductivity $0,06 \text{ Вт/(м}\cdot K)$; the third layer is made of brick thickness 510 mm. Room volume $37,5 \text{ м}^3$ height 2,5 m, width 3 m, length 5 m, area of the outer wall, minus the area of the window $6,5 \text{ м}^2$, thickness of heat-accumulating material was taken 10,50 and 100 mm. In figure 1 shows the graphs of the change in air temperature in the room.

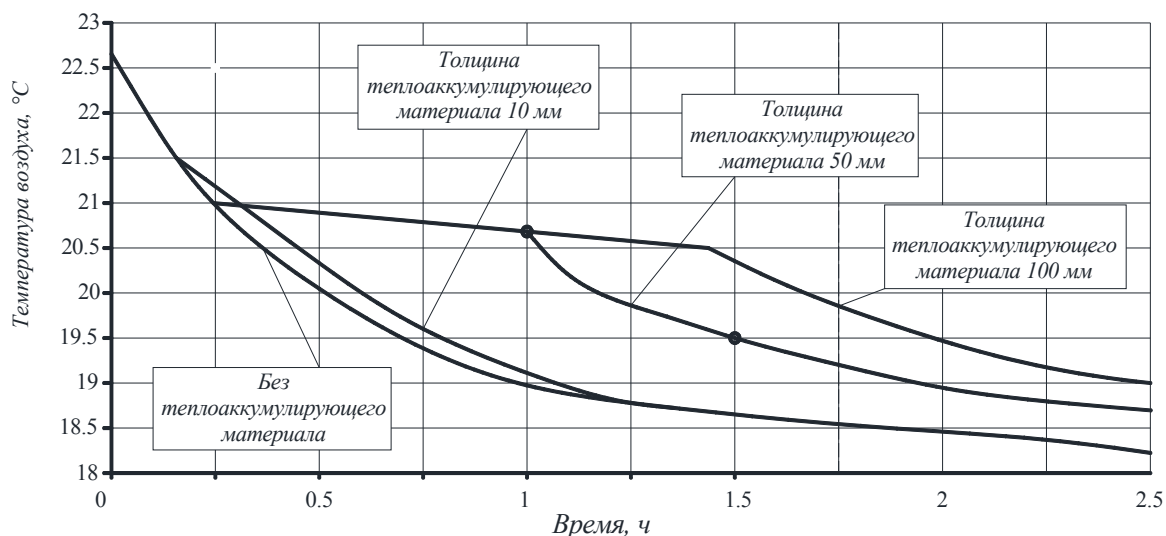


Figure 1 – Change in air temperature in the room

According to the idea of work, when the temperature of the outer surface of the layer of heat-accumulating material is reduced to the crystallization temperature, the thermal-accumulating material passes from the liquid state to the solid state, releasing the heat of the phase transition. The temperature of the TAM layer throughout the entire thickness becomes equal to the temperature of the phase transition. As crystallization, the boundary of the phase transition shifts to the inner surface of the fence. The process is completely completed when the boundary of the phase transition reaches the inner surface of the TAM. This process is reflected by a horizontal plot on the graphs of the air temperature change in the room of figure 1. After the TAM crystallization process is complete, the cooling process again passes the regime of regular heat exchange.

Thus, the use of TAM in enclosing structures retains the internal air temperature of the room for a longer time within acceptable limits, increasing the time of comfortable stay in the room.

Currently, work is underway to develop encapsulated TAM for inclusion in the finishing layer of the fence. For example, BASF has developed a heat-accumulating material for a phase transition based on paraffins, which are microcapsules made of polymers. Inside the microcapsules, there is a paraffin-based material that has a phase transition at temperatures close to room temperature [12].

Microcapsules are incorporated into various finishing materials. Capsules have high strength and do not change the technology of working with building materials. Excess heat of absorption during the day, at night, is released back, which "smoothes out" the temperature fluctuations, creating a comfortable climate in the room.

In the design of exterior enclosures of buildings, solar energy active use systems have been widely used in recent years, which are based on a limited combination in the construction of a layer of material with a large heat-storage capacity and a heat-insulating layer. Figure 2 shows the energy-active design of a fence with a heat storage panel [13].

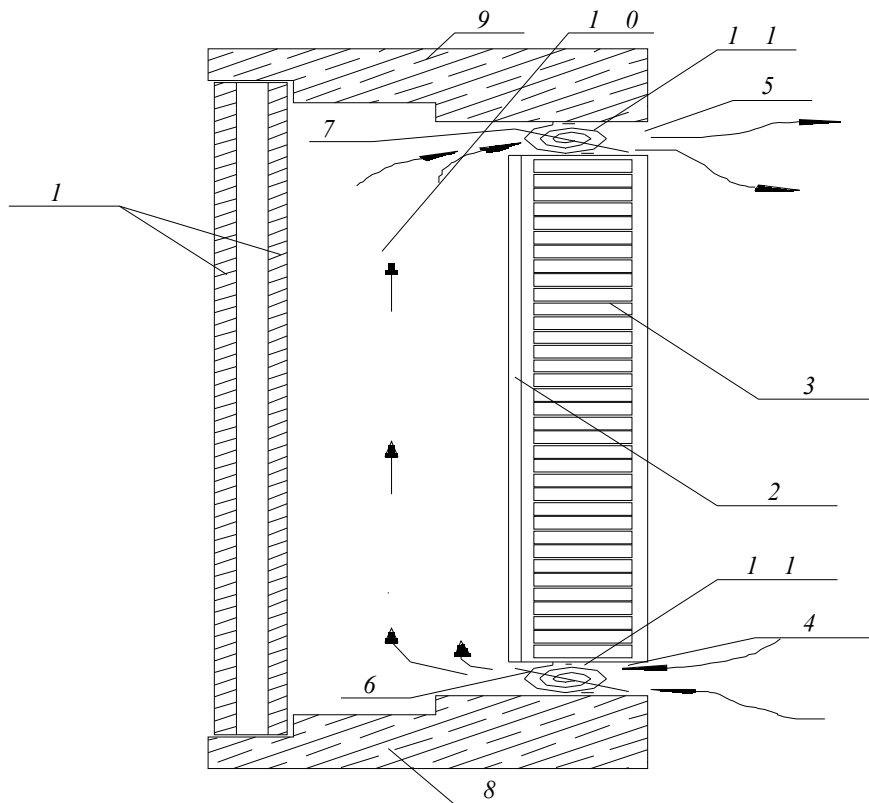


Figure 2 – Energy-efficient fence construction with heat storage panel:

- 1 – double translucent coating; 2 – reflective foil film; 3 – wall panel; 4 and 5 – openings in the upper and lower parts of the fence, respectively inlet and outlet; 6 and 7 – thermostatically controlled dampers; 8 and 9 – respectively, the lower and upper parts of the fence; 10 – the channel; 11 – thermostats, regulating flaps

Together with the heating of air in channel 10, according to the principle of the Trombus-Michel wall, a heat storage panel filled with phase-transition TAM based on paraffin is heated up to the melting temperature of TAM and above. The energy-efficient design of the fence ensures a reduction in heat losses and an increase in the energy efficiency of the building. At the same time, the heat capacity of the enclosure increases due to the use of a heat storage panel with a phase-transfer heat-storage material, since its melting enthalpy is greater than the heat capacity of the materials used. Heat accumulation in the fence panel regulates the thermal regime in the room, and the heat-reflecting layer of the foil and the heat-storage pane with the phase-transition heat-storage material serve as a heat-shield layer in the enclosure.

Note that the effectiveness of TAM depends not only on the design of the fence, wall panels or heat storage devices, but also on the use of the most effective materials used as phase-transfer TAMs.

The accumulating material developed by us on the basis of the phase transition used in construction is supposed to have the following properties:

- high enthalpy of phase transition and density;
- the required operating melting temperature;
- high heat capacity, both in solid and liquid phases;
- lack of stratification of heat-accumulating material and temperature stability;
- low thermal expansion and slight shrinkage during melting;
- weak chemical activity (inertness) to structural materials.

Thus, the scope of TAM in the construction industry is very wide, which justifies the need to develop new materials adapted to operational conditions of buildings.

The solution to this problem lies in a strict scientific approach and the need for a systematic study of the thermophysical characteristics of TAM, ensuring the stability of these characteristics, as well as intensifying research and using multicomponent TAMs with high values of the heat of phase transition.

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ТЕПЛОАККУМУЛИРУЮЩИЕ МАТЕРИАЛЫ НА ОСНОВЕ ФАЗОВОГО ПЕРЕХОДА В СТРОИТЕЛЬНОЙ ИНДУСТРИИ

Аннотация. Представлены краткий аналитический обзор и возможные способы получения теплоаккумулирующих материалов, обладающих оптимальной удельной теплоемкостью. Полученные теплоаккумулирующие материалы характеризуются следующими свойствами: высокую энтальпию фазового перехода и плотность; необходимую эксплуатационную температуру плавления; высокую теплоемкость, как в твердой, так и в жидкой фазах; отсутствие расслоения теплоаккумулирующего материала и температурную стабильность; низкое термическое расширение и незначительную усадку при плавлении; слабую химическую активность (инертность) к конструкционным материалам. Технической и научной новизной работы является получение теплоаккумулирующих материалов, с уменьшением тепловых потерь, повышенной теплоаккумулирующей способностью за счет повышения энтальпии фазового перехода, предохраняющие здания от перегрева летом и переохлаждения зимой.

Ключевые слова: теплоаккумулирующие материалы, конструкции, температура, теплоемкость, кристаллизация.

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ҚҰРЫЛЫС ИНДУСТРИЯСЫНДАҒЫ ФАЗАЛЫҚ АУЫСУ НЕГІЗІНДЕ АЛЫНАТЫН ЖЫЛУАККУМУЛЯЦИЯЛАУШЫ МАТЕРИАЛДАР

Аннотация. Мақалада оңтайлы меншікті жылусыйымдылық қасиетіне ие жылуаккумуляциялаушы материалдарды алу мүмкіндігі мен қысқаша аналитикалық әдебиеттік шолулар берілген. Алынған жылуаккумуляциялаушы материалдар келесі қасиеттерге ие болатыны анықталды: фазалық ауысудың жоғарғы энтальпиясы мен тығыздылығы, қажетті эксплуатациялық балку температурасы, қатты және сұйық фазадағы жоғарғы жылусыйымдылық, жылуаккумуляциялаушы материалдардың қабаттануының болмауы мен температуралық тұрақтылығы, төменгі термиялық кеңеюі және балку кезінде азғана шөгуі, конструкциялық материалдарға әлсіз химиялық белсенділігі (инерттілік). Бұл жұмыстың техникалық және ғылыми жаңалығы жылуаккумуляциялаушы материалдарды кезінде келесі факторлар: жылу шығындардың төмендеуі, қыстақатты суықтаудан және жазда қызып кетуден ғимаратты қорғайтын, фазалық ауысу кезінде энтальпия арттыру арқылы жылу сақтау қабілеті артуы ескерілген.

Түйін сөздер: жылуаккумуляциялаушы материалдар, конструкциялар, температура, жылусыйымдылық, кристаллизация.

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THERMAL CRACKING OF FUEL OIL IN SLATE MIXTURE

Abstract. The results of investigation of thermal cracking of fuel oil of Zhanazhol deposit in the mixture with bituminous slate are specified in this article to obtain motor fuels and raw materials for catalytic cracking. The dependence of light distillate fractional yield of slate concentration (3-12 wt. %), temperature (668-708 K) and time of thermal cracking are determined by the method of non-linear regression. According to the light distillate fractional yield, the following can be considered as optimal conditions of reaction: temperature 688 K, time of treatment 60 minutes and quantity of activating agent (slate) 9 wt. %. Total light distillate fractional yield under these conditions reaches 50.8 wt. %. The obtained light distillates of cracking contain moderate quantity of aromatic hydrocarbons (25.5-30.1 %), unsaturated compounds (iodine value is equal to 1.5-3.9) and very small amount of sulphur (0.01-0.04 wt. %), that ensures compliance with modern requirements for gasoline and diesel fuels according to environmentally hazardous components.

Key words: thermocatalytic cracking, activating agents, slate, fuel oil.

Introduction. Ever-growing demand on motor fuels, which at least pollute environment, stipulates further development of advanced processing of high-molecular oil raw material (boiling temperature exceeds 520-560 °C), as well as solid combustible minerals (coal, slate, top soil).

Strengthening of requirements for the quality of obtained products leads to significant changes of process diagrams and methods of use of the specified types of raw materials [1-3].

An original process of thermochemical treatment of black oil fuel of native and destructive origin (fuel oil, tar, reduced pyrolysis resin, cracked residual, used oils, etc.) is developed in Russian and Kazakhstan, which includes the use of activating agents, which have no analogues abroad. This process is implemented at a pressure of 0.5-2 MPa, temperature of 400-430 °C without hydrogen [4-6].

Natural agents of sapropelite origin (bituminous slate, top soil, sapropelites, liptobiolites, boghead minerals) are used as activating agents. The effect of their interaction on oil residuals is studied on the example of use of bituminous slate [7-12]. It is established, that organic and mineral parts of bituminous slate have an activating influence on thermal conversion of heavy-oil products. Thus, various compounds, offering properties of hydrogen donors are generated during deconstruction of organic mass of slate (kerogen) within a range of temperatures of 370-420 °C. These compounds actively conduce to the hydrogenation reaction of unsaturated compound, which are created during cracking of oil residuals and prevent heavy carbon producing.

On the other hand, mineral part of slate, which contains aluminosilicates, black iron oxide, molybdenum, cobalt, nickel and other catalytic active metals, also conduces to the intensification of reactions of cracking and hydrogenation. While using bituminous slate as activating agent in the quantity of 5-25 % and containing 15-70 % of kerogen, the process of thermal cracking of oil residuals, implemented within a range of temperature of 390-450 °C can be controlled, with light distillate fractional yield up to 70 % without pellet and carbon producing, not exceeding 5 % [13-20].

Experiment. The results of investigation of development of slate thermal cracking in the mixture with refined bituminous slate are specified in this article to obtain components of motor fuels and raw materials for catalytic cracking.

Samples of bituminous slate of JSC Kverts (Kenderlyk deposit), additionally enriched by the floatation and liquid centrifugal separation methods, with the following specifications (wt. %) have been used for the investigations: W^a 1.2-1.3; A^d 18-22; C^{daf} 74.2-74.7; H^{daf} 8.9-9.0; S^{daf} 1.2-1.4; N^{daf} 0.4-0.5; Q^{daf} 14.5-15.0. Silicium (58.2 wt. %) and aluminium compounds (17.2 wt. %) prevail in the composition of mineral part of Kenderlyk slate.

Fuel oil of Zhanazhol oil with a boiling temperature of >520 °C with the following specifications has been used as raw material: density at a temperature of 20 °C 0.933 g/cm³; viscosity 9.8 cSt.; content of asphaltene 1.6 and solids 0.3 wt. %. Thermal cracking has been carried out in rotating autoclave with a volume of 2 l at a temperature of 400-440 °C and operating pressure of nitrogen of 5-8 MPa.

Slate has been mixed with fuel oil up to 12 wt. % while preparing oil and slate paste refined in ball mill (table 1). The obtained paste has been singly dispersed in laminar dispersant of Pushkin-Khotuntsev with holes between plates of 1.0 mm at a speed of moving plate rotation of 1420 rpm.

Table 1 – Influence of slate concentration on product yield (wt. %) of catalytic thermal treatment of fuel oil and slate (688 K, 60 min, 5 MPa)

The thermolysis product	The amount of oil shale, wt. %				
	0	3	6	9	12
Gas	8,1	4,9	5,3	5,5	7,8
Fraction up to 180 °C	15,0	7,1	10,8	13,5	20,0
Fraction 180-360 °C	14,0	28,7	31,8	37,3	39,0
Fraction > 360 °C	62,9	59,3	52,1	43,3	33,2
The total yield of light distillates	29,0	35,8	42,6	50,8	59,0

The results of investigation of slate concentration influence on thermal cracking of fuel oil show that the increase in concentration of slate leads to the increase in light distillate fractional yield up to 50 %.

It is worth noting that thermal cracking of fuel oil with slate additives proceeds with insignificant gas production (4.9-8.1 wt. %), ensuring the high yield (more than 90 %) of ash-free hydrotreated feed and components of motor fuels.

According to the data specified in Table 1, the dependence of light distillate fractional yield on the quantity of slate (x) and fractional yield >360 °C (y) has been determined by the method of non-linear regression.

$$G(x, y) = 4,483*x + 0,4569*y - 0,02491*x*y \quad (1)$$

Data specified in table 2 shows that function $G(x, y)$ satisfactorily present experimental data. The diagram of function $G(x, y)$ is shown on figure 1. It can be seen that the dependence of light distillate yield on the quantity of slate is linear: light distillate yield increases, when the slate weight increases.

The results of investigations under autoclave conditions are specified in tables 3–5. According to the data specified in table 3, it is worth noting that light distillate fractional yield is equal to 37.0-50.8 % depending on the temperature of thermal cracking. Besides, the yield of gasoline fraction increases with a boiling temperature up to 180 °C increases from 6.2 % at a temperature of 668 K up to 21.2 % and at a temperature of 708 K the yield of diesel fraction with a boiling temperature of 180-360 °C is equal to 30.8-23.2 %, correspondingly.

Table 2 – Comparison of experimental and design data on the dependence of total light distillate yield on quantity of slate and fractions >360 °C

Total yield of light products		$\Delta = (\text{exp.} - \text{calc.})$	$100*\Delta/\text{exp.}, \%$
experiment	calculation		
29,0	28,74	0,26	0,8966
35,8	36,11	-0,31	-0,8659
42,6	42,91	-0,31	-0,7277
50,8	50,42	0,38	0,7480
59,0	59,05	-0,05	-0,0848

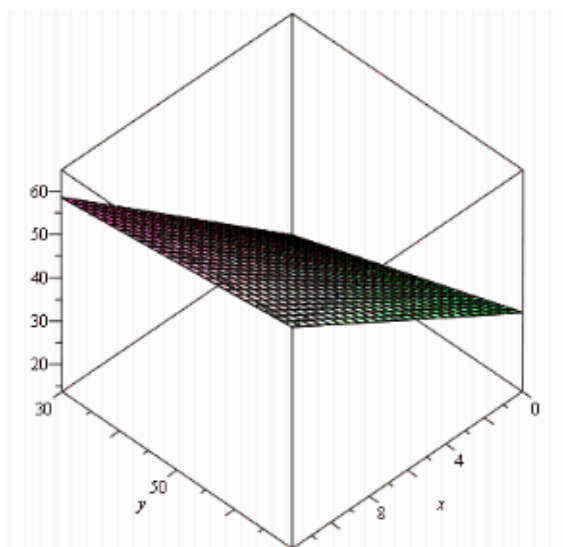


Figure 1 –
The graph of the function G (x, y)

Table 3 – Influence of temperature on thermal cracking of fuel oil mixed with slate (9 % of slate, 60 min, 5 MPa)

The thermolysis product	Temperature, K				
	668	678	688	698	708
Gas	3,0	4,4	5,5	7,1	9,1
Fraction up to 180 °C	6,2	11,9	13,5	17,6	21,2
Fraction 180-360 °C	30,8	34,9	37,3	31,0	23,2
Fraction > 360 °C	60,0	48,8	43,3	44,3	46,5
The total yield of light distillates	37,0	46,8	50,8	48,6	44,4

According to the data specified in table 3, the diagram of dependence of total light distillate yield on the process temperature is constructed (figure 2). It is shown on the figure that light distillate yield has a polynomial dependence on temperature ($R=0.9845$).

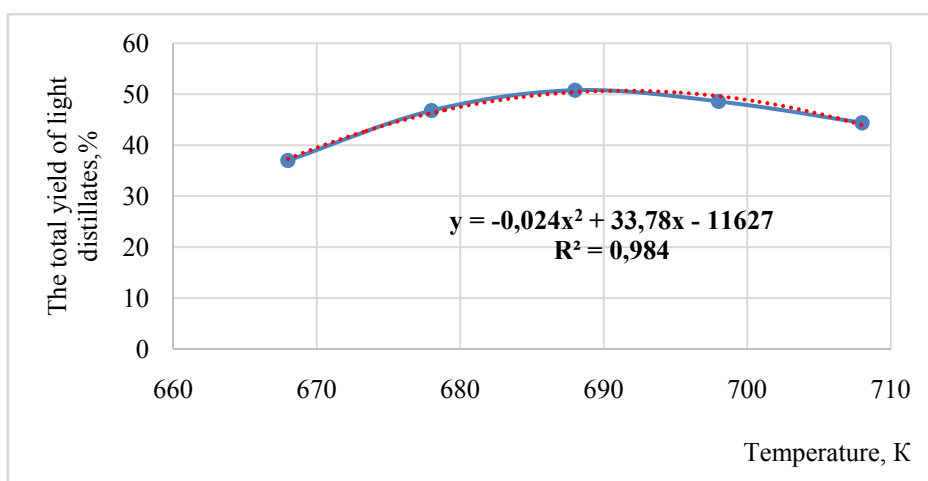


Figure 2 – Dependence of light distillate yield on thermal cracking temperature

The function describing total light distillate yield $G(t, n)$ of t temperature and fractional yield 360°C n , is the following:

$$G(t, n) = 0,1492*t + 3,663*n - 0,007045*t*n \quad (2)$$

Function repeatability is specified in table 4, and its diagram is shown on figure 3 in 3-D coordinates.

Table 4 – Comparison of experimental and design data
on the dependence of total light product yield on temperature and fractions >360°C

Total yield of light products		$\Delta=(\text{exp.}-\text{calc.})$	100* $\Delta/\text{exp.}$, %
experiment	calculation		
37,0	37,1	-0,1	-0,2703
46,8	46,9	-0,1	-0,2137
50,8	51,3	-0,5	-0,9843
48,6	48,6	0	0
44,4	44,0	0,4	0,9009

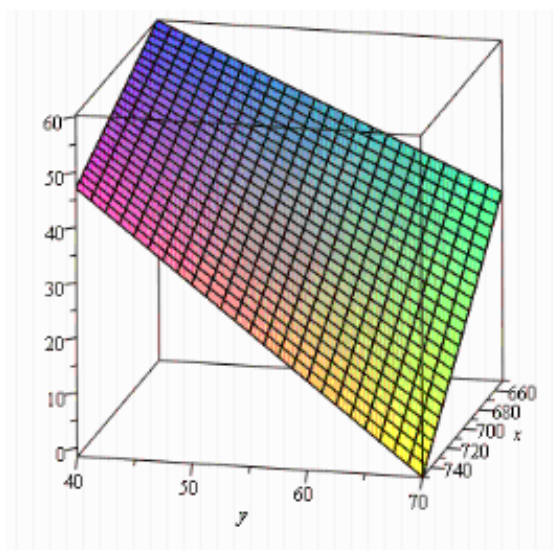


Figure 3 – The graph of the function $G(t, n)$

The results of investigation of influence of thermal cracking time duration on main results of the process (table 5) show that when the time of reaction changes from 10 to 60 minutes, the yield of gasoline fraction increases (from 7.5 to 13.5 %) and yield of medium distillates increases (from 22.6 to 37.3 %), which are better than indices of industrial process of thermal cracking of such type of raw material.

Table 5 – Results of thermal cracking of fuel oil mixed with slate at a various time duration of the process
(688 K, 9 % slate, 5 MPa)

The thermolysis product	Thermolysis time, min				
	10	15	30	45	60
Gas	2,0	2,8	3,7	5,2	5,5
Fraction up to 180 °C	7,5	8,9	10,5	13,5	13,5
Fraction 180-360 °C	22,6	28,3	33,1	36,9	37,3
Fraction > 360 °C	67,5	60,0	52,7	44,4	43,3
Coke on a solid phase	2,4	2,8	3,7	5,2	5,5
The total yield of light distillates	30,1	37,2	43,6	50,4	50,8

According to tables 1, 3, 5, the yields of gasoline fractions with a boiling temperature up to 180 °C is equal to 13.5-20.0 % at a temperature of 688 K, and the yield of diesel fractions is equal to 37.3-39 %. Gasoline and diesel fractions of cracking (table 6) contain moderate quantity of aromatic hydrocarbons (25.5 and 30.1%, correspondingly), unsaturated compounds (iodine value is equal to 1.5 and 3.9) and very small amount of sulphur (0.01-0.04 wt. %), that ensures compliance with modern requirements for gasoline and diesel fuels according to environmentally hazardous components.

Table 6 – Specification of distillate products of thermal cracking of fuel oil mixed with slate

Index	Fractions with b.t., °C	
	up to 180	180-360
Density at 20 °C, g/cm ³	0,7460	0,8696
The refractive index, n_D^{20}	1,4200	1,4795
Group hydrocarbon composition, wt. %		
paraffin + naphthenic	74,5	69,6
aromatic	25,5	30,1
Iodine number, g J2 / 100 g of product	1,5	3,9
Element composition, wt. %:		
C	85,50	87,14
H	13,82	12,81
S	0,01	0,04
N	0,08	0,01

Conclusion. Therefore, to optimize the conditions of thermal cracking, the investigation has been carried out using simple slate of Kenderlyk deposit as activating agent. The influence of slate concentration, temperature and time of reaction on thermal cracking product yield has been studied. According to the yield of distillate fractions, the following can be considered as optimal conditions of reaction: temperature 688 K, time of treatment 60 minutes and quantity of activating agent (slate) 9 wt. %. Total light distillate fractional yield under optimal conditions reaches 50.8 wt. %.

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МАЗУТ ПЕН ТАҚТАТАС ҚОСПАСЫН ТЕРМИЯЛЫҚ КРЕКИНГІЛЕУ

Аннотация. Мақалада мотор отындары мен каталитикалық крекингке арналған шикізат алу мақсатында Жаңажол кен орнының мазутын жанғыш тақтатас қоспасында термиялық крекингтеу үрдісінің нәтижелері келтірілген. Сызықтық емес регрессиялық талдау әдісімен жеңіл дистиллят фракцияларының тақтатас концентрациясына (3-12 масс.%), температураға (668-708 К) және термокрекингті жүзеге асыру ұзақтылығына (10-60 мин.) тәуелділіктері анықталды. Жеңіл дистилляттардың шығымына қарайтын болсақ, оңтайлы деп 688 К температураны, 60 минут уақытты және 9 масс. % тақтатас концентрациясын айтуға болады. Осы оңтайлы жағдайларда жеңіл сұйық өнімдер шығымы 50,8 мас. %-ға жететіндігі дәлелденді. Алынған жеңіл крекинг дистилляттарының құрамында орташа мөлшерде ароматты (25,5-30,1%) және қанықпаған көмірсутектер (йод саны 1,5-3,9) анықталған. Сонымен қатар, экологиялық қауіпті компоненттері бойынша бензин мен дизель отындарына қойылатын талапты қанағаттандыратын күкірт мөлшері (0,01-0,04 масс.%) өте аз екендігі анықталды.

Түйін сөздер: термиялық крекинг, белсендіргіш қоспалар, тақтатас, мазут.

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ТЕРМИЧЕСКИЙ КРЕКИНГ МАЗУТА В СМЕСИ СО СЛАНЦЕМ

Аннотация. Приведены результаты исследования термического крекинга нефтяного мазута месторождения «Жаңажол» в смеси с горючим сланцем для получения моторных топлив и сырья для каталитического крекинга. Методом нелинейной регрессии определены зависимости выхода светлых дистиллятных фракций от концентраций сланца (3-12 масс.%), температуры (668-708 К) и времени осуществления термокрекинга (10-60 мин.). Судя по выходу светлых дистиллятов оптимальными условиями реакции можно считать: температуру 688 К, время переработки 60 минут и количество активирующей добавки (сланца) 9 масс. %. Суммарный выход светлых дистиллятных фракций при этих условиях достигает 50,8 масс. %. Полученные светлые дистилляты крекинга содержат умеренное количество ароматических углеводородов (25,5-30,1%), непредельных соединений (йодное число равно 1,5-3,9) и очень малое количество серы (0,01-0,04 масс.%), что обеспечивает современные требования на автобензины и дизельные топлива по экологически опасным компонентам.

Ключевые слова: термокаталитический крекинг, активирующие добавки, сланец, мазут.

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HYDRO-ELECTROSTATION OF HYDROCYCLONE TYPE OF SMALL POWER FOR LOCAL ENERGY SUPPLY

Abstract. The results of the analysis of the structural features of the existing mini hydroelectric power stations operating with the use of a circulating effect are presented to improve the rotation of the turbine and protect its surface from the ingress of mechanical impurities.

It is shown that the developed structure differs from existing ones, where the water intake of the hydraulic station is made in the form of a cylinder-conical hydrocyclone capsule inside which the turbine is coaxially located and attached to the capsule by means of a discontinuous septum from curved plates in the direction of water twist. Advantages of the improved version of the laboratory stand for testing the hydrocyclone mini hydro-power plant and its main dimensions are indicated.

It is noted that when using the proposed solution, the working capacity of the hydraulic unit is increased, the power characteristic of the unit is improved to 10-15%. The degree of water purification in hydrocyclones during operation in the pressure regime reaches 95-97%. The simplicity of the design of the hydroelectric power station and the technological layout scheme reduces the manufacturing costs by up to 20%.

Key words: low-power hydroelectric power station, hydraulic turbine, abrasive wear, design development, hydrocyclone, laboratory bench, preliminary test.

Experience in the use of most mini and small HPP has shown that one of the problematic issues in the system of development of various types of hydroelectric power stations is the maintenance of operational reliability in general and the protection of hydroturbines from abrasive wear [1-12].

As the results of patent information search in this direction show, a number of known technical solutions to the problem of wear protection are based on preliminary cleaning of the supplied water from the water source into the hydroturbine [13-20]. For example, in the invention with the name "Hydroelectric power plant on a spiral flow of water" [13], 27.10.2009, in order to improve water treatment, the booster tank is designed as a spiral tray, the output part of which runs under the bottom of the input part of tray with offset. In this case, before the flow out of the tray, a threshold that is movable in the vertical plane is installed, which to some extent complicates the design and operation of hydroturbine when the depth of watercourse changes. In addition, the lack of a node for continuous removal of trapped mechanical impurities in the dump leads to an overestimation of operating costs.

«Gravitational vortex station» of Franz Zotlöterer from Switzerland used in practice [15], including the water supply system, the circular pool with a spiral swirl outlet in the center, works by using tangential effect of water supply to central part of the station, which creates swirling flow and rotation hydro turbines located in the center of the funnel. However, this mini hydropower plant construction requires a large water flow per unit of output power with a low head (0.7-1.0 m). The significant diameter of the pool (more than 5 m) and the complexity of the layout scheme lead to an increase in construction costs, complicates maintenance and to some extent leads to a decrease in the power characteristic.

It has been established that the main shortcomings of hydroelectric power plant, equipped with settling tanks that capture suspended solids, are the cumbersome structure, passivity of water purification

processes, due to the precipitation of mechanical impurities through its own weight. Poor-quality water treatment leads to the erasure of the surface of water conduits and turbines, a significant drop in coefficient efficiency, therefore, to a decrease in power and generation of electricity from hydroelectric power plant.

The closest in terms of the technical essence to the proposed development is "Circulating mini-hydroelectric power station" [16]. It contains a water intake from the river supply water conduit, cylindrical tank, hydro turbine, and generator, characterized in that in the bottom of the cylindrical container there is an aperture with a shell, in front of which there is nano-collecting gallery, the output part of which passes under the bottom of a cylindrical vessel. In this case, sediment deposition in the annular nano-collecting gallery is carried out tangentially.

However, the following disadvantages are inherent in the said hydroelectric power station. Water intake execution basin of circulating action in the form of cylinder to a certain extent reduces its sand separating capacity from incoming water and complicates accumulation and removal of trapped mechanical impurities into the dump. The presence of rectangular cross, on which the hydro turbine is attached, prevents rotation of flow inside the cylindrical basin.

The task of the proposed development is simplification of design mini-hydroelectric power stations of circulation action and ensuring purification of water entering the working hydro turbine from mechanical impurities by using rotational effect in hydrocyclones.

The goal is achieved by the fact that water intake of station is made in form of cylindrical-conical hydrocyclone capsule inside which a turbine with smaller diameter is coaxially located to cylindrical part, the hydro turbine axis to the capsule being attached by means of a discontinuous baffle plate from curved plates in the direction of water twist, tangentially fed to the water intake (applied NIIP №2018/0169.1 or 15.03.2018y.).

Figures 1 and 2 show the scheme and general view of the hydrocyclone type mini hydroelectric power station developed. It includes an advance chamber 1, gate valve 2, supply water conduit 3, hydrocyclone-receiver 4, hydro turbine 5, partition 6, drainage branch 7, sand hole 8, generator 9, belt transmission 10 and tensioner 11.

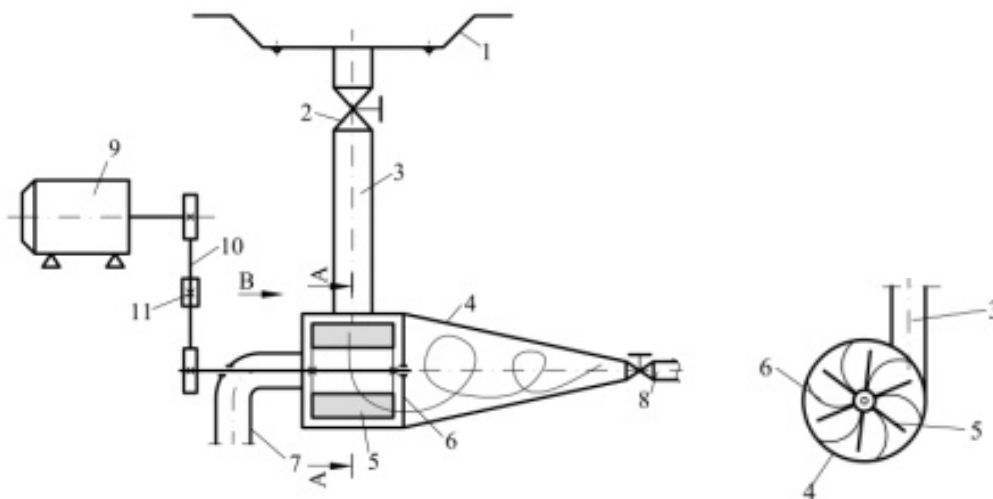


Figure 1 – Constructive diagram of mini hydroelectric power plant hydro-cyclone type

The developed mini hydroelectric power plant works as follows. When the hydroelectric power plant is put into operation pressurized water, which from the pre-chamber 1 with mechanical impurities through the gate valve 2 along the supply conduit 3 enters tangentially into the hydrocyclone-receiver 4 where the hydro-turbine 5 is coaxial.

Due to the tangential input of water, a strong rotational motion is formed, i.e., the circulation of the flow, which acts on the upper surfaces of blades and rotates the turbine fixed inside capsule by means of a discontinuous septum 6 of curved plates in direction of water twist.

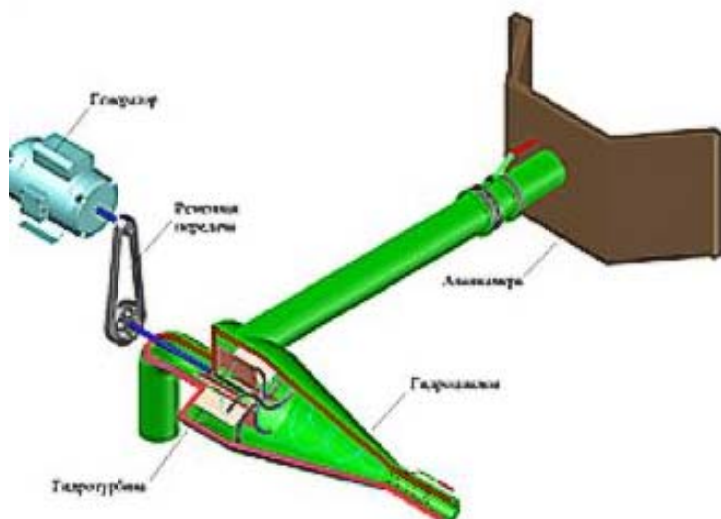


Figure 2 – Scheme of mini hydroelectric hydro-cyclone type, made in 3D

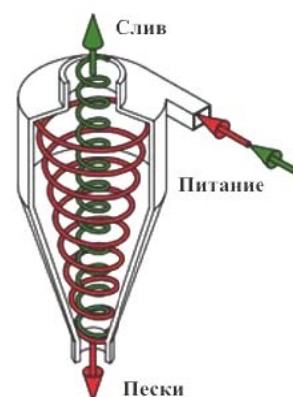


Figure 3 – Types of external and internal swirling water flows in the hydrocyclone

In the separation and carrying away solid particles towards the sand hole 8 of hydro-cyclone, the internal swirling flow of purified water rising to the top of the spout 7 enhances the rotation of the turbine shaft from the inner side (figure 3).

The interaction of two surface swirling flows significantly increases the efficiency of the hydraulic unit and increases the power by 15-20%.

Rotation of the turbine through the belt transmission is transmitted to the generator 9. The generator generates an electric current.

The mechanical impurities trapped in the hydrocyclone, predominantly in the form of fine sand, accumulate at the sand hole and are ejected at the expense of the residual head into the dump through the pipe.

In the mini hydropower plant technological scheme, if necessary, i.e when the water level in the river fluctuates to a smaller or larger side can be used a tensioner 11 provided with an additional wheel with a spring.

Minihydroelectric power station is mainly adapted for individual use in mountainous conditions, where the water supply is sufficient.

The first version of this development for a small hydroelectric power plant was demonstrated at EXPO-2017 among 28 domestic projects [17, 18].

When developing a new mini hydroelectric power plant of hydrocyclone type, the calculated power output was determined by the formula:

$$N_p = 9,81 Q_t H_t, \quad (1)$$

where Q_t – water flow to the turbine, m^3/h ; H_t – water pressure at the hydro turbine, m.

Then, the power on the turbine shaft is $N_t = N_p \eta_t$, where η_t is the turbine efficiency, N_t is in kW.

The value of the efficiency of the turbine depends on the change in the load. For small turbines, with a diameter of the impeller less than 1 m, efficiency is 0.89-0.91; for large turbines 0,94-0,96. Electric power of the unit N_u (kW) at the generator terminals is less than the turbine power by the amount of losses in the generator

Estimated water flow for one turbine:

$$Q_t = \frac{N_a}{9,81 \cdot H_p \cdot \eta_a}; \quad (2)$$

To determine the diameter of the impeller, we use the universal characteristic of the executed turbine.

The diameter of impeller D of a hydroturbine is determined by the formula:

$$D = \sqrt{\frac{N_t}{9,81 \cdot Q'_t \cdot H_p \sqrt{H_p \eta_T}}}, \quad (3)$$

where N_t – nominal power of the hydroturbine, kW; Q'_t – reduced flow at the design point, m³/s; H_c – rated head of the turbine, m; η_T – the full efficiency of the full-scale hydroturbine, corresponding to the mode of its operation at the design point.

The initial data for the calculation of the hydrocyclone body for providing the hydroturbine of mini hydro power plants with water purified by water were adopted:

The flow rate of water passing through the hydrocyclone is Q_p , m³/h;

The pressure drop of the liquid at the entrance to the hydrocyclone and the exit from it $-\delta H$, m;

Density of water with mechanical impurities $-\rho_h$, kg/m³;

The content of suspended particles before purification is γ , mg/l.

Then, according to the method described in [19], the diameter of the cylindrical part of the hydrocyclone:

$$D_c = \sqrt{\frac{Q_H}{0,13 \times k_1 \times \sqrt{\delta H}}}, \quad (4)$$

where Q_p – water flow through the hydrocyclone, m³/s; k – experimental coefficient of dimension, $k = 0.45-0.65$; δH – pressure drop of the fluid at the entrance to and exit from the hydrocyclone.

Usually for hydrocyclones of medium and large diameters, depending on the inlet pressure, δH is (15–25) H_{out} ;

Diameter of the discharge pipe

$$d_{dis} = \frac{D_c}{k_2}, \text{ m}, \quad (5)$$

where k_2 is the coefficient determining the ratio of the diameter of the discharge pipe to the diameter of the cylindrical part, $k_2 = 3.5 \dots 4$.

Figure 4 shows a diagram of a laboratory bench for testing a hydro-cyclone mini hydroelectric power plant. The stand is placed on two tables [20].

On the first table is the main part of the research stand, made on the basis of a centrifugal pump 1.5KM with step-by-step power control, parameters of the pressure hydrocyclone and a hydroturbine. To change the operating mode, special valves, electronic pressure sensors, installed at the assembled units of the hydraulic unit, as well as an electronic flowmeter were used. Under the table was a container with water for circulating water supply, into which liquid is supplied from the suction pipe of the model of a small hydroelectric power plant.

On the second table a personal computer with a monitoring program of the stand installation and a communication cabinet with control and measurement elements, as well as a module for interface of measuring sensors with a personal computer, are installed.

The basic pump of the stand has a capacity up to $Q = 20-25$ m³/h and a head $H = 30$ m. A hydro-cyclone body with an internal diameter of $D = 200$ mm at rated operating conditions can provide a purified water capacity of up to 20 m³/h. Connecting and distribution pipes have diameters in the range of 32–40 mm. The water tank is designed for 70–80 l. Based on these parameters of the basic units, the power produced by the hydroturbine was determined to 4–5 kW.

Preliminary experiments show that the value of the generated power (energy) directly depends on the pressure on the line and frequency of rotation generator shaft. Increasing the pressure on the impeller of the turbine increases the speed of rotation and thereby increases the technological capability of unit to maximize the use of energy from water resources.

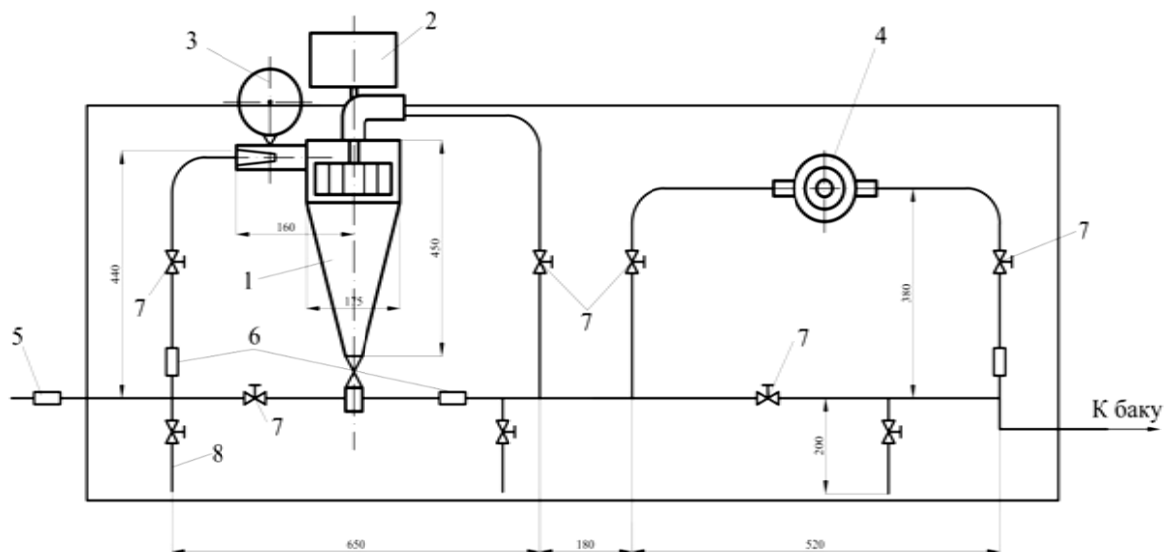


Figure 4 – The stand-alone diagram of a laboratory stand for testing a hydro-cyclone minihydroelectric power plant type:
 1 – hydrocyclone with a hydroturbine; 2 – generator; 3 – dispenser; 4 – small hydroelectric unit;
 5 – electron flowmeter; 6 – electronic pressure sensors; 7 – gate valve; 8 – drainage

As indicated in work [1], the modeling of water purification processes in the hydrocyclone allows to determine the data for designing production plants that provide the most productive work. In this way, modeling the operation of the hydrocyclone significantly reduces the number of model and full-scale tests.

Based on the results of the analysis, it is established that to use computer simulation data the numerical model must be verified by a physical experiment. Therefore, numerical analyzes of the processes were carried out on the basis of STAR CCM + 6.04 software package using the results of experimental studies of the hydrocyclone water treatment unit, set forth in the scientific report [1].

A positive feature of the upgraded booth is that its design provides possible modes of operation for different layouts, for example: pump-hydrocyclone, pump-hydrocyclone-hydraulic turbine and pump-tank. Using the adopted technological closed line, it is possible to carry out experiments in a continuous mode and to study the parameters of the main elements separately and in aggregate.

In general, the minihydropower plant under consideration, in contrast to the existing analogs, makes it possible to use mini hydro power plants in the capsular version and to master the hydrocyclone effect for separating the solid phase from the liquid in the water supply of the hydroturbine. At the same time, the working capacity of the hydraulic unit is improved, the power characteristic of the unit is improved to 10-15%. The degree of water purification in hydrocyclones during operation in the pressure regime reaches 95-97%. The simplicity of the design of the hydroelectro station and the technological layout scheme reduces the manufacturing costs by up to 20%.

The considered mini hydroelectric power station of hydrocyclone type is developed according to the target program "Creation of the basics serial production of Kazakhstan renewable energy sources of the world level" (BR05236263, NASRK, 2018-2020).

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БӨЛЕК ОРНАЛАСҚАН НЫСАНДАРДЫ ЭНЕРГИЯМЕН ҚАМТАМАСЫЗ ЕТУГЕ АРНАЛҒАН ШАҒЫН ҚУАТТЫ ГИДРОЦИКЛОН ТИПТЭС ГИДРОЭЛЕКТРОСТАНЦИЯ

Аннотация. Гидротурбинаның айналуын жақсарту және механикалық қоспалардың әсерінен оның бетін қорғау үшін су айналымы әсерінен жұмыс істейтін қолданыстағы шағын гидроэлектростанциялардың жобалық ерекшеліктерін талдау нәтижелері келтірілген.

Қарастырылып отырған гидростанцияның бұрынғылардан ерекшелігі, яғни оның су қабылдағышы цилиндрлі-конусты түрде жасалған гидроциклондық капсуладан тұратындығы, оның ішіндегі қалақшалы турбинаның бір бойлықта орналасқандығы және оның капсулаға айналма су бағытына сәйкес қисатылған пластинкалармен бекітілгені көрсетілген.

Гидроциклондық шағын гидроэлектростанцияны сынақтан өткеруге арналған стендтің жетілдірілген нұсқасының артықшылықтары және оның негізгі өлшемдері келтірілген.

Ұсынылған шешімді пайдаланған жағдайда гидравликалық агрегаттың жұмыс қабілеттілігінің артып, қуаттық сипаттамалары 10-15%-ға дейін көтерілетіндігі, қысымдық жұмыс режимі кезінде суды тазарту дәрежесі 95-97% жететіндігі баяндалған. Гидроэлектростанция құрылымының қарапайымдылығы және технологиялық оңтайлылығы тұрғызу және пайдалану шығындарын 20%-ға дейін төмендетеді.

Түйін сөздер: мини ГЭС, гидротурбина, абразивті қажалу, құрылымды жасау, гидроциклон, тәжірибелік стенд, алдын ала сынақтан өткеру.

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ГИДРОЭЛЕКТРОСТАНЦИЯ ГИДРОЦИКЛОННОГО ТИПА МАЛОЙ МОЩНОСТИ ДЛЯ ЛОКАЛЬНОГО ЭНЕРГООБЕСПЕЧЕНИЯ

Аннотация. Приведены результаты анализа конструктивных особенностей существующих мини ГЭС, работающих с использованием циркуляционного эффекта для улучшения вращения гидротурбины и защиты ее поверхности от попадания механических примесей. Показано отличие разработанной конструкции от существующих, где водоприемник гидростанции выполнен в виде цилиндрико-конической гидроциклонной капсулы, внутри которой соосно расположена лопастная гидротурбина и она к капсуле прикреплена с помощью несплошной перегородки из изогнутых пластин по направлению закрутки воды. Указаны преимущества усовершенствованного варианта лабораторного стенда для испытания мини гидроэлектростанции гидроциклонного типа и его основные размеры.

Отмечено, что при использовании предлагаемого решения повышается работоспособность гидроагрегата, улучшается мощностная характеристика агрегата до 10-15%, Степень очистки воды в гидроциклонах при работе в напорном режиме достигает 95-97%. Простота конструкции гидроэлектростанции и технологической схемы компоновки снижает затраты на изготовления до 20%.

Ключевые слова: мини ГЭС, гидротурбина, абразивный износ, разработка конструкции, гидроциклон, лабораторный стенд, предварительное испытание.

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METABOLIC SYNDROME AND CEREBRAL STROKE IN KAZAKHSTAN: SOME MANAGEMENT FACTORS

Abstract. The purpose of the paper is to study the specific features of the influence of certain factors on mortality due to cerebral stroke (CS) in different regions of Kazakhstan.

Materials and methods. The data on incidence and mortality in CS from the national statistics of Kazakhstan were used. The analysis was carried out using the methods of descriptive and analytical statistics.

Results. Three groups of regions of Kazakhstan have been formed depending on the level of the specific gravity of the CS in the overall structure of deaths for 2012-2016. The ratio of incidence to mortality in Kazakhstan indicated stable dynamics from 2012 to 2016 among the population. The data obtained suggest that among the generally accepted medical and non-medical measures, the management of the development of metabolic disorders before the risks of aging-associated diseases can be used to manage their mortality, including from a cerebral stroke.

Keywords: cerebral stroke, metabolic syndrome, incidence, mortality.

Introduction. In Kazakhstan, the problem of cerebral stroke (CS) is the most important problem in the structure of the causes of CS deaths and ranks second after coronary heart disease, which corresponds to the structure of the leading causes of death in the world [1-5]. However, in the country, the rate of mortality growth in CS, against the backdrop of an increase in life expectancy and an increase in the proportion of people over 65, significantly outstrips the rate of death in acute myocardial infarction. Therefore, in the coming years Kazakhstan may well be among the countries where CS is the first cause among other causes of deaths of the population.

Such dynamics is confirmed by the conclusions obtained by Feigin V.L. with co-authors within the framework of the systematic review "Global and regional burden of stroke during 1990-2000" [6].

The Republic of Kazakhstan is located in Central Asia, it includes 14 regions and 2 cities of republican significance, differing significantly in the density of residence (from 2.7 to 23.5 sq.km.), the proportion of people over 65 (from 3, 74% to 10.68%) and, accordingly, the main indicators of incidence and mortality. The specific gravity of CS deaths also has significant differences in different regions of the country (from 3.2% in the West Kazakhstan in 2012 to 12.8% in the Karaganda in 2016).

Purpose of the study. To study the specific features of the influence of certain factors on mortality due to cerebral stroke in different regions of Kazakhstan.

Materials and methods. The study was conducted in the following stages:

1. A retrospective study of cases of CS among population of 16 regions of the country and cities of Astana and Almaty was carried out based on the data of statistical reports of the Ministry of Health and the Agency for Statistics of the Republic of Kazakhstan for 2012-2016 [3, 4].

2. The CS situation was assessed based on the data of the electronic health records of patients treated in the country's hospitals [3, 4].

3. A retrospective analysis of the effectiveness of CS prevention at the level of correction of metabolic disorders was made based on the data of the Medical Center Hospital of President's Affairs Administration of the Republic of Kazakhstan.

We used software tools VBA Microsoft Excel and a package of statistical programs Statistica 9.0. for statistical data analysis. Standardized indicators were calculated taking into account the age-sex pattern of the population of the Republic of Kazakhstan. The method of direct standardization was applied. Data on the distribution of the number of men and women by age groups in Kazakhstan were used. Fisher's exact test was used to determine the reliability of the differences in the obtained indicators. The critical level of significance in testing hypotheses was $p = 0.05$.

Results. The regions of Kazakhstan were divided into 3 groups according to the level of specific gravity of CS in the overall structure of deaths for 2012-2016.

The first group (high-level) included the regions (4 regions) of the country, where the indicator is higher than the average republican range (10.68% and higher): Karaganda (12.88%), South Kazakhstan (10.94%), Aktobe (10.77%), Atyrau (10.69%) regions. In these regions, 32.1% of Kazakhstan's population (5,655.0 people) live, and 38% (4,368 cases) of the population died of the total number of deaths from stroke in Kazakhstan (11,510 cases) in 2012-2016.

The second group (mid-level) included the regions (3 regions and 1 city) of the country, where the indicator is close to the average republican range (from 8.73% to 10.67%): Astana (9.63%) city, Zhambyl (10.45%), Kyzylorda (9.60%), West Kazakhstan (9.38%) regions. In these regions, 19.1% of Kazakhstan's population (3,385.3 people) live, and 18.4% (2,117 cases) of the population died of the total number of deaths from stroke in Kazakhstan (11,510 cases) in 2012-2016.

The third group (low-level) included the regions (7 regions and 1 city) of the country, where the indicator is below the average republican range (8.72 and below): Almaty (8.36%) city, Pavlodar (8.05%), North Kazakhstan (7.22%), Mangystau (7.07%), East Kazakhstan (6.94%), Almatynskaya (6.78%), Akmola (6.30%), Kostanai (5.17%) regions. In these regions, 48.8% of the population of Kazakhstan (8,629.5 people) live and 43.6% (5,025 cases) of the population died of the total number of deaths from stroke in Kazakhstan (11,510 cases) in 2012-2016.

A number of indicators were evaluated, reflecting the impact of medical and non-medical factors on the specific gravity of CS in the total number of deaths in 2012-2016. The most significant factors were formulated as follows:

– non-medical factors: density of residence, the ratio of unemployed and employed people among hospital cases, the ratio of women and men among hospital cases, the proportion of people over 65, total 4 indicators;

– medical factors: incidence to mortality rate of CS, specific gravity of hospital mortality of CS, case fatality rate of CS, number of concomitant diseases per 1 inpatient case with CS, total 4 indicators. The evaluation of each factor was carried out both during the period under study and through the indicator averaged for the period under study.

Non-medical factors. The proportion of unemployed people among hospital cases indicated a direct effect on the proportion of deaths from stroke in the structure of causes of death in the regions of Kazakhstan, prevailing in the regions with a high specific gravity of deaths from strokes (7.39) over regions with a low specific gravity of deaths from stroke (1.89) 3.9 times (table 1).

Table 1 – Non-medical factors in the main study groups (2012-2016)

Indicators	The first group (high-level)	The second group (mid-level)	The third group (low-level)
Density of residence, sq.km.	8,8	5,1	5,5
The ratio of unemployed and employed people among hospital cases	7,39	5,75	1,89
The ratio of women and men	0,978	0,977	1,02
The proportion of people over 65, %	5,83	5,61	8,3

Source: Statistical compilation of the Ministry of Health of the Republic of Kazakhstan "Health of the Population of the Republic of Kazakhstan and the Activities of Health Organizations in 2012-2017", "Demographic Yearbook of Kazakhstan in 2017", Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan.

In the indicators common to the group of regions there is no noticeable influence of the ratio of women and men, the proportion of the old population on the proportion of deaths from CS. However, after a parallel assessment of the dynamics of these indicators in the period under study, it became apparent that the ratio of women to men is 1:1, in the regions of the third group where the proportion of the population over 65 is higher than the national average. Conversely, the ratio of women to men is 1:1, in the regions of the first and the second group where the proportion of the population over 65 is below the national average. Thus, in the context of the significant difference between the life expectancy of women (76.61 years) and men (67.99 years), the influence of the predominant increase in the number of deaths from stroke among women over 65 is increasing in Kazakhstan.

Non-medical factors should be taken into account when developing integrated approaches to the model of management of incidence and mortality of CS: employment of the population, especially the able-bodied, with the aim of self-sufficiency with the necessary resources for a quality life, the development of transport and social infrastructure in the regions with a low population density. In addition, such work is conducting in Kazakhstan within the framework of state programs [1, 2].

Medical factors. In the regions of the group with a high level of death of CS (the first group), patients are more likely to receive inpatient medical care, although at the same time in-hospital case fatality rate increases to some extent. In addition, comorbidities are more often recorded. This situation makes it possible to evaluate emergency medical assistance in case of CS as more organized.

The average specific gravity of deaths in CS was accompanied by an even higher incidence in the regions of the group with mid mortality level in CS (the second group), but in this group, patients die less in hospital than in others, and the number of concomitant diseases for hospital stroke is below the average by country (table 2). For this group of regions, the organization of emergency medical assistance was evaluated as less organized.

Table 2 – Medical factors in the main study groups (2012-2016)

Indicators	The first group (high-level)	The second group (mid-level)	The third group (low-level)
Incidence to mortality rate of CS	2,93	6,53	4,71
Specific gravity of hospital mortality of CS	45	44	57,0
Case fatality rate of CS	10,8	9	9,2
Number of concomitant diseases per 1 inpatient case with CS	0,55	0,41	0,53
<i>Source:</i> Statistical compilation of the Ministry of Health of the Republic of Kazakhstan "Health of the Population of the Republic of Kazakhstan and the Activities of Health Organizations in 2012-2017", "Demographic Yearbook of Kazakhstan in 2017", Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan.			

Thus, medical factors can also be used to manage mortality from strokes: from standard counseling at the prehospital level to timely inpatient care, since they have a direct effect on the specific gravity of CS in the overall structure of deaths. Within the framework of the State Health Development Program "Densauyk" for 2016-2019, the management of strokes, as well as the management of the four most significant non-communicable diseases related to age, is built based on an integrated model of medical care (cluster).

However, these activities involve the provision of medical care to patients who already have cerebrovascular disease. In this regard, it is appropriate to present some results of the work on the prevention of strokes at the level of correction of metabolic disorders. This work is carried out at the Medical

Table 3 – Basic data on the group of patients of the MCH PAA RK

Indicators	2012	2013	2014	2015	2016
The proportion of people over 65, %	4,4	4,4	5,5	6,4	7,4
The ratio of women and men	1,3	1,3	1,2	1,3	1,27
The incidence of stroke, 100 thousand people	75,7	56,2	73,5	65,3	98,9
Mortality from strokes, 100 thousand people	8,4	32,1	14,7	13,1	11,6
Incidence to mortality rate of CS	9,0	2,4	5,0	4,98	8,52
<i>Source:</i> Statistical reports of the MCH PAA RK for 2012-2016.					

Center Hospital of President's Affairs Administration of the Republic of Kazakhstan (MCH PAA RK) for 5 years with a group of 19,328 patients. The incidence, mortality, and the ratio of these indicators show stable dynamics from 2013, unlike similar indicators for Kazakhstan (table 3).

The data obtained suggest that among the generally recognized medical and non-medical measures, the management of the development of metabolic disorders prior to the implementation of risks can be used to manage the risks associated with mortality, including from CS.

Conclusions. Clinical and demographic data for Kazakhstan indicate an increase in the frequency of CS in relation to myocardial infarction, which is a serious challenge for the health care system and social protection of Kazakhstan and the need for their readiness for the growth of disability among the increasing proportion of the population of the elderly and senile age.

Given the continuing increase in incidence and mortality of CS with a stable ratio against the background of objective improvement of medical care for patients with cerebrovascular diseases in Kazakhstan, it is necessary to recognize the insufficient effectiveness of today's measures.

Kazakhstan needs a comprehensive and comparable assessment of incidence, prevalence, mortality, disability and epidemiological trends of diseases associated with age, which would allow defining an effective strategy for management of functional aging, which determines the development of anti-aging medicine.

It became obvious that the prevention of high risk of stroke at the level of previous metabolic disorders can be much more effective than the detection and treatment of already realized diseases. This is evidenced by a significant decrease in incidence and mortality of CS in the group of patients under preventive supervision for metabolic syndrome, against the backdrop of the continued growth of these indicators in Kazakhstan.

Thus, a population strategy focused on the prevention of the risk of aging-associated diseases will allow move their incidence and mortality to a later age, and therefore significantly increase the period of active longevity.

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ҚАЗАҚСТАНДАҒЫ МЕТАБОЛИКАЛЫҚ СИНДРОМ ЖӘНЕ ЦЕРЕБРАЛЬДЫ ИНСУЛЬТ: КЕЙБІР БАСҚАРУ ФАКТОРЛАРЫ

Аннотация. Зерттеудің мақсаты Қазақстан аймақтарында церебральді инсульттың (ЦИ) салдарынан болған өлімге кейбір факторлардың әсерінің ерекшеліктерін зерттеу болып табылады.

Материалдар және әдістер. ЦИ кезінде ауру және өлім-жітім туралы Қазақстанның мемлекеттік статистикасының мәліметтері пайдаланылды. Талдау статистикалық және аналитикалық статистиканы қолдана отырып жүргізілді.

Нәтижелер. 2012-2016 жылдардағы өлім-жітімнің жалпы құрылымында ЦИ үлесінің деңгейіне байланысты Қазақстан аймақтарының үш тобы құрылды. Осы топтағы аурудың өлім-жітімге қатынасы 2012-2016 жылдар аралығында Қазақстан халқының арасында тұрақты динамикаға ие болды. Алынған мәліметтер жалпы қабылданған медициналық және медициналық емес шаралардың ішінде метаболикалық бұзылулардың дамуын басқару жас-ассоциацияланған аурулар қауіптерін іске асыруға дейін олардың өлім-жітімін, оның ішінде церебральды инсульттан болған өлімді басқару үшін пайдаланылуы мүмкін екендігін көрсетеді.

Түйін сөздер: церебральді инсульт, метаболикалық синдром, ауру-сырқау, өлім-жітім.

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МЕТАБОЛИЧЕСКИЙ СИНДРОМ И МОЗГОВОЙ ИНСУЛЬТ В КАЗАХСТАНЕ: НЕКОТОРЫЕ ФАКТОРЫ УПРАВЛЕНИЯ

Аннотация. Целью исследования было изучение особенностей влияния некоторых факторов на смертность по причине мозгового инсульта (МИ) в разных регионах Казахстана.

Материалы и методы. Использованы данные о заболеваемости и смертности при МИ официальной государственной статистики Казахстана. Анализ проводился с использованием методов описательной и аналитической статистики.

Результаты. Сформированы 3 группы регионов Казахстана в зависимости от уровня удельного веса МИ в общей структуре смертей за период 2012-2016 годы. Соотношение заболеваемости к смертности в этой группе имело стабильную динамику с 2012 года по 2016 году среди населения Казахстана. Полученные данные позволяют предполагать, что в числе общепризнанных медицинских и немедицинских мероприятий управление развитием метаболических нарушений до реализации рисков возраст ассоциированных заболеваний может быть использовано в управлении их смертностью, в т.ч. и от мозгового инсульта.

Ключевые слова: метаболический синдром, долголетие, антивозрастная медицина, мозговой инсульт, заболеваемость, смертность, летальность.

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THE CURRENT PRACTICE OF THE NATURAL SACRED SITES WORSHIP AND THE LOCAL NARRATIVES FORMATION IN KAZAKHSTAN

(using Ulytau region as an example)

Abstract. The actual revival of the natural sacred sites worships and the inclusiveness of its new elements is an ongoing dynamic process. It correlates with the updating of the narrative, which is related to these sacral sites.

The article aims on identifying and analyzing the current practice of honoring of the natural sacred sites and the narratives associated with these sites. The focus of the study are the Ulytau worship natural sites and related narratives. The key study issues are: the prerequisites for contemporary revival of the natural sacred places veneration and attributed narratives; the reason for its updating demand; and the core nature of these processes.

For a long period, the Ulytau region has been attracting the interests of historians and archaeologists, and a certain academic knowledge has been collected here. However, the specific nature of the Ulytau cultural code formation, functioning and preservation of has been never a subject of an adequate studies. The article benefits from the works of Kazakh and Russian scientists, as well as fact-finding field surveys and in-depth interviews of the local inhabitants and sacred sites keepers of (*baksy*, *shyrakshy* and assistants). The findings were collected within the period of years 2016-2018.

In the course of preparation of this article the authors used the retrospective and comparative-historical methods. The article presents an analysis of the current worship practice of the natural sacred sites and the related narratives, which reflect the new cultural elements in this practice.

Keywords: sacred natural sites, worship tradition, local narrative, cultural dynamics, identity, Kazakhstan.

Introduction. Since ancient times all cultures attribute a practice of veneration of the natural sacred places as the inalienable spiritual and devotional element. Nowadays we can observe Currently, a kind of renaissance for this phenomenon: an appearance of a new sacred places; preserving and updating of the ritual practices and related narratives. The demand goes from the grass-roots level, and there is no single algorithm, however, one can identify some common motivations and tendencies along with certain regional peculiarities.

The growth of ethnic and pilgrim tourism today provides a significant impact on the traditional ritual practices that have been continuously shaped within a specific regional historical and cultural context. Hence, the pre-Islamic cultural layers do not compete with later impact, but synthesize with it in a quaint complex system of spiritual values and beliefs. One can observe this manifesting in current worship practice to sacred places and objects.

Currently, this process implements by amending some new elements, which have not been used previously. These elements are incorporated in the traditional practices based on verbal knowledge provided by elder inhabitants. The amended recommendations become guiding instructions within a short time.

The article is aimed to identify and analyze of the incorporated worship elements and specific features of a narrative changes related to the given sacred sites and events. The key study questions are: the nature of present-day veneration practice of natural sacred places and its narrative; the reasons for updating and the essence of these processes. The study was implemented in the context of traditions of

pilgrimage to the Ulytau shrines, which are considered of being the important historical and cultural Kazakhstan focus areas. Ulytau region is closely interconnected with the formation of the Kazakh's state, being at some point, ideological and political center of Kazakhstan.

Methods. The article uses the analytical, retrospective and comparative-historical methodology approaches. The research problem area considers findings of two field expeditions to the Ulytau region (2016-2018) with a focus on four natural objects (Terekty-Aulieh mountain area, Aulie-Tau, Orkesh-Tau, and Yedyge mountains). The study used mainly a method of in-depth interviews with pilgrims, site-keepers (shyrakshys), shaman (bucksy) and local population.

It should be noted that some natural sacred sites in Ulytau from the medieval period and more recent, also became the burial places of the ruling and spiritual elite representatives. That's why the authors also found appropriate to refer to the previous studies of modern pilgrimage practices in the Almaty region (a total of six objects, mostly man-made, - graves of batyrs, biys and bucksy, which are known for its healing and expurgatory power).

Results. Ulytau (also known as "Sary-Arka") is the geographical center of Kazakhstan and the immense territory of hills and hummocks. The region owes its name to the homonymous mountain group (its highest point is about 1,100 m). Eventually, in Sary-Arka there are more picturesque mountain groups. Despite of this fact, most of archaeological and historical monuments of the Stone Age sites, petroglyphic drawings, Saka burial mounds, ancient sites, and also evidence of ancient metallurgical production as well as mausoleums and other monuments of the Middle Ages are concentrated in Ulytau.

The Ulytau region is a 'land of promise' in the historical and cultural landscape of Kazakhstan. Looking chaotic, the cluster of man-made historical and archaeological monuments of various epochs links to the Ulytau mountain group (natural site) which has a sounded sacred meaning, this sacral sense became the originating source for the remarkable and numerous¹ folklore stories (only few are known in our days), as well as transfer of relict worship rituals and renewed cults of sacred places. Perhaps such a one-place combination of magic, religious and social meaning have predicted the specific Ulytau role as focal center of Kazakh steppe and the cradle of the Kazakh nation.

The two points are important: the meaning of toponym 'Ulytau' is 'Great Mountain' and settled expression «*Ұлытауға бардың ба, ұлар етің жедің бе*»², which is still in common use by Ulytau inhabitants (elder people from other regions continue using it). Formally, the given expression goes back to the great historical meeting in Ulytau of the representatives of three hundred tribes from all three Kazakh's Zhuzes. They agreed on alliance and joint military campaign against their common enemy - Jungars and took an oath by putting their ancestral tamgas on the sacred rocks of the mountain. The oath rite had been supported by ritual meals of an ular bird. Nowadays the expression serves as a very stark reminder and reproach on keeping one's promise [1, 14], [2, 78], [3, 392].

The adequate analysis of the current worship practice of natural sacred sites should be considered concurrently with a local narrative, which had shaped the transfer of pilgrimage rites to a large extent. As noted by Danto A. [4], a narrative in this case was an 'explanatory story' which includes traditions, myths, legends and sketches about sacred places, and also their keepers' oral stories guiding the practice of reverence. Hence, the 'explanatory story' also implies the historical knowledge of nomadic Kazakhs, which Yudin V.P. [5] named 'verbal historiography of steppes'.

We share the vision of Chideister D. in his consideration of the sacral space creation through the synthesis of ritualization and interpretation [6, 36-37]. Hence, these *specific* spaces are thought of as 'providential' ones and so it are traditionally provided to us, and we transfer it further in the same way. In reality man creates the sanctity of an object or site through the sustained ritual practices and desired meanings' interpretations.

Although the Kazakhs esteem the entire Ulytau region for being the sacral area, we aimed on four current and most important ethnic and religious pilgrimage sites: Terekty-Aulieh eco-site (located 210 km

¹The oral history of Ulytau, folklore and mythopoetics in particular, has never been collected or considered by academicians. On a large scale, the "historical and political" narrative of this region, preserved in relative integrity, dates back to the 16th-18th centuries, or to the era of Kazakh state formation; and "religious" one – to the pre-Islamic times and the Middle Ages (most often fixed on the images of cultural heroes).

²Have you ever been to Ulytau, did you eat a snowcock there?

away from Ulytau Mountain) and Aulietau, Edigetau and Orkeshtau Mountains. Contrary to tourism, the pilgrimage states to be mandatory the visiting to all four sites.

The given sacral natural sites have the regulations for venerating practice is regulated, and table 1 shows the comparative features of the traditional and modern worship elements.

Table 1 – Elements of Ritual and Ceremonial Procedures at the Ulytau Sacral Natural Sites

Rites Elements	Traditional Practice (the second-half of the 20th century -1980s)	Present Day Practice (1996-2018)
Compliance with a dress code (<i>rules for men and women</i>)	Obligatory for pilgrims. Optional for other visitors.	Obligatory for pilgrims. Optional for other visitors.
Ritual purity (<i>mental and corporal ablution</i>)	Obligatory for pilgrims. Optional for other visitors.	Obligatory for pilgrims. Optional for other visitors.
Beads bidding (Surah of the Qur'an)	Mandatory for every visitor	Mandatory for every visitor
Ritual sacrifice ('living soul')	Obligatory for wealthy pilgrims. Optional for other visitors.	Obligatory for wealthy pilgrims. Optional for other visitors.
Voluntary donations in cash and/or food	Obligatory for wealthy pilgrims. Optional for other visitors.	Obligatory for wealthy pilgrims. Optional for other visitors.
Attributes of the sacral site (1): 'nodular magic' – tying of animate and inanimate objects (<i>including tugs</i>)	'Knotting' or 'nodular magic' was exercised on animate objects - trees, bushes and tugs (wooden pole used for flags)	Tying of inanimate objects, like fences, gratings and tugs is being exercised in addition to the animate objects.
Attributes of the sacral site (2): <i>tribute offer of fabric and/or textiles</i>	No information available	Tribute offer of white fabric, (<i>aktyk</i>) and colored textiles (<i>oramaly</i>)
Ritual use of water from a sacred source (<i>drinking, ablution</i>)	Mandatory for every visitor	Mandatory for every visitor
Various worship procedures at the natural sacral site (<i>rolling downhill, moving along a sacred path in rocks including passing through a narrow cleft, round tour, rotation, etc.</i>)	Passing through a narrow cleft in stones, reclining and touching/kissing stones, was known for Terekty-Aulie. Reclining and touching/ kissing stones of Zerdesh-Baba cave was known for Aulietau. Touching stones of the mountain cleft was known for Orkshtau	All elements are continuously followed. The newly added elements refer to the sacral amount of 'seven': a seven-fold rotation of the body, a seven-fold solar-wise round walk with open arms around a stone pyramid, a seven-fold rolling downhill ' <i>Aulie Sirganaga</i> ' (so-called <i>saint's slide</i>)
Ritual use of fire (<i>lighting of candles</i>)	No information available	Lighting of seven candles is continuously practiced
Ritual use of stones (<i>constructing "pyramids", cast of stones, etc.</i>)	No information available	A new element (as per informants)
Sacrificial meal	Obligatory for pilgrims	Desirable for every visitor, but not obligatory
Overnight stay at the site a	Obligatory for pilgrims visiting Orkeshtau Mount. Optional for other sites	Mandatory for pilgrims visiting Orkeshtau Mount
Presence of a site-keeper - <i>shyrakshy</i> and a master of rituals in a sacred place (healer, <i>bucksy</i> , etc.). Guiding for visitors includes rites, procedures, history of the site and associated folklore	There was no keeper - <i>shyrakshyi</i> at sites (no information available). The elder (senior) person (<i>aksakal</i>) from the visitors' group took a role of a ritual mediator. In case of female visitors it was the eldest women	Now the <i>shyrakshy</i> is available on Aulietau Mount and some other sites. A <i>shyrakshy</i> and masters of rituals (healer, <i>bucksy</i> , etc.) provide necessary guidance.

The second column compiles the data on traditional rites and procedures, which were collected in 1940s-80s from the elder residents (see the list of the informants attached). The third column presented data which were collected during the field studies (conducted by the authors and archaeologist Bedelbaeva M.V. [7]). The table 1 shows the identical elements in both groups: compliance with a dress code, ritual purity, praying, ritual sacrifices, various forms of voluntary donations, adherence to a spring water sources, and overnight stay at sacred site. Almost all of the described elements are known for standard

pilgrimage practice while visiting the Kazakhs' sacral natural sites. Some aspects have already been documented by researches [8-12]. The coincidence of the traditional and newly adopted rites procedures has been documented for 7 elements from 14 (50%).

Nowadays, the range of involved elements has been modified and notably expanded. The so-called 'nodular magic' – the procedure of tying trees and bushes with scraps of material – is wide-spread in Central Asia. In case of absence of trees and bushes pilgrims tie its symbolic analogue – *tugs* (wooden poles). A number of the researchers, who studied this tradition, noted the visible presence of that tying scraps of material in Central Asia, mainly on graves of saint persons or of equal to them (following Islamic tradition) [13, 113-114]. Castagne J.A. [14, 53] also mentioned a long pole with strands of horse hair and various scraps near the entrance of the Sunak Ata Mausoleum (Turkestan). In Kazakhstan this element can be observed frequently at known petroglyphs sites of Bronze Age and other cultural epochs, which are not necessarily related to Muslim rituals [15, 160-162].

At present, the tradition of tying scraps of material extends to other landscape objects nearby: isolated stones and man-made stone hills (*turs/obo*), *tugs*, which one stuck into rock clefts. These objects can be apart from specific sacred site parts (fence of a grave, tree, etc.). The practice of tribute offer of fabric and/or textiles is very common (white cloth patterns (*aktyk*), kerchiefs (*oramals*) etc.).

Apparently, the ritual range of worship process has been extended significantly, as one can observe from modern pilgrimage to the sacred Mountain of Aulieu-tau - the highest point of the entire Ulytau group and the burial place of seven outstanding and high-credited persons - *akyns* and *bucksys* (some of them were buried with the spouses). Apart from customary reading of Qur'an at the site, pilgrims make three/seven-fold walk around a grave or other ritual object in the form of an impressive *tur/obo*. Sometime pilgrims also rotate themselves, fondle stones, talk to them, tie them with fabric, bring the 'owned stone' from outside and build it into the existing hill or a new one. No one explains the reasons for such a manipulation, but pilgrims immediately follow the initiative and everyone tries to join the common procedure. Often it is a keeper-*shyrakshy* and 'mediators' (*healers*, *bucksys et al*) to invite pilgrimage to proceed. Similar processes are observed in other regions of Southern Kazakhstan apart Ulytau.

Pilgrims follow strictly clockwise order in walk round tour at the Ulytau sacred places is exercised, which is typical for many religious and spiritual practices world-wide. Probably, the Ulytau rits originated also from the Buddhist practice, which had been widely spread in medieval time at the territory of modern Kazakhstan. The findings from known researches conducted in Southern Kazakhstan [16-20] provided basis for this, and also studies of the ancient Buddhist Kyzyl-Kent temple (located in Karkaralinsk, Karaganda region) may serve as an example. According to the hypothesis of the archaeologist E.R. Usmanova¹, the moving of the monks around this cross-shaped temple formed shape of a 'living *mandala*' - a sign of Universe.

Hence, it should be noted that the elderly representatives of the Ulytau local community indicated that even twenty or thirty years ago it was sufficient just to ascend the holy mountain to worship it.

Abdrakhman Tukmanbetov, the keeper-*shyrakshy*, moved to Ulytau in 2012. He received so-called mountain 'call', which was sent to him through a prophetic dream (*ayan*) of Bakbergen Ayashev, the local healer-*bucksy*, give rise to his decision. Abdrakhman Tukmanbetov needed to migrate to Ulytau from Uzbekistan, where he lived before. It took for him more than a year and a half to realize his mission and settle in Kazakhstan to serve the sacred mountain. A. Tukmanbetov kindly agreed to accompany the given field expedition to Auliye-Tau.

The Ulytau region abounds in sacred natural sites and it is sprinkled with related legends, tall stories, popular beliefs and folk tales, which were handed over from previous generations. The authors collected a certain part of this folk narrative with the assistance of informants and works of Z. Chumakova² (see table 2).

All narratives presented in table 2 can be divided into four key groups. The group 1 includes eight narratives associated with cults of water, mountains (gorges, caves, stones, etc.) and trees. The group 2 includes two narratives on cults of animals - a horse and a snake. The group 3 includes six narratives related to legendary heroes - prophets and saints, warriors, military leaders, governors, shamans-*bucksy*,

¹Emma Radikovna Usmanova - Senior Researcher, Saryarkinsky Institute of Archeology, Karaganda State University. Named after E. Buketov.

²Chumakova Z. Holy spring with poplars, or Terekty-Aulieu // Zhezkazgan newspaper. 2003, 15 August. P. 3.

Table 2 – Characteristics of local narrative of the Ulytau sacred natural places

Sacred places	Plot of a Narrative
1	2
<p>Terekty Aulie (Holy poplar place) is a historical and archaeological complex with more than fifty objects monuments dated from the Neolithic age to the XIX century: petroglyphs, neolithic sites, settlements and necropolises of the Bronze age, old mining pits, mounds of early Iron age and <i>mazars</i> of IX, XVII-XIX centuries of the Kazakh's tribes <i>baltaly</i> and <i>bunalaly</i>. There are also burials similar to anonymous mass grave (presumably military). Rock paintings belong to different epochs: bronze age (end II - the beginning of the I millennium BC), the Saka era (XII century BC - the first centuries of our era) and medieval petroglyphs of the Middle ages. Almost 90% of the petroglyphs shows the horse images from the Bronze age.</p>	<p>The name 'Terek' in the Kazakhs' worldview is the World Tree (Baiterek), which is a common Indo-European archetypal cultural concept</p>
	<p>Local community believes the water from spring source to have a holy curative feature; they apply it in case of various diseases. There is a legend about the sacral total number of sources ('seven sources'), but nobody can identify its exact location.</p>
	<p>The legend about a rock painting 'Dancing horses' tells that a long time ago a young herdsman was very fond of playing dombra in the natural boundary. Once the owner of these horses followed the herdsman to monitor. He surprisingly noticed the herdsman relaxing in the shade and playing dombra. Then he saw graceful horses dancing, and at the next moment the owner was dancing himself enchanted by the music.</p>
	<p>The legend about Khazret-Ali and his horse Duldulu: once upon a time he was trying to escape from his enemies, Khazret-Ali was badly wounded, and reached Terekty. Next to the poplars, he saw a life-giving spring, surrounded by thick grass and cane. After washing his face and drinking a spring water, Khazret-Ali found that all body scars and scratches had disappeared, and he felt no fatigue. He prayed to Allah then, and one of the granite hills still has traces and imprints of his knees and hands. The rock niche became his crash pad, and there are hoofprints of his legendary horse Duldulu. They say that since that time the natural boundary had been renamed as Terekty-Aulie.</p>
<p>Aulietau (Holy Mountain, another name <i>Akmeshit</i> or White Mosque) is the highest point of the Ulytau mountains. It is 1,134 meters above sea level. In spite of the need to climb over 500 m to the top of the mountain, pilgrims visit this sacred place.</p>	<p>Narrative about the serpent: A double-headed serpent lives inside an ancient well with siliceous veins. This serpent is considered to be a keeper of this holy place.</p>
	<p>Narrative about the spring source. The legend associates this Aulietau spring with the name of Gulsara Ana, healer. The spring is considered wonder-working at present time also. Mr. Abdрахман Tukmanbetov, the <i>shyrakshy</i> of Aulietau Mount, recommended to solicit the mistress permission in praying before tasting spring water. Local inhabitants advise to throw a coin - a token payment for water.</p>
	<p>Narrative about seven saints. There are burials of Yirza-Ana, Kali-Ata, Tursyn bucksy-Ata, Gulsara Ana, Sapar aulie Ali, Tana Ana and Murat-Ata at Aulietau Mount. According to the legend all of them were famous <i>bucksys</i>, <i>zhirshys</i> and <i>akyns</i>. Sapar aulie Ali was considered to be the master of Aulietau Mount.</p>
	<p>Narrative about Asan Kaigy. Asan Kaygy (XV century) was the famous nomad philosopher, poet-<i>zhyrau</i> and sage, the main ideologist under the sultans Kereye and Zhanibek, founders of the Kazakh Khanate. He was buried in Aulietau. The folks associate the close female burial of Tana-Ana with the name of the eldest wife of Asan Kaygy.</p>
	<p>Narrative about Zerdesh-Baba: a long time ago young man Zardesh made an overnight stop at a cave of Aulietau Mount. In his dream he was led to the top of the mountain. Then the sky lit up with gold, and everything sparkled. He sang the song which originated from his heart. The light beam touched him and then Zardesh got sacral knowledge from the Most High to convey to people. The next day Zardesh came to the people in the valley and start teaching the New Doctrine of Good and Justice. He informed the people about his enlightenment at the mountain, and his new knowledge about the way to common happiness. Then Zerdesh started his travel and reached Iran, where he launched <i>Zoroastrian</i> and people named him Zarathushtra (originated from the Kazakh '<i>Zharatusha</i>' or 'The Creator').</p>
	<p>Narrative about the shaman center - <i>baksy ordasy</i>. The local population believes that long time ago there was a center of shamans - <i>baksy ordasy</i> at the foot of Aulietau Mount and some of shamans were buried on its top. The folks say that, Alexander the Great (in Kazakh - <i>Eskendir</i>) used the services of the Ulytau <i>shamans-bucksy</i>.</p>
<p>The 'Dancing birches' at the foot of Aulietau Mount are considered to be sacred, that's why nowadays pilgrims decorate tree stems and branches with fabrics.</p>	

<i>Continuation of table 2</i>	
1	2
Edigetau (Edige Peak) is located 35 km to West of the of Ulytau village.	The legend says that Edyge batyr and Tokhtamysh (Toktamys), Khan of the Golden Horde were buried at the top of the Edige mountain. Edyge-batyr is the founder of the Nogai Horde, as per folk legends of the Kazakhs, Karakalpaks and Bashkirs. The inhabitants of Ulytau keep the saying about Biy Edyge time - «Едыгеның майлы журты», which means ‘well-fed people of Edyge’.
Orkeshtau (or Emschetau) - the lowest Ulytau peak, which looks like a female bosom. <i>Orkesh</i> - the literary term for a woman's breast, and <i>emschek</i> – for common use.	Local inhabitants translate the image of the Ulytau mountains as a lying young woman, and the Orkeshtau mountain then will form her bosom. This small mountain became the popular place for women's pilgrimage. It starts with Gulsara Ana spring and ends at the top of Orkeshtau. Childless women are advised to make an overnight in the gorge of this mountain and solicit a child.
Modern narratives	

folklore representatives (*akyn*, *zhirshy*, etc.). Modern narratives, which are characterized by a combination of various worship narratives, we include in the group 4.

The first group includes the numerous amount of narratives of Ulytau and perhaps the most archaic elements, which reflect animated natural force of water. Heaven water (rain, hail, rainbow) and ground water (rivers, springs) is considered as ‘live-giving’ and possesses a status of *kiye* (‘sacral’). Different aspects of sacral water in Turkic and Kazakh cultures were raised in the studies of Konshina N.Ya. [12], Poyarkova V.F. [21], Potapov L.P. [22; 23], Shulembaeva K.Sh. [24], Tokhtabaeva Sh. Zh. [25], Stasevich I.V. [26] and others.

The toponym *Orkeshtau* (‘Bosom-Mountain’) is notable. Bogoraz V.G. [27] stated that an identification of natural objects with parts of a human body can be considered to be one of primarily human’s religious belief. The current female worship practice at the given lower mountain coincides with Mongols and Tibetans veneration of caves and gorges equaling it to a mother's womb mountain [Potapov P., 23, 81].

The second group of narratives has a small number of elements, which apparently have a specific value for understanding of the cultural history of the region. Contrary to other areas, here there are relict elements of the sacral horse cult. Petroglyphs of Terekty-Aulie are the largest known compendium of the horse-related rock paintings in Central Asia [28, 560].

The story of the holy sheikh Khazret Ali and his horse Duldulu is one of the stable narratives in the horse-related folklore of Ulytau. Local residents strongly believe that rocks of Ulytau keep the saint’s foot and hand prints, and also his horse's hoof prints. The peculiar signs of human foot and horse hoof can be observed in the Arganat mountains (Ulytau region), in the Sary Su river-valley and in the Karkaraly mountains (Kokshetau).

Margulan A.Kh. et al. [29, 13] noted that so-called Tulpartas stones with pictures of horse's hoof can be observed almost everywhere. The narrative about Khazret Ali is well-known to the Western Pamir inhabitants: they use term ‘kadamjoy’ to mark the legendary worship sites where the saint Hazrati ‘Ali and his orse Ali ‘Dul-Dul (Zayn al-Abidine) made a stop [30, 208]. Stassevich I.V. [20] described similar sacred stone with printmarks of hands and knees of praying prophet Suleiman (prophet Muhammad in other version) at the holy Mount Tahti Suleiman.

Shulembaev K.Sh. provided a vivid example from South-Eastern Kazakhstan: ‘... close to a Chapaev farm in Kurdai district, there is a hill, known as Holy Hill. Mullahs, using a misconception about the mountain, made up a legend about the prints of the prophet’s knees, palms and feet left by him on a stone during praying (*namaz*)” [24, 42]. Thus one can see how the worship practice of natural sacred place combines various mythological and religious visions, cults of horse and mythologic hero, pre-Islamic and Islamic cultural layers.

One more important narrative in the sacred landscape of Terekty-Aulieu is associated with the Serpens image (snakes). ‘Kazakhs nomads were always in positive favor of Serpens/snakes, which were considered as mentors and assistants. A Serpens has symbolized the sacral forces of Water/Earth and other associated magic features. The Kazakhs, being in high honor to the Earth and Water, extend this worship

to the image of a snake; and one can still observe the strong solid complex of taboos, beliefs and procedures up to nowadays' [28, 129].

Previously mentioned toponym 'Terekty'/Baiterek (World Tree) in Turkic/Kazakh mythology associates with aidahar (dragon/Serpens). The dragon comes every evening to the World Tree to eat the Samruk Bird golden egg (symbol of the day light). The narrative about a snake as a guardian and protector is fairly frequent in folk stories in Ulytau sacral places. For example, a shyarakshy Sembai told about a huge Serpens known to be the keeper of the Zhoshi Khan Mausoleum (Dzhuchi Khan). The spring of Gulsary-ana is also under protection of a snake, according to the local shyarakshy.

The third group of narratives is the most big' it compiles the narrative stories related to mythologic heroes. The main persons for Ulytau region are: prophet Zarathushtra, holy Khazret Ali, Edyge batyr, Khan Toktamys, seven holy Sufis-bucksys (Yrza-Ana, Kali-Ata, Tursyn bucksy-Ata, Gulsara Ana, Sapar aliye Ali, Tana Ana, Murat-Ata), Asan Kaygy and others. In our vision we can observe a specific time axis linking the Iron Age with the twentieth century.

The above three groups are compiled of the most consistent narratives, and it can be appropriate to define a stable semantic nucleus, which shapes the interpretation of a sporadic amendments. Those amendments, in its turn, transform and/or create a new ritual elements in the pilgrimage practice.

There is one more interesting group of stories about an obstacles for pilgrims in reaching the sacral site. These can be some natural obstacles, like steep paths or its total absence, thickets of thorn bushes, bad weather, etc.). However, some 'supernatural force intervention' can be counted as a reason for this obstacle: the mountain spirits-*aurakhs* get angry, or a pilgrim has some unholy thoughts, etc. While these reasons are popular among pilgrims, we have the impression of *shyarakshy's* initial influence for most of such cases.

Eventually, the pilgrims and tourists get a narrative and information about a sacred place from *shyarakshy*, and they perceive it with variable extent of trust, especially if it's irrational. However, in most cases, people follow the instructions made by *shyarakshy* (it should be noted that guiding recommendations from the keepers in Ulytau are advisory only).

It is possible that later after the visit, a pilgrim tells the story in his/her own way story. The narrative is being picturized by pilgrim's imagination and degree of involvement into the sacral action. As a result, an amended narrative contributes to the expanding of the sacral object's worship process.

Conclusion. The analysis presented in the article showed that worship practice of natural sacred places is changeable, like any other element of culture. Both changes of the narrative and procedures impact equally on the transformation of the pilgrimage rites. It is impossible to verify whatever was the leading influence – narrative or procedure.

Study of the samples of Ulytau pilgrimage cases confirmed that a narrative defines specific sites of pilgrimage (closely referring to a local folklore in form of legends, stories from mythological heroes, animals and events); also narrative impacts on certain types of ritual procedures (but not all). Pilgrims and tourists contribute to amendments of worship of the given sacral sites, depending on strength of their faith, mentality, wide-scope etc., thus strengthening the veneration.

Pilgrimage to Auliye-Tau combines Islamic elements (Quran recitation, prayers, appeal to the Islam moral values, sacrifice, etc.) and visible pre-Islamic and non-Islamic rites as appeal to ancestors/*aruakhs*, who guard this sacred place, 'nodular magic', animism (worship of water, soil, wind, sun), construction of turs/*obas* (it can be found everywhere on the way to the top of the mountain) and walking around the largest ones, etc.

A majority part of rites practices at natural sacred places is identical to rituals conducted at the artificial (man-made) holy objects. However, it should be noted that man-made sacred objects are more relevant to Muslim rituals (*mazars*, graves, cenotaphs). This should be the result of impact of the accompanying narrative, which determines specific nature of the pilgrimage practices.

While analyzing similarities and disappearances of ritual pilgrimage to sacral objects, one comes across an alive and dynamic myth-making process. We believe that here we are not dealing with the reversion of a man of today to any delusions and throwbacks (although sometimes this happens). It is rather man's desire to acquire some stability as necessary element of a sustainable environment, both in private life and in other social relations.

‘Bringing-in’ of tourists and pilgrim-beginners to the worship practice of sacred objects, when they carry out most of procedures without debating, whenever they are believers or non-trusting people, can be explained by the intuitive need to join the collective memory and collective conscience (here rationality steps backward). Then the existing narrative and newly emerging mythological narrative consolidate as a whole and become a specific tool for preserving and translating the cumulative social experience.

There is a concern that the process of the obvious veneration of natural sacred sites through synthesis of narrative semantic interpretations and practical actions, can be affected by some ‘narrative speculations’, which can damage the autochthonous cultural traditions. Thus, in Ulytau study we observed the pushing of modern Islamic narratives and practices, almost unfamiliar to the local population. This moves back to shadow the known, familiar and understandable pre-Islamic context.

This can be a real threat to the unique endemic cultural features which are very specific to different sacred places and objects. This can be also the reason for known reluctance of the local communities to initiatives of enhanced popularization of the sacred places, infrastructure development (visit centers, etc.).

The fact-finding academic studies; active regional/local studies; meaningful can be efficient in opposing such speculations and perversion of history. The community involvement is inevitably demanded for comprehensive research and promotion of native intangible cultural heritage.

This is of a particular concern of today, when Kazakhstan people restore ethnic and cultural memory and look for their place in the global world.

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ҚАЗАҚСТАНДА ТАБИҒИ НЫСАНДАРДЫ ҚАСТЕРЛЕУДІҢ ҚАЗІРГІ ТӘЖІРИБЕСІ ЖӘНЕ ЖЕРГІЛІКТІ НАРРАТИВ

(Ұлытау өңірі негізінде)

Аннотация. Табиғи салттық нысандарды қастерлеу тәжірибесін өзектендіру және онда жаңа бөліктердің пайда болуы белсенді динамикалық үрдіс болып табылады, сонымен осы киелі орындарға қатысты нарративтің жаңаруы тікелей байланысты болады.

Мақала киелі табиғи жерлерді қастерлеудің қазіргі тәжірибесіне жаңа бөліктерін және онымен байланысты нарративті айқындауға және талдауға бағытталған. Осы зерттеудің проблемалы аясы ерекше қастерленетін Ұлытаудың табиғи нысандары және нарративтері болып табылады; бұл ретте негізгі мәселе болып мыналарды атауға болады: киелі жерлердің және оның нарративтерін қастерлеу тәжірибесінің заманауи ренессансы немен түсіндіріледі; олардың жанартылуы неге орын алады; осы үрдістердің мәні неде?

Ұлытау өңірі бұрыннан тарихшылар мен археологтардың қызығушылығын тудырып келеді, белгілі бір ғылыми бастама жинақталған, алайда оның мәдени кодын қалыптастырудың, болуының және сақталуының ерекшелігі осы күнге дейін арнайы ғылыми зерттеудің пәні болмады. Осы мақаланың әдіснамалық базасын қазақстандық және ресейлік ғалымдардың зерттеулері, ал фактілік материалы – жергілікті халықпен және қасиетті жерлердің сақтаушыларымен (бақсы, шырақшы және олардың көмекшілері) 2016-2018 жж. екі далалық экспедиция барысында авторлармен жүргізілген интервью болып табылатын далалық зерттеулердің нәтижелерін құрайды.

Мақаланы дайындау кезінде оның құрылымында жаңа мәдени бөліктерді объективті түрде айқындайтын қасиетті жерлер мен оның нарративін қастерлеудің қазіргі тәжірибесіне талдау жүргізуге мүмкіндік берген ретроспективалы және салғастырмалы-тарихи әдістер қолданылды.

Түйін сөздер: қасиетті табиғи жерлер, кастерлеу дәстүрлері, жергілікті нарратив, мәдени динамика, сәйкестік, Қазақстан.

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СОВРЕМЕННАЯ ПРАКТИКА ПОЧИТАНИЯ ПРИРОДНЫХ ОБЪЕКТОВ И ФОРМИРОВАНИЕ ЛОКАЛЬНОГО НАРРАТИВА В КАЗАХСТАНЕ

(на примере Улытауского региона)

Абстракт. Актуализация практики почитания природных сакральных объектов и появление в ней новых элементов является активным динамическим процессом, с которым непосредственно связано обновление нарратива, относящегося к данным священными местам.

Статья направлена на выявление и анализ новых элементов в современной практике почитания священных природных мест и связанного с ними нарратива. Проблемным полем настоящего исследования выступают особо почитаемые природные объекты Улытау и нарративы; при этом ключевыми видятся следующие вопросы: чем объясняется современный ренессанс практики почитания священных мест и его нарратива; почему происходит их обновление; и в чем суть этих процессов.

Улытауский регион давно интересует историков и археологов, собран определенный научный задел, однако специфика формирования, бытования и сохранения его культурного кода до настоящего времени не становилась предметом специальных научных изысканий. Методологической базой настоящей статьи стали работы казахстанских и российских ученых, а фактологическим материалом – результаты полевых исследований, представляющие собой преимущественно интервью с местным населением и хранителями сакральных мест (баксы, шырақшы и их помощниками), проведенные авторами в ходе двух полевых экспедиций в 2016-2018 гг.

При подготовке статье использовались ретроспективный и сравнительно-исторический методы, позволившие провести анализ современной практики почитания священных мест и сопутствующего нарратива, объективно отражающего новые культурные элементы в ее структуре.

Ключевые слова: сакральные природные места, традиции почитания, локальный нарратив, культурная динамика, идентичность, Казахстан

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PHYTOMELIORATION OF SECONDARY SALINE IRRIGATED LANDS OF THE SOUTHEAST OF KAZAKHSTAN

Abstract. The article describes phytomeliorative methods for increasing the productivity of saline irrigated lands by sowing phytomeliorants and treating seeds and spraying the above-ground part of crops with PA-2,1 (adaptogen) preparation. The results of observations of the growth and development of phytoemeliorants showed that phytoemeliorants intensively grew, developed and accumulated aboveground masses, especially on variants treated with adaptogen. The intensive growth and development of phytomeliorants contributed, at the end of the growing season, to a decrease in the salt content in the soil and an increase in the yield of soybeans, sorghum, and Sudan grass. The conducted economic calculations to determine the effectiveness of cultivation of phytomeliorants on degraded irrigated lands showed that cultivation of phytomeliorants on saline soils, along with a decrease in the content of salts in the soil, makes it possible to obtain net incomes with high profitability. The article presents the results of field research on the cultivation of basic and intermediate crops and the economic justification for obtaining two crops per year.

Key words: phytomelioration, drip irrigation, fodder units, Sudan grass, sorghum, soy, adaptogen (PA-2.1).

Introduction. The current condition of secondary saline irrigated lands in the southeast of Kazakhstan requires a new approach to the problem of melioration of saline soils. Due to the lack of a collector-drainage systems, improperly using of the irrigation systems and crop rotation in agriculture, irrigated lands were salinized and the area of irrigated land decreased from 2.3 million hectares to 1.3-1.4 million hectares. Therefore, in the message to the people of Kazakhstan on January 31, 2017, the President of the Republic of Kazakhstan Nazarbayev N.A. noted that within 5 years, it is necessary to increase the area of irrigated land by 40%, and reach to 2 million hectares [1].

According to the Concept on the transition to the "green" economy by 2030, 15% of the agricultural lands will be transferred to water-saving technologies. It is also necessary to develop agrarian science and create experimental agro- innovative clusters [2].

In connection with the above-mentioned programs for the development of the agriculture in the country, especially in irrigated systems, the development and introduction of new methods to improve the productivity of saline irrigated land is an actual challenge. Therefore, there exists a solution which is the introduction of phytomeliorative crop rotations, where salt-tolerant phytomeliorants are cultivated to promote the reduction of salts in the soil and increase its fertility.

The research results show that the agribiological methods for improving degraded irrigated lands are a resource-saving and inexpensive method for the restoration of saline lands [3-5].

Materials and methods. The phytomeliorative role of the safflower and sweet clover that contributed to a decrease of salt content in saline soils by 6-8% has been revealed by experiments carried out earlier [6, 7]. The field research on developing techniques for increasing the productivity of saline irrigated lands by cultivating phytomeliorants was carried out on gray-brown soils of Akdalinsk in Almaty oblast.

The climate of the Akdalinsk is sharply continental with a wide temperature difference between day and night, summer and winter, with a cold little snowy winter and a hot and dry summer. The sum of temperatures above 10 °C is 3400-3500 °C. The annual amount of precipitation is 250 mm, 64% of which fall in the spring-summer period. The soil of the experimental land is characterized by a low content of humus (0.54 to 1.16%) and other elements.

The subject of the research was gray-brown soils, phytomeliorants, sudangrass, sorghum, soybeans, drip irrigation and preparation PA-2,1 (adaptogen). The total area of the experiment was 0.3 hectares. The area of the plots was 120 m², and the repetition was threefold. Records, observations, and analyses were performed by conventional methods in the experiments. The content of humus and other elements was low in the soil. Irrigation was carried out by a drip irrigation methods by maintaining soil moisture not less than 70% of the lowest moisture capacity of the soil.

The studies on the growth and development of phytomeliorants were made according to the generally accepted Rudnev's method [8]; soil moisture was determined by the thermostatic-weight method [9]; observation of the dynamics of accumulation of biomass of phytomeliorants was made according to the generally accepted method [10]. The selection of soil samples before sowing and harvesting along the soil horizons was carried out by soil drill to determine the salt content. The analyses were carried out in an accredited soil analysis laboratory of the Kazakh Research Institute of Agriculture and Plant Growing. The norms of vegetative irrigation were determined by the moisture deficiency in the soil according to the Kostyakov's formula [11]; the processing of harvest data was made according to Dospekhov's method [12]. The water-physical qualities of the soil were determined by conventional methods [13-18].

There was studied the dynamics of the content of salts in the soil before sowing and harvesting. Also, there was experimented the effect of adaptogen on the growth and development of phytomeliorants. Seeds were treated with a two percent solution of adaptogen and sprinkled with vegetative plants with 0.03-0.05 percent of aqueous solutions.

Adaptogen increases bioenergetics and ecological resistance of plants to soil salinity. Also, the preparation increases plant's germination energy with pre-sowing seed treatment. Spraying after germination of plants gives them additional energy for vegetation [19].

The preparation increases germination energy of seeds, promotes the increased growth of roots and the other parts of plant. This also influences the on growth of the utilization rate of nutrients from the soil of introduced fertilizers and affects the ripening of cereals for 7-9 days [20].

Results and discussion. The field experiments conducted on saline soils of the Akdalinsk irrigation massive where there were studied the effects of various phytomeliorants on the content of salts in soil and adaptogen for growth and development and yield of phytomeliorants.

The results of the conducted field experiments showed that the treatment of planting seeds of phytomeliorants promotes the emergence of crop germination two days earlier in comparison with the variants of seeds that were not treated with adaptogen solutions.

There was an observation of the growth and development of phytomeliorants in the main phases of their development. The results of analysis before harvesting showed that the accumulation of raw mass on an area of 0.3 m² in sudangrass, sorghum and soybean was 1043, 769, 690 grams with adaptogen, respectively, while without the adaptogen it was 982, 742, 681 grams (table 1).

Table 1 – Results of experiments of the growth and accumulation of biomass phytomeliorants.
24.08.2016, 0.30 m², average data

Variants of experience, phytomeliorants	Seed treatment with preparation PA-2,1 (adaptogen)	Plant height, cm	Weight, gram	
			raw mass	dry weight
Sudangrass (ejection of panicle, 2 slopes)	with treatment	270	1043	688
	without treatment	262	982	648
Sorghum (grain filling)	with treatment	190	769	501
	without treatment	183	742	490
Soybean (wax ripeness)	with treatment	103	690	414
	without treatment	94	681	409

The intensive growth and development were observed in phytomeliorants of sudangrass, where the plant height averaged up to 270 cm, and on the variant without adaptogen treatment was 262 cm. Also, there was an intensive accumulation of raw and dry above-ground mass (table 1). The intensive growth and development were observed in soybean. Soybean at the expense of active growth and development has suppressed weed plants. The crop also showed a good seed formation. There were selected soil samples at the beginning of the year, during the sowing and before harvesting, to determine the primary and residual salt content in the soil. This experiment was done to study and determine the influence of phytomeliorants on the dynamics of changes in the content of salts in the soil.

Comparative data on the content of a dense residue of salts before the sowing of phytomeliorants (May 23, 2016) and residual salts before harvesting (August 25, 2016) showed that phytomeliorants contributed to the reduction of salts in the upper horizon 0-20 cm from 0.06% in sudangrass, 0.10% in sorghum and 0.27% in soybean. On the lower layer of soil with 20-40 cm, the reduction of salts was in the range of 0.04-0.05%. There was a decrease in salts by 0.27% in field of soybean (table 2).

Table 2 – The content of salts in the soil horizontally before sowing and harvesting phytomeliorants

Phytomeliorants	Depth, cm	Solid residue, %		Ions HCO ₃ , %		Sulfate ions, %		Sodium, %	
		before sowing	before harvesting	before sowing	before harvesting	before sowing	before harvesting	before sowing	before harvesting
Soybean	0-20	0,78	0,51	0,13	0,06	0,21	0,18	0,18	0,01
	20-40	0,94	0,67	0,06	0,03	0,40	0,09	0,22	0,01
Sorghum	0-20	0,31	0,21	0,02	0,05	0,19	0,16	0,09	0,06
	20-40	0,20	0,16	0,05	0,05	0,09	0,12	0,09	0,07
Sudangrass	0-20	0,19	0,13	0,03	0,05	0,16	0,16	0,01	0,06
	20-40	0,21	0,16	0,03	0,05	0,19	0,08	0,01	0,07

The intensive growth and development of phytomeliorants which seeds were treated with adaptogen promoted the reduction of salts in soil. In addition, irrigation was carried out by drip irrigation system where water was supplied by small norms and the upper layer of the soil was moistened. Ground (saline) water does not rise to the root zone of plants with such soil moistening. The intensive growth and development of phytomeliorants have had an impact on their yields (table 3).

In the given data in table 3, the formation of a high above ground mass of phytomeliorants of sorghum and sudangrass without treatment with adaptogen formed a high yield of green mass where average yield was 947.0 t/ha in sudangrass and 740.4 c/ha in sorghum. The processing of seeds and the above-ground mass of the crops contributed to an increase in the yield of sudangrass to 990.3 c/ha and sorghum to 777.6 c/ha. Also, a high yield was obtained in soybeans where varieties without treatment were on average 54.7 c/ha on, and with treatment increased to 56.6 c/ha.

Table 3 – The yield of green mass and grain of phytomeliorants in drip irrigation (average data for 2015-2017)

Variants of experience, phytomeliorants	Seed treatment with preparation PA-2,1 (adaptogen)	Productivity, green mass, grain, centner / ha	Gathering of fodder units, centners / hectare
Sorghum (green mass)	With treatment	777,6	176,6
	Without treatment	740,4	168,2
Sudangrass (two slopes per green mass)	With treatment	990,3	219,0
	Without treatment	947,0	210,0
Soybean (grain)	With treatment	56,6	73,0
	Without treatment	54,70	70,2
SSD ₀₅ 5,87			
Note: The fodder units from the soybean stems are not taken into account when calculating the collection of feed units.			

The most important indicators of the final results and the overall efficiency of production in a market are the profitability of the products.

The calculations showed that along with improving the meliorative condition of saline soils, it is possible to obtain additional cost-effective crops (table 4).

Table 4 – Economic efficiency of phytomeliorants cultivation with the use of adaptogen

Variants of experience, phytomeliorants	Seed treatment with preparation PA-2,1 (adaptogen)	Average yield for 2015-2017. c/ha	Total cost of production, thousand tenge / ha	Total costs, thousand tenge / ha	Income, thousand tenge / ha	Level of profitability, %
Sorghum (green mass)	With treatment	777,6	31,1	19,10	12,0	62,8
	Without treatment	740,4	29,6	18,8	10,8	60,0
Sudangrass (two slopes per green mass)	With treatment	990,3	39,6	23,2	16,4	71,0
	Without treatment	947,0	37,8	22,3	15,5	69,5
Soybean (grain)	With treatment	56,6	448	205	243	118,5
	Without treatment	54,7	437	201	237	117,0

Calculations of economic efficiency of cultivation of phytomeliorants on degraded soils have shown that further effective use of irrigated lands and improvement of meliorative condition, it is necessary to introduce inexpensive agrobiological and agromeliorative methods of land restoration, which have come out of order.

The highest net income was received from soybeans with 237-243 thousand tenge per hectare, and the crop showed accordingly a high level of profitability with 117.0 % and 118.5% out of all the cultivated phytomeliorants (table 4). These economic indicators show that among the researched phytomeliorants, the highest number was given in soybean for seeds. Also, the highest for green mass was given in sudangrass.

Conclusion.

1. The results of cultivation of phytomeliorants on soils which susceptible to salinization have shown that sorghum, sudangrass, and soybean are intensively growing and accumulate above ground masses. Moreover, the intensive growth and development were observed on the variant where the seeds of phytomeliorants were treated with the preparation of adaptogen. Increasing the energy of germination of seeds, the preparation PA-2.1 promoted the emergence of seedlings two days earlier than in the untreated variants.

2. The intensive growth, development, and accumulation of the above ground mass was observed in phytomeliorants of sudangrass, where the plant height averaged up to 262 cm, and on the variant with adaptogen treatment was 270 cm;

3. The intensive development of phytomeliorants contributed to a decrease in salts on the upper horizon of the soil (0-20 cm) from 0.06 to 0.27%. On the lower soil layer (20-40 cm) was from 0.04 to 0.27%.

4. The intensive growth and development of phytomeliorants contributed to the production of high yields. Thus, the average yield of green sorghum without treatment was within 740.4 c/ha, and with processing was 777.6 c/ha. The yield of sudangrass without treatment was 947.0 c/ha, and with treatment was 990.3 c/ha. The yield of soybean grain varied within the range of 54.7-56.6 c/ha.

5. Calculations of the economic efficiency of cultivation of phytomeliorants on saline soils showed that the highest net income was received from soybean grain where it was 237-243 thousand tenge per hectare. Also, there was accordingly a high level of profitability with 117 and 118.5%, and the green mass was highest in sudangrass.

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ФИТОМЕЛИОРАЦИЯ ВТОРИЧНО ЗАСОЛЕННЫХ ОРОШАЕМЫХ ЗЕМЕЛЬ ЮГО-ВОСТОКА КАЗАХСТАНА

Аннотация. Приводятся фитомелиоративные приемы повышения продуктивности засоленных орошаемых земель путем посева фитомелиорантов и обработкой посевных семян и опрыскиванием надземной части культур препаратом ПА-2,1 (адаптоген). Результаты наблюдений за ростом и развитием фитомелиорантов показали, что фитомелиоранты интенсивно росли, развивались и накапливали надземные массы, особенно на вариантах с обработкой адаптогеном. Интенсивный рост и развитие фитомелиорантов способствовали, в конце вегетации, уменьшению содержания солей в почве и увеличению урожайности сои, сорго и суданской травы. Проведенные экономические расчеты по определению эффективности возделывания фитомелиорантов на деградированных орошаемых землях показали, что возделывания фитомелиорантов на засоленных почвах, наряду с уменьшением содержания солей в почве, дают возможность получать чистые доходы с высокой рентабельностью.

Ключевые слова: фитомелиорация, капельное орошение, кормовые единицы, суданская трава, сорго, соя, адаптоген (ПА-2,1).

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ҚАЗАҚСТАННЫҢ ОҢТҮСТІК-ШЫҒЫСЫНДА ҚАЙТАДАН СОРТАНДАНҒАН СУҒАРМАЛЫ ЖЕРЛЕРДІ ФИТОМЕЛИОРАЦИЯЛАУ

Аннотация. Мақалада, сортаңданған (тұзданған) суғармалы жерлерді пайдалануды фитомелиорация әдісі арқылы жоғарылату, әртүрлі фитомелиорант дақылдарын егіп, олардың егілетін тұқымдарын және өскіндерін адаптоген ПА-2,1 препаратымен өңдеп-өсіріп ол жерлердің өнімділігін арттыру жолдары қаралады. Жүргізілген зерттеулердің нәтижелері бойынша, адаптоген ПА-2,1 препаратымен өңделген нұсқаларда фитомелиоранттардың қарқынды өніп-өсуі байқалды. Фитомелиоранттардың қарқынды өніп-өсуі, вегетация соңында, топырақтағы тұздардың азаюына және майбұршақ, қонақ жүгері, судан шөбі дақылдарының өнімділігінің артуына себепін тигізді. Тозған (сортаңданған) суғармалы жерлерде фитомелиоранттарды егіп-өсіру, топырақ құрамындағы тұздарды азайту мен қатар, экономикалық жағынан тиімді екені дәлелденді, өйткені ол жерлерден алынған өнімнің таза пайдасы және рентабельдік деңгейі жоғары болды.

Түйін сөздер: фитомелиорация, тамшылатып суғару, азықтық өлшем, судан шөбі, қонақ жүгері, майбұршақ, адаптоген (ПА-2,1).

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MYTH AS A CONVENTIONALLY METAPHORIC NARRATIVE FORM

Abstract. The article is written within the framework of the grant AP05133019 “Cultural codes of modern Kazakhstan (literary and media discourses)” funded by the Committee of Science of the Ministry of Education and Science of the Republic of Kazakhstan. The subject of the article is myth viewed as a conventionally metaphoric form. Some basic correlations of myth with folklore and literature are considered. It is argued that the specificity of mythic narration and mythic thought suggests an ample opportunity for creating a myth-oriented imaginative literature, since mythic plots have essential functions in literary texts.

Key words: myth, archetype, narrative, mythic consciousness, mythologeme, mythic chronoscope.

Introduction.

The specificity of mythic narration. Mythological direction is an integral part of the history of literature and culture of all mankind. Over the centuries, the poly-semantic nature of the myth, its inexhaustible artistic resources, have attracted the attention of philosophers, poets, artists of diverse ideological and aesthetic orientations: realists, classicists, sentimentalists, symbolists, modernists, postmodernists, avant-gardists and others. In this regard, we can quote E.A. Tsurganova: "myth is inherent in different methods, with its help it is possible to recreate different concepts of the world and personality" [1, p.9].

What is myth in general and myth in literature? What are its functional possibilities for structuring the textual and non-textual space, reflecting the integral artistic concept of the work? There are many different definitions of a myth.

The word “myth” comes from the ancient Greek word *μῦθος* meaning “story” or “plot” and, most generally, is applied to sacred and secular stories that "offer supernatural explanations for the creation of the world ... and humanity, as well as for death, judgment, and the after life" [2, p. 284]. Creation or origin myths often position “the cultural group telling the myth” as the first people or the “true” people [ibid.]. Such sacred stories, or narratives and a particular mythology express a culture’s worldview: that is, a people’s conceptions and assumptions about humankind’s place in nature and the universe, and the limits and workings of the natural and spiritual world. A myth as a sacred legend helped the ancient recipient to create a kind of mentally and emotionally logical image of the world, nature, harmony, to set up algorithms for his subsequent actions.

These much used definitions highlight the myth’s fundamentally narrative and discursive nature. The French structuralist anthropologist Claude Levi-Strauss defines myth as “language”, arguing that "Its substance does not lie in its style, its original music, or its syntax, but in the story which it tells. It is language, functioning on an especially high level where meaning succeeds practically at "taking off" from the linguistic ground on which it keeps on rolling. <...>language in myth unveils specific properties. Those properties are only to be found above the ordinary linguistic level" [3, p. 430-431]. In other words, myth can not and should not be reduced to the semantics of linguistic phenomena: it is all-encompassing and mobile, ready to disclose new meanings to readers of every epoch as soon as the artist and the interpreter of the "told story" are susceptible enough to see them.

Robert Weiman, a leading German theoretician, was as well aware of the complexity of myth and of the theoretical contradictions around this phenomenon. "Nowadays it is very difficult to give a theoretical definition of the concept of "myth" and its relation to artistic creation. With the wide and varied use of this concept, literary criticism tries in every possible way to avoid its definition. There are strange discrepancies between the concept of myth and myth as an object" [4, p. 260].

Classical definitions of myth as a story of "first creation" are especially favoured by philosophers, anthropologists, cultural studies persons and mythologists of different schools and directions. For literary critics, myth and mythology are of particular interest from the point of view of their content and functional orientation in a specific artistic text and / or in analyzing the creative method of a concrete writer, poet or playwright. Simply put, it is not so much a myth for a myth, but a myth in the text, a myth as a text, a myth in the context, a myth as a pretext that matters. In the complex analysis of a work of art, it is important not only to identify the signs of the archaic myth in it, but also to understand the purpose for which it is brought into the plot or in the text structure. This remark applies to the so-called new myth, which is very common in modern culture and literature.

Myth is regarded as a phenomenon of culture and as a "phenomenon of the future" (W. Jens), as the foundation of all artistic, philosophical, folklore and other practices and as "absolute reality" (A.F. Losev). "Myth is most often regarded as one of the forms of artistic convention, or the compositional beginning of a work, i.e. the problem of myth is solved in terms of poetics, – writes E.A. Tsurganova. – / ... / Western literary critics, often express the idea that myth-making is a sign of modernist art.

At the present stage of the development of literature (novel and drama) it is obvious, however, that myth is rather a disregarded category of creative methods, and therefore it is wrong to associate it with modernism" [1, p. 9]. M.K. Mamardashvili characterizes the "the world of myth and ritual" as "a world in which there is nothing incomprehensible, nothing problematic / ... / myth is an organization of the world in which, no matter what happens, everything is clear and meaningful" [5].

However, a myth is built into almost any artistic narrative: the mythical (or conceivable events) "unfolds" the story in the direction of its deeper comprehension and leads to the widest possible generalizations. The text becomes elastic, "porous", multifaceted, regardless of its genre. "Myth is not a genre, not a definite form, but a content that does not depend on the form in which it is expressed" [6, p.57].

Considering the universality of myth's functions and properties, we propose to view it as a basic conventionally-metaphorical narrative form of artistic creativity, which, along with other philosophical, aesthetic, and cognitive possibilities, has great inter-textual connections and potencies. Of course, the proposed definition refers primarily to myth in the context of a literary work.

The problems of myth poetics, in our opinion, cannot be considered outside the context of the concept of the multi-dimensionality of contemporary art [7]. A holistic and harmonious mythic world, the "real and maximally concrete reality" (A.Losev) contained in it, is often a concept of even greater importance than those of realistic or historical and philosophical planes. These planes overlap, complement each other, revealing their hidden meanings or creating new meanings and a certain tonality. "An important methodological approach to analyzing a particular myth poetic system is the principle of inter-textual analysis. In this case, into the orbit of the research phenomena are entered. These phenomena are connected not only with an immediate ("close") context, but also with "distant" and "mediated" ones, not excluding the possibility of involving a deeper intent of the author, be it conscious or unconscious" [8].

Myth and archetype, myth and folklore. Another fundamental problem of contemporary humanist thought is that of identifying correlations of myth and archetypes, myth and folklore, and that of interpreting each of the phenomena in question as primary or secondary. It is a well-known fact that the notion of the archetype was introduced into scientific discourse in 1919 by the father-founder of analytical psychology K.G. Jung. According to Jung's conception, the archetypes (Greek ἀρχέτυπον– primitive) are "universal innate mental structures that make up the content of the collective unconscious, recognized in our experience and, as a rule, in the images and motifs of dreams. The same structures underlie the universal symbolism of myths and fairy tales. Theoretically, any number of archetypes is possible" [9].

"The concept of the archetype, belonging to K.G.Jung, has acquired a historical and cultural meaning as the basis on which the system of mythology is built. On the basis of primitive archetypal connections, mythologems of external and internal space are formed, models of binary oppositions, culture of elements, certain situations" [8].

As is often the case in science, this term, due to its semantic flexibility and universality, has gained wide recognition in many branches of fundamental knowledge: psychiatry, psychology, biology, computer science, linguistics, philosophy, history, ethnography and others. This led to establishing a specific interdisciplinary discourse, built around various analytical interpretations of the term in question. Naturally, the issues of artistic realization of archetypes in literary creativity could not but attract the attention of philologists in search of its semantic and communicative filling.

As N.O. Osipova puts it, "An immersion into the psychology of the unconscious (S. Freud, C.Jung) determined the application of the archetype theory and symbols to myth poetic analysis; The structural approach allowed to designate a system of binary oppositions and system-forming cultural models reflecting the representations of the ancient person in the structure of the myth poetic model (C.Levi-Strauss, R.Jakobson, J.Lotman, V.V. Ivanov, V.Toporov). The study of the semantic structures of the language and the mechanisms of genre formation (A. Potebnya, O. Freidenberg) was reflected in the concepts of myth-generation of figurative systems"[8].

In the Great Encyclopedic Dictionary, in addition to the Jungian interpretation, two more meanings of the archetype are also given: "1) The most ancient text unknown to us, the rest of the texts of the written record go to; 2) Hypothetically reconstructed or actually attested linguistic form, initial for its later developments, for example, Indo-European languages *Mater –all-Slavonic Mati (Russian "Mati"), Latin Mater, etc.*" [9, p.73].

Archetypes, archetypal complexes and models in the literary text become the subject of many literary and cultural studies. The semantic, emotional, communicative capacity of this concept led to an extensive understanding of the archetype, the emergence of its invariant – the "literary archetype". "Literary archetype - often repeated images, plots, motifs in folklore and literary works. By the definition of A. Yu.Bolshakova, the literary archetype is a "through", "generative model," which, despite the fact that it has the capacity for external changes, conceals in itself an invariable value-semantic nucleus"[10].

There are two main characteristics of a literary archetype, "his typological stability and a high degree of generalization. According to A.A. Faustov, the archetype can designate "a universal image or a plot element, or their stable combinations of different nature and different scale (right up to the author's archetypes)" [11]. Although, in our opinion, the literary archetype is a concept ambivalent: on the one hand, the archetype is the prototype, on the other - literature as a phenomenon of a later, mainly, written culture.

E. Luludova gives a lot of dictionary and reference definitions of the term "archetype", their semantic similarity is noted: "archetype" – "prototype", "original image", "idea"; "primary form", "sample"; "model"; "a symbolic formula," "a model, a prototype" [12, p.9]. A complex analysis of the archetypes and mythologems of the Chekhov's artistic world is presented by her. Summarizing the set of definitions and relationships of the archetype (according to Jung), she derives the following formula: "The archetype is a concentrated human experience (inclinations, views, traditions, patterns, typical life situations, etc.) and averaged picture of mental life (the possibilities of all mental Processes and experiences, predispositions, innate forms of representation and imagination, ideas and any manifestations of creative imagination). The primary and therefore irreducible language of archetypal patterns is the metaphorical language of myths" [ibid, p.11].

Thus, it can be considered that in the bundle "archetype is a myth (mythologeme)", the first is the basis on which "a system of binary oppositions and system-forming cultural models" (N.Osipova) is built, among other structures, various figurative, cognitive constructions of the myth. The literary archetype is an important, but secondary, in our opinion, structure in relation to the myth. Graphically, these relationships can be represented as follows: archetype → myth → folklore and/or literary archetype.

"Folklore (from the English *"folk wisdom"*) - folk art, most often oral. Artistic, collective, creative activity of the people, reflecting his life, views, ideals, principles; The popular among the masses of the people and are created by people *poetry* (legend, songs, ditties, anecdotes, tales, epic), *folk music* (songs, instrumental plays and plays), *theatre*(drama, satirical plays, puppet theater), dance, architecture, pictorial artwork, décor and applied art.

The most important feature of folklore, unlike literature and modern literary-bookish culture, is its traditionalism and orientation to the oral method of communication. The term "folklore" was first

introduced by the English scholar William Thoms in 1846 to designate both the artistic culture (legends, dances, music, etc.) and the material culture (habitation, utensils, clothing) of the people's culture" [13].

E.M. Meletinsky notes the genesis of the connections between myth and other narrative forms: "Genetically, literature is connected with mythology through folklore; In particular, the narrative literature that takes us first of all – through a fairy tale and a heroic epic that have arisen in the depths of folklore (of course, many of the epic monuments and tales continued to develop or even re-created as book works). Accordingly, the drama and partly the lyrics initially perceived the elements of the myth directly through rituals, folk festivals, religious mysteries" [14].

Generally speaking, the myth is primary in relation to folklore, since its action is prehistoric, secondly, its goal-setting (ritual, comprehension and explanation of the surrounding world, sanctification, etc.) differs significantly from folklore (didactics, entertainment, fiction). These two powerful narrative corps unite the common aesthetic function: the creation of an artistic reality. Both myth and folklore have an enduring high value for literature, as sources of timeless imagery and symbolism.

At the same time, authoritative opinion of one of the founding fathers of Russian folklore V. Propp: "Propp recognizes the identity of myth and fairy tales, emphasizing, however, the role of religiosity in the comprehension of myth. So the motive of the campaign for the Golden Apple is in the myths about Hercules and Russian fairy tales about Ivan Tsarevich. However, Hercules was for the ancient Greeks a deity to whom sacrifices were made, and Ivan Tsarevich is nothing more than an artistic hero. It is in this, in the opinion of V. Ya. Propp, that there is a main difference between the fairy tale and the myth. Myths differ from fairy tales in function: the main functions of the myth are explanatory, ritual and sacred, and the fairy tale has entertaining, moralizing and poetic. Myth is perceived both as a narrator and a listener as a reality, a fairy tale as an invention. The time of the myth is prehistoric, the tale takes place in an extra-historical time" [13, 15]. For example, in the TV program "The Hour of Truth. Where did the Turks come from?" we can hear from competent orientalists the myth about Ashin Khan, the mythic progenitor of the Turks. (*Where did the Turks come from.* <http://youtube.com/watch?v=QE4IGmW3x8I>). As an interesting illustration of the "germination" of the mythic component in folklore material, it is also possible to offer a supplementary video "Tatars from Siberia" [16].

Myth and literature: aspects of correlation. Inconsistency, quickness of changes in the modern era gives a powerful impetus to the development of various symbolic and mythological discourses in literature and art. Myth has the integrity of the expressions and symbols embedded in it, sense is equally as exceptional value of aesthetic phenomenon. "Thanks to old centuries tradition of its understanding, the myth of the twentieth century, - writes A. Mozhayeva, - has become an extremely important category that can express, illustrate, indicate and symbolize an extremely wide palette of meanings» [17]. The myth can be perceived as an image of the world, a holistic meaning, a conceptual system, or, on the contrary, highlighting certain aspects of life.

The usage of ancient myth in modern narrative is poured:

- a new interpretation of the myth,
- re-creation of famous sacred images as a metaphor for modernity,

– appeal to myth as an additional means of internal organization of the plot. When analyzing the myth poetics of specific literary works, it is necessary to concentrate on the certain terms: myth-poetic analysis, mythologem, mythical chronoscope (mythical time and space) and etc.

It is important to understand the functional load carried by one or another conditional and metaphorical narrative forms (myth, parable, legend, fairy tale, etc.) in the context of the whole artistic world. What is their aesthetic focus? It is in as a some goal-setting mythic and other conventional and metaphorical forms of it can be called:

- creating a specific poetry tone;
- construction of the original structure and composition of the work;
- expression of the author's concept, ideas;
- formation of author's style or offer new styles;
- creation of a new genre or its variety.

In this regard, we distinguish the so-called "mythological chains" with the presentation of individual basic and specific mythologems in works of different aesthetic orientation. Installation on metaphoric, conditionality in the most extreme and probabilistic values makes myth for literature and art so attractive means of achieving maximum aesthetic impact on the reader/recipient.

Artistic creation is, primarily, a fiction. Fiction is genetic feature of literature. In this sense, myth is an inexhaustible source of building of complex communicative – discursive, narrative plans of the work. But it is also true that "the era that gave rise to them lives in artistic images, and the viability of artistic creation is its practical comprehensive test of artistry, the problem of artistry puts us before the understanding of holistic (the specificity of art) and value (axiological aspect) of knowledge" [18, p.4, p.12].

In the context of a literary work myth can be perceived in several aspects: as the way of the world, holistic sense -the conceptual system, or, vice versa, highlights certain aspects (fragments) of being. E. G. Malygina, exploring the genre and stylistic features of romantic fragments of Novalis, identifies and substantiates the specificity of the fragment of the narrative, the mythologem "the World is like a Symphony": "Mythologizing the world picture is carried out in fragments by creating a romantic kind of "directory" of the universal images, motives and concepts, reflecting the morphology of entities in the world; shuffling them, revealing their deep genetic and historical connections, superstructure over the "system of entities" ("world cognized/conceivable") "system of ideas" ("world imaginary"), understanding the relationship between the world of matter and the world of spirit, universe and man, external and internal universe.

So fragments reveal not only features of philosophical thinking of romantics and specific principles of their logic, but also peculiar formation and development of their artistic image of the universe: from the micro – image depicting this or that side of the universe, through its system of interactions with other images – reflections, attraction and repulsions – to the macro-image of the Cosmos as a mythologem about the "World-Symphony" [19]. The following typical features of the myth in the context of literature are justified by the specifics of mythological consciousness.

Basic characteristics of myth and mythical consciousness. Mythological consciousness is a significant (however not the only) type of artistic thinking. It is a specific consciousness determined by mythical content, corresponding goal-setting. The content and purpose of literature determines the system of interrelated, sometimes opposing each other, the types of artistic thinking. Exploring the existential paradigm in the Russian literature of the twentieth century, V. Zamanskaya raises the question of "comprehension of the multidimensional artistic consciousness of the XX century": "Literature of the XX century is a system of dominants (types) of consciousness (existential, dialogical, religious, mythological, politicized, etc.), which are embodied in the individual figurative thinking of writers, in the stylistic structure of their works» [20].

To the selected type of aesthetic consciousness can also be added: metaphysical, catastrophic ("landslide"), ritualized. Mental processes of modern art suggest a well-known synthesis of the above-mentioned types of consciousness with the dominance of one or another type. For example, in postmodern texts existential and mythological types of consciousness often prevail, taking into account the conceptual setting of postmodernism on the "plurality" of interpretations, including mythological, eschatological subjects and motives.

The most accurate and reasonable presentation of the theoretical aspects of the mythological consciousness is presented in a review paper "Literature and myth" by J. Lotman, Z. Mints, E. Meletinsky in the encyclopedia "Myths of Nations of the World" [21]. By the way, this is the only joint work of outstanding scientists J. Lotman and E. Meletinsky, who made a fundamental contribution to the development of the relevant issues of the General theory of myth, myth-poetics, correlation of myth and literature [22].

The authors consider the relation of myth and literature in two aspects: evolutionary and typological. From an evolutionary point of view, according to scientists, there is an irresistible "opposition" myth and literature, because they "never coexist in time". Typological aspect "removes" the problem of such opposition: "mythology and written literature are mapped as two fundamentally different ways of seeing and describing the world that exists simultaneously and in interaction, and only in varying degrees manifested in a certain era" [21]. Of course, in our opinion, for the theory of literature preferred typological aspects of the study of the relationship between myth and literature, particularly in the study actually poetic characteristics of a myth/newmyth in the modern literary text.

E. Meletinsky, Z. Mints and Yu. M. Lotman identified several basic signs of myth and mythological consciousness, which confirm the uniqueness of the myth ("and the texts generated by it") as a holistic aesthetic phenomenon:

- "Inseparability, unity, isomorphically and homomorphically transmitted by these texts messages" [ibid]. Inseparability of mythological consciousness defines clearly oriented communicative, informative approach and the cognitive specifics of the myth, mythological text, mythological messages;
- limit of conventionality, metaphors of mythological consciousness: "the symbolic image represents the otherness of what it models" [ibid]; "the naive humanization, the universal personification in myths and a broad metaphorical mapping of natural and cultural (social) objects» [ibid];
- previous thesis implies an additional sign of mythological consciousness – creation model of genesis of an object – modeling the sign;
- "the symbolism of myth" [ibid], mythical consciousness operates of the most part concretely sensuous forms. The myth acts as a symbol of many ideas and concrete objects.
- "Myth genetics - the replacement of cause – and-effect relationships by precedent-the origin of myth is given for its essence" [ibid]. Hence case is a sign of mythological consciousness;
- focus on the initial (mythical) precedent as the root cause of all events, situations. You can tell the orientation of mythological consciousness on quasi maximum accuracy in a wide range;
- "etiology (from Greek "cause") is included in the specifics of the myth, because the myth of notions about the world are transmitted in the form of a narrative about the origin of certain of its elements» [ibid];
- syncretism of myth and mythological consciousness: "Mythology, by virtue of its syncretic nature, played a significant role in the genesis of various ideological forms, serving as a source material for the development of philosophy, scientific ideas, literature» [ibid];
- mythical consciousness is characterized by a model of "direct" superposition of meanings on the objects of narration, images, symbols: what is the idea, this is the model of the world.

Considering the specifics of mythological consciousness N.O. Osipova writes: "Myths belong to the second level of mythological consciousness, i.e. do not belong to the age-old ancient consciousness, and the culture that develops beyond primitive mythology" [8]. It highlights the following important functions: epistemological/.../; axiological/.../; aesthetic (focus on the story-shaped system of the archaic myth is due to the idea of its high artistic and national cultural value, the installation on the creation of its own text-myth)" [ibid.]. In other words, mythologems in the modern text act as a kind of coded elements.

"Roland Barthes sees myth as semiological system, referring to well-known models of the sign Saussure, as it has three main elements: the signifier, signified and the sign as a result of the association of the first two elements. According to Barthes, in the myth we find the same three-element system, however, its specificity is that the myth is a secondary semiological system, built over the first language system or language object. This secondary semiological system or myth Barthes calls "meta-language" because it is a secondary language in which they speak about the first» [23].

Mythologism is associated with the search for adequate artistic and stylistic forms of complicated reality. As E.Tsurganova rightly points out: "Modern mythological thinking captures and features the most persistent life situations and character traits of a person, the most slowly changing laws of their existence and development of their personality, which do not depend directly on socio-historical conditions (love, friendship, honor, duty, kindness, aspiration to the truth). The myth in the literature highlights the real and poorly understood processes occurring in the life" [1, p.9-10].

In other words, the issues of mythological poetics in contemporary literature and wider - in culture are closely intertwined with the global and national cultural tradition, the free author's choice of a peculiar, subordinate to the concept of the work, chronoscope, various conventional art forms, including mythological, folklore, fantastic and other motives and images.

Speaking of mythological consciousness, one should keep in mind that it is one of the dominants of modern artistic consciousness along with existential, transfrontier, dialogic, religious, politicized and other types "that finds expression in the individual imaginative thinking of writers in their style, structure of their works" [24, p.146]. As S. Kaskabasov points out: "For the mythical consciousness is typical the unity of spirit and nature which is based on the law of identity" [25]. In many works, in particular "Kazakh unsubstantial prose", of S.Kaskabasov, we can find deep reflection of the ambiguous connection of genre-conditioned folklore narrative forms and proper literary texts. In particular, the scientist is one of the first who investigates the fundamental question of the reliability / unreliability of the narrated events, comprehends such central categories of narrative poetics as "narrator", "event", "situation" and others.

In historical prose, as a rule, the "narrator is behind the scenes" prescribes a large space-time extension of the novel: previous events ↔ narrative event ↔ subsequent, future, supposedly, in a certain sense, speculative events. S. Kaskabasov points out "the normality of Kazakh folklore" [25, p.41]. He substantiates the interesting in the aspect of narratology, main points about the nature of the events and, in general, the plot of the Kazakh epic: "The epic story is a chain of successively stated events, and the events are different adventures of the hero during the wanderings, the difficulties he meets ... The plot develops not on the basis of internal contradictions, but through the contamination of various motives and situations, which allows to interrupt it anywhere or continue further» [ibid, p.40].

A significant perspective direction of modern philological and cultural studies are the questions of the correlation of postmodern aesthetics and the philosophy of mythology, the study of specific archetypal forms in the contemporary artistic text.

In the development of modern world culture and literature, a special place takes the development of the so-called "myth-poetic paradigm" as one of the "iconic cultural areas of the epoch, its meaningful factors" [8]. In relation to the mythological tradition, in different literatures new methodological approaches and terminological definitions are singled out and substantiated.

The theory of the "mythological infrastructure" of the Latin American literature developed by the well-known Russian scientist A. Kofman is the most reasonable, scientifically proved concept [26]. Based on the comparative typological analysis of many of the works of Latin American literature, especially the twentieth century, he revealed in it "the sum of the stable artistic elements - permanent images, characteristics, motifs, plot moves, types of heroes, etc." [ibid]. This system of interconnected and interdependent elements is called by him the "mythological infrastructure" of Latin American literature.

A.Kofman proved that "Latin American culture and literature is a complicated civilizational artistic and philosophical "code". The world of modern Latin American literature combines myths, legends, tales and other universals at the same time with European images, motifs, symbols, allegories, autochthonous Indian and own historically formed national traditions. Therefore, we can say that the existence of a Latin American mythological tradition that has had a huge impact on world literature. Here we are talking about a special art-philosophical "code," which is convincingly postulated by Russian Latin Americanists, a universal "key" that determines the peculiar image of not only Latin American, but of any other literature and culture.

Modern Latin American prose continues Asturias, Borges, Marquez's tendencies of a complicated interacting of traditional and innovative, in both artistic and genre-style decisions, and in the choice and development of original ideas, themes, images. Here, surprisingly closely and subtly, on the level of allusions, reminiscences, symbols, roman-Germanic (European) and Indian mythological artistic "codes" were intertwined. Therefore, it is difficult to agree with some researchers who argue that "the artistic code of Latin American literature is inversion, paraphrase, travesty, reinterpretation of the European tradition", reducing the genesis of Latin American literature to one, although sufficiently developed, European system. In this context, it is appropriate to quote A. Zverev's "myths of Indian origin become an important component of the narrative / ... / mythological method" not only orders chaos, it enriches the panorama with great meanings that reveal a certain understanding of the phenomenon of man and the phenomenon of time, and the phenomenon of history "[27, p.35,34].

S. Kaskabasov revealed deep interrelations of common archaic myths and national Kazakh folklore genres in his book "The Cradle of Art": "Kazakh myths were found in the composition of oral folk prose, for all of its main components were close to / ... / archaic classical myth. They may reveal (of course, not purely in the archaic form)the traces of the ancient mythical consciousness, mythical time, various mythical representations and concepts"[28, p.42]. He distinguishes such specific features of the archaic myth as "mythical time and mythical consciousness, mythical concept and mythological thinking, understanding of heaven and earth, man and nature as a whole" [ibid, p.40].

In further research in the field of folklore, mythology's corresponding areas are history and literary theory, Kazakh scientists are mainly agree with the theory which was given by S. Kaskabasov, and also R. Berdybai, B. Azibaeyva, Sh. Ibrayev, A. Konyratbayev, B. Abylkasymov, A. Seidimbekov, S. Kerim, B. Rakymov, K. Matyzhanov, P. Auesbayeva and others. Complex development of various aspects of semantics and typology of Kazakh folklore and mythology is also presented in the works of A.Margulan, E.Tursynov, S.Kondybai and others. Questions of the ancient and medieval history, including the early

period, the Turkic literature and philosophy, whose monuments belong to the intangible cultural heritage, connected on the ontological level with the mythical consciousness, are deeply covered in the works of H. Suyenskaliev, A. Kiraubayeva, K. Omiraliyev, A. Egeubai, M. Orynbekov and others.

Modern Kazakh literature continues the tradition of a wide-format lyric and epic narrative. So, on the basis of the analysis of the novel by R. Seisenbayev, "Despair, or the Dead roam in the sands", G. Shainova identifies several specific parameters of the mythology in the text: "Mythical time and space, mythical consciousness, cultural hero, trickster", the struggle of two principles-Good and Evil, and finally, the Apocalypse. The novel is built like a myth. Myth is realized at all levels - ideological, imaginative, plot, space and time. Every image and motive in the novel has its own prototype in the myth" [29, p.50]. She also notes that "the synthesis of the mythological aspect with the intellectual led in the end not only to the expansion of the subject matter, but also to the complication of the artistic structure of the work. / ... / Writers of modern prose are characterized by close attention to ancient, archaic myths. Especially the myths of an eschatological nature predominates" [ibid, p.49]. The mythical structure of the artistic text is subordinated to the author's concept of the total intertwining of the original universal mythologems indicated by the researcher.

Conclusion. Myth poetics as a field of the theory of literature deals with numerous mythological constructs embedded in the text and performing various functions. In some cases, myth poetic agents perform an additional function of expanding the philosophical, ideological, and aesthetic doctrine of the work, in others we are dealing with texts of a mythologizing type. The latter are characterized by a dominant mythological structure and semantics; in fact these are new myths, or new myths, which act as cross-cultural phenomena of the all-encompassing artistic thinking.

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МИФ КАК УСЛОВНО-МЕТАФОРИЧЕСКАЯ ПОВЕСТВОВАТЕЛЬНАЯ ФОРМА

Аннотация. Статья выполнена в рамках грантового финансирования КН МОН РК по проекту AP05133019 «Культурные коды современного Казахстана (литературный и медийный дискурсы)». В статье исследуются особенности мифа как условно-метафорической формы. Определяются основные аспекты соотносительности мифа и фольклора, мифа и литературы. Специфика мифического повествования, мифического сознания показывает большие возможности построения мифоориентированной художественной литературы. Для литературоведения мифология представляет особый интерес с точки зрения его содержания и функциональной направленности в конкретном художественном тексте.

Ключевые слова: миф, архетип, нарратив, мифическое сознание, мифологема, мифохронотоп.

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ШАРТТЫ-МЕТАФОРАЛЫҚ ФОРМАНЫҢ МИФТІК ЕРЕКШЕЛІКТЕРІ

Аннотация. Мақала ҚР БЖҒМ ҒК AP05133019 «Заманауи Қазақстан дағы мәдени кодтар (әдеби және медиалық дискурстар)» жобасы бойынша гранттық қаржыландыру аясында орындалған.

Мақалада шартты-метафоралық форма мифтік ерекшеліктер ретінде қарастырылады. Миф және әдебиет, миф және фольклор мағыналарының бір-біріне байланысының негізгі аспектілерін айқындайды. Мифтік сипаттама, мифтік сананың ерекшелігі көркем әдебиеттегі мифтік бағыттағы үлкен мүмкіндіктерді көрсетеді. Әдебиеттанудағы мифология нақты көркем мәтіндегі аса қызығушылық тұрғысынан қарастырылғанда оның мазмұны мен функционалды бағытын қарастырады.

Түйін сөздер: миф, архетип, нарратив, мифтік сана, мифологема, мифохронотоп.

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PSYCHOLOGICAL ASPECTS OF MEDICAL HEALTH CARE

Abstract. Improvement of social and economic development of society allowed to set fundamentally new tasks directed to the creation of an available and useful health care system for the branch. Integration of the Kazakhstan economy into the world economy, scales and the nature of the activity of the system of social institutes, including health care systems, demands a new approach to the organization of management. Its practical embodiment and also new institutional operating conditions of a health care system from the development of the new ideas, precepts of the law, standard procedures and the mechanisms realizing them, and in general - high-quality system transformations of a health care sector of Kazakhstan. At the same time, it should be noted that in such complex and multiple-factor branch as the health care, the universal model allowing to provide the full solution of all available problematic issues does not exist. It is well-known that the countries which are characterized by identical income levels, education and expenses on health care differ by the opportunities to solve the most critical problems of health protection. Thus, the creation of a national health care system has to be carried out by assessment of a possibility of the solution of priority tasks in specific economic, social and political conditions taking into account an international experience. In our article, we will see off research about a role of psychological intervention within diagnostics and therapy of psychosomatic patients.

Keywords: health care system, public policy, psychosomatic manifestations.

Introduction. According to the existing state program of health development of the Republic of Kazakhstan, one of the objectives is – to improve the availability and quality of healthcare through the development and improvement of the Unified National Health System, with priority development of socially oriented primary healthcare and increased joint responsibility of citizens.

Currently, according to WHO, up to 25% of patients of internal medicine is the patients with somatoform psychosomatic disorders, and absorbs about 20% of the money spent on healthcare. The prevalence of such diseases is 280 cases per 1000 population (V. Popov, V. Type A, 1997; Gindikin VY, 2010; Williams S., Villar R., Peterson J., 1988; Hassenfeld IN, 2011). Somatoform disorders are the independent pathology which are difficult to diagnose (ICD-10); it's proved the absence of a transition corresponding to the "large" psychosomatic disorders (Ababkov V.A., 1992; Alexander A., 2005; Craig T. K. J., Boardman, A.R., 2004).

In the etiology and pathogenesis of psychosomatic disorder, psychological factors are very important, among which the leading role is played by intrapsychic neurotic conflict (Topolyansky V.D., Strukovskaya. M.V., 2008; Karvasarsky B.D., 2000; Frankl, 2011). However, in the medical literature, the importance of psychotherapeutic treatment is referred to only and suggests methods of pharmacotherapy in combination with herbal medicine and homeopathic treatment. Questions of psychotherapy for these patients are not well defined, undifferentiated.

These disorders tend to manifest themselves in the form of psychosomatic disorders in outpatient and inpatient physical profile. Psychosomatic component is presented in patients with diseases of the circulatory, digestive, musculoskeletal and skin, respiratory diseases. Neglect of mental factors in the diagnosis and treatment of medical conditions leading to their complications, prolonging the period of treatment, increased costs for examination, treatment, maintenance of hospital beds, etc.

The main factor in improving the quality and availability of psychotherapeutic and medical care is the timely detection of borderline mental disorders by physicians - internists, especially the local therapist.

It is now necessary to put the relevant issue of the integration of specialized types of treatment into the primary level of healthcare in order to improve its quality.

The results of our study, the practice of healthcare proves that the primary healthcare needs a strong, adequate psychotherapy service.

The purpose and objectives of the study. The main purpose is to prove the effectiveness of psychotherapy in primary care from economical, practical and preventive points of view.

To reach the main purpose it is necessary to solve the following objections:

1. To study the social, clinical and psychological status of patients with disorders of the gastrointestinal tract and the cardiovascular system.

2. To carry out experimental and empirical psychological research, using a comprehensive model for psychological prophylaxis and to evaluate its effectiveness.

3. To implement a designed psychotherapeutic model for psychosomatic disorders of the gastrointestinal tract and the cardiovascular system.

Research methods. The design is prospective empirical study. 220 patients with psychosomatic disorders were chosen. The subjects were selected from the outpatient therapy department contingent consisting care record. All study patients we observed for a long time and unsuccessfully treated by internists with suspicion on the following diseases: duodenal or gastroesophageal reflux disease, chronic gastritis, hyper motor or hypokinetic intestinal dyskinesia, dysbacteriosis, biliary dyskinesia, chronic acalculous cholecystitis, hypertension, cardioneurosis. Age range - 18-65 years old, median age – 41.5±4.9. Male to female ratio – 1:2.3. For exclusion of organical diseases of the brain and/or endocrinal or metabolic syndromes additional instrumental diagnostic methods were used (ultrasound, EEG, CT, MRI).

Findings. Selected contingent was divided into two experimental groups:

Gastroenterological - 100 and cardiac - 120.

All patients of the **gastroenterological** group experienced complaints of nausea, dry mouth, difficulty swallowing, vomiting, aerophagia, hiccups, abdominal pain and epigastric pressure, heaviness in the abdomen, frequent stools, flatulence (at least 6 months, 2 years maximum). The above symptoms and syndromes of psychosomatic diseases of the digestive system are functional gastrointestinal disorders, certain by Roman III criteria (2006 r.). 71 patients (1G group) was treated using Gestalt therapy method, 29 patients (2G group) received only conservative gastrointestinal treatment (table 1).

Table 1 – Summary (gastroenterological group)

		1 group (1G)		2 group (2G)		Total	
		abs	%	abs	%	abs	%
Sex	F	51	72	19	65	70	70
	M	20	28	10	35	30	30
Age	18-27	16	22,5	6	20,7	22	22
	28-37	34	48	13	44,8	47	47
	38-47	21	29,5	10	34,5	31	31
Total		71	71 %	29	29 %	100	100 %

All patients received adequate conservative therapy. The comprehensive model of Gestalt therapy was performed as group sessions, once in a day, for 2.5 hours every week. The duration of treatment - 2.5 months. The total duration of therapy was 24 hours. After the course of treatment, control research was conducted, using the same methods.

Patients of the **cardiac group** were divided into 3 groups (1C, 2C, 3C):

1C group (n=40) - patients receiving antihypertensive therapy and group psychotherapy sessions (direct-to-elimination or weakening of the symptoms of the disease, the improvement of the general condition).

2C group (n=45) - patients on antihypertensive therapy, were differentiated individual psychotherapy (including personal characteristics)

3C or control group (n=35- those patients receiving antihypertensive medication therapy only (table 2).

Table 2 – Summary (cardiac group)

Demography	1C, n=40,	2C, n=45	3C, n=35
Age			
35 - 45	8(20%)	11(24,4%)	6(17,1%)
46 - 50	17(42,5%)	21(46,7%)	18(51,4%)
51 - 55	15(37,5%)	13(28,9%)	11(31,4%)
Illness duration			
below 5 years	16(40%)	17(37,8%)	13(37,1%)
6-10 years	13(32,5%)	15(33,3%)	12(34,3%)
above 10 years	11(27,5%)	13(28,9%)	10(28,6%)

All the patients took one or more antihypertensive drugs "first tier" (diuretics, P-blockers, a-blockers, ACE inhibitors, calcium antagonists), i.e. 5 main groups of drugs.

Psychotherapy sessions were held three times in a week, duration of session - 1-1.5 hours. Individual meetings for 2C group were held 2-3 times a week, the duration of one session was 1 hour. Total course duration was, on average, 42 hours.

Group sessions were held once in a week for 2.5 hours. The duration of treatment - 3 months. Total duration of therapy was 30 hours. Psychotherapy groups were heterogeneous in age and sex composition and homogeneous in nosology. Throughout the study period, patients kept private diaries in which the frequency of heart attacks and blood pressure levels was stored. Patients were measured BP independently three times per day: morning, afternoon and evening. We also measured blood pressure at each visit to doctor (3 times per week). On the basis of these data, mean blood pressure was calculated.

To determine the psychological profile of all the patients there were used the following psychodiagnostic techniques: scale of the *level of reactive and personal – anxiety (1G, 2G)*; *Giessen questionnaire (all patients)*, *Beck's level of depression questionnaire (1C,2C,3C)*, *the scale of the level of personal and reactive anxiety (1G, 2G)*, *types of attitude towards the disease (TATD) (1G, 2G)*, *Toronto's Alexithymia Scale(1G, 2G)*. Psychiatric disorders from the group of schizophrenia, affective disorders, anxiety and phobic anxiety and neurotic disorders were also excluded.

Effectiveness of treatment in terms of reduction of neurotic symptoms was estimated using the following tests: clinical-psychopathological method (all patients); questionnaire neuroticism (Jachin K.K., Mendelevich D.M., 1978) (1G, 2G); MMPI test to assess the psychological portrait and LSI (index lifestyle) (1C, 2C, 3C) for evaluation of psychological defense mechanisms. Assessment of the dynamics of the clinical condition of the patients was based on "Bekhterev's clinical scale" (1G, 2G), and Tukaev's clinical score (1C, 2C, 3C).

The obtained data were processed by mathematic statistic methods: criterion differences by Mann - Whitney, method of frequency analysis, using descriptive statistics. Mathematical treatment of empirical data was performed using parametric and non-parametric tests using standard computer program for statistical processing SPSS 21,0.

Gastroenterological group:

Mathematical processing of studied parameters dynamics before and after a course of therapy revealed no statistically significant changes in most of the studied parameters (table 3).

Results are positive. There has been a decrease of the levels of reactive and, to a lesser extent, personal anxiety, alexithymia, the intensity of complaints on all scales of the questionnaire Giessen somatic complaints; harmonization of relations of patients to the disease.

Analysis of the control group also showed statistically significant improvements in all parameters studied (table 3). In determining the potential differences between the study and control groups during the

Table 3 – Comparison of the dynamics of the studied patients; the main parameters of study group before and after treatment according to the Wilcoxon test

Pair	n		T		U		p-value	
	1G	2G	1G	2G	1G	2G	1G	2G
Trait anxiety	71	29	0	0	7,32273	4,703046	p < 0,01	p < 0,01
Reactive anxiety	71	29	0	0	7,16744 5	4,622599	p < 0,01	p < 0,01
«exhaustion» G.q.*	71	29	0	0	7,27133 7	4,372373	p < 0,01	p < 0,01
«gastric complaints» G.q.	71	29	0	0	7,27133 7	4,197264	p < 0,01	p < 0,01
«rheumatoid factor» G.q.	71	29	14,5	4,5	7,23964 7	3,283507	p < 0,01	p < 0,01
«cardiac complaints» G.q.	71	29	0	0	7,21957 8	4,014509	p < 0,01	p < 0,01
«total number of complaints» G.q.	71	29	0	0	7,32273	4,622599	p < 0,01	p < 0,01

*Giessen questionnaire.

Table 4 – The significance of differences between the study and control groups during the second pilot study (Mann-Whitney-U)

Variables	Control group,	Study group,	U	U cor.	p-value
	n	n			
trait anxiety	29	71	442	4,47761	p<0,01
reactive anxiety	29	71	300	5,55498	p<0,01
"Exhaustion" G.Q. *	29	71	223,5	6,14848	p<0,01
"Gastric complaints" G.q. *	29	71	72	7,3067	p<0,01
"Rheumatoid factor" G.q. *	29	71	374,5	5,05611	p<0,01
"Cardiac complaints" G.q. *	29	71	578	3,45223	p<0,01
"The total pressure of complaints" G.q. *	29	71	65	7,33224	p<0,01

G.q. – Giessen questionnaire.

second pilot study using Mann - Whitney criteria (U), groups were heterogeneous (the differences in the parameters reliably) (table 4).

After the application of complex model of Gestalt-therapy the symptoms exciting the attention of patients (nausea, dryness of in the mouth, the difficulties when swallowing, vomiting, pneumophagia, a hiccup, pains, the pressure of in the epigastrium, heaviness in the abdomen, liquid stool, a meteorism) have ceased to be felt by patients, has decreased feelings of anxiety and stress, sleep normalized, patients have become more active. Recovery was observed in 90.1% of patients (p < 0.01). The patients of the control group have similar symptoms appeared again and caused the patients' need to undergo gastroenterology reexamination (48.2% of patients).

Average spot on the scales of the Giessen somatic complaints questionnaire after a course using of a complex model of Gestalt therapy corresponds to the average values in healthy subjects on all parameters studied. The mean values on the scale of the depletion decreased from 15.6 to 7.8, "stomach complaint" from 13.6 to 6.3, "rheumatoid factor" from 5.5 to 2.1, and the "cardiac" from 8.5 up to 4.2 points. The overall mean pressure complaints, reflecting the "hypochondriacally" of patients decreased from 42.9 to 20.4 points. In patients undergoing medical treatment only, reduction of complaints has not reached the degree of the study group.

Analysis of the results obtained during the final testing of 2 groups patients of the survey using Spielberger - Hanin anxiety scale (table 5, 6) shows that in the main group results of personal anxiety after therapeutic manipulation corresponded to the normal level in 33.8% of cases, the indicators of reactive anxiety in 76.0% of cases ($p < 0.01$). In the control group, research indicators of trait anxiety were within the normal range in 10.4% of cases, while a reactive anxiety in 34.5% of cases. Personal anxiety, being a stable characteristic of the individual, is difficult to treat. However, the decline in personal anxiety in the application of a comprehensive model of Gestalt therapy was 2.8 times greater than in the control group.

Table 5 – Comparative dynamics of the level of reactive anxiety during treatment and control groups, abs. (%)

The level of reactive anxiety	Group				The reliability of the results of therapy in the study and control groups (P 2-4)
	1G (n=71)		2G, control (n=29)		
	Before treatment (0)	After treatment (2)	Before treatment (3)	After treatment (4)	
Low	—	54 (76,0%)**	—	10(34,5%)**	<0,01
Moderate	61 (85,9%)	16 (22,6%)**	24 (82,8%)	19 (65,5%)	<0,01
High	10 (14,1%)	1 (1,4%)**	5 (17,2%)	**	>0,05

**Reliability of differences between patients of one group before and after treatment <0.01.

Table 6 – Relative changes in the level of trait anxiety during therapy in study and control group, abs. (%)

Trait anxiety	Groups				The reliability of the results of therapy in the study and control groups (P 2-4)
	1G (n=71)		2G, control (n=29)		
	Before treatment	After treatment	Before treatment	After treatment	
Low	—	14 (39,8%)**	—	1 (3,4%)**	<0,01
Moderate	51 (71,8%)	44 (64,4%)**	22 (79,3%)	24 (83,8%)	<0,01
High	20 (28,2%)	12 (16,9%)*	7 (20,7%>)	4 (13,8%)*	>0,05

**Reliability of differences between patients of one group before and after treatment <0.01.

TATD dynamics showed that in the control group there was no effect of treatment in 82.8% of cases, while in the basic group the rate of success was 50.8% ($p < 0.01$) (table 7).

Table 7 – The effectiveness of psychotherapy according to TATD

Group	The effectiveness of psychotherapy according to TATD			
	TATD's type: non-harmonic		TATD's type: harmonic	
	abs	%	abs	%
2G	24	82,8	5	17,2
1G	36	50,8	35	49,2

Common to both groups as a result of psychotherapy is to ease tensions of psycho regulation. In the mind's sphere in both cases, there is an improved emotional state, reducing the processes of psychological conflict. While improving the state of the autonomic areas, reducing the level of neuroticism also improve emotional. Thus, psychotherapy of psychosomatic disorders in patients with hypertension leads to qualitatively meaningful results.

Conclusion. Thus, the study of the clinical picture of patients with somatoform disorders of the gastrointestinal tract revealed, in addition to physical illness, a significant representation of psychiatric syndromes, which allowed to determine the clinical target for the developed model of psychotherapy. An adequate system of diagnosis and differential diagnosis of patients suffering from psychosomatic disorders of the gastrointestinal tract should include not only the clinical criteria of the disease and the main characteristics of psychogenic, but also a negative and a positive diagnosis of neurotic disorder.

Using an integrated psychotherapeutic model is preferable, because the result is a reduction in the number of psychosomatic complaints and the lack of severe anxiety (both reactive and personal), which creates the basis for the restoration of favorable emotional background, potentiating effect of conservative treatment.

Studies have shown high efficiency of differential integrative psychotherapy techniques of cardiac diseases. In addition, it was revealed that during therapy in patients with the purpose of correction of borderline mental disorders and normalization of blood pressure, it is necessary to carry out the correction of non-adaptive forms of psychological defenses. Inclusion in the program of the treatment of hypertensive patients with psychosomatic disorders, individual psychotherapy makes the effect of psychotherapy persistent (according to the follow-up): leads to permanent improvement, reduce the severity of psychosomatic disorders, improve the efficiency of medical treatment and stabilization of the indicators of the level of blood pressure.

Timely structural and functional reorganization at primary health care level is very important: addition of psychotherapy would play a big role in the prevention and early detection of psychological disorders, underlying the majority of somatic disorders, which will improve the quality and efficiency of health (including pharmacotherapeutic) help.

In connection with the theoretical and practical importance of these issues, creation of psychotherapy departments should be considered appropriate in the practice of primary health care facilities. The combined use of different methods and forms of psychotherapy with the simultaneous implementation of adjacent specialists in primary care can be implemented on the basis of outpatient psychotherapy unit cabinet, in order to provide quality and efficient care.

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ДЕНСАУЛЫҚ САҚТАУ ЖҮЙЕСІНІҢ ПСИХОЛОГИЯЛЫҚ АСПЕКТІЛЕРІ

Аннотация. Қоғамның әлеуметтік-экономикалық дамуын жақсарту сала аладында қол жетімді және тиімді денсаулық сақтау жүйесін құруға арналған мақсатты жаңа тапсырмалар қоюға мүмкіндік берді. Қазақстандық экономиканың әлем экономикасына интеграциялануы әлеуметтік институттар жүйесінің қызметтік бағыттары мен ауқымын, соның ішінде денсаулық сақтау жүйесін, басқаруды ұйымдастыруды жаңа бағытты талап етеді. Оның тәжірбиеге айналуы, сондай-ақ денсаулық сақтау жүйесінің қызметтер атқаруындағы жаңа институционалды шарттар мен денсаулық сақтау жүйесін жаңа идеялар, құқықтық нормалар, нормативтік үрдістер және оларды іске асыратын механизмдерді негізге ала отырып дамытуды талап етеді. Тольктай алғанда, Қазақстанда денсаулық сақтау секторын сапалы жүйелі түрде қайтадан қарастыруды қажет етеді. Сондықтан денсаулық сақтау секілді қиын және көп факторлы салада барлық сұрақтардың толық шешімін қамти алатын әмбебап модель жоқ екенің атап өткен жөн. Табыстардың деңгейлері, білімі мен денсаулық сақтауға шығындарды бірдей мемлекеттер денсаулық сақтаудың басты мәселелерін шешуде өз мүмкіндіктері бойынша ерекшеленетіні жалпыға белгілі. Осылай, денсаулық сақтау ұлттық жүйесін құру әлемдік тәжірбиені ескере отырып, экономикалық, әлеуметтік және саяси шарттардағы басты мақсаттарды шешу мүмкіндіктерін бағалауға негізделіп құрылуы керек. Біздің мақаламызда психосоматикалық ауруларды емдеу, терапиясы мен диагностикасы аясындағы психологиялық интервенцияның рөлі туралы зерттеу нәтижесін ұсынамыз.

Түйін сөздер: денсаулық сақтау жүйесі, мемлекеттік саясат, психосоматикалық құбылыс.

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ПСИХОЛОГИЧЕСКИЕ АСПЕКТЫ СИСТЕМЫ ЗДРАВООХРАНЕНИЯ

Аннотация. Улучшение социально-экономического развития общества позволило поставить перед отраслью принципиально новые задачи, направленные на создание доступной и эффективной системы здравоохранения. Интеграция казахстанской экономики в мировую экономику, масштабы и характер деятельности системы социальных институтов, в том числе системы здравоохранения, требует нового подхода к организации управления. Ее практическое воплощение, а также новые институциональные условия функционирования системы здравоохранения требуют развития системы здравоохранения на основе разработки новых идей, правовых норм, нормативных процедур и реализующих их механизмов, а в целом - качественных системных преобразований сектора здравоохранения Казахстана. Вместе с тем, необходимо отметить, что в такой сложной и многофакторной отрасли как здравоохранение, не существует универсальной модели, позволяющей обеспечить полное решение всех имеющихся проблемных вопросов. Общеизвестно, что страны, характеризующиеся одинаковыми уровнями дохода, образования и расходов на здравоохранение различаются по своим возможностям решать важнейшие проблемы охраны здоровья. Таким образом, построение национальной системы здравоохранения должно осуществляться на основе оценки возможности решения приоритетных задач в конкретных экономических, социальных и политических условиях с учетом мирового опыта. В статье мы проводим исследование о роли психологической интервенции в рамках диагностики и терапии психосоматических больных.

Ключевые слова: система здравоохранения, государственная политика, психосоматические проявления.

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GRADUATES OF HIGHER EDUCATIONAL INSTITUTIONS AND BUSINESS: MUTUAL EXPECTATIONS

Abstract. The problems on the labor market have been and remain actual. The need to analyze the situation with university graduates in the labor market is conditioned by two very important circumstances: the difficulty of finding a job by young specialists as well as the need to develop the human resources capacity on the country's labor market. A serious problem in the labor market is the disagreement between supply and demand, which is reflected in the gap between employers' preferences and the expectations of university graduates. The problems mentioned are of a real economic nature because competitiveness, pace of economic, technological, innovative development of the country as a whole directly depend on their solution. The purpose of the publication is to analyze the current situation with the employment of graduates of higher educational institutions on the labor market, to identify the problems that arise and to find the ways to solve them. The main content of the research is a survey conducted among graduates of 14 universities in Almaty, Astana, and Taldykorgan. The subject of the study is the mutual expectations of universities' graduates and employers. As research task, the author attempted to assess the situation in the labor market, namely: the demand for IT specialists, the skills necessary for the employment of young professionals, the demographic analysis of the market, the situation in the labor market by the following criterion: work experience; analysis of the expectations of universities' graduates and employers.

Key words: university, graduates, higher education, business.

The market economy of Kazakhstan is more than 25 years old. Business moved from spontaneous forms of organization to planned ones. In this regard, the attitude towards the personnel of the company from the employer has changed. An employer who wants to respond to new challenges seeks to provide greater flexibility for wage labor through job rotation, a variety of work operations, a variety of work skills, continuous training, and introduction of flexible work time schedules. Earlier the employee was required to learn a certain set of techniques for the rest of his life, now the employee should be ready to constantly master new skills as new information technologies are introduced. The fourth industrial revolution (robotics, nanotechnology, 3D printing, biotechnology, etc.), which has been discussed in the last decade, has also affected the labor market. Today, more and more questions arise as: which professions will become obsolete, who will be replaced by robots, what tasks will be automated, what experts and skills will be required in the future? A variety of skills implies the constant mode of retraining. Moreover, today the employer clearly prefers professionalism rather than kinship ties. However, professional knowledge and experience is not the only requirement, compliance of which provides specialist's entry to the company. The latter situation is especially relevant for young graduates, who have not been confirmed by the experience of solving production or management tasks, the availability of knowledge acquired in universities. The lack of such experience sharply reduces the advantages of young people in hiring and determining the value of their labor.

Nowadays, higher education is perceived by employers as a necessary, but insufficient condition for obtaining a job in the labor market. The poll conducted in 2016 by the National Chamber of Entrepreneurs "Atameken" revealed the fact that among 7,000 employers of Kazakhstan only 15% of them when hiring

an employee who paid attention to availability of the diploma of higher education, and the remaining 85% noted that the diploma of the university does not matter, the main thing for them is that the applicant must have practical skills. Often higher education, even where it was not previously required, should be supported by an additional education aimed at deepening or specializing of knowledge and skills. Complexity and dynamism inherent to the labor sphere often generate young specialists with inaccurate representations about it and cause inadequate expectations. On the other hand, in many cases, the employer does not receive the employee he needs, and is forced to invest funds for training and upgrading of the staff. 15-20% of working time [1]. Employers in Kazakhstan spend for employees on average 2 million tenge per year. In 2016, 5.6 billion tenge was spent for training the employees, that is more than in 2015[2]. Many large players of the financial market of our country have their own corporate universities and centers of professional development for their employees (BI-GROUP, all second-tier banks, Samruk-Kazyna FND, etc.) [3-5], where young specialists before starting their working duties take 3-6 months courses where mentors teach them the subtleties of profession. II International Forum "Entrepreneurship education in fast-growing societies: transformation of values" held on May 29-30, 2018 at the AlmaU university opened the veil of problems arising in training of young professionals at universities. According to speeches of representatives of business community and higher education institutions, one can conclude that today the labor market requires young professionals not only with professional competence, but also a talented, creative employee with developed emotional intelligence. Proceeding from this, many domestic and foreign scientists came to the conclusion that it is necessary to develop an interdisciplinary approach of training at universities. Such requirement to experts from employers is caused by a number of circumstances, in particular, by high rate development of scientific and technical progress, complication owing to production productions, strengthening of competition in connection with globalization and integration of the economy. According to requirements of the labor market not only graduates but society, the economy in general and employers, in particular, are interested in compliance of professional training of graduates.

Literature review. Since 1950s, when the scientific and technological revolution unfolds into full force, and later the informatization of the economy takes place, the role of higher education as a channel of mobility has been continuously growing. Education has become a social elevator for the masses of people and, first of all, opened the doors to the middle class, for people from the lower strata of society. The importance of higher education as an important social welfare is confirmed by a multitude of facts, the brightest of which is the difference in the level of incomes between university graduates and those who do not have higher education [6]. The income gap between these groups became more distinct in the 1960s-1980s and was approximately the same in all industrial economies: in the USA (data for 1989) - 65% [7] in Russia in the early 1990s - 60-70%[8]. In Kazakhstan, the average salary of workers classified as managers was 2.0 times higher than the salaries of specialists at the highest level of qualification, 2.6 times higher than those of mid-level qualification specialists and 4.4 times higher than those of unskilled workers [9].

In modern conditions, new trends arise in the content and structure of jobs. Theoretical basis for understanding these trends can serve the concepts of the post-industrial society (2004, D. Bell) [10], a society of network structures (2011, M. Castells) [11], information society. According to G. Perkin [12], in the third professional revolution, the beginning of which he dates back to the 1970s, there is a global competition that highlights the highly educated people of liberal professions.

Such people G. Perkin calls transprofessionals, who must be prepared at the expense of their thinking and ways of organizing activities to work in various professional environments. Transprofessionals are characterized by the free use of various methods for solving creative tasks, abandoning formal standards, creative thinking style, situational approach to structural components of the organization. In the era of the fourth industrial revolution, in which we are rapidly moving, the employer will place higher demands on the quality of "human capital". For example, scientists Carl Frey and Michael Osborne in 2013 determined that 47% of professions in the US are at high risk of automation for 10-20 years[13]. Continuing this research with Citibank, in 2016 the authors disseminated the findings to more than 50 countries: on average for OECD countries, in 57% of professions, algorithms will replace people [14]. Employers will

need specialists whose work cannot be replaced by automated labor. According to the study of the World Economic Forum (WEF) "The future of jobs", 14 key future skills are defined: presentation, critical thinking, negotiation skills, persuasion skills, resource management, creative skills, programming, complex problem solving, time management and others [15].

Highly qualified specialists are the most important component for the development of country's economy, increase of productivity and competitiveness of the company. Realizing the fact that without interaction with higher educational institutions employers won't be able to receive necessary experts in the course of training, business in Kazakhstan began showing interest in the work of higher education institutions. So, in 2018 the National Chamber of Entrepreneurs "Atameken" conducted an analysis of educational programs of 66 universities of the country. Research result revealed the factors that showed the following problems of higher education:

- educational programs are outdated, there are facts of applying obsolete programming languages in teaching, which companies have not used for a long time.

- in the recommended literature there was a literature of 1999-2000, where the used materials are not relevant nowadays

- there were unnecessary topics for study, etc. [16].

Thereby business community reacts to changes in the external environment and gives a signal to higher education institutions and the state that they need highly qualified personnel, they are interested in meeting and conducting a dialogue in this direction. And now, due to lack of such professionals in the local labor market, they are forced to attract them from abroad. Nowadays (2010-2017), 308.6 thousand foreign workers were engaged in the country who perform labor activity in various spheres of production, including in the management apparatus of companies. The main share is the share of highly qualified specialists as they make deficiency in the local labor market [17].

One of the main problems with employment and related social dissatisfaction of university graduates in the country is disproportion between the number of graduates and market capacity. Now the share of students-economists in the general contingent of higher education institutions makes 25-27% of their total number, whereas by results of the conducted market researches the need of the market for them makes only 13% [18]. "Overproduction" of economists and financiers, from the one hand, and an acute shortage of qualified specialists in the same areas on the other hand - are the two poles of the same problem. By the results of the audit company "E & Y" about one third of employees in Kazakhstan do not work according to their specialty [19]. Most of the activities aimed at solving employment problems in the country including training, retraining and professional development of the staff are carried out without proper study of the market demand for personnel. The absence of these data causes a weak link between the labor market and the education sector, as well as the "constraint of universities by state standards and existing classifier of specialties" [20] as a result, state orders for training of specialists are distributed blindly, which leads to increased disparities between supply and demand on individual segments of the labor market, i.e, there is an increase in the number of one specialists and the lack of others [21]. The specified circumstances actualize the study of mutual expectations of employers and young specialists, that is, university graduates in order to approach the solution of a number of problems. First of all, they include overcoming of discrepancy between the labor market and the market of educational services, as well as reducing the scale of the spread of informal relations and building a new organizational culture.

Research results. This article describes the research results of the employment problem of university graduates of IT specialty. Considered questions are: why graduates of higher educational institutions experience difficulties in finding a job in their specialty; what competencies they lack; what help students expect from the university.

The research of graduates' opinions was conducted by using the questionnaire. The answers were subjected to qualitative analysis. The study involved graduates of 14 higher educational institutions of the country preparing specialists in IT specialties. Most of them studied at universities in Almaty, several respondents - representatives of the cities Astana and Taldykorgan. The number of respondents is 81 people.

First of all, we were interested in the question whether graduates work in their specialty. If not, why?

By results of a research, it has become clear that the majority of graduates (approximately 76,9%) work in their specialty. During the first year, they had difficulties in the process of work such as:

- inability to apply knowledge into practice (51.6%),
- lack of knowledge (19.4%),
- other respondents noted a low salary (3.2%),
- unfair selection on a vacant position (3.2%).

23.1% of graduates noted that they do not work in their specialty. 40% out of these respondents do not work according to their specialty because of interests' change, other respondents indicated the reason: they did not have experience in specialty (20%), there is lack of vacancy (10%), they are continuing their study at the university (30%).

That is, out of all graduates 71.6% noted that the most important problem was not the knowledge of the labor market, new technologies, not the ability to apply knowledge in practice, but the knowledge that they had gained at the university have become outdated.

It should be noted that training of IT professionals is dispersed today in a large number of universities from different regions, which cannot but affect the quality of their training. Today, more than 89 universities of Kazakhstan are preparing IT specialists (70% of their total number). The main problems of most of these higher education institutions are the insignificant contingent of full-time education, problems with providing qualified teachers, insufficient material, and technical resources, lack of financial opportunities and interest in developing external and internal academic mobility. The implementation of these tasks today can only be achieved by large, financially sustainable, specialized educational institutions. They will be able to ensure their solution and create decent conditions for training our students. The scale effect and specialization prove its efficiency in the system of higher education. In this regard, the course towards integration and specialization of the operating educational institutions from the Ministry of education of RK is an objective need and command of the time. Graduates noted that for IT specialties the importance of practice-oriented knowledge is very high. The sphere of IT professional activity changes so quickly that teachers often do not have time to work out the relevant competencies and to comprehend them. In this regard, the involvement of practitioners for reading author courses within elective disciplines is an indispensable element in the learning process. Of course, some universities use this practice of binary lectures, but this practice is not regular and permanent. Since it is very difficult to attract practitioners to such lectures because of lack of time and motivation of practitioners. Specialists with extensive experience in production do not want to be distracted by additional unpaid work. Therefore, universities need to use personal connections and attract their acquaintances. We see the solution to this problem in the following:

- higher education institutions need to resolve an issue of constant professional improvement of teachers, their inclusions in real professional activity, including through participation in professional associations and internship in companies.

- high-quality forecasting on the basis of requirements of labor market, continuous monitoring and involvement of employers will allow to provide competitive services in the field of education and train personnel for them.

- it is possible to use the capacity of association of university graduates where the working graduates can share the knowledge with students of the Alma Mater. But unfortunately, when conducting the survey and drawing up the list of university graduates, we were faced with the problem of obtaining contact details of graduates. It was necessary to resort to opportunities of social networks: Facebook, WhatsApp groups. There is an opinion that some higher educational institutions do not use the opportunities and advantages of involving university graduates by drawing up educational/training programs, replenishment endowment funds, conducting lectures, etc. The following question reveals the problem of why university graduates had difficulties in the first year of their work in the specialty.

Question	Theoretical	Practical	Both
In your opinion, what direction of teaching prevails at universities?	69,2%	23,1%	7,7%

69.2% of respondents noted that the theoretical part prevails at universities and less attention is paid to the practical one. Thus, it is influenced by the material and technical resources of higher education institutions. Many private higher educational institutions have no laboratories and computers with a sufficient memory with big data which are necessary for IT experts' work. Another problem is a low salary of teachers, which does not allow teachers to reproduce the workforce normally and improve their living conditions (paying for an apartment, food, clothes, etc.), bring up and educate children. It is known that if the salary at the main place of employment does not provide an employee and members of his family, then there is an objective need for sources of additional income. Overtime work or work in several fields leads to depletion of labor potential, decrease in professionalism, deterioration of labor and production discipline, etc. [16] Specialists with knowledge of new technology (Big Data) are not attracted by the salary in higher educational institutions. In this case, it would be possible to use the methods of company's social responsibility, as it is done in other countries. In European higher educational institutions, top managers and specialists of companies try to hold free lectures in sponsored schools and universities on a regular basis. These events are associated as social responsibility. Thus, the manager fulfills his obligations to the society.

Graduates of national research and specialized universities - 23.1% respondents noted the practical orientation of training. At the same time, some respondents noted that the quality of education at these universities was at a high level, partnership with business was established: permanent and stable, competitions were regularly held with representatives of the business community, but they themselves could not understand the necessity of the event in forming practical skills and did not show activity and due diligence during study.

Table 1

Question	Helped very much	Helped	Did not help
How much did the theoretical knowledge help you that you acquired during training?	23.1%	61.5%	15.4%

23.1% of the respondents answered helped very much, 61.5% helped, only 15.4% of the respondents answered their theoretical knowledge did not help them in the first year of work in the companies.

Table 2

Question	Yes	No	A little
In your opinion, would production practice help students with employment at the university?	69.2%	20.5%	10.3%
Were you satisfied with the training / production practices?	46.2%	12.8%	35.9%

The majority of respondents (69.2%) consider that the production practice in companies helps with job search, while this practice helps the students of senior courses to determine the further trajectory of their professional career. To the question: Were you satisfied with the training / production practices? 46.2% noted that they not only managed to apply their theoretical knowledge gained in practice, but also got experience of interaction in the team. 12,8% of respondents did practical training formally, 35.9% of respondents noted that expectations from the production practice were not justified, as they were involved in work where professional skills were not required. Basically, their work was used to perform routine work of the archivist, courier, etc.

Summarizing the conducted research, it is possible to tell that innovations promote an increase in productivity of the enterprises that reduces their demand for a manpower. The consequences of introducing the new technologies will be different for all, depending on the characteristics of enterprises, sectors, and countries, so they are difficult to predict. Experts from the WEF (World Economic Forum) analyzed 15 developed and developing economies of the world with a coverage of 65% of workforce and

concluded that about 27% of jobs in the world will disappear as a result of a new wave of automation, and by the end of 2020 the number of jobs will decrease by 5,1 million units, two thirds of which are office and administrative ones [12]. In Kazakhstan, the level of robotization of the economy is significantly behind the indicators of the developed countries and there are 70 robots per 10 thousand workers [18]. In South Korea, Japan, and Singapore, the same number of workers account for more than 500 robots. In Russia, robotization is not extended yet - 1 industrial robot per 10 thousand workers [19]. To prepare highly professional, competitive specialists not only within the country, but at the international level as well, it is necessary to take into account the changes taking place in the economy of developed countries. Are universities ready to meet such challenges? Young university graduates are vulnerable in this regard. Young people have much less chance of finding a job than adults, while the youth unemployment rate in the world is 13% or three times higher than that of the adult population (4.3%). In Kazakhstan, this indicator in the 1st quarter of 2018 was 4.1% at the general unemployment rate of 4.9% [20].

As the research has shown the role of the higher education as the institution of mobility decreases: contrary to expectations of young people, it stops being the major career resource, gives fewer advantages in the labor market. Today an employer needs experts with practical skills, but not the diploma. Therefore, for employment of graduates of higher educational institutions in their specialty, the theoretical and practical orientation of training is a prerequisite, but practical skills are the priority. According to young graduates, employers at recruitment proceed from the fact that they want to use young energy, activity, openness to new and opportunity to use young potential for less salary. Most of young IT professionals after working in companies for 2-3 years and gaining valuable practical experience, open their own company. They, as employers, expressed the opinion that young people also have the advantage that they are easier to integrate into the organizational culture of the company, it is easier to work with them, they are easier to "mold" their own than to alter an employee with extensive experience and the established "blinkered" outlook on life. In their company they want to see dynamic young professionals open to all new.

Undoubtedly, education plays a key role in the process of adaptation to the changing requirements of the economy. The higher is the level of education quality, the higher is labor productivity and the greater are the chances for young professionals to find a quality workplace. Therefore, the starting point in improving the policy is to understand interrelations between tendencies in labor market and education.

First and foremost, an effective system for staff forecasting needs has to be introduced, the results of which should become the basis for adaptation of educational programs and career guidance of the population. This work should take place with the participation of all social partners.

The second priority of the policy is development of highly effective working methods from the part of enterprises. Such methods are associated with both organization of work and management practice including teamwork, mentoring.

Thirdly, it is necessary to intensify introduction of modern teaching methods, teaching styles that allow the graduate to adapt, so that he could take the worthy place in professional space.

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ЖОҒАРЫ ОҚУ ОРЫНДАРЫНЫҢ ТҮЛЕКТЕРІ МЕН БИЗНЕС: ӨЗАРА ҮМІТТЕНУ

Аннотация. Еліміздің еңбек нарығындағы шешілмеген мәселелері қазіргі таңда өзекті болып отыр. Жас мамандардың еңбек нарығында мамандық бойынша жұмыс іздеудегі қиыншылықтары мен елдің еңбек нарығының кадр әлеуетін дамыту қажеттілігі осы айтылған екі өте маңызды жағдай еңбек нарығында жоғарғы оқу орындарының (ЖОО) түлектерінің жағдайын талдау қажеттілігін туындатады. Еңбек нарығындағы маңызды мәселе - сұраныс пен ұсыныс арасындағы келіспеушілік, бұл жұмыс берушілердің жалдамалы жұмысшыларға деген қойылатын талаптары мен жоғарғы оқу орындарының түлектерінің ең алғашқы жұмыс орынына деген үміттері арасындағы алшақтықта көрініс табады. Аталған мәселелер нақты экономикалық сипатқа ие, өйткені еңбек нарығындағы жұмысшылардың бәсекеге қабілеттілігі, елдің экономикалық, технологиялық және инновациялық даму қарқынына тікелей әсерін беретіні айқын. Осы мақаланың мақсаты - жоғарғы оқу орындары түлектерінің еңбек нарығында жұмысқа орналасу барысында туындайтын мәселелерді анықтау және оларды шешу жолдарын табу. Зерттеудің негізгі мазмұны - Алматы, Астана және Талдықорған қалаларындағы 14 жоғарғы оқу орындарының түлектері арасында жүргізілген сауалнамаға негізделген. Зерттеу пәні жұмыс берушілер мен ЖОО бітірушілер арасындағы өзара бір бірінен үміттену жағдайларын зерделеу болып табылады. Зерттеу міндеті ретінде мақаланың авторы еңбек нарығындағы жағдайды бағалауға тырысты, атап айтқанда: IT мамандарына сұраныс, жас мамандарды жұмысқа орналастыру үшін қажетті дағдылар, нарықтағы демографиялық ахуалды талдау. Еңбек нарығындағы жағдай келесі критерийлерге сәйкес: жұмыс тәжірибесі; университеттер мен жұмыс берушілердің түлектерінің үміттерін талдау.

Тірек сөздер: университет, жоғарғы оқу орындарының түлектері, жоғарғы оқу орыны, бизнес

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ВЫПУСКНИКИ ВУЗОВ И БИЗНЕС: ВЗАИМНЫЕ ОЖИДАНИЯ

Аннотация. Проблема рынка труда была и остается актуальной. Необходимость анализа положения выпускников вузов на рынке труда обуславливается двумя важнейшими обстоятельствами: сложность трудоустройства молодых специалистов и необходимостью развития кадрового потенциала рынка труда страны. Серьезная проблема на рынке труда – это рассогласованность предложения и спроса, которая выражается в разрыве между предпочтениями работодателей и ожиданиями выпускников вузов. Обозначенные проблемы носят реальный экономический характер, так как от их решения напрямую зависят конкурентоспособность, темпы экономического, технологического, инновационного развития страны в целом. Цель публикации – анализ сложившейся ситуации с трудоустройством выпускников вузов на рынке труда, выявление возникающих при этом проблем и поиск способов их разрешения. Основное содержание исследования составляет анкетирование, проведенное среди выпускников 14 вузов г. Алматы, Астаны и Талдыкоргана. Предмет исследования – взаимные ожидания выпускников вузов и работодателей. В качестве исследовательской задачи автором была предпринята попытка оценить ситуацию на рынке труда, а именно: спрос на специалистов IT направлений, навыки необходимые для трудоустройства молодых специалистов, демографический анализ рынка, ситуация на рынке труда по следующим критериям: опыт работы; анализ ожидания выпускников вузов и работодателей.

Ключевые слова: университет, выпускники вузов, высшие учебные заведения, бизнес

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FROM NOMADS HERITAGE TO FUTURE ENERGY AT EXPO-KAZAKHSTAN: A STUDY OF PATRIOTISM, COSMOPOLITANISM AND VISITORS' SATISFACTION

Abstract. The main goal of the study is to analyze the impact of patriotism and cosmopolitanism on visitors' satisfaction with the international exhibition "Expo: Energy of the Future" which was held in Kazakhstan in 2017. Hosting recognized expo bring hundreds of millions of dollars and extensive international exposure of the host nation's culture and economy. The present study analyzes how the attitudes of local citizens, in particular, patriotism, cosmopolitanism, and satisfaction, affect the international economic integration of Kazakhstani economy. The current study uses a quantitative survey method. Construct measures for this research were derived from existing literature. Data from 428 questionnaires were used for confirmatory factor analysis and regression model to test hypothesized relationships. The results showed the significant positive relationship between patriotism and satisfaction and cosmopolitanism and satisfaction.

The study contributes to the existing literature on event marketing and international exhibitions in the context of transitional economies as well as the impact of patriotism and cosmopolitanism on visitor satisfaction. The study has implications for practitioners in tourism, hospitality, exhibitions, and service industries. The present research suggests that patriotic and cosmopolitan attitudes of Kazakhstani citizens can contribute to the development of international relationships and further integration of Kazakhstan into the global economy.

Keywords: patriotism, cosmopolitanism, satisfaction, international exhibitions.

Introduction. After 226 years since the first international industrial exhibition in Prague in 1791 and no world recognized exhibition held in Central Asia, the international exhibition "Expo 2017: Energy of the Future" held in Astana, Kazakhstan has become the greatest achievement of Kazakhstan at the international level and offered the opportunity to advance the latest technological, scientific and cultural achievements. Since the collapse of Soviet Union, Kazakhstan has done better than any of its Central Asian neighbors. The country jumped from 51st to 35th place on the World Bank's ease of doing business rankings between 2016 and 2017. Kazakhstan is literally and figuratively at a crossroads of past and future trade routes between Asia, Europe, and Africa. Hosting recognized expo bring hundreds of millions of dollars and extensive international exposure to the host nation's culture and economy. The world-class event, such as Expo, has an impact on the local population as well. The present study analyzes how the behavior of local citizens in Kazakhstan, a former Soviet totalitarian regime country, affects the international economic integration of this transitional economy. The purpose of the paper is to examine the impact of patriotism and cosmopolitanism on visitors' satisfaction with "Expo 2017: Energy of the Future" international exhibition.

Literature Review. The events such as EXPO, World Forums, World Exhibitions and other cultural and sports events are considered as major events, mega events or even giga-events in the globalized world (Muller, 2015). According to Muller (2015), "most cities, countries and regions aim to make strategic use of mega-events to develop infrastructure and push urban renewal, often through leveraging funds that would not be available otherwise". Most significant are the demonstration of patriotism, cosmopolitanism among citizens of host events countries. Interesting definition of patriotism and nationalism and difference

between those words was derived as the following: “a patriot loves his country and is proud of it for what it does whereas a nationalist loves his country and is proud of his country no matter what it does” (<https://www.indiatoday.in/fyi/story/nationalism-patriotism-difference-people-973461-2017-04-25>). The other measure of customer’s and citizen’s satisfactions relate to cosmopolitanism as evidence of globalized world and has different aspects such as political, socio-economic, sociocultural and other prospective. From sociocultural perspective, for example, “cosmopolitanism can be viewed as a collective and personal learning process that unfolds through encounters with competing systems of meaning and alternative cultural models... (Delanty, 2006 in Levy et al., 2016).

Moreover, Levy et al. (2016) highlighted that many researchers and scientists pay attention to the “cosmopolitanism” as developing in different directions (e.g., Brimm, 2010; Dahlander & Frederiksen, 2012; Grinstein & Riefler, 2015; Haas, 2006; Haas & Cummings, 2014; Janssens & Steyaert, 2014; Levy, Beechler, Taylor, & Boyacigiller, 2007; Riefler, Diamantopoulos, & Siguaw, 2012 in Levy et al., 2016). They highlighted that it is multidisciplinary approach: there is an interest from the point of management, global leadership, corporate social responsibility (Levy et al., 2016).

Thus, patriotism and cosmopolitanism are the major indicators of local visitors’ satisfaction with such global mega-event conducted in the country as it can raise pride and honor for the home country. Based on the past research the following hypotheses were stated for this study:

H1: Patriotism of Kazakhstani citizens is related to visitor satisfaction with international exhibition Expo.

H2: Cosmopolitanism of Kazakhstani citizens is related to visitor satisfaction with international exhibition Expo.

Methodology. The current study uses a quantitative survey method. Construct measures for this research were derived from existing literature. The construct of Patriotism was measured by four items: “Being a Kazakhstani citizen means a lot to me”, “I am proud to be a Kazakhstani citizen”, “When a foreign person praises Kazakhstan, it feels like a personal compliment”, and “I feel strong ties with Kazakhstan. The construct of Cosmopolitanism was measured by four items: “I like immersing myself in different cultural environments”, “I like having contact with people from different cultures”, “I would enjoy travelling to foreign countries for an extended period of time”, and “Getting information and news from around the world is important to me. The Satisfaction was measured by two items: “Overall I am satisfied with the EXPO exhibition” and “Comparing to what I expected, I am satisfied with EXPO”. All measures used have been proven psychometrically sound in cross-cultural contexts. Five-point Likert-type scales (1 = strongly disagree to 5 = strongly agree) were utilized for the individual scales to measure the constructs. In the process of translation and cross-cultural adaptation of the research stimuli and questionnaire (scale items), the guidelines for conducting international consumer research by Craig & Douglas (1999) were followed. For the quantitative survey, systematic sampling (also known as interval sampling) was applied. This method is recommended when a stream of representative people are available – visitors to Expo in this case. Data collection was distributed across the time of day and day of the week. A thousand questionnaires were distributed over the period of four weeks during the exhibition.

Results. After cleaning 428 questionnaires were used for analysis. The sample consisted of 58% of females and 42% of males. The age ranged from 16 to 67 years old. The confirmatory factor analysis was performed on items with Principal Component Factor analysis and varimax rotation (see table 1.) All items produced good loadings (high than 0.7). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.91 is classified as ‘marvelous’ and is far above the minimum level of 0.5 that means that the sample can be used for factor analysis. Reliability of the scales was established using Cronbach’s Alpha (0.90 for patriotism and 0.85 for cosmopolitanism and satisfaction scales). For all scales, alpha values are “respectable or better”, i.e. higher than 0.7 as recommended in the literature.

The resulting factors were used for further analysis. A regression model with Patriotism and Cosmopolitanism as independent variables and Satisfaction as dependent variable was tested to examine hypothesized relationships. The model produced good fit with R Square of 0.641. The results supported both hypotheses and showed the significant positive relationship between Patriotism and Satisfaction and Cosmopolitanism and Satisfaction (see table 2).

Table 1 – Measures and Item Loadings

Construct / Items	Loadings
Patriotism	
1. Being a Kazakhstani citizen means a lot to me	0.850
2. I am proud to be a Kazakhstani citizen	0.853
3. When a foreign person praises Kazakhstan, it feels like a personal compliment	0.768
4. I feel strong ties with Kazakhstan	0.870
Cosmopolitanism	
1. I like immersing myself in different cultural environments	0.705
2. I like having contact with people from different cultures	0.804
3. I would enjoy travelling to foreign countries for an extended period of time	0.800
4. Getting information and news from around the world is important to me	0.834
Visitor Satisfaction	
1. Overall I am satisfied with the EXPO exhibition	0.711
2. Comparing to what I expected, I am satisfied with EXPO	0.744

Table 2 – Results

Hypotheses	Linkage	Est (t-value)	Result
H1:	Patriotism → Visitor Satisfaction (+)	0.616 (16.61)	Supported
H2:	Cosmopolitanism → Visitor Satisfaction (+)	0.349 (8.84)	Supported

Conclusions. This paper examined the relationship between patriotism and residents' satisfaction and relationship between cosmopolitanism and residents' satisfaction. The results confirmed the significant positive relationship between Patriotism and Satisfaction and Cosmopolitanism and Satisfaction with Expo of visitors from Kazakhstan. The event, World Expo which was held in Astana in summer 2017, was recognized worldwide and raised patriotism and pride of residents. Through the international consumer survey during the period of four weeks of the exhibition, factor and regression analyses it was determined that local residents have a high satisfaction with positive changes produced by events in economy, culture, environment, science, and technology, which were represented during mega-event EXPO-2017. On one hand, the importance of such mega-events may have an impact on country economic development through investments in building new exhibition' pavilions; cultural events may attract tourists and other stakeholders to visit the country. On the other hand, there is an opportunity for the host country to present technological achievements to the world and raise the image and reputation of the country. The residents' perception showed that there is a high positive relationship between patriotism and local visitors' satisfaction and between cosmopolitanism and residents' satisfaction. However, despite the importance of such kind research and results, this study has limitations. First, the study was conducted during the event and there are no data to perform a longitudinal study to see whether residents' perceptions had changed over time. Second, the study was focused on the residents' perception and satisfaction in terms of patriotism and cosmopolitanism without other stakeholders' analysis of attitude and perception, which will be a valuable contribution to the study. As a result, future studies will be a valuable addition in term of conducting longitudinal post-event perception after some period of time. Another proposition is including in the study other participants of this mega-event such as entrepreneurs and foreign visitors, in order to add depth to the study.

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**КӨШПЕНДІ ХАЛЫҚТАН БОЛАШАҚТЫҢ ЭНЕРГИЯСЫ ЭКСПО-ҚАЗАҚСТАНҒА:
ПАТРИОТИЗМДІ, КОСМОПОЛИТИЗМДІ ЗЕТТЕУ ЖӘНЕ
КӨРМЕГЕ КЕЛУШІЛЕРДІҢ РИЗАШЫЛЫҒЫ**

Аннотация. Зерттеудің негізгі мақсаты – 2017 жылы Қазақстанда өткен «ЭКСПО: Болашақтың энергиясы» халықаралық көрмеге келушілердің ризашылығына патриотизм мен космополитизмнің әсерін талдау. ЭКСПО сияқты ауқымды шараларды өткізу ұйымдастырушы елдерге жүз миллион доллар алып келеді және сол елдердің мәдениеті, экономикасы кеңінен халықаралық танымал болады. Бұл зерттеуде патриотизм, космополитизм жеке қарым-қатынас ретінде талданады және халықтың ризашылығы, қазақстандық экономиканың халықаралық экономикаға бірігуіне ықпалын қарастырады. Ғылыми жұмыста зерттеудің сандық әдісі пайдаланылды. Бұл зерттеудің модель критерийлері бұрыннан қолданылып келген әдебиеттерден алынды. 428 анкеталық сауалнама мәліметтері факторлық талдау мен кемімелік талдауды дәлелдеу жолымен болжамды қарым-қатынасты тексеру үшін пайдаланылды. Сауалнаманың нәтижесі патриотизм мен ризашылықтың және космополитизм мен ризашылықтың арасындағы айтарлықтай жағымды байланыстың бар екенін көрсетті. Зерттеу инвент-маркетинг бойынша және өтпелі экономикалық жүйе контексіндегі халықаралық көрмелерді ұйымдастыру бойынша әдебиеттерге, сол сияқты, келушілердің ризашылығына патриотизм мен космополитизмнің әсерін зерттеуге үлес қосады. Зерттеу сонымен қатар туризм, қонақ үй бизнесі бойынша тәжірибе алушыларға, көрме ұйымдастырушыларға және қызмет көрсету саласындағы мамандарға маңызды болып келеді. Қолданылған зерттеу қазақстандық азаматтардың патриоттық және космополиттік қарым-қатынасы халықаралық қатынастардың дамуына және әлемдік экономикаға Қазақстанның алдағы бірігуіне мүмкіндік беретінін болжайды.

Түйін сөздер: патриотизм, космополитизм, ризашылық, халықаралық көрмелер.

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**ОТ НАСЛЕДИЯ НОМАДОВ К ЭНЕРГИИ БУДУЩЕГО НА ЭКСПО-КАЗАХСТАН:
ИССЛЕДОВАНИЕ ПАТРИОТИЗМА, КОСМОПОЛИТИЗМА
И УДОВЛЕТВОРЕННОСТИ ПОСЕТИТЕЛЕЙ ВЫСТАВКИ**

Аннотация. Основная цель исследования – проанализировать влияние патриотизма и космополитизма на уровень удовлетворенности посетителей международной выставки «ЭКСПО: Энергия Будущего», которая прошла в Казахстане в 2017 году. Проведение таких признанных мероприятий, как ЭКСПО, для стран-организаторов приносит сотни миллионов долларов и широкое международное признание культуры и экономики этих стран. Данное исследование анализирует влияние патриотизма, космополитизма, и удовлетворенности посетителей на международную экономическую интеграцию казахстанской экономики. В научной работе использованы количественные методы исследования. Модель исследования была адаптирована из литературы по данной теме. Данные 428 анкетных опросников были использованы для проверки гипотетических взаимоотношений путем подтверждающего факторного анализа и регрессионной модели. Результаты показали значительную позитивную связь между патриотизмом и удовлетворенностью, и, космополитизмом и удовлетворенностью. Исследование вносит вклад в существующую литературу по ивент-маркетингу и по организации международных выставок в контексте переходных экономических систем, а также, по изучению влияния патриотизма и космополитизма на удовлетворенность посетителей. Исследование также имеет значение для практиков по туризму, гостиничному бизнесу, для организаторов выставок и для специалистов в сфере услуг. Данное исследование предполагает, что патриотические и космополитические отношения казахстанских граждан могут способствовать развитию международных отношений и дальнейшей интеграции Казахстана в мировую экономику.

Ключевые слова: патриотизм, космополитизм, удовлетворенность, международные выставки

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EXPLORING PROBLEMS PERTAINING TO GLOBAL COMPETENCE FORMATION IN FUTURE TEACHERS

Abstract. Global education is based on the concept that information about the world is of utter importance for human existence both in the society and in nature. Formation of the world view is connected with the selection of factors in different spheres of knowledge, with cognition strategy, information processing, and different mental processes such as exchange conditions. In this regard, one of the components of the global education process is of key importance, i.e., the formation of global thinking. In the selection of a global education concept, any educational institution should be oriented toward the general cognition of the environment. Correct development of the world view can support the formation of global competence of teachers. Therefore, the present study aimed to show that the formation of global competence need to be paid attention to, and methods to improve them need to be identified. Findings revealed that global competence is an important characteristic that pedagogues need to possess in the globalized world. However, to foster the same, it is first important to define the concept clearly and to then design and implement appropriate educational programs for future teachers.

Keywords: global competence, professional orientation, professional competence, knowledge, skill, abilities, concept, technology, process, integration.

Introduction. In the contemporary society, there is a demand for professionally skilled and competent pedagogues who are capable of solving various problems arising every day and of correctly assessing advancements in education and science, and who are interested in enhancement of their professional efficiency, are highly responsible, and are capable of planning their future. There is a need for specialists who are willing to accept the new concepts of education; who can think globally, act locally, and be active socially. In recent years, the global competence of a professional pedagogue has gained attention, leading to constant changes in social practice, restructuring of the educational sphere, and appearance of innovative schools and unique pedagogical systems. Therefore, instructional design and technologization of the educational process is considered a need of the time.

The need to connect the professional competence of a pedagogue with global competence arose due to continuous social development, technologization of education, intensification of information processes, variability of social events, and updated thinking paradigms, while globalization dynamics continued to affect the educational sphere. According to Robertson's definition, globalization is the process of increasing influence of different factors of international significance on the social reality in separate countries [1]. Many subsequent researchers and academicians have used this definition as a basic one because it covers different spheres; economic and political, and information and social, and it is the earliest and most comprehensive definition of this notion [1, 2]. By the mid-1990s, the concept of globalization was widespread, and it was interpreted as one of the most important constructs in the contemporary global society. Waters noted, "while the basic concept of the 1980s was postmodernism, globalization may become the key idea of the 1990s, meaning the human transition to the third millennium" [3].

However, the book “Globalization Theory: Approaches and Controversies”, edited by Held, D. and McGrew, A. pointed out only to the existence of “modern theories and narratives of globalization, applied and normative” (Introduction: Globalization at Risk, 2007), but it did not mention the proponents of these theories [4]. The book is a collection of articles by several scientists on specific issues related to globalization. Instead of a single comprehensive theory, there are many fragmentary notions on globalization. As a research object, it is a whole scientific area, which has been acknowledged by the recent publication of the “Encyclopedia of globalization” [5]. And appearance of encyclopedias proves completely that the boundaries of theory are lost forever. That is why we can only share Taylor's opinion who in the middle of 90-s compared theories of globalization with appeared in the end of 18th century notion of internationalization and suggested that new term is able “to repeat the same chaotic way and come to the same hollow final as its 200-years old predecessor” [6]. To avoid this, and to capitalize on the advantages of globalization, there is an urgent need to develop a clear understanding of the competencies that are required in each field to match the rapid changes that occur owing to globalization and its impact. The present paper aimed to show that the formation of global competence is one of the important problems that need to be addressed, and appropriate solutions need to be identified.

The Concept of “Competence”. The term “competence” is used by scientists from various spheres. For instance, researchers have conceptualized and studies different forms of competence such as professional, pedagogical, social, legal, and management competence. According to the Pedagogical dictionary, the term “competence” (Lat. *competentia*) has two meanings. First, it is defined as the scope of power granted to a certain organization or an individual on the basis of legal decrees or other regulations. Second, it is explained as the knowledge and experience possessed by an individual on a certain sphere [7]. Thus, the latter considers “competence” as a measurable aspect of an individual’s knowledge regarding a specific area of expertise. In the field of education, the idea of competence is considered to distinguish general individuals from professional specialists based on their functional, cognitive, and personal attributes, and on their educational and professional qualifications.

One of the aspects of “competence” is “educational competence,” according to which, the level of the future pedagogue’s development is related to the qualitative implementation of the educational content in compliance with higher school graduates training standards. Additionally, this concept is used to determine “educational results.” Competence is determined in terms of the graduate’s level of training, ability and skills in implementing the methods and tools of one’s profession, and his/her level of achievement of the objectives and tasks in a different environment. Thus, competence is considered as an indicator of the extent of an individual’s development or his/her performance on educational outcomes. In this regard, competence, as opined by Selevko (2004), is an integral feature of an individual’s personality, which potentially determines future academic activity and specialization based on knowledge and experience [8]. Dakhin (2001) revealed that the essence of a pedagogue’s educational competence lies in his/her potential to exercise various comprehensive kinds of activity. Therefore, he considers competence as a personal characteristic. According to his interpretation, educational competence can be achieved by focused teaching, while pedagogical competence is formed only in the course of task performance in certain complex situations [9]. Dakhin (2001) explained that some researchers use the terms “qualification” to explain “competence.” However, the distinction between these two terms is made based on the levels of the following criteria:

- ability and level of knowledge utilization (quality and use of knowledge);
- scope and range of knowledge;
- ability to efficiently arrange and plan one’s own work;
- ability to creatively apply knowledge in emergency situations;
- ability to engage in effective practical actions (e.g., machinery, technology, and labor); and
- ability to quickly adapt to organizational changes.

Having examined the concept of competence, the next section presents some of the major models of competence.

Theoretical Models of Competence. Kabardov and Artsyshevskaya (1996) defined “competence” by comparing it to “ability.” They defined competence as a behavior required for the establishment of essential skills [10]. Based on this perspective, “competence” is considered to emerge from education [11].

Khovov compared the terms “qualification” and “competence,” and noted that the latter has a wider meaning as compared to the former [12]. Thus, in addition to professional knowledge and general proficiency, which determine an individual’s qualifications, the concept of competence includes initiative, cooperation, ability, communicative skills, teaching, assessment, logic, perception and use of information, and other such characteristics. Based on this perspective, an individual’s personality characteristics, such as activeness and social communication, are considered to impact his/her “competence.” Further, competence is used as an indicator of professional training level (table 1). Thus, competence is the readiness and ability to perform certain duties in compliance with theoretical knowledge and personal practical experience.

Table 1 – Relationship between “qualification” and “competence” [12]

Competence model	Traditional qualification model
1. Result oriented/development of performance assessment and control tools	Result of teaching; it is different for every student
2. Flexible in terms of class assignments/“steps” in teaching vary across individuals	Non-flexible in terms of class assignments/“steps” in teaching are the same for all individuals
3. Includes knowledge, general proficiency, skills, and personality characteristics	Includes knowledge and general proficiency alone
4. Measurement is qualitative and is based on simple (or univocal) features.	Measurement is quantitative and is justified by the appropriate size.

Other research on the meaning of “competence” has also paid attention to various components of competence. For instance, Kholodnaya (1992) defined competence as a special kind of knowledge on a subject, which ensures efficient decision-making in the respective sphere [13]. Similarly, Kudaibergenova (2008), in her work “Nature of competence in personality development,” explained that while “competence” pertains to understanding the information one is exposed to, knowledge pertains to the ability to make decisions using this information [14].

Foreign authors have studied various aspects of competence. For instance, Fessler (2008) revealed that the following three types of environmental influences affected the establishment of professional competence [15]:

- “Personal environment” (life experiences, family, positive and negative events, crises, individual inclinations and interests, etc.);
- “Organizational environment” (rules, management style, public opinion, social expectations, professional arrangement, etc.);
- “Career environment” (education, professional establishment, competence growth, enthusiasm, disappointment, stabilization and stagnation, end of career, etc.).

Thus, Fessler’s idea of the influence of career environment indicates that an individual’s professional growth is affected by his/her exposure to varied activities. Evidently, this notion feeds into the concept of “global competence,” which is the focal point of individuals’ professional growth today. According to Fessler (2008), competence pertains to complex psychological characteristics that ensure the efficient use of certain functions to capitalize on new resources to adjust systematically to changing circumstances. As explained in the Introduction, globalization is leading to diverse experiences that require individuals to adjust quickly to a dynamic and rapidly changing society. Thus, to meet the increasing demand for global competence and to cater to the needs of the 21st century, pedagogues also need to emerge as unique specialists, in other words, they need to be considered a “professional” in their field.

Professional Competence. The term “professional” refers to a competitive, highly professional, intelligent, socially multifaceted, competent specialist with creative potential, who is in high demand [16].

Proponents of contemporary psychology and pedagogy, Zeer (2000) suggested that the concept of professionalism comprised the following constructs:

- professional orientation;
- professional competence;
- qualities essential to the profession; and
- psychological characteristics essential to the profession [17].

Out of these, our area of focus is “professional competence”; however, it is important to note that professional development and the formation of structural content occurs owing to the interaction among and integration of these four components. They are the basis for the formation of integrated professional behavior. The latter, in turn, ensures competitiveness, professional mobility, and quality of professional activity, and allows for professional growth, improvement of skills, and opportunity to advance (Zeer, 2000).

Professionalism is considered as a system of priority motivations in which the interests, needs, and professional abilities of the individual determine his/her professional orientation. Markova (1996) defined professional orientation as “the system of individual’s self-attitudes and global attitudes [18]. Individual’s activity and order, uniformity of behavioral patterns allow him/her to resist external and internal negative impact, being the basis of professionalism and self-development, and are the benchmarks in the assessment of purposefulness and morals.” Thus, the basic conditions for the formation of an individual’s professional orientation arise out of the formation of his/her pedagogical and professional qualities.

In the context of education, Oja (2009) put forth a model of teacher’s professional competence, according to which professional development is not dependent on the length of service but is determined by teacher’s cognitive development [19]. Indeed, the professional development of a teacher occurs in the course of his/her professional activities, along with the combined influence of his/her education, experience, and personal professional competence. Bauer, Kopka, and Brindt (2006) suggested that knowledge, actions, and ethics together play a crucial role in the development of professional competence [20]. Further, they proposed that competent pedagogues are aware of the structure and strategies of their knowledge, which comprises didactical, scientific, and organizational components. Therefore, such individuals are able to make pedagogically sensitive and efficient responses. They added that the professional ethics of successful pedagogues include their attitude toward themselves, toward pedagogy, toward student-teacher relationships, etc. [20]. Emerging from this concept of professional competence is that of “pedagogic professional competence,” which pertains to the professional competence of teachers.

Pedagogic Professional Competence. Grishin (1979) suggested that pedagogic competence is a core skill of professional teachers, and that it comprises their communicative, constructive, and organizational abilities. Additionally, he emphasized that teaching offers the pedagogue an opportunity to use these abilities [21].

Kuzmina (1982) explained that pedagogic professional competence is a personal characteristic that comprises the following five elements [22]:

1. Special and professional competence pertaining to the studied subjects,
2. Methodological competence in the formation of knowledge and skills,
3. Social and psychological competence in the relationship process,
4. Individual activity and auto-psychological competence in personal achievements and failures, and
5. Differentiated psychological competence in the abilities and motivations of pedagogues.

In this regard, Larionova (2004) revealed that studies on professional pedagogical competence pertained to “designating the volume of competence” and “scope of powers in the sphere of activities.” [23].

According to [23], though competence is a generic term that denotes an individual’s ability and knowledge related to his/her area of work, when the term is used with reference to a person with a certain social and professional status, it characterizes his/her volume of knowledge, concerns and skills, complexity of problems to be solved, and tasks to be accomplished.

In the context of globalization and the competences required in the 21st century professional competence should be based on the development of interactive and analytical abilities to understand social development dynamics and individual professional activity. Thus, pedagogic professional competence is viewed as a teacher’s unique functional characteristic, and the ability to assess a situation correctly and take appropriate action. For instance, a skilled pedagogue will be capable of implementing a self-education oriented high school curriculum that will help students adopt practical skills that they can practice in their future professional activity.

Results. The present article aimed to understand pedagogic activity in the context of globalization by examining issues related to the global competence of pedagogues. The literature revealed a systemic structure in which the external and internal factors are closely related to each other, with motivational and

moral, cognitive, and functionally estimative components. The motivational and moral relationships of an individual (personal qualities that determine the pedagogue's professional pedagogical orientation and status) and his/her curiosity (the cognitive component) ensure that teaching is conducted as a consciousness activity using a set of skills (the functional component) that have been tested over time, to ensure the efficient use of personal abilities. Evidently, all the three components are interrelated. For instance, the formation of motivational and moral relationships occurs not only through emotions, but also through the use of professional knowledge and skills. On the other hand, an individual is capable of using his/her knowledge and professional skills appropriately only when he/she has an appropriate attitude toward the pedagogic activity in the context of globalization. Each stage of the formation of a future pedagogue's professional competence is influenced by his/her personality and the various components of the concept of competence. Thus, the scope of the individual's professional and general development is widened. However, a teacher's attitudes toward the educational process is, in turn, affected by this gradual development, increase in his/her basic and general knowledge, and experiences gained through practical training [24].

With the emerging importance of global competence, several researchers are now focusing on this topic. For instance, according to Jacques Delors (1996), this research attention has led to the emphasis of the following four basic educational principles [25]:

- *Learning to live together*: Developing knowledge about others, their history, traditions, and mindset;

- *Learning to gain knowledge*: Accounting for rapid changes owing to scientific progress and the emergence of new forms of economic and social activity;

- *Learning to work*: Improving professionalism, and in a wider sense, gaining competence by managing various, possibly unpredictable, situations, facilitating team work; and

- *Learning to live*: Acknowledging that every individual has a hidden treasure comprising memory, ability to think, imagination, physical abilities, aesthetic sense, and communication ability.

Thus, global competence is viewed as the ability to work in a way that helps achieve individual professional goals as well as facilitates team work, development of general competences, and appropriate decision-making according to changing circumstances [25]. Cropley (1989) observed that the globalization of education leads to the development of a teaching strategy through which teachers improve their knowledge using methods that address issues related to globalization [26].

In this regard, we agree with the opinion of Brazhe (1992) that, in addition to basic (scientific) knowledge, the professional competence of an individual working in a “man-man” system comprises his/her value-conscious orientation as a specialist, activity motivations, global self-perception, communication style with co-workers, their common culture, and ability to develop one's creative potential [27]. Specifically, the teacher's profession comprises the exploration of various teaching methodologies, the ability to understand the mental world of students and to exert influence on it, having a respectful attitude toward students, and possessing important professional and personal skills. Lack of any of these components greatly reduces the efficiency of teaching work, which proves the need for global thinking as an important component of global competence [27].

In the present globalized world, teachers have a dual task of having to train a conscious citizen of his/her country and a global citizen, which will allow in a dialectic combination of both responsibilities to ensure productive self-actualization of the personality based on the perception of universal democratic and humanistic values. Quantitative research conducted by numerous international and national organizations acknowledges the lack of the required competences in high school graduates with regard to professional abilities in a constantly changing global environment. Specifically, these future pedagogues do not understand or perceive the essence of the globalization process and its impact on the development of education. Therefore, there is an urgent need for scientists from various countries to review teacher training methods to enable them to work in the contemporary globalized society [28].

A professor at Minnesota University, Craig Kissock, describing the situation in the American pedagogic education, added, “the contemporary culture of pedagogical education is rather local and serves to meet the requirements of nearby schools but not those of the globalizing world's citizens” [29].

According to the analytical document “Training American teachers for globalization epoch: imperatives of changes,” the global competence of a pedagogue should entail complex knowledge about the

world's regions, diversity of cultures, and global problems, as well as the ability to efficiently cope with the global environment while being driven by a responsible attitude. In particular, it notes that a pedagogue with adequate global competence exhibits the following characteristics:

- 1) knowledge of major international subjects and expertise on global problems related to his/her major;
- 2) skills to teach his/her students to analyze primary information sources from various parts of the world and admitting various points of view; and
- 3) an orientation to groom students as responsible citizens of both local and global societies [30].

The present review revealed that these effective learning skills for the 21st century, also called as global competencies, also comprise personal characteristics such as perseverance, insistence, purposefulness, stress resistance, and flexibility [31].

The present analysis of psychological and pedagogic literature revealed the basic universal competence and specific competences comprising knowledge and skills that are necessary for teachers in the globalized world. These competences are multifunctional, subject-dominated, and have a wide scope, and their use helps individuals solve various problems in their everyday and social life. These competencies account for the essential psychological qualities and perceptions of teachers. Therefore, it is recommended that the contemporary system of professional pedagogic education focuses on a competence-based approach for training future professional teachers [32].

Discussion. The present study aimed to highlight the urgent need for the formation of global competence in today's pedagogues. By reviewing relevant literature on globalization and its impact on all aspects of life, this study also attempted to identify ways to address problems related to the formation of global competence. The thematic review conducted in this study revealed that the first step towards this is to clearly define global competence. This section discusses the findings of the present review further.

Components of Competences for the Future Generation. With the rapid changes in science and technology, each teacher is expected to be perceptive of students' need for knowledge, which in turn leads to the students' active involvement in research and creativity. Such a teacher can work anywhere in this world. The present examination of literature on competence provided a deep understanding of the problems that need to be addressed to tackle the demands of a globalized world. The related competences have been summarized in table 2.

Table 2 – Levels of competence by Durand [38]

Levels of competence	Interpretation/Understanding
1. Data	I have access to external pieces of information.
2. Information	I know/I have learnt/I found out.
3. Knowledge	I have integrated frameworks of information. I can explain the information to someone else.
4. Skills	I can do it.
5. Know-how	I know how to do it, I can do it, and I can explain how to do it to someone else.
6. Competence	I am more capable than the others at explaining what to do and how to do it, but also at doing it.
7. Expertise	I am an expert at doing it, as well as at understanding what to do and explaining how to do it.

Competence is an estimative category characterizing an individual as a subject of certain activity in the social development system. It comprises the abilities of an individual to suggest appropriate ideas, to make responsible decisions, and to plan and perform actions conducive to efficient achievement of goals. It is the individual's orientation toward comprehensive practical learning to ensure successful work in the basic spheres of life.

The present findings revealed that competence consists of the following core components:

- stimulation, perceiving values, and business proficiency required for certain kinds of activity;
- perception about oneself through one's role in the social structure; and
- understanding mutual relationships and social order.

As evident from table 1 presented in the section on theoretical models of competence, “qualification” is a more narrow term as compared to competence. Therefore, in the teaching/learning process in an organization, the following points should be noted:

- Qualification and competence do not replace each other, they are complementary characteristics of specialists.

- Qualification is formed on the basis of obtained and developed competencies.

- The formation of competence is influenced by several factors.

Considering that current high school graduates will form the workforce in future, the practical implication of this competence model lies in the understanding that competence pertains to individual’s adaptability to changes, predictability of behavior, and human flexibility in the face of environmental changes.

Therefore, Shishov and Agapov suggested that educational institutions should establish the following competences in members of the future workforce:

1. Political and social competence: This pertains to the individual’s ability to take responsibility.

2. Competence related surviving in a multicultural society: This pertains to interethnic consensus and possessing a respectful attitude to other cultures and religions.

3. Competence in writing and in verbal communication: This important skill also includes the knowledge of several languages.

4. Competence related to life in an information-rich society. This includes the knowledge of new technologies, ability to choose what is needed from the information available, and ability to critically assess information.

5. Ability to acquire knowledge throughout one’s life, which is the basis of personal and public life [33].

Choshanov (1996) added that knowledge, skills, and abilities were combined to form “competence.”[34]. A competent individual differs from others in terms of his/her critical view, thinking, ability to update knowledge and learn new information, and ability to use new resources for finding solutions to novel problems. However, competence is not only a cognitive ability, but it also includes a procedural component (skills). Therefore it not only involves the identification of solutions to problems, but also involves their actual implementation. Consequently, Choshanov (1996) suggested that competence means mobility, curiosity, methodological flexibility, and mental criticism.

In the context of education, Markova (1996) put forth that pedagogical professional competence comprises the following elements:

- Professional education,

- Professional pedagogic activity, and

- Professional teacher’s psychological principles that are compliant with the profession.

Personal characteristics of the teacher, ensuring the development of knowledge and skills

Characteristics of a Competent Pedagogue. According to Pavlyutenkov (1990), a pedagogue’s professional competence lies in his/her ability to fulfill the functions of an effective teacher, which is related to possessing a deep knowledge of the subject matter, learning the scope of work in today’s world, and possessing the following important qualities of a pedagogue [35]:

- Ability to make decisions related to oneself and to facilitate self-development,

- Ability to fight self-doubt,

- Ability to identify the most efficient method to achieve goals, and

- Ability to utilize one’s knowledge and experience to determine the nature and characteristics of an activity with reference to the current circumstances.

In addition, having studied professional competence, Larionova (2004) concluded that “intercultural, intersectoral knowledge, skills, abilities for successful activity are required for various professional associations.” [23] They (intercultural, intersectoral knowledge, skills, abilities) are the invariant aspects of the macro- and micro-skills of professional competence required for successful professional activity in any field. On the other hand, pedagogical professional competence is the aspect of professional competence that is unique to teachers. It comprises three kinds of interrelated competences that develop simultaneously; the individual style of pedagogy, the unique image of a specialist, and personality characteristics of the individual

These basic, main, and special competences interact with each other and are used in various situations based on the nature and complexity of the task. Teachers' global competence is considered as a special competence.

Finally, the nine competences identified by Zimnyaya (2003) provide a comprehensive list of competences that are desirable for future pedagogues working in the context of globalization [36]:

Competence of an individual as a person, subject, and pedagogue. Healthcare competence: e.g., knowledge about health standards, understanding of the dangers of smoking, physical culture and freedom, and responsibility regarding choosing a lifestyle.

– Integration competence: e.g., structuring knowledge and extending the knowledge obtained.

– Civil competence: e.g., knowledge of and exercising the rights and liabilities of a citizen, freedom and responsibility, self-confidence, and civil duties.

– Self-improvement competence: e.g., self-regulation, self-development, purpose of life, language development, perception of the native language culture, and learning foreign languages.

Competence pertaining to the social impact on individuals and the social sphere

– Competence pertaining to social relationships: e.g., public, collective, and family cooperation; expressing tolerance and respect toward other races, gender, nations, statuses, and religion.

– Communication competence: e.g., written, verbal, dialogue, monologue, knowing and preserving traditions, and business correspondence.

Competence pertaining to individual activity

– Competence regarding cognitive activity: putting and solving cognitive matters, identifying non-standard solutions, problem situations;

– Functional competence: e.g., playing, studying, labor, work, and nature and types of economic activity.

– IT competence: e.g., accepting information, processing and sending information, mass media, multimedia technologies, computer knowledge, and electronic devices.

Summarizing the above opinions on “global competence,” we can identify the components of “pedagogue’s global competence.” Specifically, a pedagogue’s global competence is the ability to consciously perceive the impact of global processes on the academic process, to understand the influences of the multinational and multicultural environment, and to engage in successful teaching work in any global environment. This understanding will help us develop appropriate programs for the development of the global competence in future pedagogues to help them cater to the dynamic and constantly changing global educational environment. Some such steps are already under way in Kazakhstan.

Conclusion. A pedagogue is one of the core factors for the development of professionals who can work in a globalized society. A valuable decision towards the integration of the higher education system on the international level was taken in Lisbon Convention of the Council of Europe and UNESCO in 1997. Kazakhstan used that document as the basis and facilitated its efficient use in the academic process. In 1998, 4 western European countries (Germany, Italy, France, and the United Kingdom) adopted the Sorbonne Declaration on the identification of educational systems and structures, and in 1999, educational delegates from over 30 European countries signed the Bologna Declaration [37]. Kazakhstan joined it in 2010 and wished to join the uniform system of European education. Developments and initiatives in Kazakhstan’s national education are aimed to bring about improvement in the global space and quality. By supporting the Lisbon Convention on the recognition of qualifications concerning higher education, signing the Sorbonne Declaration on harmonization of the architecture of the European higher education, and by joining the Bologna process, our country successfully complies with the new requirements of education, which reflects the Republic’s political and economic stance. This is a step towards the improvement of Kazakhstan’s educational system. It has resulted in transition of all higher school institutions, including pedagogic colleges, to the European credit system. The current system of pedagogic education in Kazakhstan comprises the following components of continuous education: pedagogic college, bachelor’s program, master’s program, and PhD program. In addition, several international universities have been established in Kazakhstan (e.g., International Kazakh-Turkish Hoja Ahmet Yassawi University, International University of Information Technologies, International Kazakh-German University, International Humanitarian and Technical University, International Kazakh-British University, International Suleiman Demirel University,

university of international relations, and kimep university). We hope that graduates from these institutions for higher studies will be able to work anywhere in the world. Further, other new initiatives have been introduced, including three-language education since kindergarten. Owing to this feature, school pupils have begun showing more interest in studying languages and students will be able to study abroad in future. Moreover, foreign specialists are now being appointed as academic supervisors of master's and phd students, which offer future pedagogues an opportunity to study in foreign countries.

Globalization affects almost all the spheres of human lives; however, the present review revealed a lack of formal definitions of "globalization" and "global education." Indeed, academic philosophers, pedagogues, and psychologists have offered some explanations on the concept of global competence, with special reference to pedagogical competence, future studies need to formally define *pedagogue's global competence* and to explain the components and structure of this term. Such information can be then used to develop teacher education programs that groom future pedagogues for working in a globalized world.

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БОЛАШАҚ МҰҒАЛІМДЕРДІҢ ЖАҒАНДЫҚ ҚҰЗІРЕТТІЛІГІН ҚАЛЫПТАСТЫРУ ПРОБЛЕМАЛАРЫ

Аннотация. Жаһандық білім қоғамда, сондай-ақ табиғатта адамның өмір сүруі үшін дүниетаным туралы ақпараттың маңыздылығы туралы тұжырымдамаға негізделген. Адамның дүниетанымын қалыптастыру әртүрлі білім салаларында факторларды таңдаумен, танымдық стратегиямен, ақпараттық өңдеу және айырбастау шарттары сынды әртүрлі ментальдық процестермен байланысты. Сонымен қатар, жаһандық білім беру компоненттерінің бірі – жаһандық ойлауды қалыптастырудың маңызы зор. Жаһандық білім беру тұжырымдамасын таңдауда білім беру мекемелері даму үдерісінде қоршаған ортаны ортақ тануға бағдарлауы тиіс. Дүниетанымды дұрыс қалыптастыру мұғалімдердің жаһандық құзіреттіліктерін қалыптастыруда демеу бола алады. Сондықтан аталмыш зерттеуде жаһандық құзіреттілікті қалыптастыруға ерекше көңіл бөлу және оларды арттыру жолдарын айқындау қажеттігі айтылған. Жасалған тұжырымдар жаһандық құзіреттіліктің жаһандалған әлемде мұғалімдерде болуы тиіс маңызды мінездеме болып табылатындығын айқындап берді. Дегенмен, мұны іске асыру үшін, ең алдымен, тұжырымдамасын нақты анықтап, содан кейін – болашақ мұғалімдерге арналған сәйкес білім беру бағдарламаларын әзірлеп, ендіру қажет.

Түйін сөздер: жаһандық құзіреттілік, кәсіби құзіреттілік, кәсіптік бағдарлау, білім, қабілет, дағды, тұжырымдама, технология, процесс, интеграция.

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ПРОБЛЕМЫ ФОРМИРОВАНИЯ ГЛОБАЛЬНОЙ КОМПЕТЕНТНОСТИ БУДУЩИХ УЧИТЕЛЕЙ

Аннотация. Глобальное образование основано на концепции о том, что информация о мире имеет большое значение для существования человека, как в обществе, так и в природе. Формирование мировоззрения связано с отбором факторов в различных областях знаний, со стратегией познания, обработкой информации и различными ментальными процессами, такими как условия обмена. При этом большое значение имеет один из компонентов процесса глобального образования – формирование глобального мышления. При выборе концепции глобального образования учреждение образования в процессе развития должно ориентироваться на общее познание окружающей среды. Правильное построение мировоззрения может послужить опорой при формировании глобальной компетентности педагогов. Поэтому в настоящем исследовании было показано, что необходимо обратить внимание на формирование глобальной компетентности, и определить пути их повышения. Выводы показали, что глобальная компетентность является важной характеристикой, которой педагоги должны обладать в глобализированном мире. Однако, чтобы способствовать этому, в первую очередь важно четко определить концепцию, а затем – разработать и внедрить соответствующие образовательные программы для будущих учителей.

Ключевые слова: глобальная компетентность, профессиональная компетентность, профессиональная ориентация, знание, умение, навыки, концепция, технология, процесс, интеграция.

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AN ANALYTICAL REVIEW OF THE CONTINUITY OF NATURAL SCIENTIFIC EDUCATION IN THE “SCHOOL- UNIVERSITY” SYSTEM IN OECD COUNTRIES

Abstract. The article considers the results of the analysis of international experience in ensuring the continuity of natural science education in the "school-university" system. The rationale for the need to reconsider the training of future teachers is explained in terms of updating the content of university programs to conformity of already updated content of school education in the Republic of Kazakhstan. The structure of the Director of the OECD, who regulates the issues of education and science, is described. A brief overview of the higher education systems of the OECD countries is given.

Key words: natural science education, continuity, school-university, renewal of the content of education, OECD.

The development of the economy, the renewal of technology, the improvement of public space and the renewal of the content of school and university education have a different pace. If at the end of the twentieth century education could expect 2-3 generations to preserve books and teaching aids, use educational programs, i.e. fully content of education, regulatory support, etc., nowadays the requirements for the school are changing more rapidly than the reaction of the school's educational environment.

At present, the Republic of Kazakhstan is modernizing the education system. This is primarily due to the renewal of the content of general secondary education, with the provision of its active and developing nature.

Updating of the content and teaching methods necessitates the improvement of teaching staff. The response to this challenge is to ensure the continuity of education in the "school-university" system, the formation of a national system of teaching and teaching staff and the revision of training programs for students of pedagogical universities, future teachers of general education organizations.

Differences between the levels in programs and content, in the forms and methods of instruction, in the formation of the learning environment, lead to difficulties in the transition of students from one level of education to another [1].

According to the definition given by S. M. Godnik, succession is considered as the progressive development of the university educational process in a dialectical connection with the system of general education school activities with the aim of forming the student as a subject of higher education and upbringing. The purpose of succession as a complex phenomenon of psychological and pedagogical activity is to create such conditions of upbringing and education that would allow a painless transition of a child-pupil-student-professional from the lowest level of education to a higher one. As a result his movement would not be interrupted along ways of development of all mental processes and abilities.

Continuity of secondary general and higher vocational education from a practical point of view assumes, first of all, the continuity of state requirements for the graduates' preparation of general educational institutions and the content of state educational standards for higher professional education in terms of requirements for the results of mastering basic educational programs [2].

The quality of schooling in which our children study affects all aspects of their lives, forming the individual way of each child's life and contributes to society and in general creativity and economic development. Therefore, modernization of the school system is a priority not only for education specialists, but also for political leaders.

The level of education is the starting point of economic, scientific and technical progress, a pledge of successful development of the state and society. Educational backwardness has a direct impact on the country's competitiveness, national perspectives and state security [3].

Natural-mathematical education is an essential component for all types of educational institutions at the pre-university level. It covers all types of general secondary education, as well as the system of additional education and extracurricular work in our country and foreign countries. Its role of fundamental training in modern society is due to the magnitude of the problems that humanity confronts [4].

The issue of continuity of natural-mathematical education both at the inter-subject level and at the vertical level between the school and the university requires a systematic approach. According to G.I. Sarantsev, "continuity in the interpretation of the basic concepts of courses in the use of a single terminology and symbols; consistency and systematic courses; availability; expediency and legitimacy of requirements to the level of students' mathematical preparation" [5].

Models of educational policy are discussed in the works of such authors as N.V. Vasilenko [6], I.A. Prakhov [7], L.L. Shpakovskaya [8]. They give a strong indication of the previously created and established models of educational policy, which are currently in the stage of transformation and adaptation to the new institutional conditions of the Bologna process.

There are a number of works by contemporary Russian authors devoted to the study of new trends in formations, in the context of globalization. N.S. Kyrabaev, T.I. Kostina [9], M.F. Kuznetsov [10], V.I. Kuptsov [11], M.V. Tlostanov [12] and many others write about the need for rapid responses from educational systems to new challenges of the era of globalization and integration.

In the modern world of globalization, state and supra-state management of secondary and higher education are being transformed, the state educational policy is changing, organizational forms of school and university education are being modified.

The state as the managing subject provides the legislatively defined rules for the regulation of new and updated relations in the progressive sphere of secondary and higher education, applies new approaches in the legal regulation of administrative relations for the development of national human capital.

Capital, land, and labor force have not been the main resources of competitive development and economic growth in OECD countries since the 1970s. Education has come first. A knowledgeable economy and a knowledgeable society are products of the epistemic, educated population. In order to generate such a population, a profound reform of education was needed. At least, everywhere, where there was a political will in order not to slide down permanently in the hierarchy of countries. In many countries of the West, and then the East, these reforms began long ago [3].

The Organization for Economic Cooperation and Development (OECD) - an international economic organization of developed countries that recognize the principles of representative democracy and a free market economy, is also deeply and shrewdly engaged in the problems of education.

One of the duties of the OECD is to "Encourage scientific research and education".

And, one of the main activities of the OECD is Education.

A permanent OECD office providing the work of its structural bodies is the Secretariat, which collects and processes information, develops documents and recommendations, issues analytical notes, publications on economic and social issues. The preparation of these materials required for the work of the OECD core committees is handled by the following Directors of the OECD Secretariat on various thematic issues, of which there are only 12.

Among the directors, there is a directorate, which oversees the issues of education and science. It's called the Directorate for Education (EDU).

The directorates play a role of international information and analytical centers. One of the functions of the Directorates is to organize annual ministerial meetings, committee meetings with representatives of national governments (twice a year), as well as periodic meetings of experts from research institutes, educational institutions, non-governmental organizations of member countries and OECD partner countries.

The highest political governance bodies of the OECD are the Committees, consisting of representatives of the member countries of the organization and countries that have observer status. Currently, the OECD employs more than 20 Committees in various areas.

Since November 22, 2011, Kazakhstan has observer status in the OECD Education Committee.

The OECD vision for education is reflected in a number of documents and materials with different status and purpose: from the recommended framework documents that countries take into account when developing their own national educational policies to extensive international comparative studies based on an agreed set of indicators for assessing the quality of education. Below are just a few of them:

- OECD / UNESCO Guidelines for Quality Assurance in Cross-Border Higher Education (2005);
- The OECD Declaration on the Future of Educational Policies in a Changing Social and Economic Context (1978);
- International Programme for the Evaluation of the Learning Achievements of 15-year-olds (Programme for International Student Assessment, PISA), since 2000;
- The International Assessment of Adult Competencies (PIAAC) program, since 2005;
- Joint OECD and UNESCO study "Teachers for schools of the future / Analysis of the World Education Indicators";

Annual report «Education at a Glance, OECD Indicators» [13].

Another document that reflects OECD's conceptual vision for educational development is the OECD Declaration on the Future of Education Policies in a Changing Social and Economic Context. The Declaration was adopted in 1978, but even today its provisions sound very relevant both for the OECD countries, and for those, like ours, who have taken the course to join the club of the developed countries of the European community.

The Declaration defined the following objectives:

- To promote the continuous development of national standards. The goal of standards development is to provide assistance to all young people in acquiring the qualities necessary for the successful commencement of adulthood.
- To improve the professional training of teachers. Such training should encourage teachers, in the context of changing needs and targets, to take more active action and play a responsible role in strengthening the school's ties with adult life.
- To develop schools as active communities. School communities should create a stimulating environment for nurturing self-confidence, a sense of responsibility and a spirit of cooperation among young people.
- To implement positive measures in the field of education to establish equality of disadvantaged groups.
- To promote lifelong development for young people and adults.
- To expand the opportunities for emigrant workers and their children to make greater use of education and training.

To ensure closer cooperation between everybody involved in education - authorities, teachers, parents, students - as well as employers and professional organizations and other interested groups of society.

A key message of the OECD Declaration on the Future of Education Policy is that in a rapidly changing social and economic context, all components of the education system (national standards, teachers, schools, etc.) should be "tuned" to readiness to accept changes and become active conductors of innovations [13].

An urgent objective for OECD countries is to ensure the quality of education. The complexity of its solution is determined by the need for active and effective interaction and coordination of efforts of various subjects of educational policy of institutional, national, supranational (regional) and transnational (world) level. The review "Ensuring the quality of education - the experience of OECD countries" shows

how the quality problem is raised at these levels and what initiatives are being implemented in OECD countries to address this problem.

When considering the national level of ensuring the quality of education, the focus is on the role of specialized intermediary agencies, which in most OECD countries delegate the functions of monitoring, controlling and improving the quality of university activities, as well as assessing the prospects for networking of such agencies.

The analysis of the experience of the OECD countries in this area is extremely relevant for the development of a clear national strategy for the internationalization of higher education in Russia, which should contribute to the growth in the volume of export of educational services, the pace of development of international educational programs for the more effective integration of Russian higher education into the pan-European and global educational space [14].

The last few years the education system in Finland is constantly at the center of international attention. Another surge of interest in it is due to the excellent results that Finnish schoolchildren demonstrated in the "Programme for International Student Assessment" (PISA) in 2000 and 2003. According to the results of both studies, Finland was in the first place and, moreover, became the only European country among the leaders.

The way in which high-quality university education is provided by quality school education can be considered in the case of Finland. And, on the contrary, to what extent special attention paid to the training of teachers in higher education institutions affects the education system in general and schooling in particular.

Finnish universities are among the few European universities that have embarked on a course to increase the "social responsibility" of higher education. In Finland, the "third role" of universities is set out in legislation, and its formation is among the priorities of national development.

Of all the institutional factors affecting the quality of schooling, the teacher training system is of particular importance. The reform of teacher training began in Finland in 1978. Its goal is to improve the professional level of teachers and unify the standards of their education.

The distinctive features of the Finnish education system are:

1) Strong internal communication of education segments. Kindergartens are integrated into schools, schools are closely connected with higher education institutions, universities are oriented to work with schools and take an active part in improving the quality of school education. Hence the primacy of continuing education and the requirement to provide "painless transitions" from one educational stage to another (for example, a minimum of exams).

2) Priority of equal educational opportunities and, as a result, weak internal differentiation. The educational system serves as an instrument of social equalization: territorial (the location of schools and universities), content (the prohibition on the differentiation of classes in secondary schools), cultural (the policy of "education - the melting pot of cultures", conducted with respect to ethnic groups in the Finnish north), institutional ("smoothing" the differences between institutions of higher education, eliminating differences between schools), economic (lack of tuition fees). The latter is particularly noticeable from the results of the PISA-2000 survey - Finland is found to have the lowest dependence of the child's performance on the economic situation of his family.

3) Increasing the "social responsibility" of higher education institutions, which has been elevated to the priority level of the national educational policy, and consequently, close interaction of educational institutions with the local community represented by various social groups. This sets the conducive context for the functioning of the education system (high status of the teacher, public support, the system of trustees' councils), but at the same time creates a situation of multiple control instances.

4) The direct consequence of the number expansion of regulatory authorities and the traditional directive management style is the persistent weak institutional autonomy of Finnish educational institutions.

5) High mobilization potential of the education system. This quality, connected with the low degree of autonomy of the Finnish universities and their scarcity, allowed to reform the educational system and, in particular, implement the program of internationalization of higher education (14).

Norway takes a notable place among the countries of the Northern European model. Interest in the Norwegian higher education system is due to several reasons:

1. In recent years, Norway has been holding the first place in the UN ratings due to its education system. The indicators of its functioning "overlap" the successes of the more economically developed countries (the USA, Canada) and consistently provide Norway with a place in the top five in terms of the level of human development in the world.

2. Norway is a striking example of the North European model in the organization of higher education. Being simultaneously egalitarian, centralized and socially oriented, it represents many characteristic features of higher education systems in the Nordic countries.

3. Today in Norway, higher education reforms are being implemented that are oriented towards the goals and objectives of the Bologna Process. Entering the international market reveals both the strengths and weaknesses of the existing educational system. The emerging problems of internationalization are not exclusively "Norwegian" - they are typical for countries with a strong social orientation of education, forming today in a pan-European educational space [14].

The educational system of the United States is one of such centers of modernization in education: it was precisely in it that such attributes of modern higher education as the credit system, the institutional autonomy of universities, the public and professional accreditation of universities were shaped and tested for the first time.

Distinctive features of the American education system:

1. This is one of the few systems dominated by the private sector. It was the non-state universities that formulated the "rules of the game" that determined the institutional shape of the modern educational model.

2. The system of university accreditation proposed in the American model, in fact, is a prototype of the current mechanisms for managing the quality of education, but, unlike European counterparts, is based on university initiatives ("accreditation from below").

3. The management system of higher education in the US differs from most systems (both Atlantic and Continental) by its decentralization and the special role of regional authorities.

4. The difficulties experienced today by the US higher education system, on the contrary, are not specific and can be considered as challenges to all educational systems of the Atlantic type [14].

Features of the «Atlantic» model characterize the Canadian system of higher education. By values, strategies and dominant orientations, it strongly resembles the British system of higher education. Historically, the traditions of British universities have been largely adopted by leading Canadian universities. Nevertheless, the development of Canada's higher education system took place in a special geographical and political context, in conditions of cultural diversity and linguistic duality. This led to a difference in the Canadian higher education system from the systems of the "Atlantic" model close to it. These are of particular interest to us:

1. Differentiation of the Canadian system, due to the administrative-territorial differences and political structure of Canada.

2. Implementation of new programs to ensure accessibility of higher education.

3. High level of autonomy of Canadian higher educational institutions, which are independent in making decisions, including the organization of the educational process.

4. Effective practice of financing the activities of higher education institutions [14].

The modern system of higher education in Italy has developed against a backdrop of large-scale state reforms related to the restructuring of the political system and the changing priorities of economic development and, on the other hand, the reforms caused by the Bologna process and the desire to include Italy in the pan-European educational space. Thus, the internal factors of the formation of the Italian educational system and external stimuli for its development proved to be mutually complementary.

Italy successfully participates in the formation of a pan-European higher education space, effectively implements the strategy of internationalization and at the same time preserves the specifics of national education.

In Italy, significant experience has been gained in the implementation of international educational projects that open the prospects for cooperation between Italian and other European universities and create favorable conditions for the mobility of students and teachers. The interesting is the peculiar educational expansion of Italy, in particular, the creation of the University Network of the Adriatic-Ionian region.

The Italian experience of reforms aimed at regionalization of higher education and increasing the role of higher education institutions in regional development, as well as improving the efficiency of financial management in the higher education system, is also interesting.

Particular attention should be paid to the role of the "first universities", which occupy an important place in the cultural and social life of Europe -Italy, being the birthplace of the European university tradition, is trying to work out a strategy of modernization and internationalization that would help preserve its historical heritage [14].

Indicators of the OECD countries, taking into account their future long-term dynamics, this is the basic reference points of our path to the list of 30 developed countries of the planet "[15]. In 2011, Kazakhstan applied for observer status in four OECD Council Committee, including the Education Committee. And, in 2010 Kazakhstan for the first time took part in the International Programme for Evaluation of Educational Achievements of 15-year-old pupils of PISA-2009, which allowed to assess the knowledge and skills of students in 200 educational institutions of the republic [16].

The analysis of Kazakhstan's results in international comparative studies provides an actual perspective for work in such areas as the transition to new educational standards and the creation of a national system for monitoring the quality of education, which have been included in the list of priority directions of educational policy set out in the State Programme for the Development of Education of the Republic of Kazakhstan for 2011-2020. The key idea of the OECD Declaration on the Future of Education Policies is that, in a rapidly changing social and economic context, all components of the education system (national standards, teachers, schools, etc.) should be "tuned" to a willingness to accept change and become active conductors of innovations. Continuous development, empowerment, and equality for disadvantaged groups, Cooperation of all stakeholders - these are the three main values that reflect the spirit of this Declaration [17].

Although enough time has passed since the adoption of this document, we can say that its provisions, sounded several decades ago as an appeal to the future, today have become the basis for developing educational policies in countries seeking to create a competitive economy and a sustainable society. If we talk about the prospects for Kazakhstan participation in international comparative evaluation studies, we can say the following: we have embarked on this path, and this is one of the most important results of educational policy, purposefully pursued by the Government of the country in recent years. These measures are aimed at the introduction in Kazakhstan of universally recognized international standards of public administration. This policy is enshrined in the State Programme for the Development of Education of the Republic of Kazakhstan for 2011-2020, the basic document that defines the political and conceptual framework for the development of the country's education in the long term. In particular, it is planned that Kazakhstan will participate (along with the already known PISA and TIMSS) in such international studies as: PIRLS - an assessment of the level and quality of reading and comprehension of the text by primary school students; TIMSS-ADVANCED - assessment of mathematical and natural-science literacy (physics) of 11th-grade students with in-depth study of these subjects; ICILS - an estimation of computer and information literacy of pupils of 8 classes. It should be noted that for countries included in the OECD organization, as a rule, recommendations are made to join the various thematic evaluation and monitoring studies. In the field of education for the OECD, it is very important that the country (along with PISA) participate in the "Programme for the International Assessment of Adult Competences" (PIAAC) and the joint OECD and UNESCO study "Teachers for schools of the future / Analysis of the World Education Indicators" [17].

Perhaps Kazakhstan will receive such an invitation and this will be another opportunity for understanding and further developing the education system of our country within the broad international perspective. Thus, our President N.A. Nazarbayev firmly stated his intention to implement some OECD standards in Kazakhstan. In the Message of 2014, he says: "I am setting the goal of starting to implement some OECD standards in Kazakhstan, they will be reflected in the concept (Kazakhstan's entry into 30 developed countries)" [15].

In addition, according to the President, "the creation of new high-tech industries will require an increase in the financing of science at least 3% of GDP." In general, the creation of knowledge economy is, first of all, the enhancement of the potential of Kazakhstan's science. In this area, it is necessary to

improve legislation on venture financing, protection of intellectual property, support for research and innovation, and commercialization of scientific developments [16].

To implement further plans by the President of Kazakhstan N.A. Nazarbayev the Government was instructed to develop and submit to the Parliament a package of relevant draft laws by September 1 of this year. The leader of the nation noted that a concrete plan for a phased increase in the financing of science for specific developments and discoveries working for the country and bringing it to the indicators of developed countries is needed. And in the end it should be noted that when implementing these directions and plans, especially in the field of education and science, it is necessary to take into account the safety of the future of our state. For this, one always needs to know that our state must adopt those innovative ideas and technological achievements that we will be able to develop and transform into a progressive field in the future. Therefore, building any plans or projects for the future is impossible, entirely and completely to copy the high technologies of the Western economic model. First of all, we should pay attention to the development of some developed countries of the East, especially South and South-East Asia. For example, Japan or Korea. These countries, despite many internal political and economic difficulties, have over the years not only been able to adapt to the modern processes of globalization, to master and improve many Western-style technologies and to rise to a higher stage of economic and political development, but also retained their identity, language and culture. And our ultimate goal is, having taken as a model the historical experience of these countries, to develop and improve our Kazakhstan, to find its worthy place in the world community [16].

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ЭЫДҰ ЕЛДЕРІНДЕГІ «МЕКТЕП-ЖОҒАРЫ ОҚУ ОРНЫ» ЖҮЙЕСІНДЕГІ ЖАРАТЫЛЫСТАНУ ҒЫЛЫМДАРЫНЫҢ БІЛІМ БЕРУ САБАҚТАСТЫҒЫНА ТАЛДАМАЛЫ ШОЛУ

Аннотация. Мақалада «мектеп-жоғары оқу орны» жүйесіндегі жаратылыстану ғылымдарының білім берудегі сабақтастығын қамтамасыз етудегі халықаралық тәжірибені талдаудың нәтижелері қарастырылады. Болашақ мұғалімдерді даярлауды қайта қараудың қажеттілігінің негіздемесі Қазақстан Республикасындағы мектептегі білім берудің жаңартылған мазмұнымен жоғары оқу орны бағдарламаларының мазмұнының сәйкестендіру тұрғысынан ұсынылады. Ғылым мен білім беру мәселелерін бақылайтын, ЭЫДҰ директорының құрылымы сипатталады. ЭЫДҰ елдерінің жоғары білім жүйесіне қысқаша шолу берілген.

Түйін сөздер: жаратылыстану ғылымдары білімі, сабақтастық, мектеп-жоғары оқу орны, жаңартылған білім беру мазмұны, ЭЫДҰ.

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АНАЛИТИЧЕСКИЙ ОБЗОР ПРЕЕМСТВЕННОСТИ ЕСТЕСТВЕННОНАУЧНОГО ОБРАЗОВАНИЯ В СИСТЕМЕ «ШКОЛА-ВУЗ» В СТРАНАХ ОЭСР

Аннотация. В статье рассматриваются результаты анализа международного опыта обеспечения преемственности естественнонаучного образования в системе «школа-вуз». Приводится обоснование необходимости пересмотра подготовки будущих педагогов, с точки зрения обновления содержания вузовских программ на соответствие уже обновленного содержания школьного образования в РК. Описывается структура директора ОЭСР, который контролирует вопросы образования и науки. Дан краткий обзор систем высшего образования стран ОЭСР.

Ключевые слова: естественнонаучное образование, преемственность, школа-вуз, обновление содержания образования, ОЭСР.

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SYSTEM ANALYSIS, MANAGEMENT AND PROCESSING OF INFORMATION

Abstract. The authors of the article revealed the concepts of modern informatization, presented the share of Internet users and presented the main consumers. According to the authors, the active information resources are that part of the national resources that is made up of information available for automated search, storage and processing: formalized and preserved in the machine media in the form of working programs, professional knowledge and skills, text and graphic documents, as well as any other meaningful data, potentially available on a commercial basis to users of the national computer park. That is, on the basis of the ratio of the volume of active information resources to the total volume of national information resources, analysis can be made, data processing can be carried out. In Kazakhstan, there is an acute tendency for the pace and level of education in the field of informatics and information technologies to lag behind the corresponding rates and level of development of tools due to the low level equipped with modern means of computer science of educational institutions. However, for the effective use of information resources and production New knowledge is needed to improve the information culture of society.

Keywords: system analysis, management, processing, information, technology, users, software, internet.

Introduction. Kazakhstan has become an integral part of the world precisely at this difficult time of the initial process of globalization. At present, the process of informatization is manifested in all spheres of human activity. So the use of modern information technologies is a necessary condition for the development of more effective approaches to teaching and improving teaching methods. A special role in this process is played by IT. Kazakhstan achieved the right to hold the International Specialized Exhibition EXPO-2017 in Astana. This is our great victory, a global event. For the candidacy of our country, an absolute majority of 160 members of the International Bureau of Exhibitions voted. Thus, the whole world recognized the economic success of Kazakhstan. For 3 months Astana will become the world economic capital, 5 million tourists will visit Kazakhstan, billions of dollars of investments will come along with new technologies and innovations, tens of thousands of jobs will be created in the sphere of construction, infrastructure development, tourism, hotel business, small and medium business.

Main part. Information - information about objects and phenomena of the environment, their parameters, properties and condition, which reduce the degree of uncertainty, incompleteness of knowledge.

The information potential is becoming an equally important economic and social development factor, such as energy, industrial and defense potential, strength and educational potential.

The concept of the information potential of a society includes not only the entire industrial and technological complex of computer science in a country, but also a network of research, educational,

administrative, commercial and other organizations and social institutions whose activities contribute to the effective use of information resources, as well as preparation for these purposes of the required number of specialists of the appropriate profile.

A set of technological stages forms a technological process (technology). It can start at any level and not include, for example, steps or operations, but consist only of actions. To implement the stages of the technological process, different software environments can be used.

Properties of information technology:

1. Information technologies allow to activate and effectively use the information resources of the society, which today are the most important strategic factor of its development.

2. Information technologies allow to optimize and in many cases to automate information processes, which in recent years occupy an increasing place in the life activity of human society.

3. Information processes are important elements of other more complex production or social processes.

The New Century and the New Third Millennium opened up new opportunities for cooperation and cooperation between states and peoples.

Table 1 – Costs of ICT in the Republic of Kazakhstan for 2015-2017

ICT costs	2015	2016	2017	Change in %	Change in %
Total of them:	375600,4	269526,7	349943,6	-71,76	129,84
costs for purchasing software used on the basis of a license agreement	122603,2	37131,4	75042,4	-30,29	202,10
costs for independent software development within the organization	69208,5	11603,0	10931,0	-16,77	94,21
the costs of staff training related to the development and use of ICT	1491,0	1276,0	11816,0	-85,58	926,02
expenses for payment for services of third-party organizations and specialists associated with information technology (except for communication and training services)	36676,1	78586,8	105111,7	214,27	133,75
<i>Note:</i> MNE RK on Statistics. http://stat.gov.kz/					

According to Table 1, ICT expenditures in 2017 increased by almost 30% compared to 2016, but in 2016 they decreased by as much as 30% compared to 2015. At the same time, the cost of purchasing software used on the basis of the license agreement in 2017 increased by 102% compared to 2016, but in 2016 they decreased by almost 300% compared to 2015. This indicates the availability of various online programs, as all function from economically rational considerations. The same can be said about the costs of independent software development within the organization in 2017 decreased by 6% compared to 2016, but in 2016 they decreased compared to 2015 by more than 80%. It should be noted that the costs of staff training related to the development and use of ICT in 2017 increased by more than 9 times compared to 2016, but in 2016 they increased by only 15% compared to 2015. That shows the interest of organizations to improve the qualification of employees. Also, the costs for the services of third-party organizations and specialists connected with information technologies (except for communication and education services) increase every year by almost 33% in 2017 compared to 2016, but in 2016 they increased compared to 2015 in more than 2 times.

Information is inseparable from the information process, so it is necessary to consider the source of information and consumers of information. The role of consumers of information is delineated in this definition: information is new information accepted, understood and evaluated by the end user as useful. Information is information that increases the stock of knowledge of the end user about the world around us.

Consider the share of the population of Kazakhstan with the skills of the user of new technologies in figure 1.

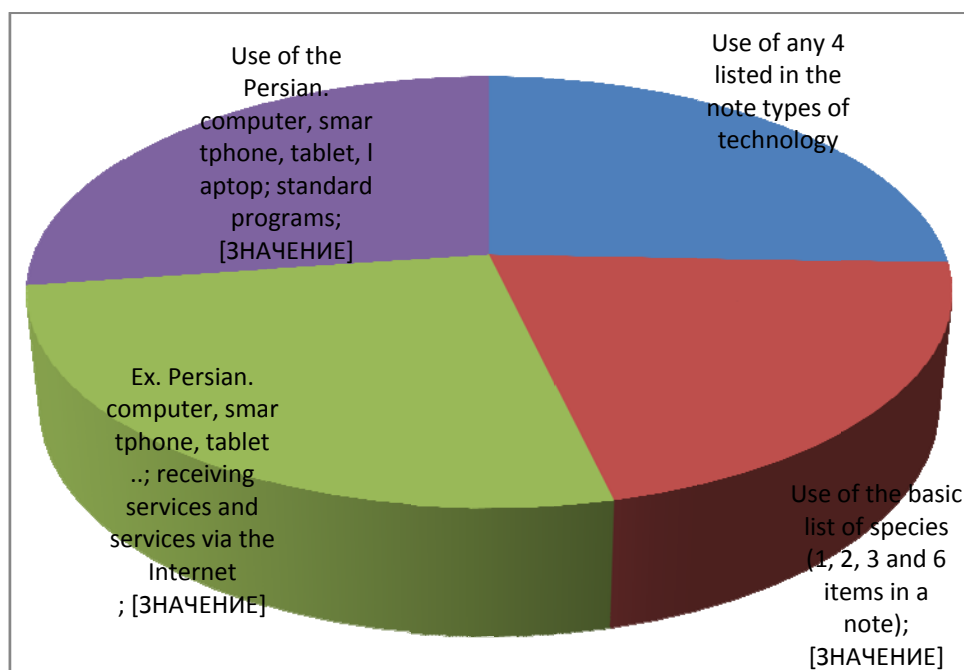


Figure 1 – Proportion of population with digital literacy for 2017.

Note: MNE RK on Statistics. <http://stat.gov.kz/>

According to the figure, the use of the basic list of new technologies is -60.8, the use by Kazakhstanis of a personal computer, smartphone, tablet, laptop; standard programs; receiving services and services via the Internet is -77.1 of the total share of residents of Kazakhstan, the use of a personal computer, a smartphone, a tablet, a laptop; standard programs-79.9, and the use of any of the four types of technology listed in the note -74.9.

Thanks to modern information technologies, the idea of continuing education is fully realized. Also, information technologies significantly increase people's motivation for learning, conducting various research works, experimenting, creating innovative projects, etc.

The share of Internet users in the Internet is discussed in table 2.

Table 2 – The proportion of Internet users for the Internet for 2015-2017, in %

Share of Internet users in the Republic of Kazakhstan	2015	2016	2017
at the age of 6-74 years	72,9	76,8	78,8
at the age of 6-15 years **	53,1	62,1	67,9
at the age of 16-74 years	77,2	80,2	81,5

Note: MNE RK on Statistics. <http://stat.gov.kz/>

The share of Internet users aged 16-74 in the Republic of Kazakhstan in 2017 was more than 80%, but the proportion of Internet users is 6-15 years old and the dynamics of this age group is increasing every year.

Modern understanding of the information system assumes the use of the personal computer as the main technical means of processing information. In large organizations, along with a personal computer, a mainframe or supercomputer may be part of the database of the information system. In addition, the technical implementation of the information system does not in itself mean anything unless the role of the person for whom the information is intended is taken into account and without which it is impossible to obtain and present it.

It is necessary to understand the difference between computers and information systems. Computers equipped with specialized software are a technical base and a tool for information systems. Information system is inconceivable without personnel interacting with computers and telecommunications.

Conclusion. The world is on the verge of a new wave of colossal technological changes. Today only those countries who will confidently pass through the crucible of the third global industrial-technological revolution will win. It will open unprecedented opportunities for development. Information and technological transformation of the world can "enslave" humanity, put it in absolute dependence on information and communication networks.

In the process of studying the discipline, not only traditional technologies, methods and forms of instruction are used, but also innovative technologies, active and interactive forms of conducting classes: lectures, laboratory classes, consultations, independent and scientific research work, lectures with elements of problematic exposition, case studies, business games, testing, solving of situational tasks, disputes, technology of explanatory - illustrative learning with elements of problematic exposition, technology of subject - orientations training, technology of developmental learning; technology of professionally oriented learning, technology of problem training, technology of information education, technology of personality-oriented learning, technology of organization of independent work, technology of collective thinking activity, technology of development of critical thinking.

In this connection, the problem of improving the information culture of society, ie, degree of his preparedness for the effective use of information resources and the production of new knowledge. The essence of this problem lies in the fact that there is an acute tendency to lag behind the pace and level of education in the field of informatics and information technology from the appropriate pace and level of development of tools. This trend is global. This is partly due to the generally known inertia of the educational system. But in Russia this problem is particularly acute because of the low level of equipment provided by modern computer science facilities of educational institutions.

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ЖҮЙЕЛІ ТАЛДАУ, БАҚЫЛАУ ЖӘНЕ АҚПАРАТТЫ ӨНДЕУ

Аннотация. Авторлар заманауи ақпарат тұжырымдамасын ашып қойды, желідегі интернет пайдаланушылардың үлесін қамтамасыз және негізгі тұтынушыларды ұсынды. Авторлардың айтуынша, белсенді ақпараттық ресурс ұлттық автоматтандырылған іздеу үшін ақпарат қол жетімді етеді ресурстарды, сақтау

және өңдеу, бұл бөлігі болып табылады: ресми және кәсіби білім мен дағдыларды, мәтін және графикалық құжаттар жұмыс бағдарламасы түрінде тасушыларда тоқтатылған, сондай-ақ кез келген басқа ұлттық компьютерлік парктің пайдаланушылары үшін коммерциялық негізде қол жетімді болатын маңызды деректер. Яғни талдау жасауға болады, ұлттық ақпараттық ресурстардың жалпы көлеміне белсенді ақпараттық ресурстарды көлемінің қатынасы негізделген, салдарынан төмен деңгейге құралдарының даму тиісті қарқыны мен деңгейіне бастап информатика және ақпараттық технологиялар білім беру саласындағы қарқынын және деңгейін қалып Қазақстан өткір үрдісі деректер өңдеу жасауға оқу орындарының компьютерлік білім берудің заманауи құралдарымен жабдықталған, бірақ ақпараттық ресурстар мен өндірісті тиімді пайдалану үшін Қоғамның ақпараттық мәдениетін жақсарту үшін жаңа білім қажет.

Түйін сөздер: жүйелік талдау, басқару, өңдеу, ақпарат, технология, пайдаланушылар, бағдарламалық қамтамасыз ету, интернет.

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СИСТЕМНЫЙ АНАЛИЗ, УПРАВЛЕНИЕ И ОБРАБОТКА ИНФОРМАЦИИ

Аннотация. Авторы статьи раскрыли понятия современной информатизации, представили долю пользователей сети интернет и представили основных потребителей. По мнению авторов, активными информационными ресурсами является та часть национальных ресурсов, которую составляет информация, доступная для автоматизированного поиска, хранения и обработки: формализованные и законсервированные на машинных носителях в виде работающих программ профессиональные знания и навыки, текстовые и графические документы, а также любые другие содержательные данные, потенциально доступные на коммерческой основе пользователям национального парка компьютеров. То есть на основании отношения объема активных информационных ресурсов к общему объему национальных информационных ресурсов можно составить анализ, произвести обработку данных В РК остро ощущается тенденция отставания темпов и уровня образования в области информатики и информационных технологий от соответствующих темпов и уровня развития инструментальных средств по причине низкого уровня оснащенности современными средствами информатики учебных заведений. Однако для эффективного использованию информационных ресурсов и продуцированию новых знаний необходимо повышения информационной культуры общества.

Ключевые слова: системный анализ, управление, обработка, информация, технологии, пользователи, программное обеспечение, Интернет.

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LEGAL PERSON AS NEW SOCIO-POLITICAL PHENOMENON

Abstract. In article on the example of the Kazakhstan citizen are considered the questions of the legal person as new socio-political phenomenon in the context of legal culture which are not studied in political science yet. In article it is in more detail investigated political problems of the legal person as "new type" of the personality.

On the basis of the conducted researches the conclusion was drawn that the legal person is a personality disciplined by the right, policy, morals and steady law and order, legal consciousness, high legal culture, given all rights and freedoms. At the same time, the constitutional state includes rational involvement of the citizen in social legal, cultural and political activity, in protection of the inalienable rights, understanding it the personal responsibility for compliance with laws by the state and each person. At the same time, the article also focuses on discussion issues.

Keywords: right, policy, morals, state, society, personality, citizen, people, law, law and order, legal person, legal culture, legal consciousness, rights, freedom.

In order to understand and assess the essence of the legal culture of Kazakhstani society, it is necessary to consider the concept of a legal Kazakhstani as a special type of person, as well as a new phenomenon of high legal culture. The issue of a legal Kazakhstani is one of the most important rightful and socio-political issues that has not yet been studied in the scientific literature. The centuries-old history of accumulating and enriching knowledge about the place and role of law and politics in the life of Kazakhstan's society allows the scientist to turn to the study in the political aspect of the relationship between Kazakhstani and law, Kazakhstani and politics.

It should be noted that the historical development of Kazakhstan's law in human relations represents progress in matters of equality of people as legally, politically freemen. The freedom of the Kazakhstani should be determined and protected by law and politics. Moreover, in the Kazakhstani society, the preservation of the citizen's freedom is possible only with the development of law and politics, legal culture [1].

In this regard, it should be noted that the process of developing and disseminating the legal culture of Kazakhstanis is bilateral and depends on the development of statehood in the legal framework, and on the formation of an individual legal culture, individual legal awareness, namely, the formation of the legal Kazakhstani citizen as an expression of the high legal culture of a citizen.

The concept of a legal Kazakhstani was introduced into the scientific literature by us at the beginning of the XXI century when scientists had a need to connect the idea of the existence and development of the rule of law in Kazakhstan with the idea of a Kazakhstani person with specific properties - "the legal Kazakhstani".

Consequently, it seems to us very interesting, not just the formulation of the problem itself, but also the concretization of this concept in political science. This, of course, will help to determine more specifically on the scientific and political level what the very concept of "legal Kazakhstani" means and answer the most important questions, the answers to which are still missing: what makes a Kazakhstani act to get the status of "legal"? In turn, the answer to this question can be clarified by another, quite natural question: what should be done to form a legal Kazakhstani, in particular, within the framework of Kazakhstan's political and legal space, and how this process can be accelerated?

We think before talking about the typical characteristics of a legal Kazakhstani citizen, it is necessary, on the one hand, to define scientifically and politically the concept of "legal Kazakhstani", comparing it with other existing types, and, on the other hand, to identify the most important political and legal characteristics of a legal Kazakhstani. This scientific and political analysis will allow us to delineate the main contours of the concept of the legal Kazakhstani, which we are considering, and their comprehension is one of the conditions for the formation of a relevant methodology for the study of a legal Kazakhstani. Herewith, understanding, mastering, comprehension of the indicated questions should be carried out in a certain sequence, generating in the forward movement of scientific knowledge of an extensive system of notions, concepts, empirical studies, and facts, forming the modern content of the concept of "legal Kazakhstani".

Consequently, an understanding of the socio-political essence of a Kazakhstani citizen, its inclusion in a historically emerging and historically changing system of social relations is organically included in the interpretation of such concepts as "individual-citizen-Kazakhstani", forming their theoretical and conceptual basis, defining general approaches to the construction of research programs in the field of intensively developing political, sociological and legal sciences concerning the problems of the Kazakhstani. All this allows us to apply the concepts of "individual citizen-Kazakhstani" to build not only a general concept of the personality theory of a Kazakhstani, but also a typical characteristic of the concept of "legal Kazakhstani".

It should be said that a legal Kazakhstani is a person disciplined by law, politics, morality and a stable legal order, legal awareness, high legal culture, endowed with all rights and freedoms, and freely using them. The Republic of Kazakhstan claims itself, as noted in our Constitution, a rule of law "state which the highest values are the person, his life, rights, and freedoms" [2]. At the same time, the rule of law in Kazakhstan includes the rational involvement of the citizen in socio-legal, cultural and political activities, in protecting his inalienable rights, understanding his personal responsibility for the observance of laws by the state and each Kazakhstani.

Within this context, we note that this is a political definition of a legal Kazakhstani citizen, which we can apply in our literature, which is our attempt to present to the society of a Kazakhstani as a "new type" of personality. The rapidly developing political, and legal system of the new Kazakhstan forced our social and political science to revive the legal Kazakhstani and give this phenomenon new qualities that correspond to the new Kazakhstan realities.

Unfortunately, to this day, Kazakhstani political scientists, sociologists, philosophers, and jurists ignore this problem: there is no socio-political notion of a legal Kazakhstani person, his features, characteristics are not indicated, the structure is not disclosed, that is all that allows to typically, model formulate the phenomenon under consideration.

Therefore, like any scientific political-legal theory, the theory of a legal Kazakhstani citizen should meet the general methodological and conceptual requirement - to give a holistic view of the laws and essential links of a certain area of reality (for example, the personality of a Kazakhstani), to offer a complete system of knowledge with its internal differentiation, which would contain the methods of not only explaining, but also predicting, appearance of certain phenomena, trends in certain conditions, and a which would be characterized by logical dependence of one of its sides on other principal possibility of removing its contents from total prime statements, etc.

The theoretical-conceptual type of a legal Kazakhstani citizen can be represented as a systemic quality of their citizen-carrier determined by the active involvement in the socio-political relationships, which has a three-link structure: personal identity, political-legal consciousness, and legal behavior that develops in the process of politico-legal socialization of a Kazakhstani person and mediated. Therefore, when defining the type of "legal Kazakhstani", we propose to follow the methodological principles of determinism and systemacity.

It should be said that the principle of determinism applied to a legal Kazakhstani is oriented not only to the idea of causality as a combination of circumstances preceding the time in the investigation, but also to its other forms - to system determinism, which is revealed in dependence of individual elements, components of the system on features, characteristics of the whole, as well as on the target determinism, in accordance with which the goal determines the process of achieving the result, the truth. Therefore, from the position of determinism, the development of a legal Kazakhstani as a systemic quality of a person is

primarily due to social recognition of the biological prerequisites for its development. The development of a legal Kazakhstani here is understood as the process of transformation of human biological structures into socially conditioned structures of his personality as a result of his political and legal activity and "mature legal awareness" [3].

In this regard, we note that the principle of systemacity as a part of the methodological type of the theory of the legal Kazakhstani allows us to present it as an integrity in which different-quality, diverse and different-level relationships, contacts, etc. are revealed. Therefore, this principle can be opened in the contexture of the most political and legal reality of Kazakhstan. For this purpose, it is necessary, firstly, to identify the systemic links, contacts that develop in the relations of "Kazakhstani-another Kazakhstani"; and secondly, to show their own specificity of a higher level of interrelations, mutual contacts, which are expressed in the relations "state-right-Kazakhstani".

Consequently, the conceptual essence of this principle, in our opinion, is that the ratio of one Kazakhstani person to another, as well as the attitude of the development of a Kazakhstani to its result, is conceived through referring to the third object - objective activity, which in its most developed formation is a consequence of the union of citizens in work and communication. At the same time, proving to be initially mediated content and organization of joint activity, interindividual relations and qualities of the developing Kazakhstani, in turn, influence the process of its political and legal socialization and its results. Here, either a highly organized legal Kazakhstani is formed or not.

Thus, on the basis of the above mentioned, one can try to present the theoretical and conceptual design of a legal Kazakhstani citizen by singling out typological features of a legal Kazakhstani. Firstly, it is the belief that only the freedom of all Kazakhstanis in society is one of the reliable guarantees of freedom for everyone. Secondly, it is respect for the dignity, honor of other persons acting as equal participants in legal, social and political communication. Thirdly, it is a sense of personal responsibility for one's own actions and inner conviction in the importance of fulfilling the responsibilities of a Kazakhstani human. Fourthly, it is a respect for law, public order, the belief that the observance of responsibilities accepted by the Kazakhstani person is an absolute condition for the normal coexistence of Kazakhstani people in the society.

As is known, Abai persistently tried to establish justice, public order, political and legal responsibility in the society. He said: "If you want to be in a reasonable series, then once a day, or once a week, or at least once a month, give yourself an account of how you behaved during this time... Did you not do that, in what you should repent? Think about how you spent your life and did you notice, did you remember how you spent it?" [4].

It should be said that such a statement of the issue will not only be in accord with the aspirations of the Kazakhstani, but also deeply relevant today, since the formation of the political responsibility of the Kazakhstani person before the society is an important point in the development of the legal culture of the Kazakhstani person, one of the moments of the struggle for lawful behavior and legal personality of the Kazakhstani.

It has to be said that the unchanged characterization of a legal Kazakhstani as a political concept is the external expression of his inner world, namely, behavior, action, and therefore a further description of the legal Kazakhstani person suggests a description of his behavioral traits, signs of actions, and so on.

For example, the attributive feature of a legal Kazakhstani is the simple implementation of laws as an obligatory condition for lawful behavior, actions. Another important political and behavioral characteristic of a legal Kazakhstani person is directly participating in the law-making process, whether it is simply participation in elections and referendums, or participating in the discussion of projects, laws, political documents and decisions of local authorities, or working in the legislative bodies of the state and so on.

In this regard, an important feature of the behavior of a legal Kazakhstani person is the comprehension and protection of one's own rights and freedoms violated by other subjects of political and legal relations. It is the realization of this right, this freedom, that supports the system of checks and balances, on which the rule of law state is built in Kazakhstan. In this connection, it is important to say that only a citizen who can actively protect his rights and freedoms and who uses exclusively legal, honestly political methods can be called a legal Kazakhstani.

In our opinion, as another behavioral characteristic of a legal Kazakhstani citizen, participation in the work of public organizations for the protection of the legal and public order is a socio-psychological

readiness to protect the rights and freedoms of third parties, by which not only individuals but also social groups are understood, society as a whole.

The next aspect of the behavior of a legal Kazakhstani citizen includes the participation of a single Kazakhstani citizen in the formation of a legal culture, in the political and legal socialization.

So, we can say that the legal Kazakhstani has special typological and behavioral characteristics. From the remaining types of Kazakhstani, the legal Kazakhstani is distinguished by the degree of legitimacy and political-legal activity of behavior.

In this context, we can give a political definition of the concept to a legal Kazakhstani. A legal Kazakhstani is a political phenomenon, a citizen represented in the political and legal perspective, that is, falling within the influence of the system of socio-political and statutory regulation, according to which, acquiring certain legal, moral and political properties, features and qualities that allow him to actively participate in the political and socio-legal reality of the society, to fully flex their rights, freedom, and responsibilities [5], as well as to carry out political and legal activities for the purpose of steady state and social development of Kazakhstan.

Here, we should say that at the same time, by introducing a legal Kazakhstani in the form of a single theoretical system, with all its internal differentiation, it is necessary to disclose its structure. Therefore, based on the activity approach, which recognizes the change in the various components of the personality of a Kazakhstani in ontogeny, the structure of a legal Kazakhstani citizen can be represented by the following images: firstly, the objective social and political needs of the Kazakhstani, that is his interests. Kazakhstan is an organic part of a Kazakhstani society. Therefore, the basis of its structure consists, first of all, of socio-political needs. In other words, the personality structure of the Kazakhstani includes those objective laws that determine the development of Kazakhstan's people as a social, political entity. At the same time, a Kazakhstani person can realize or not realize these needs, but from this, they do not cease to exist and determine his behavior. However, in the conditions of changing priorities, the personality of the Kazakhstani person is now on the first place, therefore, comprehension of his personal interests, which should respect the state, society and guarantee their provision, also comes to the fore. At the same time, expressing his interests, a legal Kazakhstani should rationally understand them, commensurate with the socio-political need, so as not to create the basis for socio-political conflict. Therefore, a harmonious, reasonable ratio of general and private interests is the key to the successful development of civil society in Kazakhstan.

Secondly, the structural elements of a Kazakhstani should be attributed to the ability to create, to learn and to acquire skills, etc. It is the creative activity of a Kazakhstani person aimed at developing the political and legal space that forms the socially useful, lawful behavior of a Kazakhstani person which is the highest level of positive behavior of a Kazakhstani person in society, characterizing his tense initiative, intellectual activity for the most effective and fullest implementation and protection of rights, freedom and the performance of their responsibilities. In this sense, the positive behavior of a Kazakhstani person is that it is the highest degree of his activity within the framework of the features and properties united together with his essential, informative qualities.

Thirdly, the most important structural element of the legal Kazakhstani is the degree of mastering the political, legal and cultural and moral values of the society that make up his spiritual world. At the same time, it should be noted that political and legal knowledge helps the legal Kazakhstani citizen to avoid violating laws and truly respect the law, spiritual value, because in the words of the great Abai, an ignorant person "is able to sell his father, mother, all relatives and friends to the first... an official, who pats him on the shoulder" [6].

Fourthly, in the structural elements that form the legal Kazakhstani, it is necessary to include socio-political, moral and legal ones, as well as the principles by which the legal Kazakhstani is guided in his conduct. In addition, in our opinion, it is necessary to include here also ideological beliefs - those profound principles that determine the main line of the behavior of a Kazakhstani person. We must say that the ideological beliefs are related to the Kazakhstani's awareness of his objective interests, which form the core of the entire structure of the legal Kazakhstani, which are the basis of his political and legal consciousness. At the same time, his ideological convictions should "take the form of not a personal appeal to the offender, but of an appeal to the collective" [7].

Fifthly, the structural elements of a legal Kazakhstani should include the sovereignty of the person. This sovereignty follows from the correlation between the rights of the state and the Kazakhstani citizen.

It should be emphasized that all of the above structural elements of a legal Kazakhstani are found in every citizen of the country. Every Kazakhstani is somehow involved in the life of society, has the knowledge, strives for something, is guided by something. Therefore, the socio-political structure of the personality of the Kazakhstani is constantly changing. The personality of the Kazakhstani gets new information, technology, acquires knowledge. This knowledge gradually turns into beliefs. In their turn, first of all, ideological beliefs determine the nature of actions. Hence, upbringing can be understood as a change in the socio-political structure of the Kazakhstani personality in accordance with the ideals of Kazakhstan society.

Therefore, some objective and subjective conditions are necessary for the formation of the legal type of a Kazakhstani person. We will not touch upon the socio-economic prerequisites, since this is a separate independent study. As you know, poverty is a vice and a threat to the development of society. In modern Kazakhstan, there is a mass orientation of people just for physical survival, which hinders the development of legal culture. After all, Kazakhstan's law as a necessary form of freedom, in general, is possible and makes sense only at the existence of free Kazakhstanis.

In addition, for the emergence of prerequisites for the formation of a legal type of a Kazakhstani, it is necessary to differentiate relations that are usually considered undivided, syncretistic. Firstly, it is the relationship of a Kazakhstani and a state, a Kazakhstani and a Kazakhstani. Secondly, it is the relationship of rights and responsibilities that are integrated by mutual responsibility: of the state before the Kazakhstani, which guaranteed the rights of the Kazakhstani person, and of the Kazakhstani before the state, who guaranteed the fulfillment of his duties. It should be noted that in the USSR, historically in the Kazakhstan legal culture, rights and responsibilities were not only ruptured, but rights were superseded and replaced with responsibilities. Currently, in Kazakhstan, there is a process of denationalization and formation of the civil sector of society. This is manifested in the fact that there is a recognition of the rights of a Kazakhstani person not only as a citizen, but also as a person, that is, one-sided consideration of a Kazakhstani person in its interrelation with the state is being expanded, and the sphere of his self-determination is developing. At the same time, giving the Kazakhstanis a greater freedom. Herewith, Kazakhstan society in modern conditions is not in a position to undertake obligations to protect rights, since it does not have developed legal, political mechanisms for the protection of rights and freedoms. And in this situation, a correct, right way of forming a legal type of a Kazakhstani is possible - this is the way of developing the abilities, skills of a Kazakhstani to defend and protect his rights and freedoms.

So here it is a conclusion: in the circumstances, the objective prerequisite for the actualization of the legal consciousness of a Kazakhstani is the life situation, the life position of a modern Kazakhstani. The Kazakhstani person, having been left to himself in all dimensions of his life-support, should take care of his subsistence level, and, therefore, look for new sources of income, combine several professional activities, change his profession, master his other species or "at his own risk and peril" to engage in commerce, which is characterized by a significant degree of uncertainty, insecurity. The Kazakhstani, accustomed to the orientation "at all", social comparison, imitation, faced the need for self-determination in complex, uncertain, rapidly changing situations. He was in a competitive situation, which meant "the opportunity" to survive alone. All this has actualized the need of the Kazakhstani in social, political thinking about, first of all, the freedom to defend his life, freedom to survive or prosper. Also, there is a need to understand the rules, norms acting in Kazakhstani society, to obtain information, to find out the reliability or unreliability of one's expectations and other people's promises. And, finally, the need to understand and comprehend the socio-political whole, in which there are many conflicting social, political, legal processes, the need to clarify the lawfulness of certain actions in a particular life situation in a "multi-ethnic and poly-confessional society..." [8], in which the Kazakhstani appeared.

Thus, the formation of a legal type of a Kazakhstani at the level of social, political practice is embodied in legal activity, in the conscious organization of his living space as a space of legal nature of socio-political interactions. Constituting his vital legal space, the Kazakhstani constantly structures himself as an active and conscious subject of law and politics as a legal Kazakhstani. However, it should be said that when speaking about legal Kazakhstani, we create an ideally-typical construction as an

analytical scheme. But at the level of social, political specifics we face real difficulties in the formation of such a Kazakhstani person.

Therefore, the requirements for a high legal culture in Kazakhstan consist in increasing the competence of its bearers, in striving for more extensive and accurate knowledge of the principles and content of legislation on the part of the Kazakhstanis themselves; in the formation of the sense of justice of the people of Kazakhstan, focused on the conscious and responsible implementation of the norms of law, morality, in support of the principles of humanism, democracy and law-abiding in real behavior.

However, we can not achieve all this "at full speed", issuing "decrees", "ordinances" or using repressive sanctions. The culture of a legal Kazakhstani, like nature, has its own "natural laws of growth", and therefore, with all the "revolutionary" nature of reforming the changes taking place in the country with regard to legal culture, one can correctly speak only about "development", about "high", but no way about "creating a new one". And this development, or high, certainly implies the preservation of something former, which is not at all prepared for rationalist legal "cultivation." At the same time, the legal culture and law itself, politics, laws of Kazakhstan are parts of one system and mutually "feed" each other, accelerating the development of both positive and negative processes. If the legislation is permeated with violence, socio-political injustice, suppression of natural rights, human freedoms and dignity, honor of the individual, then there is a strengthening of political and legal nihilism, criminalization of consciousness and behavior, growth of negative perceptions of law and the state, and so on. On the other hand, the adoption of progressive legislation that takes into account the specific features of the cultural and legal development of Kazakhstan society leads to socio-political stabilization, to the flourishing of the initiative, to the development of the nation and the economic growth of the country, where citizens "can live in social and legal harmony with each other and with the state" [9].

Therefore, it is necessary to be admittedly aware of that the legal culture of Kazakhstan society does not just require improvement, it needs constant and vigilant care, planned actions of state power, legal institutions, political organizations, educational, educational and disciplinary system of the country.

In this regard, it should be noted that the establishment of a high legal culture and a new culture of legal relations in Kazakhstan society depends to a large extent on the current legal culture of people who are professionally involved in lawmaking, law enforcement and law protective, political and cultural-educational activities. But their cultural level, in turn, depends and even is determined in mass by its legal culture, which prevails today in Kazakhstan. Here we can state that today the law enforcement and administrative sphere is charged with nihilism and mercantilism, and in part with criminalization.

From this, it follows that currently, it is possible to count only on innovative opportunities of the legal culture that has developed in Kazakhstan, which has a significant national, multinational specificity, but at the same time is open and receptive to successful foreign and international experience. In this regard, it should be noted that in our days in Kazakhstan social science, there are areas that try to justify the transition of Kazakhstan's legal policy, legal culture to European-Western values. Therefore, the characterization of the modern legal culture of Kazakhstan will be incomplete if we do not consider such a feature as Westernization, the desire to copy the European-Western patterns of liberalism and constitutionality and transplant them onto Kazakhstan soil. However, the political and legal institutions established in Kazakhstan, based on European-Western political and legal traditions and having no experience of implementation in Kazakhstan's conditions, have become ineffective in the current country. One of the reasons for this is different psychologies, the different mentality of most citizens of Kazakhstan compared to Western Europeans. In particular, we are talking about natural, inalienable human rights, about the legal autonomy of an individual within the political and legal community, dominant of law over the state, etc.

The great French thinker Sh. Montesquieu wrote: "The laws should be in close correspondence with the properties of the nation for which they are established, that only in extremely rare cases the laws of one nation can be suitable for other people" [10]. However, unfortunately, this principle has not always been taken into account and is not considered in the practice of Kazakhstan lawmaking. Therefore, it is pointless to copy something from someone else's experience or abstract concepts [11].

It should be said that the perception or borrowing by Kazakhstanis of some elements and other national laws, legal culture or policy, should be in accordance with ours - the mentality of the population,

the value system, be a conscious necessity, be introduced gradually, carefully and with due consideration for the national, religious features of Kazakhstan, dosed, reasonable.

Thus, in order to build our own legislative base for Kazakhstan socio-political life, based on the experience of others, to enhance our legal culture, it is necessary to take into account and recognize those differences that make the modern Kazakhstani legal culture unique and inimitable.

A legal Kazakhstani is a citizen who, above all, is endowed with certain properties, features and qualities. Among them we can distinguish the following: First of all, the awareness of the legal Kazakhstani of his personal, socially-group and common national interests, which becomes an incentive for the socially useful legal behavior of the personality of the Kazakh. Secondly, the awareness of the legal Kazakhstani of his responsibilities before other people, social groups and society as a whole. Thirdly, the socio-political and legal activity of a legal Kazakhstani, which is expressed in his law-abiding, lawful, positive behavior.

So, the main, essential characteristic of a legal Kazakhstani as a political concept is the external expression of his inner world, that is, the behavior of a Kazakhstani who creates objective prerequisites for his self-realization in the policy and legal space of the state and society in Kazakhstan.

In this connection, it should be emphasized that in the modern development of Kazakhstan society, a new concept is needed - a legal Kazakhstani, which will embody the entire palette of those diverse, multi-level relationships that arise in the process of interaction between the state and the Kazakhstani person, the state and the civil society. Therefore, this particular kind of interconnection in modern Kazakhstan society is based on the establishment of legal principles in the relationship between the state and the Kazakhstani person, the state and the civil society and is an essential moment, a stage of democratization of Kazakhstan political system.

In conclusion, we would like to add that the modern legal Kazakhstani is a set of special properties, features, and qualities of the personality of the Kazakhstani in general, arising from its political and legal state. Therefore, the most important condition for the formation of a legal Kazakhstani in modern Kazakhstan is his possession of a certain level of political, moral and legal consciousness that act as system-forming factors of this process. Thus, beyond the mechanisms of the formation of the politico-legal, moral consciousness of a legal Kazakhstani, his full-fledged informatory characteristics would be simply impossible.

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ҚҰҚЫҚТЫҚ АДАМ ЖАҢА ӘЛЕУМЕТТІК-САЯСИ ҚҰБЫЛЫС РЕТІНДЕ

Аннотация. Мақалада саяси ғылымдарында әлі де зерттелмеген құқықтық адам мәселелерін жаңа әлеуметтік-саяси құбылысы көрінісі ретінде құқықтық мәдениет контекстінде қарастырады. Мақалада егжей-тегжейлі тұлғаның жаңа типі ретінде құқықтық адам саяси проблемары зерттеледі.

Жүргізілген зерттеу негізінде мынадай қорытынды жасалған: құқықтық адам – бұл құқықтық тәртібімен, саясатпен, мораль және тұрақты құқықтық тәртіппен, құқықтық саналықпен, жоғарғы құқықтық мәдениетпен, барлық құқықпен және еркіндікпен қамтылған, және оларды еркін пайдаланатын тұлға. Сондықтан құқықтық мемлекет өзіне азаматтық әлеуметтік-құқықта, мәдени-саяси қызметте ажыратылмайтын құқығын қорғауда, оны мемлекет және әрбір адам заңдарды сақтауда өзінің жеке жауапкершілігінде түсінуін, орынды әрекет етуін кірістірді. Сонымен қатар мақалада дискуссиялық мәселелерге де көңіл бөлген.

Түйін сөздер: құқық, саясат, мораль, мемлекет, қоғам, тұлға, азамат, халық, заң, құқықтық тәртіп, құқықтық адам, құқықтық мәдениет, құқықтық саналық, құқығы, еркіндік.

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ПРАВОВОЙ ЧЕЛОВЕК КАК НОВОЕ СОЦИАЛЬНО-ПОЛИТИЧЕСКОЕ ЯВЛЕНИЕ

Аннотация. В статье на примере казахстанца рассматриваются вопросы правового человека как нового социально-политического явления в контексте правовой культуры, которые еще неизучены в политической науке. В статье более подробно исследуются политологические проблемы правового человека как «нового типа» личности.

На основании проведенных исследований был сделан вывод о том, что правовой человек – это личность дисциплинированный правом, политикой, моралью и устойчивым правопорядком, правовой сознательностью, высокой правовой культурой, наделенный всеми правами и свободами, и свободно ими пользующийся. При этом, правовое государство включает в себя рациональную задействованность гражданина в социально-правовой, культурно-политической деятельности, в защите своих неотчуждаемых прав, понимание его своей персональной ответственности за соблюдение законов государством и каждым человеком. Вместе с тем, в статье уделено внимание и дискуссионным вопросам.

Ключевые слова: право, политика, мораль, государство, общество, личность, гражданин, народ, закон, правопорядок, правовой человек, правовая культура, правовая сознательность, права, свобода.

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Moscow, Russia**DEMOGRAPHIC ASPECTS OF FORMING
THE HUMAN CAPACITY IN AGRICULTURAL ORGANIZATIONS
OF THE STAVROPOL TERRITORY**

Abstract. The demographic and labor resource situation in the municipal formations of the Stavropol Territory is characterized by a decrease in the number of the rural population due to migration outflow, which is not compensated by natural growth. The demographic dependency ratio between persons of unemployable age and people of working age is increasing. Agricultural organizations feel a labor shortage. The share of young people under 30 in the structure of agricultural organizations in certain areas of the Stavropol Territory is less than five percent. The value of this indicator depends on the migration increase, the amount of investment per hectare of agricultural land and the level of wages. Accounting for these factors is necessary for the interrelated solution of the problems of investment and demographic development in rural areas of the region.

The analysis revealed the demographic features of the formation of the human capacity of agricultural organizations in the Stavropol Territory. The socio-economic situation in the rural areas of the region contributes to the attraction of migrants, but cannot ensure their full securing and retain their own inhabitants, does not contribute to the rise in births, leads to an increase in the demographic burden of the unemployable ages for persons of working ages.

Agricultural organizations have an unmet need for manpower, while the resources of young ages for replenishment are very limited. In these conditions, the investment activity of agricultural producers and the level of material incentives for employees are among the main factors in securing young people in the countryside. Their account is necessary for the justified adoption of strategic decisions on the development of agricultural production in the Stavropol Territory, the definition of targeted measures to improve the current and prospective demographic situation and to prevent its deterrent influence on the development of the rural economy.

Keywords: rural population, migration, natural population movement, age composition, rural youth, factor analysis, economic factors.

Introduction. In the agriculture, the formation of a reliable system of human resources supply, an effective mechanism for its regulation and, on this basis, ensuring sustainable development of the industry is one of the priority and most acute national problems. However, despite the measures taken in recent years to stabilize the personnel situation in the countryside, the demographic aspects of the formation of the human resources capacity hamper its solution.

Many Russian scholars pay attention to this. Bayrushina F.F. notes that the growing processes of rural migration worsen the professional potential of the branch economics. [1] Mindrin A.S. considers the rural population as the most important factor of sustainable development of the territories [2]. The interconnection of the innovative economy and rural employment is studied by E.Yu. Legchilina, G.V. Sapogova, I.A. Pronin in their work [3, 4]. The problems of training and attracting professional personnel for the development of import-substituting industries in the agrarian sphere of the economy are covered in the works of Kovalchuk I.E. [5]. The issues of ensuring food security and competitiveness of agriculture on the basis of advanced training of managers and specialists in the agro-industrial complex are reflected in the works of A.V. Kozlov [6]. Regional features of the demographic foundations of the personnel supply in agriculture are not fully considered.

This imposes the aim of the research: to analyze the demographic aspects of the formation of the human capacity in agriculture of the Stavropol Territory.

Methods of the research. The theoretical and methodological bases of the study were the modern economic theory, the works of domestic and foreign scientists on the formation of human resources capacity. Studies were conducted following the dialectical, abstract-logical, computational-constructive, comparative methods using the analysis of official statistical information. The information and empirical base was provided by the annual statistical reports of the bodies of the Federal State Statistics Service for the Stavropol Territory, monitoring of the social and labor sphere at the regional level; materials of departmental surveys of the personnel of agricultural organizations for 2013-2017. The object of the research is the agriculture of the Stavropol Territory, the subject - the staffing of agricultural organizations.

Results. The Stavropol Territory is a large agro-industrial region of Russia. Almost 90% of the territory is occupied by agricultural lands; of the total population, which is 2,800,100 people as of January 1, 2018, 41.5% (1163.8 thousand people) live in rural areas.

Reproduction of the rural population is the basis for the formation of the human capacity of agricultural organizations, which determines its basic quantitative characteristics - size and composition, as well as qualitative characteristics - health and intellectual abilities. The study of these aspects revealed that the number of rural residents in the Stavropol Territory has a stable tendency to reduce (figure 1).

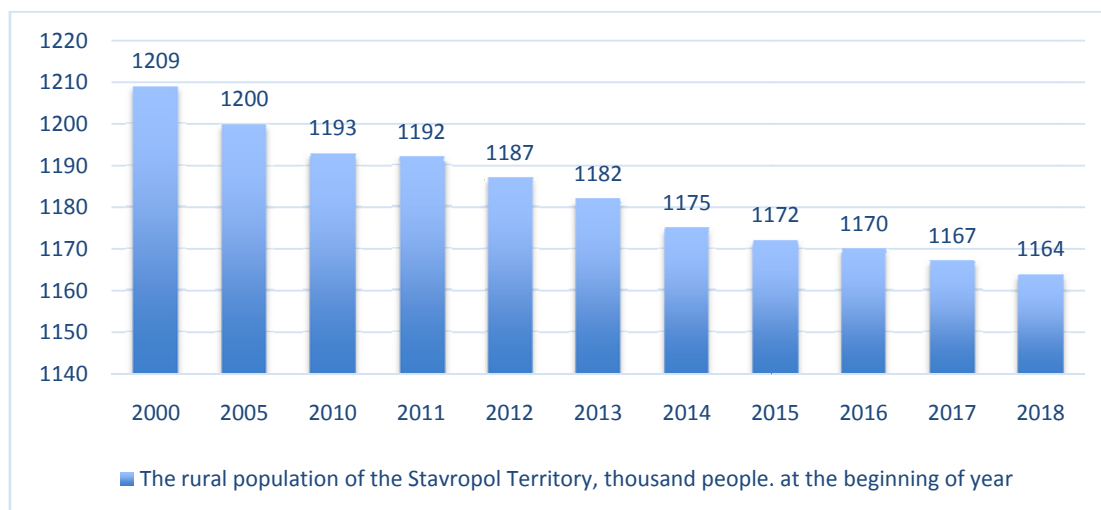


Figure 1 – The rural population of the Stavropol Territory, thousand people

Over the period from 2000 to 2018, it decreased by 45 thousand people. The largest outflow (34 thousand people) took place in 2000-2015. In subsequent years, the rate of rural depopulation decreased significantly, but the trend persisted. Average for 2015-2018 period the number of rural residents annually decreased by 2 thousand people (0.2% compared to the previous year).

The rural depopulation takes place in seventeen of the twenty-six districts of the Territory. The growth occurs in the areas of major cities, primarily the regional centers, the Caucasian Mineral Waters, certain regions bordering the neighboring North Caucasian republics.

The change in the number of rural residents occurs both at the expense of the natural, and the migration movement of the population.

According to the data for 2012-2017, each year about 40 thousand migrants leave the rural settlements of the Territory, and an average of 35 thousand people arrives in the countryside. Thus, over the last six years, the rural population has lost an average of 5 thousand people per year due to migration outflow. The intensity of the total migration loss¹ of the rural population in the region in 2017 decreased slightly and amounted to 13.2 %, while in 2015, the value of this indicator reached 21.3 %.

¹The intensity of migration growth (outflow) is the balance of population migration per 10 thousand people of population.

More than 40% of all migration movements in the Territory account for intra-Territory migration, due to which the greatest outflow of the rural population occurs. At the same time, the priority direction of intraregional migration flow is "village-city".

Within the framework of interregional migration, every third migrant arrives in the countryside of the Territory from the neighboring North Caucasus republics. In this respect, there is a danger of a certain ethnic imbalance in the structure of direct and reverse migration flows, especially in the eastern regions of the Territory. The flow of migrants from other Russian regions does not compensate for the migration loss of their own inhabitants. More than half of the migrants leaving the countryside migrate to the Southern and Central Federal Districts. This means that the situation with the attractiveness of the rural areas of Stavropol is complex, and they have problems fixing their own residents.

The processes of natural movement of the rural population in the Stavropol Territory reflect a consistent decrease in the number of births and deaths, and the rate of decline in births, starting from 2015, is faster than the rate of decline in deaths. The result is a natural decline in the population, which in 2017 reached 972 people (table 1).

Table 1 – Natural movement of the rural population of the Stavropol Territory, people

Indicators	2012	2013	2014	2015	2016	2017	Absolutedeviation 2017 from 2012	2017 % to 2012
Wereborn	16241	16078	16087	14477	14090	12898	-3343	79,4
Died	15268	14911	14963	14482	14479	13870	-1398	90,8
Naturalincrease (- decrease)	973	1167	1124	-5	-389	-972	-1945	x

Birth rates in rural areas in 2015-2017 were lower, and mortality was higher than in urban. For every 1,000 people, an average of 11.9 children are born in rural areas over a three-year period, 12.9 children - in urban areas; 12.2 and 11.0 people respectively die. Observed in 2012-2014 the rate of natural increase in the rural population (0.8) was replaced by the rate of natural decrease (-0.8) (table 2).

The current situation shows the difficulties in solving the tasks of socio-economic development of rural areas of the Territory. The decline in the birth rate worsens the demographic picture and complicates the processes of reproduction of the labor potential of the countrysides in the Territory.

An important factor determining the possibility of a natural increase in the rural population is its age structure. In 2017, out of 1167.6 thousand people living in rural settlements of the Territory, 237.1 thousand people, or 20.3% - are children and adolescents aged 0-15 years old; 653.1 thousand people (55.9%) are persons of working age, including young people aged 18 to 29 years old -180.5 thousand people (15.5%); men and women older than working age - 277.4 thousand people. (23.8%).

Table 2 – Coefficients of the natural movement of the population in the Stavropol Territory (per 1000 population of the corresponding category)

Indicators	2012	2013	2014	2015	2016	2017
	Birth rate					
TotalintheTerritory	12.6	12.6	13	13	13	11.5
including:						
- inurbanareas	11.7	11.9	12.5	13.4	13.6	11.8
- in rural areas	13.7	13.6	13.7	12.4	12.1	11.1
	Mortalityrate					
TotalintheTerritory	12	11.7	11.7	11.6	11.7	11.2
including:						
- inurbanareas	11.4	11	11	11.1	11.2	10.8
- in rural areas	12.9	12.6	12.7	12.4	12.4	11.9
	Rate of natural increase (- decrease)					
TotalintheTerritory	0.6	0.9	1.3	1.4	1.3	0.3
including:						
- inurbanareas	0.3	0.9	1.5	2.3	2.4	1
- in rural areas	0.8	1.0	1.0	0.0	-0.3	-0.8

The dynamics of the age structure of the rural population reflects the growth in the number of persons of retirement age. The coefficient of demographic burden of disabled people for people of working age is increasing. In 2017, there were 770 unemployables per 1000 persons of working age, which is 11.0% higher than the value of this indicator in urban areas. According to the predictive estimates, the demographic burden on the rural population of working age will continue to grow, and by 2031 it will reach 948 people [8].

In this connection, the consolidation of young people in the village is of fundamental importance. The share of persons from 18 to 30 years old in the municipal districts of the Stavropol Territory declines annually and in 2017 amounted to 15.1% (against 16.3 in 2015). In the Sovetsky, Ipatovsky, Kochubeevsky, Trunovsky districts, this figure does not exceed 13.5%. The share of youth in the structure of workers in the agro-industrial complex is even lower and amounts to an average of 11.9% in the Territory. In some areas, it reached a critical level. Thus, the share of workers under 30 in the agro-industrial complex organizations: Neftekumsky district - 3.25%, Blagodarniy - 5.05%, Budennovskiy - 5.58%, Arzgirsky - 6.37%, Ipatovsky - 7.04, Apanasenkovsky - 7.41 (figure 2).

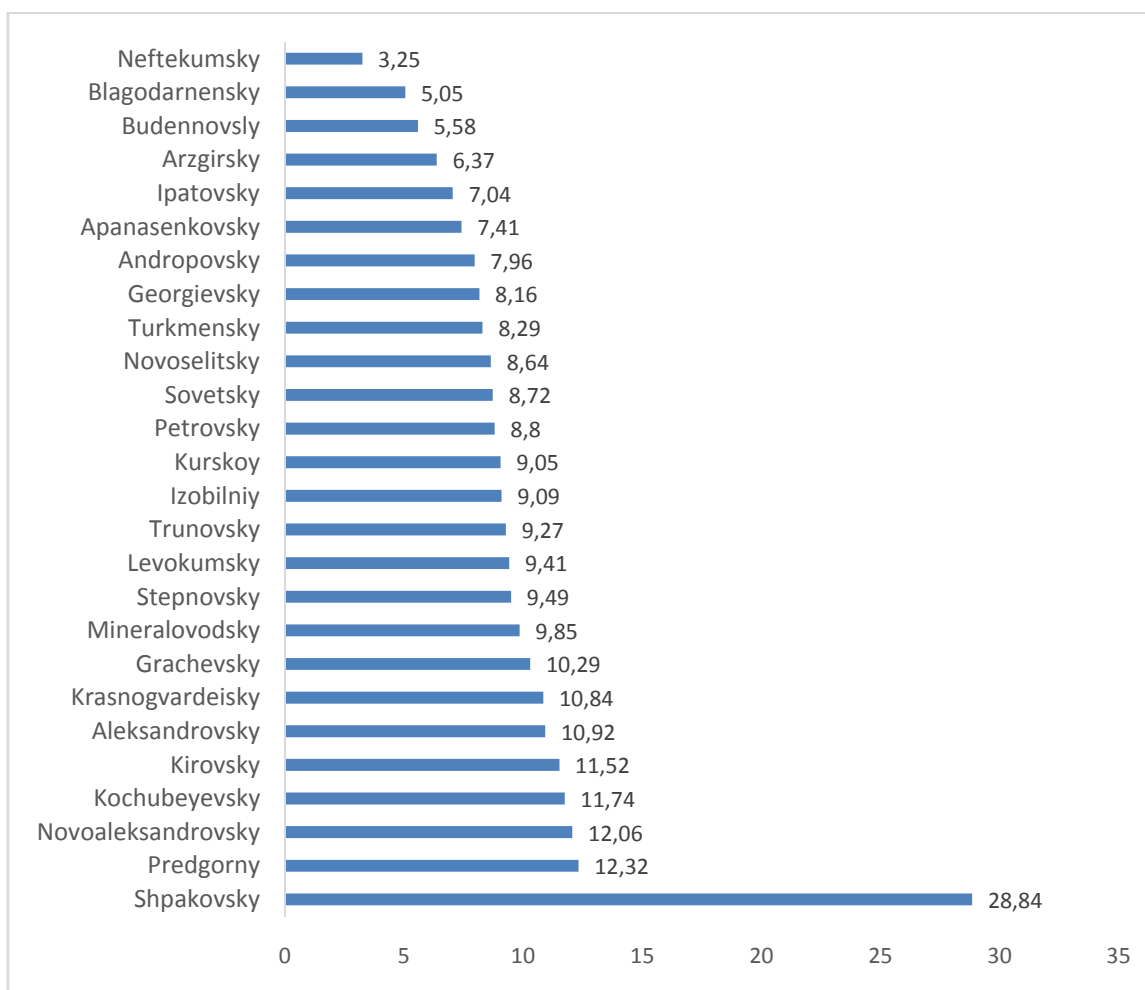


Figure 2 – The proportion of employees of enterprises of the agro-industrial complex in the Stavropol Territory under the age of 30 in 2017 in the context of municipal districts, %

Deepening this situation could have the most negative consequences for agriculture when demographic processes would become an obstacle to economic growth.

Agricultural organizations of the Territory are already experiencing a shortage of permanent employees. According to the annual reports of agricultural organizations subordinated to the Ministry of Agriculture of the Stavropol Territory, the supply of labor in 2017 for agricultural organizations is 96.1%,

which does not meet the needs of production. The deficit of workers is 2136 people. At the same time, the supply of managers and specialists fluctuates around 97%, which is 404 people. The supply of workers of mass professions is 96%, which corresponds to the need of 1732 people.

The most pronounced deficit of workers in Predgorniy district is 284 people, Novoaleksandrovsky - 200 people, Trunovsky-163 people, Petrovsky - 163 people, Kirovsky - 155 people.

In order to determine the factors affecting the presence of youth in agricultural organizations, according to the data of 26 districts of the Stavropol Territory for 2016-2017, a multiple correlation-regression analysis was performed. The indicator of the proportion of employees aged 18-29 in the total number of personnel of agricultural organizations was adopted as a dependent variable. Five factor indicators are considered: migration and natural population growth, the average wage level of workers in agricultural organizations, the amount of capital investment per 100 hectares of agricultural lands; the amount of subsidies paid to agricultural organizations from the regional budget. They determine 71% of the dispersion of the effective characteristic

The greatest influence on the fluctuation of the share of youth in the team of workers of agricultural organizations of the Stavropol Territory is provided by the level of wages (regression coefficient - 0.59). The next most important are the amount of investments per 100 hectares of agricultural lands ($K=0.53$) and migration growth ($K=0.39$). The remaining indicators play a less significant role.

The data of the factor analysis are confirmed by the results of the groupings. Investment activity of agricultural organizations has a direct connection with the presence of the youth in the work collectives. In areas with an investment level of up to 10 thousand rubles per hectare of agricultural lands, the share of young people in the structure of the workforce is 7.7%; with an increase in the level of investment from 10 to 40 thousand rubles - 8.8%; more than 40 thousand rubles - 13.8% (table 3).

Table 3 – The proportion of employees of organizations of the agroindustrial complex under the age of 30, depending on the amount of investment per hectare of agricultural lands

Groups of districts by investment level, thousand rubles/ha	Number of districts	The amount of investment, thousand rubles/ha	Proportion of employees under 30, %	Names of the districts
Up to 10	13	5.23	7.7	Turkmeny, Kurskiy, Arzgirskiy, Stepnovskiy, Georgiyevskiy, Petrovskiy, Levokumskiy, Budennovskiy, Apanasenkovskiy, Sovetskoy, Neftekumskiy, Aleksandrovskiy, Blagodarnenskiy
From 10 to 40	6	16.3	8.8	Novoselitskiy, Trunovskiy, Grachevskiy, Ipatovskiy, Mineralovodskiy, Andropovskiy
40 and more	7	90.0	13.8	Shpakovskiy, Kochubeevskiy, Novoaleksandrovskiy, Izobilny, Kirovskiy, Krasnogvardeyskiy
Average in the territory	26	31	11.9	x

The implementation of investment projects involves the creation of new working positions, and the use of advanced technologies helps to ensure that vacancies are occupied by young people armed with advanced knowledge.

An important factor in securing young people in the countryside is the offer of a decent level of payment for labor. The grouping of the districts of the Stavropol Territory by salary level revealed that the share of agricultural workers under the age of 30 increases in proportion to the growth of wages (table 4). Thus, in districts with an average level of monthly wages of up to 20 thousand rubles the proportion of young people under the age of 30 is an average of 7.8%, with an increase in wages from 20 to 25 thousand rubles - 9.4%, and in the districts with an average salary of 25 thousand rubles and higher - 15.3%.

Table 4 – The proportion of employees of agricultural organizations under the age of 30, depending on the average monthly salary

Groups of districts by level of wages, rubles	Number of districts	Average monthly salary, rubles/month	Proportion of employees under 30, %	Names of the districts
Up to 20000	8	16551	7.8	Neftekumsky, Kursksky, Stepnovsky, Budennovsky, Andropovsky, Grachevsky, Kirovsky, Levokumsky
From 20000 to 25000	8	2255	9.4	Turkmensky, Izobilny, Apanasenkovsky, Novoaleksandrovsky, Petrovsky, Ipatovsky Predgorny, Arzgirsky
25000 and more	10	28592	15.3	Novoselitsky, Trunovsky, Kochubeevsky, Shpakovsky, Mineralovodsky, Georgiyevsky, Sovetsky, Aleksandrovsky, Blagodarnensky, Krasnogvardeysky
Average in the territory	26	21384	11.9	x

Conclusion. The analysis revealed the demographic features of the formation of the human capacity of agricultural organizations in the Stavropol Territory. The socio-economic situation in the rural areas of the region contributes to the attraction of migrants, but cannot ensure their full securing and retain their own inhabitants, does not contribute to the rise in births, leads to an increase in the demographic burden of the unemployable ages for persons of working ages.

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СТАВРОПОЛЬ АЙМАҒЫНДАҒЫ АУЫЛШАРУАШЫЛЫҚ ҰЙЫМДАРЫНЫҢ МАМАНДАР ӘЛЕУЕТІН ҚАЛЫПТАСТЫРУДЫҢ ДЕМОГРАФИЯЛЫҚ МӘСЕЛЕЛЕРІ

Аннотация. Ставрополь өлкесіндегі муниципалдық құрылымдардағы муниципалдық және еңбек ресурстары ахуалы табиғи өсіммен өтелмейтін көші-қон ағымының салдарынан ауыл халқының санын азайтумен сипатталады. Еңбекке жарамды жастағы адамдарға мүгедектердің демографиялық жүктемесінің коэффициенті ұлғаяды. Ауылшаруашылық

ұйымдарында жұмыс күшінің жетіспеушілігі сезіледі. Ставрополь өлкесінің кейбір аудандарында ауыл шаруашылығы ұйымдарының қызметкерлері құрамында 30 жасқа дейінгі жастардың үлесі бес пайыздан аспайды. Бұл индикатордың құны көші-қонның өсуіне, ауылшаруашылық жерлерінің гектарына салынатын инвестиция көлеміне және қызметкерлердің жалақыларының деңгейіне байланысты. Бұл факторларды есепке алу облыстың ауылдық жерлеріндегі инвестициялар мен демографиялық даму проблемаларымен өзара байланысты.

Талдау барысында Ставрополь өлкесі ауылшаруашылық ұйымдарының кадрлық әлеуетін қалыптастырудың демографиялық ерекшеліктері анықталды.

Облыстағы ауылдық жерлердегі әлеуметтік-экономикалық жағдай жалдамалы қоныс аударушыларды тартуға ықпал етеді, бірақ олардың толықтай топтасуы мен өздерінің тұрғындарын сақтап қалуы, туудың өсуіне ықпал етпейді, еңбекке қабілетті жастағы адамдар үшін мүгедектердің демографиялық жүктемесінің өсуіне алып келеді. Ауылшаруашылық ұйымдарында жұмыс күшінің қажеті жоқ, ал толтыру үшін жас мамандардың ресурстары өте шектеулі.

Мұндай жағдайларда ауыл шаруашылығы өндірушілерінің инвестициялық белсенділігі және қызметкерлерге материалдық ынталандыру деңгейі ауылдағы жастарды қамтамасыз етудің негізгі факторларының бірі болып табылады. Олардың есебі Ставрополь өлкесі аумағында ауыл шаруашылығы өндірісін дамыту бойынша стратегиялық шешімдерді негіздеу үшін, ағымдағы және болашақтағы демографиялық ахуалды жақсарту бойынша мақсатты шараларды анықтау және ауыл шаруашылығының дамуына кедергі келтіретін әсерін болдырмау үшін қажет.

Түйін сөздер: ауыл тұрғындары, көші-қон, табиғи халықтың қозғалысы, жас құрамы, ауыл жастары, факторлық талдау, экономикалық факторлар.

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ДЕМОГРАФИЧЕСКИЕ АСПЕКТЫ ФОРМИРОВАНИЯ КАДРОВОГО ПОТЕНЦИАЛА СЕЛЬСКОХОЗЯЙСТВЕННЫХ ОРГАНИЗАЦИЙ СТАВРОПОЛЬСКОГО КРАЯ

Аннотация. Демографическая и трудовые ресурсы ситуация, сложившаяся в муниципальных образованиях Ставропольского края характеризуется снижением численности сельского населения за счет миграционного оттока, некомпенсируемого естественным приростом. Растет коэффициент демографической нагрузки нетрудоспособных возрастов на лиц трудоспособного возраста. Сельскохозяйственные организации ощущают дефицит рабочей силы. Доля молодежи в возрасте до 30 лет в структуре работников сельскохозяйственных организаций в отдельных районах Ставропольского края составляет менее пяти процентов. Значение этого показателя зависит от миграционного прироста, величины инвестиций в расчете на гектар сельскохозяйственных угодий и уровня заработной платы работников. Учет этих факторов необходим для взаимосвязанного решения проблем инвестиционного и демографического развития сельских районов региона.

Анализ выявил демографические особенности формирования кадрового потенциала сельскохозяйственных организаций Ставропольского края. Социально-экономическая обстановка сельских районов региона способствует привлечению мигрантов, но не может обеспечить их полную закрепляемость и удержать собственных жителей, не способствует росту рождаемости, приводит к увеличению демографической нагрузки нетрудоспособных возрастов на лиц трудоспособного возраста.

Сельскохозяйственные организации испытывают неудовлетворенную потребность в рабочей силе, при этом ресурсы молодых возрастов для ее восполнения весьма ограничены. В этих условиях инвестиционная активность сельхозтоваропроизводителей и уровень материальной заинтересованности работников являются одними из основных факторов, закрепления молодежи на селе. Их учет необходим для обоснованного принятия стратегических решений о развитии сельскохозяйственного производства на территории Ставропольского края, определения мер целенаправленного воздействия в целях улучшения текущей и перспективной демографической ситуации, предотвращения ее сдерживающего влияния на развитие сельской экономики.

Ключевые слова: сельское население, миграция, естественное движение населения, возрастной состав, сельская молодежь, факторный анализ, экономические факторы.

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INVESTIGATION OF MODERN ECONOMIC MECHANISMS FOR CONSTRUCTION OF THE INTELLECTUAL POTENTIAL OF THE COUNTRY AS A MOVING FACTOR OF INNOVATIVE ECONOMIC DEVELOPMENT

Abstract. According to the authors, the main instrument is the reduction of the corporate profit tax, which depends on the level of innovation susceptibility achieved by the enterprise. The higher the level of innovation susceptibility, the more tax benefits you can get. At the same time, a study of modern economic mechanisms for building the country's intellectual potential has shown that the main condition for obtaining commercialization of R & D results. And also affect: the rate of bank interest, the level of taxation of profits of industrial companies and incomes of citizens, the size of the tax rate on transactions with securities, etc. Currently, the issue of competitiveness is increasingly acute for the domestic commodity producer due to the influence of integration processes. However, the driving factor of the innovative development of the economy is: the potential for the development of knowledge, the potential for generating knowledge, the potential for the dissemination of knowledge and the potential demand for knowledge. The presented analysis of innovative development of Kazakhstan, reveals problems, in connection with what the authors proposed ways of solving them.

Keywords: activity, innovation and technological platform, innovative development, innovative potential, methodological approaches, science, scientific and technical progress, education, basic higher education institution, perspective directions.

Introduction. The creation by the state of conditions for free access to domestic enterprises for the results of fundamental research is a huge contribution to the development and strengthening of the relationship between innovative and reproduction relations, and, accordingly, to increasing competitiveness. In this case, the entrepreneur will be interested in accumulating and allocating investments in the creation and implementation of innovations, as his goal will be to ensure the competitiveness and financial stability of his production.

Preservation and development of intellectual potential and formation of the human capital of a society are the main direction of development of any civilized country. It is seen as an important factor in socio-economic development, solving global problems associated with the progressive development of a particular society. Due to this, in many countries the problem of intellectual potential growth is assigned to priority areas in the policy of states.

In his lecture "Innovative industry of science and knowledge - a strategic resource of Kazakhstan in the XXI century" President Nursultan Nazarbayev noted the need to strengthen the intellectual potential of the nation.

Kazakhstan has now entered the industrial-innovative phase of economic development. This stage is characterized by the adaptation of the sphere of science to the current economic conditions, which should lead to fundamental changes in the structural, organizational, personnel, infrastructure and financial support for the development of science regulated by the relevant regulatory legal framework.

The development of scientific and technological potential should not be seen as a co-factor that is not characteristic of traditional sectors of the economy. The field of science is the same sector of the economy that has all the features, rules and regulatory mechanisms common to other sectors.

In conditions when more than 80% of the economy of Kazakhstan is in the private sector, the principles of regulating the sphere of science, inheriting a weak focus on market demands, are outdated and imperfect.

The ineffective mechanism for attracting the private sector to the development of scientific and technical potential, the relatively low activity of participants in R & D are still weak links in the entire scientific and technical system of Kazakhstan, while the development and introduction of new technologies and science-intensive products in production are key factors for achieving and maintaining competitive advantages in the domestic and foreign markets.

Thus, in the Republic of Kazakhstan today all the prerequisites for the formation of innovative capacity are being formed. However, to ensure innovative economic development of the RK, it is necessary to create favorable conditions conducive to the commercialization of innovation activities. Otherwise, all costs, which today are primarily of a national nature, will not have the required economic performance.

Innovative activity in the economic context is any new way of creating economic added value, for example, through a new production or distribution process, a new business model, a new way of organizing work, or by creating new markets or finding new sources of supplies (resources). And innovation policy is any measure of a policy or mechanism that influences the innovation process.

Main part. Today, innovations are the basis for the economic development of any state. To ensure the country's competitiveness, it is necessary to ensure the innovative development of the country. In this connection, it is expedient to identify factors of innovative economic growth, which are the basis for further innovative economic development of the country. The presence of these factors is determined by the specific features of the economic development of each state and should be considered for each country individually. Under the factors of economic growth in a broad sense should be understood those processes that contribute to a positive change in certain quantitative and qualitative economic indicators. There are various classifications of factors of economic growth:

- the essence of manifestation: economic and non-economic.
- by production method: extensive and intensive;
- on factors of production: factors of demand, supply and distribution;
- in terms of evaluation: objective and subjective;
- in the field of activity: economic, financial, production, educational, etc .;
- in terms of exposure: short-term, medium-term and long-term;
- impact level: sectoral, state and international, etc.
- by the control method: reproducible and non-reproducible;
- in the environment of exposure: internal and external.

Classification of factors of economic growth according to the mode of influence is considered to be generally accepted:

1. Direct factors are the factors determining the ability to grow economically (availability of labor, financial, production and technical resources and the involvement of these resources in economic processes, entrepreneurial activity).

2. Indirect factors are factors that influence the possibility of transforming existing capabilities into reality (the degree of monopolization of the market, tax incentives, preferential credit system). Innovation is primarily aimed at ensuring the competitiveness of both individual enterprises, so the country as a whole.

And, as you know, the main components of the innovative potential are: the potential for knowledge acquisition, the potential for generating knowledge, the potential for the dissemination of knowledge and the potential demand for knowledge.

An important tool for innovative development of industry is the development of a system for training scientific and engineering personnel and specialists in the field of innovation management and intellectual property management.

Innovative development involves the formation of new national technological systems and the deepening of the competence of each state as a result of the development of the ability to create fundamentally new products and their promotion to certain markets.

The main indicators of innovation activity of enterprises of the Republic of Kazakhstan and by regions will be considered in table.

Key indicators of innovation activity of enterprises of the Republic of Kazakhstan and by regions

	2015	2016	2017	Changes +/-, %	Changes +/-, %
The Republic of Kazakhstan	31784	31 077	30 854	97,78	99,28
Akmola	1 325	1 301	1 299	98,19	99,85
Aktobe	1 236	1 234	1 149	99,84	93,11
Almaty	1 643	1 648	1 797	100,30	109,04
Atyrau	1 276	1 193	1 145	93,50	95,98
West Kazakhstan	857	917	932	107,00	101,64
Zhambyl	852	834	846	97,89	101,44
Karaganda	2 340	2 235	2 309	95,51	103,31
Kostanay	1 502	1 438	1 475	95,74	102,57
Kyzylorda	846	812	784	95,98	96,55
Mangistau	1 027	1 060	1 131	103,21	106,70
South Kazakhstan	2 315	2 366	2 499	102,20	105,62
Pavlodar	1 354	1 286	1 292	94,98	100,47
North-Kazakhstan	1 047	1 049	1 023	100,19	97,52
East Kazakhstan	2 091	1 985	2 010	94,93	101,26
Astana city	4 103	4 003	4 039	97,56	100,90
Almaty city	7 970	7 716	7 124	96,81	92,33

In general, in Kazakhstan, there has been a drop in the number of enterprises engaged in innovation activities each year almost 2% over the period 2015-2017, but in some regions there has been an increase in innovation activity for the corresponding period. So, the leader is the Almaty, Mangistau and South-Kazakhstan regions, and lag behind in the innovative development of Almaty, Aktyubinsk and Atyrau oblasts. This fact is evidence that Kazakhstan is strongly dependent on global trends in the economy.

The creation of fundamentally new products in modern conditions is possible only on the basis of the development of fundamental research, and, first of all, at the intersection of scientific disciplines. Considering the significant costs, high risk and uncertainty of the commercial results characteristic of many areas of fundamental research, combining efforts, intellectual and financial capital, eliminating duplication of expensive research, and accelerating the diffusion of technologies that have a high commercial effect, are becoming important factors in the market for the success of innovation activity.

Expanding the diversity of technologically new products involves expanding the capacity and deepening the diversification of the sales market for this product. In this regard, the definition of general rules for trade in innovative products and the formation of a common trading space for it are becoming important conditions for the success of innovation. It should be noted that low interest and the desire for innovation from enterprises, organizations and companies.

The implementation of any innovative project involves the availability of investments, the organization of its financing. The larger the project, the more investment is needed for its implementation, the greater the variety of risks, the more difficult it is to take into account the interests of the participants in the innovation project, to ensure its economic efficiency, accordingly, more attention should be paid to the organization of financing.

In the modern world, innovations are becoming of strategic importance for increasing the competitiveness and sustainable growth of the national economy. States that implement the policy of developing the knowledge economy demonstrate high rates of economic growth. The formation of a promising policy that can ensure the innovative development of the national economy is one of the most difficult.

Aging and deterioration of fixed assets and especially technological equipment are a deterrent to economic growth, reduce the level of economic security and increase the likelihood of emergencies of anthropogenic nature.

An important tool for innovative development of industry is the development of a system for training scientific and engineering personnel and specialists in the field of innovation management and intellectual property management.

Conclusion. To eliminate the reasons restraining innovative development, it is necessary to develop a policy of state intervention taking into account the experience of foreign countries. At the same time, it is necessary to use the principles of coordination, harmonization and motivation, allowing to coordinate the activities of all participants. The main tool for innovative development should be state programs as a set of interrelated resources, terms and implementers of activities that ensure the effective solution of critical scientific and technical problems in the priority areas of economic development.

In Kazakhstan it is important to create the necessary conditions for stimulating the innovative behavior of all economic players. Of particular importance in this process is the increased effectiveness of public and state institutions aimed at promoting and replicating effective technologies and mechanisms, developing and using non-standard methods and instruments of regulation. Modernization of the country's economy should be oriented towards a system of long-term technological breakthroughs, which is formed taking into account global trends, internal socio-economic tasks related to sustainable development, increasing competitiveness and national security.

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ИННОВАЦИЯЛЫҚ ЭКОНОМИКАЛЫҚ ДАМУДЫҢ ЖАҒАНДЫҚ ФАКТОРЫ РЕТІНДЕ ЕЛІМІЗДІҢ ИНТЕЛЛЕКТУАЛЬДІ ПОТЕНЦИАЛЫН САЛУ ҮШІН ҚАЗІРГІ ЗАМАНҒЫ ЭКОНОМИКАЛЫҚ МЕХАНИКАЛАРДЫ ЗЕРТТЕУ

Аннотация. Авторлардың айтуынша, басты құралы кәсіпорын инновациялық қабылдағыштық қол жеткізілген деңгейіне байланысты, корпоративтік табыс салығы төмендеуі әрекет етеді. Инновацияның сезімталдық деңгейі қаншалықты жоғары болса, соғұрлым салық жеңілдіктері пайда болады. елдің зияткерлік

әлеуетін құрылысының қазіргі экономикалық механизмдерін осы зерттеуге R & D нәтижелерін коммерцияландыруды алудың негізгі шарты екенін көрсетті. Сондай-ақ әсер етеді: Қазіргі т.б. банк пайыз мөлшерлемесі, өндірістік компаниялар мен табыстардың пайданың салық салу деңгейі, бағалы қағаздармен операциялар бойынша салық сомасы, отандық өндірушілер көп өткір байланысты интеграциялық процестің әсер бәсекеге қабілеттілігі мәселесі болып табылады. Алайда, экономиканың инновациялық даму қозғаушы күші болып табылады: білім жұтып қабілеті, білім ұрпақтың әлеуетін, білімді тарату және білім әлеуетті сұраныстың әлеуетін. Қазақстанның инновациялық дамуының қазіргі талдау, авторлар оларды шешу жолдарын ұсынамыз, соларға байланысты проблемалар анықтайды.

Түйін сөздер: инновациялық және технологиялық тұғырнама, инновациялық даму, инновациялық әлеует, әдістемелік тәсілдер, ғылым, ғылыми-техникалық прогресс, білім беру, базалық жоғары оқу орны, перспективті бағыттар.

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ИССЛЕДОВАНИЕ СОВРЕМЕННЫХ ЭКОНОМИЧЕСКИХ МЕХАНИЗМОВ ПОСТРОЕНИЯ ИНТЕЛЛЕКТУАЛЬНОГО ПОТЕНЦИАЛА СТРАНЫ КАК ДВИЖУЩЕГО ФАКТОРА ИННОВАЦИОННОГО РАЗВИТИЯ ЭКОНОМИКИ

Аннотация. По мнению авторов, основным инструментом выступает снижение налога на прибыль предприятий, зависящее от достигнутого предприятием уровнем инновационной восприимчивости. Чем выше уровень инновационной восприимчивости, тем больше налоговых льгот можно получить. При этом исследование современных экономических механизмов построения интеллектуального потенциала страны показало, что основным условием получения коммерциализация результатов НИОКР. А так же влияют: ставка банковского процента, уровень налогообложения прибыли промышленных компаний и доходов граждан, величина ставки налога на операции с ценными бумагами и др. В настоящее время для отечественного товаропроизводителя все острее стоит вопрос конкурентоспособности из-за влияния интеграционных процессов. Однако, движущим фактором инновационного развития экономики является: потенциал освоения знаний, потенциал генерирования знаний, потенциал распространения знаний и потенциальный спрос на знания. Представленный анализ инновационного развития Казахстана, выявляет проблемы, в связи, с чем авторами предложены пути их решения.

Ключевые слова: деятельность, инновационно-технологическая платформа, инновационное развитие, инновационный потенциал, методические подходы, наука, научно-технический прогресс, образование, опорный вуз, перспективные направления.

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TO THE QUESTION OF HISTORY OF FORMATION AND DEVELOPMENT OF INDEPENDENT KAZAKHSTAN

Abstract. The concept “constitution” is applied in two meanings. In formal sense the legal Constitution is the fundamental law of the state, regulated the socio-economic system, the form of government and form of administration; also the legal status of the personality. It is the document, which defines the constitutional and legal status of the official organs. However, during the legal reforms in our society the practical application and whole situation have changed: there are new institutions were created; new constitutional laws, etc. were adopted. In the practice there is such procedure of the government, which can significantly differ from the official order, fixed in the Constitution. This real procedure of the election and appointment of the government has called the actual Constitution or the Constitution in material sense of the word. The actual and legal Constitutions can both coincide and disperse. In some countries the political elite seeks to govern, besides the Constitution. It turns out that, from one hand, the constitution is necessary in any democratic state. From the other hand, the Constitution conflicts with the reality. The historical collision between legality and expediency every time is solved, depending on the arrangement of the political forces in the society.

Keywords: Supreme Law, government, constitutional laws, form of government, political elite, democratic state, civil society, legality, legal collisions, branches of the power.

Kazakhstan suddenly became an independent nation in 1991 with the collapse of the Soviet Union, and thus had to develop institutions for self-government in a hurry. In doing so, Kazakhstan faced not only the structural problem of what institutional arrangements would best serve the nation, but also of how they would accommodate the major problems of 1) managing the country’s considerable ethnic diversity; 2) shifting from a socialist to a capitalist economy; 3) securing and advancing human and social rights in the wake of independence.

This paper will first discuss the drafting and operation of Kazakhstan’s Constitution in August of 1995. One focus will be on how the drafters changed structures and tried to resolve problems inherited from the old Soviet totalitarian regime by creating a strong system of checks and balances between the executive, legislative and judicial branches. A second focus will be on how the government created by this constitution had great difficulty addressing the country’s problems, because the provisions for checks and balances inhibited cooperation and encouraged political “grandstanding”, particularly in the legislature.

Second, the paper will discuss the dissatisfaction with the August of 1995 Constitution, the election of a new drafting convention (Supreme Body), and the amendments to the of Kazakhstan’s acting constitution. The Supreme Body drafted a constitution that had fewer checks and balances and gave more power to the President, who could often make policy by his Decrees. It also removed the judiciary from the constitutional interpretation process, substituting instead a Constitutional Council appointed by the President. The Constitution of August 1995 also gave more power to the President to meet problems of ethnic conflict and economic transition. Finally, this paper will discuss, how the Constitution of August 1995 is working in operation, during 23 years, including as an example the removal of the Prime Minister and restructuring of the Cabinet of Ministers.

Kazakhstan was established as an independent sovereign state on December 16, 1991, joining the CIS and, shortly afterwards, becoming a member of the United Nations. Kazakhstan was the second largest of the former republics of the USSR, after Russia, with a total area of 2.72 million square kilometers, approximately equivalent to the whole of Western Europe.

Schooling is compulsory from grades one to eight, with children normally starting school at age seven. Prior to that, the state provides some funding for nursery and kindergarten education, although no longer at the level seen during the Soviet times. After completing grade eight, students are awarded with the *diploma*, graduation certificate. Of those remaining in formal education, 30 percent switch to vocational or technical schools after eighth or ninth grade, pursuing two or three year courses. The remainder continues through eleventh grade in general schools. Entry into higher education institutions is open to all on a competitive basis, each institution setting up its own entrance examination or test.

This paper will present changes in education policy and provision since 1997, when the “Law on Higher Education in the Republic of Kazakhstan” was adopted. At the national level, there is a determination to develop an independent and high level education program, providing qualifications recognized throughout the world. However, there are peculiarities of the reforming processes in the educational field in the Republic of Kazakhstan. Part of the discussion will focus on the replacement of former vocational and technical schools with more general occupational colleges. A second focus will be on the impact of new tuition policies in higher education in Kazakhstan today, and some discussion of the proposed student loan scheme. These plans are contained within the draft revisions to the Education Law, which can be delayed, with the dissolution of the parliament.

The paper will also discuss the general curricular revisions across the entire educational sector during the past years. These proposed some actual changes are being attempted to encourage greater development of courses in new fields. Among these changes are an increase in the study of computerization in some schools, and the introduction of language laboratories - although the availability of adequate equipment and of new teaching skills is limited. In addition, special study courses are being established, such as those in a higher education business school, based in Almaty.

Today it is the ninth largest independent nation in the world. The current population is approximately 17 million, of whom 43.2% are ethnic Kazaks, 36.5% Russians, 5.2% Ukrainians, 4.1% Germans, and the remainder Uzbeks, Tatars and other ethnic minorities. Despite a steady and continuing shift of population to the cities, there is still an overall predominance of the total population in rural areas, where ethnic Kazaks form the vast majority [1, p. 62]. Among all other educational reforms, instituting new instructional language curricula is perhaps highest on the agenda of the republican government. Kazakh is now the official language of the republic, but Russian has been given a special statute as the language of interethnic communication. This recognizes the fact that the language used most often in official situations has become Russian, and was the primary language of instruction taught in the Republic's schools for 50 years and until independence. As a result, many ethnic Kazaks have a poor knowledge of the official state language, and less than one percent of all Russians can speak Kazakh either. Many Kazak-medium schools have been opened since 1992, and many post-secondary education institutions are now starting to teach at least first and second year students in Kazak.

With democratization aims of the sovereign republic and the belief that teachers should be given the ability to be more pedagogically creative secondary schools have become more circularly diverse. There are 103 government certified gymnasiums and 71 lyceums in Kazakhstan today, of which 18 gymnasiums and 11 lyceums are in Almaty. The gymnasias and lyceum theoretically offer higher level classical and technical curricula than regular secondary schools, with special facilities for “talented” children. A Lyceum may have, for example, classes in space biology, management, marketing or art. For example, Technical Lyceum No. 28 at Mametova has support from the regional administration, the joint Kazak-British firm “Kazinterlink”, and Almaty State University. This school has a mini-plant for the production of radio technology (TV sets, computers, video players and calculators, etc.), and it is designed to underscore the practical application of theoretical technical knowledge to emerging needs of Kazakhstan's economic development.

For example, European languages, the latter opening Russians access to Western culture and science show the different points of view. By the end of the century the system of industrial schools offering first-grade training to those, who wanted to use their talents in the field of industry, had been formed. Actually,

the Russian system of secondary education surpassed in quality of training the educational systems, existing then in Europe and USA. Attempts at reforming now present educational system should preserve the best features of the European system of education rather than replicate American system [2].

Kazakhstan held its Union Republic status within the Soviet Union continuously until 1991. Its historical continuity with its own past broke down severely during Soviet dominion, and, over the seven decades preceding independence, was subject to destructive forces sometimes bordering on genocide. Not only were the Kazakh people abused, but the land bears a record of decline and degradation: a place which seemed eternal for a thousand years is now suffering from severe ecological problems.

The American higher education is respected all over the world. The training of university students in America, with its vibrancy and ability to keep abreast of the latest scientific discoveries and technological inventions, did not prompt criticism until quite recently. We cannot but admire the widespread ramifications of the American university educational system, which comprises 1,964 universities (compare this figure with less than one hundred in Russia) and 1,416 colleges with two-year highly specialized courses. These figures do not call for further comment. If we add to them several thousand one-year vocational schools, then what is there to discuss and argue about?

But in spite of all these evident accomplishments, troubled voices make themselves heard today. It is becoming more and clearer that taken as a whole the American secondary school gives only a superficial knowledge of subjects studied, and universities have to devote a large part of the first years of study to remedial teaching. Besides, the disparity of knowledge among students is too great. Fairly good knowledge of some subjects and unacceptably poor knowledge of other subjects is the rule at both the collective and individual level; that is, every student has a specific set of subjects known well and subjects hardly known at all.

These disparities are caused by an Anglo-American system of electives, which allow a student to follow the principle of "I study what I want to and I don't study what I don't want to, that's my business". It is true that a student must take certain compulsory courses in each of the main subjects such as physics, mathematics, chemistry and biology. Even so a student still has the right to choose both teachers and varieties of a compulsory course, so it is possible for one to complete a course in, say, physics which does not even touch upon theories fundamental to the discipline and leaves a student simply less than completely ignorant.

Here I'd like to share with my readers the impression I received from couple years of lecturing in American universities and from discussions held by thinking American professors concerned with the situation. It is beyond doubt that University of Kentucky, Illinois, Oklahoma and other attract well-prepared candidates from all over the world and, after a strenuous selection, admit only the best of them. However, even professors of these universities speak of an evident fall in the level of training of first-year students, which has to be still more noticeable in the other two thousand universities. The best professors and leaders of science and education in America are apprehensive of a general decline in the educational level of young Americans, especially young university students, as well as a nearly complete ignorance of social sciences and humanities among those who study the natural, physical etc. and applied sciences. Some young people, when in primary school, gravitate to computers and forget about all else; others at the same age decide to become neurobiologists or surgeons and study nothing but subjects pertaining to their future occupation. Some American experts in education say that today about eighty-five percent of American boys and girl are not acquainted with elementary arithmetic and unable to add or subtract without calculators. Some experts are alarmed by the fact that television prevents children from reading books to the degree that those familiar books with which the older generation has lived their whole life have been taken out of print and moved to computer disks. If a child wants to read a classic, he takes a Shakespeare disk and sits at his computer.

I don't want to grumble or speak ill of American students. They are clever and tenacious in their aims and they work much more than Russian students. But they work only in their chosen field, and moreover, they are depressingly lacking in what is called a general social education, which is almost totally absent. To receive a course of study, a student must pay a large sum, so he tries to get the utmost possible for his/her money. From my experience at teaching, I can tell that in every group of students there are only two or three with poor results, and several dozen whose results are excellent. I am quite satisfied by the results my students achieve on the whole. But in every group of students I come across one and the same

thing; that is, if I digress from the textbook or the subject, I see that students' knowledge is fragmentary and limited in scope. As I now understand it, the main reason accounting for these facts are the following circumstances.

1. Freedom in choice of subjects for study, from the secondary school to a university. Each course earns a student a certain number of credits and in order to get a certificate of education, a student has to gain a set number of point's credit/hours and pass a set number of examinations. That is why students take on subjects they are interested in and avoid subjects they are not interested in. The absence of a set system of knowledge enveloping what should be known to any educated person, as existed in Russia for more than a century, makes many university professors speak of the importance of imposing on the secondary school a so called "core curriculum", or an obligatory set of knowledge, which is aimed at improving the situation when a person claiming to be educated is ignorant of so many subjects that a professional looks like a twisted tree, being well-grown in one direction but clipped and undeveloped in all other directions. The traditional freedom of choice is a result of struggle for personal freedom in all areas, subjects for study included. Freedom in itself is excellent, but the cost of its extremes is self-evident. The price of freedom of choice is a low level of education.

2. The second causal circumstance the freedom of teachers, who are at liberty to teach only what they themselves consider necessary and important. First, any university professor can work out any course of study he has invented himself and he can teach it if it has been approved by his or her colleagues at a university (at some universities a prior approval by other professors is not required). Second, a professor has the right to choose any textbook from a large number offered by publishing houses. Third, from a chosen textbook any part can be omitted, if a professor isn't well acquainted with it or doesn't think it important. If a professor has acquired permission to teach a given course from a school or university administration, everything else is up to him.

3. The great merit of American schools and universities lies in the fact that all examinations are taken in written form only, be it examinations taken at some point of a course of study of final examinations at the end of a course. No oral examinations, no oral questioning students of their knowledge of a subject, especially in the presence of other students. This advantage has a negative side to it, which may seem negligible at first sight, but which serious analysis shows to be substantial. Again I want my readers to understand me correctly. Written examinations when students receive lists of the same questions and fill in the empty spaces left with brief answers have many positive aspects as all students are put in the same position. Any prejudices on the part of an examiner are excluded as are any grounds for complaints about an examiner's prejudice against a student's race, religion, etc. (the number of people squabbling in courts of law is growing in America more and more rapidly, being parallel to the growing number of lawyers and becoming a tragedy for that beautiful country, but this is a different topic). A student puts down in his questionnaire what he wants to and has nobody to complain against. If a student does make a complaint, a committee is set up which examines what has been put down and then makes a decision. It is simple. It is democratic. It is practical. In Russia teachers at all levels of education (at schools and universities alike) put questions to students in class, make students solve mathematical problems on blackboards in the presence of other students, and nobody raises any objections on moral or other grounds. At American universities practices of this kind are completely excluded; nobody has the right to put a student in an awkward situation or make results of intermediate or final examinations public. A teacher cannot test a student's knowledge at will, to say nothing of arbitrary questions at oral examinations when a teacher can see that a student is weak at some particular part of the course and ask him more questions about it.

4. At most American schools and at all universities students are not put into any particular class or group. They are free to choose subjects and teachers and then take lessons. For example, to get a certificate of secondary education in Washington, a student should have a mathematical subject for each of his last four years of study and subjects in physics, biology and chemistry during his last three years of study. But as concerns, for instance, mathematics, a student is not obliged to study everything - algebra, geometry, and elementary differential calculus. His to choose are several dozen different mathematical courses with less material; a student has to have just one of them at each of his last four years of study. If a student does not study all mathematics, it is his business. The same with physics and other main subjects. All other subjects are still simpler - everything depends on the student's initiative. But if a student chooses subjects, he cannot establish a permanent peer group to work with. A student chooses courses and teachers

and is free to move about. For one of his lessons he comes to an open classroom where the teacher he has chosen delivers a lecture, for another lesson he goes to another classroom. So all notion of group is lost, as there are no teams about. There are individual students who are strangers to each other, moving from one classroom to another. If there is an acquaintance in one classroom, he is greeted with a couple of sentences, while the others sitting there would be totally ignored as strangers. This does not surprise anyone. But this is destroying a very important thing that group teaching has: a group is a family where people help each other, know each other, and it is acceptable to announce the results of a test before such a group in order to prick the conscience of a poor pupil (or his ambition, as might be). Yet in the USA, to do so is to commit something like strip-tease, which could easily be followed by the students demanding the removal of a teacher guilty of disclosure of personal data - and having their demand met. And since group teaching is absent, students are robbed of an important part not just of their social life, but of a more efficient method of making knowledge reach every individual, and thus the advantages of competitiveness, which, paradoxically, Americans care so much about.

We would like to note, that mention above is true for the majority of the American schools and colleges, there are still exceptions. In rich suburbia of big cities, and in some other places, excellent schools exist where teachers are not afraid to call the student to the blackboard and ask him questions there (according to the tradition of a particular school, and according to the rules approved by the parents' committee, by the way, parents' committees are exceptionally influential bodies throughout America); where the requirements of knowledge in the obligatory set of subjects are higher than the average American level; where the students, though also moving from one classroom to another, know each other personally, because the number of pupils is small, and because they all participate in extensive extra-curricular activities; so the ties of school fraternity hold for life. These excellent schools provide students for the best universities, and are extremely popular. But my article deals with ordinary public schools. Another exception is private schools, in most of which there are permanent classes of students, obligatory sets of subjects, and many other typical features reminding one of the former Russian gymnasia. But the number of private schools is small, and so is the number of their graduates, and a true American schools looks quite different.

So, comparing the systems of Kazakh, American and Russian education, and the tradition formed within the two, we will state that what riches the Republic of Kazakhstan, Russia Federation possesses lie in its traditional system of secondary education that should be preserved. And within this system, there are rare precious gems - our best teachers, born with a gift for teaching, whose intellect, talent and self-denial contributed to the heritage of the nation and should continue to do so [3, p. 50].

Well, the Constitution of Kazakhstan created a strong presidential republic and distributed powers between three branches of authority. Thus, steady and successive institutions of strong state authority have been created, and that has allowed the stabilization of all internal political processes.

The 1995 Constitution, solving the character of statehood, says that "the Republic of Kazakhstan approves itself as a democratic, secular, legal and social state, higher values of which are the person, his life, rights and freedom", (Art. 1, pt. 1). The new Basic Law of the independent state determines the limit of the constitution and ensures steady development. Kazakhstan, as a state, is characterized as "unitary" and "integral", (Art. 2, pts. 1 and 2). Of primary importance is the fact that Kazakhstan contains no other independent states or entities within its borders. Also, fundamental to the concept of unitary state is uniform citizenship, legislation, and a system of state authority. "We can say that, over the course of a year, and due to the new Basic Law, the fundamental bases of new statehood have been established, and a uniform state authority, capable of adjusting and directing public development, has been generated".

In the conclusion we would like to say, that the state authority in the Republic of Kazakhstan is divided into legislative, executive, and judicial branches, which cooperate among themselves with a system of costs and counterbalances. The new parliament has two chambers, consisting of the Mazhilis and the Senate. Executive authority is carried out by a system of executive agencies. The head of state establishes internal and external policy. Government implements these policy directives. Judicial authority is subordinated to the Constitution and the law. The Constitutional Council is allocated from the general judicial system, the circle of powers of prosecutor's office, courts and others vary. When the supreme arbitrator in the state is the President, the Constitutional Council serves as an optimizing body on maintenance of the constitutional legality.

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ТӘУЕЛСІЗ ҚАЗАҚСТАННЫҢ ҚҰРЫЛУЫ МЕН ДАМУ ТАРИХЫНЫҢ МӘСЕЛЕЛЕРІНЕ

Аннотация. «Конституция» түсінігі екі мағынада қолданылады. Ресми тұрғыдан алғанда, заңды Конституция – әлеуметтік-экономикалық жүйені, билік түрі мен мемлекеттік құрылымды және тұлғаның құқықтық мәртебесін бекітетін мемлекеттің негізгі заңы болып табылады. Бұл құжат қандай болуы тиіс екендігін айқындайды. Алайда, оны тәжірибе барысында қолдану кезінде жағдай өзгереді: жаңа институттар пайда болады, жаңа конституциялық заңдар қабылданады және т.б. Іс жүзінде, мемлекеттік билікті жүзеге асыру тәртібі заңды Конституцияда белгіленген тәртіптен айтарлықтай ерекшеленуі мүмкін. Мемлекеттік билікті жүзеге асырудың нақты тәртібі сөздің материалдық мағынасында нақты Конституция немесе Конституция деп аталады. Нақты және заңды Конституция сәйкес те қарама-қайшы да келуі мүмкін. Кейбір елдерде саяси элита Конституциямен бөлісуге тырысады, бұны олар қажеттілік және орындылықпен түсіндіреді. Демек, бір жағынан конституция қажет, өйткені онсыз демократиялық мемлекет болмайды. Екінші жағынан, Конституция реалдылыққа қайшы келеді. Заңдылық пен мақсатқа сәйкестік арасындағы тарихи қақтығыстар әр уақытта қоғамдағы саяси күштердің ұйымдастырылуына қарай шешіледі.

Түйін сөздер: Ата заң, мемлекеттік билік, конституциялық заңдар, мемлекеттік құрылым формасы, саяси элита, демократиялық мемлекет, азаматтық қоғам, заңдылық, құқықтық жанжалдар, билік тармақтары.

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К ВОПРОСУ ОБ ИСТОРИИ СТАНОВЛЕНИЯ И РАЗВИТИЯ НЕЗАВИСИМОГО КАЗАХСТАНА

Аннотация. Понятие «конституция» применяется в двух смыслах. В формальном смысле юридическая Конституция – это основной закон государства, закрепляющий общественно-экономический строй, форму правления и форму государственного устройства и правовое положение личности. Это документ, предписывающий то, что должно быть. Однако в ходе его практического применения обстановка меняется: появляются новые учреждения, принимаются новые конституционные законы и т.д. На практике складывается такой порядок осуществления государственной власти, который может существенно отличаться от порядка, предписанного юридической Конституции. Этот реальный порядок осуществления государственной власти называется фактической Конституцией или Конституцией в материальном смысле слова. Фактическая и юридическая Конституции могут, как совпадать, так и расходиться. В некоторых странах политическая элита стремится править помимо Конституции, объясняя это необходимостью и целесообразностью. Получается, что, с одной стороны, конституция нужна, так как без нее не может обойтись ни одно демократическое государство. С другой стороны, Конституция вступает в противоречие с реальностью. Историческая коллизия между законностью и целесообразностью каждый раз решается в зависимости от расстановки политических сил в обществе.

Ключевые слова: основной закон, государственная власть, конституционные законы, форма государственного устройства, политическая элита, демократическое государство, гражданское общество, законность, юридические коллизии, ветви власти.

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Выступление Президента НАН РК М. Ж. Журинова по Национальному докладу по науке за 2017 год на заседании ВНТК при Правительстве РК 22 августа 2018 г.

Құрметі Бақытжан Әбдірұлы және Үкімет мүшелері, әріптестер!

Есепті баяндама дайындалған 2017 жылғы ғылыми зерттеулер ЖҒТК бекіткен ғылымның бес басым бағытына сәйкес: табиғи ресурстарды ұтымды пайдалану, шикізат пен өнімдерді қайта өңдеу; энергетика және машина жасау; ақпараттық және телекоммуникациялық технологиялар; өмір туралы ғылым; еліміздің зияткерлік әлеуеті жүзеге асырылды.

Ғылым жөніндегі ұлттық баяндама Қазақстан Республикасы Президентінің Қаулысымен бекітілген ережелеріне сәйкес әзірленді.

Бір Баяндамада бес басымдықтың барлық бағыттарын бірдей қамту қаржыға байланысты мүмкін болмағандықтан, әр басымдық үш блокқа бөлінді. Бір блок сол саланың бірнеше ғылыми бағытын қамтиды. Осылайша, үш жыл сайын әрбір жеке басымдыққа толыққанды шолу жасалып, оның ғылым салалары бойынша 3 жыл бойы жарияланған жаңа материалдарға сараптама жасалып, Баяндамаға енгізіледі.

Сарапшы ғалымдардың авторлық құрамы конкурстық негізде іріктелді. Осы Баяндамада ғылыми-технологиялық дамудың келесі бағыттары талданды: минералды шикізатты қайта өңдеу; атомдық электр станциялары, ядролық технологиялар, қауіпсіздік; телекоммуникациялық жүйелер мен технологиялар; фармацевтика, экология және антиэйджинг; химия және мұнай-газ технологиясы; математика; экономика және заң.

Ғылымның басым салалары бойынша іргелі және қолданбалы зерттеулердің жүзеге асырылуын ҰҒА академиктері мен корреспондент-мүшелері: 1. ҚР ҰҒА академигі, т.ғ.д., проф. **Ракишев Б.Р.** (минералды шикізатты қайта өңдеу); 2. ф.-м.ғ.д. **Буртебаев Н.Т.** (атомдық электростанциялар, ядролық технологиялар, қауіпсіздік); 3. т.ғ.к. **Малишевский Е.В.** (телекоммуникациялық жүйелер мен технологиялар); 4. ҚР ҰҒА корреспондент-мүшесі, м.ғ.д., проф. **Балмуханова А.В.** (фармацевтика, экология және антиэйджинг); х.ғ.д., ҚР ҰҒА құрметті мүшесі **Жармагамбетова А.К.** (химия және мұнайгаздық технология); 5. ф.-м.ғ.д., проф. **Кангузин Б.Е.** (математика); 6. э.ғ.д., проф. **Мухамедиев Б.М.** (экономика); 7. з.ғ.д., проф. **Ибраева А. С.** (юриспруденция) және еліміздің жетекші ғылым докторлары талдады.

Уважаемые коллеги!

Структура Доклада за 2017 год:

- общая характеристика казахстанской науки с представлением наукометрического анализа за последние три года;
- анализ реализации фундаментальных и прикладных исследований в соответствии с приоритетными направлениями развития науки Казахстана;
- анализ состояния научного потенциала, качества подготовки отечественных научных кадров, привлечения зарубежных ученых;
- анализ финансирования научных исследований и разработок;
- анализ мировых тенденций в развитии науки, открытий и достижений;
- анализ развития национальной инновационной системы через механизмы коммерциализации и интеграции науки, промышленности и бизнеса;
- анализ деятельности отраслевых уполномоченных органов по управлению наукой и научно-технической деятельностью;
- выводы и предложения по дальнейшему развитию национальной научной системы.

Общая характеристика казахстанской науки с представлением наукометрического анализа за последние три года, а также другие разделы представлены в строгом соответствии с Правилами подготовки Национального доклада.

В 2017 году завершена реализация 1547 научных проектов грантового финансирования и 95 научно-технических программ по программно-целевому финансированию на 2015-2017 годы.

По результатам работ **опубликованы 2557 статей. Получены 222 охранных документа**, в том числе: **патентов – 201, авторских свидетельств – 21. Внедрено в практику 86 разработок.**

– По проектам коммерциализации по линии Фонда науки, который стал работать в последние годы эффективно, и проекта Всемирного банка в 2017 году было достигнуто 15%-ное софинансирование, а по проектам Консорциума производственного сектора – 50% от суммы грантов. В целом реализуются 140 грантовых проектов, на общую сумму 28 млрд. тенге, в том числе софинансирование составляет 3,2 млрд. По 3 проектам ученые уже вышли на продажи инновационных продуктов. Также реализуется проект «Стимулирование продуктивных инноваций» в рамках Соглашения о займе между Казахстаном и Международным Банком Реконструкции и Развития на сумму 110 млн. долл. США, который направлен на коммерциализацию технологий и повышение эффективности инновационного и научного потенциалов страны.

Наиболее значимые разработки по приоритетным направлениям в рамках завершенных работ за 2015-2017 гг. следующие:

– По приоритету «Рациональное использование природных ресурсов, переработка сырья и продукции»: разработана технология получения ферросилиция, технология получения коррозионноустойчивых материалов, технология получения кристаллического кремния.

– По приоритету «Энергетика и машиностроение» разработан метод синтеза прозрачных пленок на основе нанотрубок TiO_2 , обладающих прочностью достаточной для использования в фотокатализе; разработан и изготовлен первый отечественный цветной 3D принтер для изготовления изделий из пластмассы.

– По приоритету «Информационные и телекоммуникационные технологии» разработана многодиапазонная фрактальная антенна для сверхширокополосных беспроводных систем.

– По приоритету «Науки о жизни» выделен концентрат полифенолов винограда Каберне Совиньон казахстанской селекции, создана универсальная закваска для пшеничного и ржаного хлеба. Созданы новые противоопухолевые препараты.

– По приоритету «Интеллектуальный потенциал страны» разработана технология получения полимерных присадок для ингибирования парафиноотложения и снижения температуры потери текучести нефти, разработаны наноразмерные каталитических системы для процессов переработки нефти, одностадийной гидроизомеризации, гидрокрекинга и гидрирования с целью получения высококачественного бензинового и дизельного топливасоответствующих стандартам Евро-4 и Евро-5.

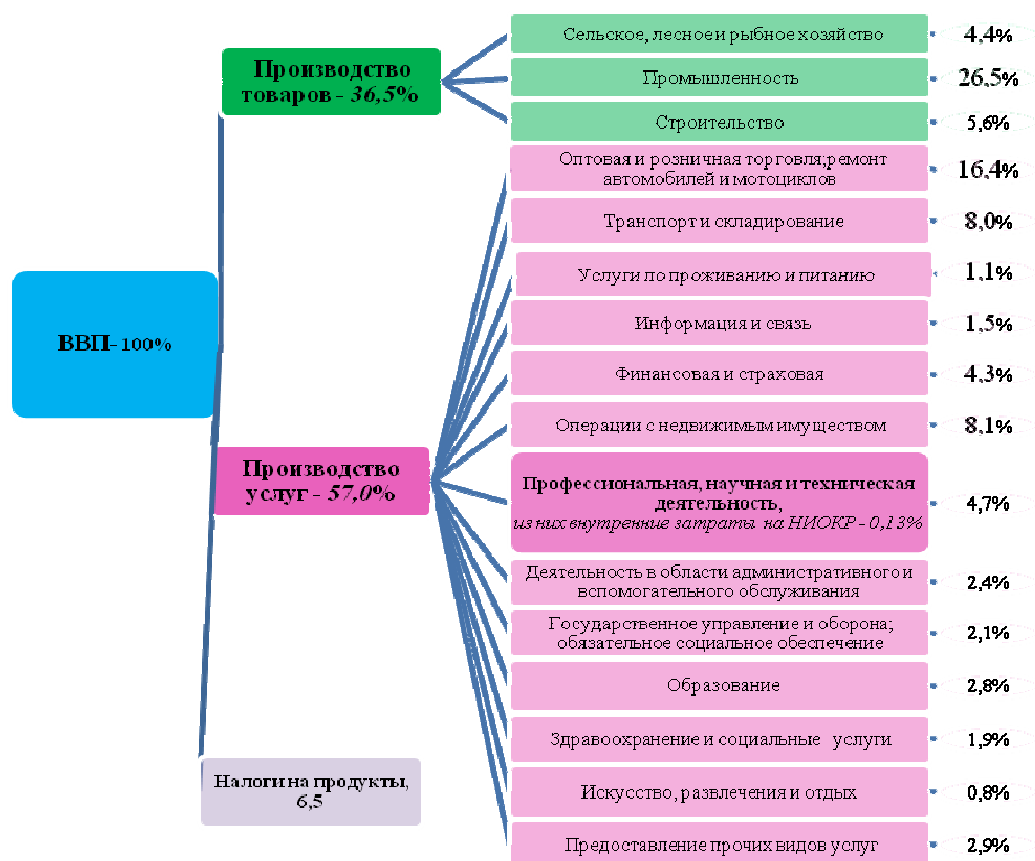
В 2017 году численность работников науки сократилась на 904 человека и составила 22 081. Из числа 230 НИИ и 93 вузов стабильно за 10 лет работают только 1/3 часть, это 45 академических НИИ, около 20 – Министерства сельского хозяйства и около 10 – Министерства здравоохранения. В условиях острого дефицита финансов необходимо уделять особое внимание научным школам и сохранить их в ведущих НИИ и национальных университетах. Созданные в течение десятилетий научные школы являются главной ценностью в научной сфере страны.

Благодаря личной поддержке министра Сагадиева Е.К. казахстанские ученые в настоящее время имеют доступ к научной информации, сосредоточенной в зарубежных ресурсах крупнейших компаний Clarivate Analytics, Elsevier, Springer. В настоящее время КН МОН РК подписывает договор с двумя крупнейшими базами Web of Science, Scopus (Elsevier). 4 научных журнала НАН РК из 8 вошли в реестр этих крупнейших баз впервые в ЦА.

В 2015-2017 годы количество казахстанских публикаций составило 6850 единиц, что позволило стране занять 76-е место из 218 стран в мировом рейтинге.

По оперативным данным в 2017 году доля внутренних затрат на НИОКР в ВВП составила 0,13%, что ниже показателя 2016 года (0,14%) и показателей стран СНГ и мира: Россия – 1,1%; Беларусь – 1,0 %; Узбекистан, Азербайджан, Украина – 0,7-1,0 %: США, Евросоюз, Япония – 2,5-4,0 %.

Соотношение производства товаров и производства услуг в ВВП за 2017 год составили 36,5% и 57,0% соответственно:



Наукоемкость ВВП носит мультипликативный эффект, т.е. при росте инвестиций в науку, валовый продукт будет расти в гораздо большем размере, чем первоначальные денежные вложения. Помимо первичного эффекта возникает вторичный и последующие положительные эффекты.

Поэтому большинство государств мира заинтересованы в увеличении инвестиций в науку, технологические лидеры поддерживают показатель наукоемкости ВВП на уровне 2,7-4,3%:

Страны / Период	2010	2011	2012	2013	2014	2015	2016	2017
Израиль	3,94	4,02	4,16	4,14	4,29	4,27	..	
Республика Корея	3,45	3,75	4,02	4,15	4,28	4,23	..	
Япония	3,14	3,25	3,21	3,32	3,40	3,28	..	
Швеция	3,22	3,25	3,29	3,31	3,14	3,26	..	
Австрия	2,73	2,68	2,93	2,96	3,06	3,07	..	
Дания	2,93	2,97	3,01	3,02	2,98	3,01	..	
Финляндия	3,73	3,64	3,42	3,29	3,18	2,90	..	
Германия	2,71	2,80	2,87	2,82	2,89	2,88	..	
Соединенные Штаты Америки	2,73	2,77	2,70	2,74	2,75	2,79	..	
Бельгия	2,05	2,16	2,36	2,44	2,46	2,46	..	
Франция	2,17	2,19	2,23	2,23	2,24	2,23	..	
Исландия	..	2,50	..	1,77	2,03	2,21	..	
Словения	2,06	2,42	2,58	2,60	2,38	2,21	..	
Китай	1,71	1,78	1,91	1,99	2,02	2,07	..	
Узбекистан	0,20	0,19	0,20	0,20	0,20	0,21	..	
Казахстан	0,15	0,15	0,17	0,17	0,17	0,17	0,14	0,13
Монголия	0,24	0,23	0,24	0,23	0,22	0,16	..	

В натуральном виде это составляет: **США – \$511,1 млрд; Китай – \$451,2 млрд; Япония – \$168,6 млрд; Россия – \$39,9 млрд.**

Кроме государственного финансирования и собственных средств научными организациями используются такие источники, как кредиты и займы банков, иностранные инвестиции, займы внебанковских юридических лиц (кроме институтов развития). В 2017 году они составляли 4717,0 млн. тенге или 6,8% от общих затрат.

	2013	2014	2015	2016	2017
<i>Внутренние затраты по основным источникам финансирования, млн. тенге</i>					
Республика Казахстан	61 672,7	66 347,6	69 302,9	66 600,1	68 884,2
Всего бюджетных средств, млн. тенге	39 273,3	43 343,5	40 719,1	35 440,5	35 979,9
Собственные средства, млн. тенге	17 836,2	19 858,3	25 356,6	26 388,8	28 187,6
Прочие средства финансирования, млн. тенге	4 563,2	3 145,8	3 227,2	4 770,8	4 717,0
<i>Доля финансирования в общих затратах, %</i>					
Республика Казахстан	100	100	100	100	100
Всего бюджетных средств, млн. тенге	63,7	65,3	58,8	53,2	52,2
Собственные средства, млн. тенге	28,9	29,9	36,6	39,6	40,9
Прочие средства финансирования, млн. тенге	7,4	4,7	4,7	7,2	6,8

В 2017 году, как и в предыдущем, произошло сокращение затрат на фундаментальные работы на 22%.

	2013	2014	2015	2016	2017
Внутренние затраты, всего	61 672,7	66 347,6	69 302,9	66 600,1	68 884,2
Из них:					
фундаментальные исследования	18 197,0	15 260,7	15 838,8	13 809,2	10 785,9
прикладные исследования	33 369,4	38 394,7	36 959,0	35 841,1	40 909,6
опытно-конструкторские разработки	10 106,3	12 692,1	16 505,1	16 949,8	17 188,7

В тоже время объем НИР по прикладным исследованиям увеличился на 14%, по опытно-конструкторским разработкам – на 1%.

Все 14 томов Нац.доклада, а также все 8 научных журналов за последние 10 лет выставлены на сайте НАН РК. Поэтому разрешите кратко остановиться только на основных выводах и предложениях:

В области технических наук. Успешно функционирует многоотраслевой горно-металлургический комплекс с его добывающими, обогатительными и металлургическими предприятиями, а также научно-исследовательскими и проектно-конструкторскими учреждениями. Истощение природных минеральных запасов требует вовлечения в сферу производства техногенного сырья. Ряд разработанных в Казахстане технологий может успешно конкурировать с передовыми технологиями, разработанными за рубежом. В числе прорывных направлений развития металлургии в Казахстане можно выделить разработку и реализацию инновационных технологий, обеспечивающих повышение извлечения цветных, благородных, редких, редкоземельных металлов; спецсталей и суперсплавов. Разработана технология получения ферросилиция с низким содержанием алюминия для выплавки электротехнических сталей. Разработаны технологии получения коррозионностойких материалов на основе шлака ниобиевого производства, кристаллического кремния с использованием микросилика. Разработаны новые гидрометаллургические и комбинированные технологии для переработки забалансовых и труднообогатимых медных руд Жезказганского месторождения, а также шлаков и хвостов обогащения для внедрения в производство ТОО «Корпорация Казахмыс». Построен и запущен в промышленную эксплуатацию

первый в Казахстане и второй в мире производственный цех горячего цианирования по доизвлечению золота из лежалых и текущих хвостов упорной углисто-мышьяковой сульфидной руды.

Сравнительный анализ разработок казахстанских ученых в области химических наук с мировыми современными тенденциями показывает высокий уровень выполненных работ в области нефтепереработки, газонефтехимии, катализа, электрохимии, синтезов на основе наноматериалов, фитохимии. Разработки характеризуются междисциплинарными подходами, использованием нанотехнологических методологий и соблюдением основных принципов «зеленой химии». Разработана технология получения гидрофобно-модифицированных полимерных присадок для ингибирования парафиноотложения и снижения температуры потери текучести нефти; разработана технология синтеза гуматсодержащих композиционных материалов для нейтрализации замазученного грунта и полимерные сорбенты для очистки водной поверхности, и почвы от нефтепродуктов. Также разработаны наноразмерные каталитические системы для процессов переработки нефти с получением высокочистых моторных топлив, соответствующих стандартам «Евро-5».

В Национальном докладе рассмотрены также проблемы атомной энергетики; телекоммуникационных систем; математики; фармации, экологии и геронтологии; а также гуманитарный сектор науки – экономика и юриспруденция.

Предложения по дальнейшему развитию национальной научной сферы:

1. Необходимо усилить взаимосвязь науки с реальным сектором экономики, коммерциализацию результатов научной деятельности. Для этого необходимо иметь развитую сеть перерабатывающей промышленности.

2. Реализовать предложение, озвученное Главой государства на юбилейной сессии НАН РК о выделении 1,0% от дохода добывающих отраслей промышленности для финансирования научных исследований, в первую очередь, на создание наукоемких производств, новых материалов и технологий, машиностроения и приборостроения.

3. Необходимо усилить государственно-частное партнерство для внедрения в производство инновационных технологий. При крупных производствах создать экспериментальные цеха и проектно-конструкторские бюро для проведения полупромышленных испытаний.

4. Для увеличения притока молодежи в науку необходимо создавать условия для подготовки PhD-докторов не только в вузах, но и в научно-исследовательских институтах, имеющих договоры о совместной подготовке с ведущими университетами.

5. Вернуть и внедрить постдокторскую (PhD) ученую степень «хабилит-доктора», что будет способствовать росту авторитета казахстанских ученых и международному признанию.

Назар койып тыңдағандарыңызға рақмет!

ҚР ҰҒА-сының президенті академик М.Жұрыновтың ҰҒА Жалпы жиналысының сессиясындағы баяндамасы

Алматы қ., 12.09.2018 ж.

Құрметті әріптестер!

Академияның 258 тұрақты мүшелерінен (169 акад., 89 корр. мүше) 30 адам уәжді себептермен – іссапарлар (командировка)мен денсаулықтарына байланысты қатыса алмайды. Тізімде қалған 228 қатысуға міндетті мүшелерден жиналысқа қатысып отырғандардың саны 203 адам, демек 3/2 қажетті мөлшерден асып тұр. Кворум толығымен бар. Академияның Жалпы жиналысының кезекті сессиясын ашық деп жариялауға рұқсат етіңіздер.

Құрметті ҰҒА академиктері, корреспондент-мүшелері мен құрметті мүшелері!

Қымбатты қонақтар!

Ағымдағы жылдың қаңтар айында өткізілген ҰҒА Жалпы жиналысынан бергі уақытта Ұлттық ғылым академиясы, жалпы Қазақстан ғылымы, ауыр қазаларға ұшырады – ҰҒА академигі, физика-математика ғылымының докторы, профессор Дробжев Виктор Иванович (29.03.18 ж.), ҰҒА академигі, филология ғылымдарының докторы, профессор Сарыбаев Шора Шамғалиұлы (02.05.18 ж.), ҰҒА академигі, геология-минералогия ғылымдарының докторы, профессор Өмірсеріков Мұрат Шүкеұлы (19.06.18 ж.), ҰҒА академигі, геология-минералдық ғылымдарының докторы, профессор Бәкенов Мұхтар Мұқашұлы (11.07.18 ж.) және ҰҒА құрметті мүшесі, медицина ғылымдарының докторы, профессор, ҚР Мемлекеттік сыйлығының лауреаты Құралбаев Бекмахан Сыбанбайұлы (12.04.18 ж.) фәни дүниеден озды. Осы ардақты азаматтарымыздың рухына тағзым етіп, орындарыңыздан тұрып, бір минут үнсіз еске алуларыңызды өтінемін. *(Үнсіздік)*. Рахмет, отырыңыздар.

Бүгінгі жиналысымыздың күн тәртібінде қаралатын мәселелер:

1. ҚР ҰҒА Төралқасының атқарған жұмыстары туралы ҰҒА президентінің баяндамасы.
2. ҚР ҰҒА президентінің есебін талқылау.
3. ҚР ҰҒА президентін (академиктер мен корреспондент-мүшелерінің жасырын дауыс беруі арқылы) сайлау.
4. ҚР ҰҒА Төралқасының жаңа құрамын (мүшелерін) ҚР ҰҒА академиктері мен корреспондент-мүшелері арасынан сайлау (ашық дауыспен).
5. Әртүрлі мәселелер (ҚР ҰҒА шетелдік мүшелерін сайлау).

Құрметті әріптестер!

Сессия жұмысын, ҰҒА Төралқасының шешімі бойынша, әрі қарай, күн тәртібінің 1, 2, 3, сұрақтарына төрағалық ету үшін сөз кезегі ҰҒА вице-президенті, Аграрлық ғылымдар бөлімшесінің төрағасы, академик Т.И. Есполовқа беріледі.

ҚҰРМЕТТІ ӘРІПТЕСТЕР!

Соңғы 5 жыл мерзім ішінде Ұлттық ғылым академиясының Төралқасы мен аппараты көптеген жұмыстар атқарды. Оларды електен өткізіп, тек қана ірі істерді тізетін болсақ – олар мына төмендегілер:

1. ҰҒА-ның тұрақты қаржыланып, жыл сайын дайындалатын ғылым туралы Ұлттық баяндамасы уақытылы ұйымдастырылып, даярланып тұрды (биыл 14 том); Ол, әр жыл сайын, ҚР Премьер-министрінің қатысуымен өтетін ВНТК мәжілісінде талқыланып, қабылданады. Әрі қарай өз кезегімен ҚР Президентіне ұсынылады.

2. Бүгінде Батыс-Еуропалық моделі бойынша дамып келе жатқан Академиямыздың Жарғысына сәйкес, 5 жыл ішінде майталман академик-ғалымдарымыздың қатары екі рет талантты жас ғалымдармен – ҰҒА корреспондент-мүшелерімен толықты. Академияға еліміздің ең алдыңғы қатардағы, таңдаулы ғалымдары конкурспен сайланды. Соңғы өткен 2017 жылдың маусым айында

Академияға корреспондент-мүшелерді сайлаудағы конкурс 1 орынға 10 үміткерге дейін барды. Оны біз өткен ҰҒА-ның Жалпы жиналысында да айтқан едік. Бұл көрініс біздің қоғамымызда Ұлттық ғылым академиясының беделі бұрынғыдай жоғары екенін тайға басқан таңбадай етіп көрсетті. Ал қазір біздің академия әлемдегі мүшелері ең жас классикалық академия болып тұр (орта жасы – 60!);

3. ҰҒА академиктері мен корреспондент-мүшелерінің денсаулығын жақсарту мақсатында Қазақстан Президенті Әкімшілігінің ресми шешімімен, Үкімет мүшелерімен және Республикаға ерен еңбек еткен мемлекет қайраткерлерімен тең дәрежеде Астана және Алматы қалаларында Президенттің клиникаларында тегін қызмет көрсетіліп отыр. Сонымен қатар оларға республикадағы санаторилерге тегін жолдама (путевка) беріліп тұрады.

4. Академиямыз 2016 жылдан бастап өз құрамына ұжымдық мүшелерді, яғни ғылыми мекемелер мен жоғары оқу орындарын қабылдады. Қазіргі кезде ҰҒА құрамында 40-қа жуық ұжымдық мүше бар, олар: академиялық институттар, республикамыздың ұлттық және аймақтық ірі университеттері;

5. Көп жылдар бойы созылған үзілістен кейін Елбасы, академик Н.Ә. Назарбаевтың қолдауымен Білім және ғылым министрі Е.К. Сағадиевтің Бұйрығымен ғылым саласындағы Қ.И. Сәтбаев, Ы.Алтынсарин, Д.Қонаев, М.Әуезов, Ш.Уәлиханов, Күлтегін атындағы атаулы сыйлықтар мен мемлекет тарапынан берілетін 75 ғылыми стипендияларды тағайындау құқығы біздің Академияға қайта берілді;

6. 1946 ж. бері шығарылып келе жатқан, 73 мемлекетке таратылатын 8 журналды тұрақты түрде уақтылы шығарылып келеді (жылына әрқайсысы 6 рет, ал барлығы 1 жылда 48 журнал). 2016 жылдан бастап «ҚР ҰҒА Хабарлары, Геология және техникалық ғылымдар сериясы» атты журналы Elsevier Scopus-қа енді, ал 2018 жылыжәне 4 академиялық журналымыз: «ҚР ҰҒА Хабаршысы» (Вестник), «ҚР ҰҒА Хабарлары, Химия және технология сериясы; «ҚР ҰҒА Хабарлары, Физика, математика және информатика сериясы», «ҚР ҰҒА Хабарлары, Геология және техникалық ғылымдар сериясы» Clarivate Analytics (бұрынғы Thomson Reuters) (АҚШ, Филадельфия) халықаралық компаниясының деректер базасына еніп отыр. Clarivate Analytics, Elsevier Scopus сияқты дүние жүзіндегі ең ірі компаниялардың мәліметтер базасына аталмыш журналдарымыздың енуі Қазақстан ғылымының дамуына нәрменді ықпал етеді және еліміздің абыройын көтереді.

7. 2018 жылы Білім және ғылым министрі Е.К. Сағадиевтің бұйрығымен ҰҒА жанынан коллегиялы орган – Этика жөніндегі Кеңес құрылды, бұл орган белсенді түрде өз қызметін одан әрі жалғастырады.

8. 5 жыл ішінде Отандық ғылымның кемел деңгейіне жетуге жағдай жасау мақсатында республиканың аймақтарында Академияның Орталық Қазақстан (Астана қ.), Оңтүстік Қазақстан (Шымкент қ.), Шығыс Қазақстан (Өскемен қ.) және Қарағанды аймақтық бөлімшелері қайта ұйымдастырылды. Сонымен қатар Талдықорған, Көкшетау, Тараз, Өскемен, Павлодар, Қызылорда және т.б. қалаларда ҰҒА өкілдіктері құрылып, олар да ғылымның дамуына аянбай еңбек етіп келеді. Алдағы сайлауларда осы аталған 4 Бөлімшелерге арнайы квота бөлу мәселесі қаралуы керек;

9. Алыс және жақын шетелдегі Ресей, Қытай, Болгария, Молдова, Украина, Беларусь, Тәжікстан, Түрікменстан және т.б. көптеген елдердің классикалық Бас академияларымен келісім-шарт жасалды. Бұл халықаралық қарым-қатынастарды дамытуға ықпал етеді және отандық ғалымдарға НАТО, ИНТАС, МНТЦ қорларының ғылыми конкурстарына қатысуға кеңінен жол ашады;

10. Түркі тілдес мемлекеттердің Ұлттық ғылым академияларының Одағы құрылып оның тұңғыш президенті болып ҚР ҰҒА президенті сайланды. Бұл біздің академияның халықаралық деңгейдегі беделін одан әрі көтеруге ықпал етті.

11. Елбасы Н.Ә. Назарбаевтың қатысуымен, ТМД елдерінің ҰҒА президенттері және АҚШ, Болгария сияқты алыс шет елдерден келген делегациялардың қатысуымен ҰҒА өзінің 70 жылдық мерейтойын жоғарғы деңгейде өткізді (22 ақпан, 2017 ж.)

Аталған іс-шаралардың барлығы ҰҒА-сының халықаралық деңгейде, Қазақстанның Бас академиясы ретінде, жоғары беделді ғылым академиясы екендігін одан әрі айқындап, бекітті. ҒЗИ және университетте жұмыс істейтін ҰҒА ғалымдары бірлескен ғылыми зерттеулерді, халықаралық

конференциялар мен кеңестер, тәжірибе алмасу және мамандар дайындау жұмыстарын өткізуде. «Жасыл» энергетика саласында айтарлықтай табыстарға қол жеткізілді, ғалымдар күн энергиясын электр энергиясына айналдыратын тиімді агрегаттар жасап шығарды, жел энергиясы мен басқа да қосымша энергетика түрлерін пайдалану бойынша тың жобалар бар. Олардың барлығы Қазақстанда өткізілген ЭКСПО-2017 көрмесінде көрсетілді. Алдағы уақытта Қазақстан ғалымдары халықаралық мегасайенс жобаларына қатысуы керек. Мысалға археология, геология, тау мұздықтарына мониторинг жасау, космос технологиясы сияқты салаларды шет ел ғалымдарымен бірлесе отырып зерттеу қажет.

Бүгінде ҰҒА мүшелері: еліміздің ірі университеттердің ректорлары, ҒЗИ, ғылыми орталықтардың Бас директорлары, зертханалар мен кафедралардың жетекшілері бола отырып, геология, металлургия, химия, мұнай химиясы, биология, математика, физика, медицина, аграрлық ғылымдар, тарих, мәдениет, тіл және әдебиет т.б. гуманитарлық ғылымдар салаларындағы іргелі және қолданбалы зерттеулердің одан әрі дамуына және жоғары білікті ғылыми кадрларды даярлауға лайықты үлес қосып отыр. ҰҒА мүшелері Қазақстан Республикасы бойынша Ғылым мен техника саласындағы мемлекеттік сыйлықтардың және басқа да ұлттық жүлделердің иегерлерін, сонымен қатар ғылымның басым бағыттарын анықтауға қатысады. Олар Үкімет жанындағы ВНТК отырысына, Қазақстан Республикасы Білім және ғылым министрлігінің алқа органдарының жұмыстарына да қатысады.

Әр жыл сайын 2-3 рет ҰҒА Жалпы жиналыстары өткізіліп тұрды, ай сайын – Төралқа отырыстары өтіп, онда Академияның өзекті мәселелері талқыланды. Төралқа отырыстарында ҰҒА-ның шетелдік және құрметті мүшелерін ұсыну және сайлау, академиктер мен корреспондент-мүшелерді мемлекеттік наградаларға ұсыну, сондай-ақ басқа да ұйымдастыру мәселелері талқыланып тұрды (мысалға академиктердің атын мекемелер мен көшелерге қою, ескерткіш қою, тұрғын үйлерге тақта қою және т.б.).

Осы аталып өткен, қол жеткізген жетістіктеріміздің ешқайсысы оңайлықпен келген жоқ, көпшілігі шиеленіскен күреспен келді. Бұл жерде ойға бірінші кезекте келетін жәйт - 2003 жылы Академияның қоғамдық бірлестік статусына түсіп, өз жұмысын нольден бастаған кезде, Академияны қолдап спонсорлық көмек көрсеткен сол кездегі университет ректорлары, академиктер: Қожамқұлов Төлеген Әбдісағиұлы, Әділов Жексенбек Мәкейұлы, Муминов Талғат Әшірұлы, Садықов Тоқмұхамед Сәлменұлы, Құлажанов Құралбек Сәдібайұлы, сол кездегі Академияның вице-президенті Байтулин Иса Омарұлы және сол кездегі Төралқа мүшелері. Оларға және бір рет үлкен рахмет айтып, ризашылық білдіруге рұқсат етіңіздер.

Сол аталған университеттерде әлі күнге дейін Академияның бөлімшелері өз қызметтерін атқаруда. Ғылым туралы Ұлттық баяндаманы дайындау және Академияның ғылыми журналдарын шығару істерін бірлесе отырып дайындап келеміз. Олардан басқа көптеген іс-шараларды өткізуде қазіргі кездегі университет ректорлары, академиктер: Мұтанов Ғалымқайыр Мұтанұлы, Есполов Тілектес Исабайұлы, Бейсембетов Ескендір Қалыбекұлы, Сыдықов Ерлан Батташұлы және Балықбаев Тахир Оспанұлы Академияға үлкен жәрдем көрсетіп келеді. Осы аттары аталған әріптестерімізге де шынайы ризашылық білдіруге рұқсат етіңіздер.

Уважаемые коллеги!

Не повторяя уже сказанное, хотелось бы подробно остановиться на задачах, стоящих перед нашими учеными, а также о путях их решения.

На данный момент казахстанская наука, как и наше молодое независимое государство, находится на важнейшем этапе, характеризующимся необходимостью делать ставку в первую очередь на интеллектуальный потенциал. Анализ тенденций развития мировой и казахстанской науки приводится в ежегодном Национальном докладе по науке, которую готовит и издает НАН РК. Все они опубликованы на сайте НАН РК.

Нацдоклад по науке выполняется в соответствии с Правилами подготовки ежегодного Национального доклада по науке, утвержденного Указом Президента Республики Казахстан. В Нацдокладе выявляются тенденции развития науки в различных отраслях, разрабатываются предложения и рекомендации для дальнейшего развития данной научной отрасли в республике. Авторский состав ученых-экспертов формируется на конкурсной основе.

Достижения Казахстана в первую очередь связаны с внедрением программы индустриализации, разработанной при непосредственном участии Главы государства. В результате появилось множество новых промышленных отраслей, рабочих мест, которые, в свою очередь, стали постоянным источником занятости для тысяч казахстанцев. Одним из эффективных способов экономического развития государства – это создание сетиперерабатывающих предприятий вокруг тяжелой промышленности и постоянно дополнять их инновационными достижениями. В развитых западных странах это называется «Scientific support» (научная помощь), то есть научное сопровождение производства. Актуальность приобретенной, пусть даже самой современной технологии (т.е. трансферт) в связи с быстрым развитием науки теряется уже в течение 5-6 лет. Поэтому научное сопровождение производства – насущная необходимость современной технической цивилизации.

Следует отметить, что в Казахстане со стороны производства нет большого спроса на науку, как это было раньше. Причин тут два. Первая – многие крупные промышленные предприятия находятся в руках иностранных инвесторов, которые в своих странах имеют множество научно-исследовательских институтов, куда и направляются их финансовые средства, выделенные на науку. А более мелкие промышленные предприятия являются монополистами, какой бы товар они ни производили, реализация есть а конкуренции нет. И без участия науки они хорошо зарабатывают, при этом беспощадно загрязняя окружающую среду.

Вторая причина – разрушен мост между научной лабораторией и заводом. За последние 25 лет накопилось большое количество завершенных работ для внедрения в производство. Однако они не внедряются из-за невозможности проведения полупромышленных испытаний и получения опытных партий продуктов. А ведь ранее для этого при крупных заводах были опытные или экспериментальные цеха. Таким образом, назрела необходимость возродить их наряду с конструкторскими отделами, несмотря на то, что требуются при этом большие финансовые вложения. Эту задачу частично можно решить с помощью создания государственно-частного партнерства.

Ярким примером эффективности интеграции науки и производства может служить универсальный аграрный холдинг «Байсерке-Агро» близ Алматы, руководитель – почетный член НАН РК, профессор Т.М. Досмухамбетов. Здесь за короткое время достигнуты рекордные показатели урожайности сельхозкультур (пшеницы, кукурузы, сои и др.) и по выращиванию племенного крупнорогатого скота с привлечением к этой работе академиков НАН РК (Уразалиев Рахим Алмабекович, Сагитов Абай Оразович, Садыкулов Тулеухан Садыкулович, Иванов Николай Петрович) работающих в КазНАУ и в научно-исследовательских институтах Минсельхоза.

На что должна быть нацелена деятельность НАН РК в будущем? Какие задачи стоят перед учеными страны? Самое главное, необходимо усилить взаимосвязь науки с реальным сектором экономики, коммерциализация результатов научной деятельности. Реализовать предложение, озвученное Главой государства на юбилейной сессии НАН РК о выделении 1,0% от дохода добывающих отраслей промышленности для финансирования научных исследований, в том числе и на создание опытно-экспериментальных цехов и конструкторских бюро.

Следует отметить, что из бывших 45 академических научно-исследовательских институтов лишь треть осталась в составе МОН РК, а остальные вошли в составы научных центров и университетов. Например, КазНИТУ имени К.И. Сатпаева объединяет 8 бывших академических институтов, КБТУ- 2. При этом самое главное – необходимо закрепить в Уставе административную и финансовую самостоятельность этих институтов. Лишь тогда это пойдет на пользу; их ученые, читая лекции студентам, получают дополнительный заработок, подготовят себе учеников, научные кадры. Здесь главный вопрос – это система их финансирования.

По системе, сложившейся до сих пор в МОН РК, около 380 НИИ на равных условиях принимают участие в конкурсе на финансирование. Это в корне неправильно. Необходимо вернуться к системе категоричности научных организаций, определяемой по результатам рейтинга. Ученые НАН РК еще 4-5 лет тому назад в своем Нацдокладе о науке подготовили новую схему финансирования и рекомендовали ее ВНТК при Правительстве РК. В ее основу положен принцип разделения институтов на категории согласно их научным достижениям (опыт, международные достижения, оснащение современными техническими и электронными установками, научные кадры и т.д.): например, 1 категория – 40 институтов, 2 категория – 40, а не вошедшие в состав этих

групп – должны считаться институтами без категорий. Через каждые 3-5 лет по результатам конкурса-аттестации составы этих групп должны изменяться, т.е. по лифтингу кто-то пойдет вверх, а плохо работающие пойдут вниз. А при этом фонд финансирования предлагается определить например, для 1 категории - 50% от всей суммы, 2 категории - 30 %,остальным -20%.Только так мы сможем сохранить имеющиеся у нас научные школы и лаборатории мирового уровня, которые создавались десятилетиями.

Необходимо принять правовой акт, регламентирующий координацию деятельности национальных научных советов (ННС). Необходимо ввести вознаграждения членам ННС за проведение экспертизы конкретного проекта, программы (отчета по ним), мониторинга выполнения научных работ. Согласно указанию Главы государства, надо исключить практику отправки НЦ ГНТЭ поступивших на конкурс проектов и программ зарубежным экспертам. Необходимо требовать аргументированного обоснования от членов ННС относительно принятого ими решения и повысить их ответственность за объективность экспертизы. Для персонификации ответственности ННС у них должно быть единое руководство.А иначе с кого спросить или кого привлечь к ответственности?

Учитывая работу ННС и НЦ ГНТЭ в условиях цейтнота из-за непомерно большого количества подаваемых на конкурс работ (проектов и программ – до 5000 шт.), целесообразно предусмотреть предварительную общественную экспертизу имеющую рекомендательный характер и передать это Национальной академии наук РК, что не противоречит существующему законодательству. Это было бы более эффективной заменой не оправдавшей себя практики отправления конкурсных работ зарубежным экспертам.

Следует отметить, что вхождение в «Болонскую конвенцию» без сохранения традиционных для СНГ правил в подготовке научных кадров не принесли желаемых позитивных результатов. Следовало бы внедрить новые элементы, сохранив необходимые положения из старой традиционной системы. Например, надо было сохранить ученую степень доктора наук. В России, Кыргызстане, Беларуси и других странах СНГ до сих пор действует ученая степень «доктор наук», т.е. они вошли в «Болонский процесс» с сохранением прежних традиционных положений чего наши специалисты в МОН РК в свое время (2010-2012 годы) упустили.

В целом переход к Болонской системе образования дал возможность «не отстать» от большинства западных стран и расширить принципы академической мобильности. Наши студенты могут, не испытывая трудностей, обучаться за рубежом по схеме «Бакалавр-магистр-PhD (доктор философии)».Однако звание PhD равнозначено прежней ученой степени кандидата наук, поэтому опыт подсказывает, что необходимо ввести более высокую ученую степень - «хабилит-доктора», согласно модели некоторых западноевропейских стран.

Одной из задач нашей Академии является популяризация научных достижений ученых. С 2016 года журнал НАН РК «Известия НАН РК. Серия геологии и технических наук» входит в крупнейшую международную базу Elsevier Scopus и является самым высокорейтинговым академическим научным журналом в Центральной Азии.

В настоящее время НАН РК, как я отметил выше, имеет сертификаты об индексировании еще 4-х академических журналов: «Вестник НАН РК»; «Известия НАН РК. Серия химии и технологий»; «Известия НАН РК. Серия физико-математическая»; «Известия НАН РК. Серия геологии и технических наук», которые вошли в базу данных международной компании Clarivate Analytics. Это открыл доступ казахстанским ученым, преподавателям, докторантам, магистрантам к многочисленным научным материалам.

Уважаемые коллеги! Работа НАН РК всегда находится под пристальным вниманием Главы государства. Функции Академии наук в последнее время расширились: кроме того, что НАН РК участвует в определении приоритетных направлений науки по Республике Казахстан, наши академики и члены-корреспонденты участвуют в работе Госкомиссии при определении лауреатов Государственной премии РК в области науки и техники и других национальных премий. Участвуют в работе ВНТК при Правительстве, в коллегии МОН РК, Национального совета РК, ННС и т.д.

Еще один вопрос, поднятый нами и поддержанный Президентом страны – это присуждение ученым именных премий. До 2003 года Академия наук занималась этим вопросом, позже эту

функцию передали МОН РК. Президент согласился с нашим предложением включить в этот процесс НАН РК, и в 2017 году впервые в НАН РК прошел конкурс по присуждению именных премий в области науки (имени К.И. Сатпаева за лучшее научное исследование в области естественных наук, имени Ч.Ч. Валиханова – в области гуманитарных наук, имени Ы. Алтынсарина – в области педагогики, имени Кюль-Тегина – в области тюркологии, имени Д.А. Кунаева – для молодых ученых в области естественных наук, имени М.О. Ауэзова – для молодых ученых в области гуманитарных наук) и государственных научных стипендий. Выделено 50 государственных стипендий молодым ученым и 25 – для ученых, внесших значительный вклад в развитие науки. Объективность принятых НАН РК решений не вызвал ни малейшего сомнения у научной общественности.

Чтобы привлечь молодых и талантливых ученых в науку, необходимо заботиться и об их материальном благополучии. Необходимо поднять авторитет ученых и сделать науку престижной. Согласно 5 социальных инициатив Главы государства в начале года Министр науки и образования (Е.К. Сагадиев) выделил 120 квартир для молодых ученых академических институтов. Такого еще в нашей постсоветской практике не было. Необходимо строить семейные общежития для молодых ученых и поднять зарплату всем научным работникам.

По оперативным данным в 2017 году доля внутренних затрат на НИОКР в ВВП составила 0,13%, что ниже показателя 2016 года (0,14%) и показателей стран СНГ и мира: Россия – 1,1 %; Беларусь – 1,0 %; Узбекистан, Азербайджан, Украина – 0,7-1,0 %; США, Евросоюз, Япония – 2,5-4,0 %. Согласно стратегическому плану РК к 2020 г. объем финансирования науки должен достигнуть 2,0% ВВП. Однако из-за продолжающегося экономического кризиса с вызванного санкциями ЕС и США против России военного конфликта с Украиной наша экономика переживает трудные времена. Но будем надеяться на лучшее. Сегодня страны – технологические лидеры поддерживают показатель наукоемкости ВВП на уровне 2,7-4,3%. В натуральном виде это составляет: США - \$ 511,1 млрд; Китай - \$ 451,2 млрд; Япония - \$ 168,6 млрд; Россия - \$ 39,9 млрд.

В настоящее время деятельность национальных академий наук ведущих зарубежных стран, как сейчас принято говорить, начали заниматься научной дипломатией, которая получает широкое распространение. Научный мир – это экстерриториальный мир, поэтому, научные контакты между учеными из разных стран способствуют быстрому восстановлению разрушенных мостов и развитию мирного сотрудничества.

Құрметті әріптестер!

Ең бастысы – өз арамызда ауызбіршілік болуы қажет. Мемлекетімізде Елбасы, академик Н.Ә. Назарбаевтың басшылығымен жүргізіліп жатқан игі іс-шараларға да үн қосып, қолдау көрсетіп отыру да біздің азаматтық борышымыз. Келешекте де осылайша ғылымның бұлақ суындай таза, әрі биік идеалдарына және Отандық ғылымды одан әрі дамыту үшін қызмет ете берейік! Сіздерге үлкен шығармашылық табыстар тілеймін!

Зейін қойып тыңдағандарыңызға рахмет!

Национальная академия наук РК стала обладателем независимой награды «Лидер науки – Web of Science Awards» в номинации «Новые научные журналы Республики Казахстан в Web of Science Core Collection».

Знаменательное событие состоялось в ЕНУ им. Л. Н. Гумилева 20 сентября 2018 года на церемонии награждения премии «Лидер науки», проводимой международной компанией Clarivate Analytics.

В ходе торжественного мероприятия с приветствием выступили исполняющий обязанности председателя Комитета науки Министерства образования и науки Республики Казахстан Еркин Садыков, управляющий директор компании Clarivate Analytics по развивающимся рынкам Виджи Кришнан, управляющий директор компании Clarivate Analytics по России и странам СНГ Олег Уткин, руководитель управления информационных ресурсов Clarivate Analytics Валентин Богоров и другие.

В церемонии также приняли участие представители Министерства образования и науки Республики Казахстан, научных, образовательных и экономических кругов Казахстана, а также авторитетные зарубежные эксперты.

В этот день также были определены 7 исследователей и 8 организаций в качестве лидеров по итогам анализа публикационной активности и цитируемости научных работ в базе данных Web of Science Core Collection.







The banner features a background of colorful, iridescent bubbles in shades of blue, green, and purple. Two large, curved lines, one purple and one green, intersect to form a large 'X' shape across the center. The text is arranged in a clean, modern layout.

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presented to
National Academy of Sciences of the Republic of Kazakhstan

in the category of
New journals in Web of Science Core Collection

Oleg Utkin

Oleg Utkin
Head of Russia/CIS,
Clarivate Analytics

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September 20th, 2018 • Astana, Kazakhstan

Юбилейные даты

ЮЛДАШБАЕВУ Юсупжану Артыковичу – 60 лет



Президиум Национальной академии наук Республики Казахстан, редакция издательство НАН РК «Гылым» и редакционная коллегия журнала «Вестник Национальной академии наук Республики Казахстан» сердечно поздравляют Юсупжана Артыковича Юлдашбаева с 60 летием.

Юсупжан Артыкович родился 09 октября 1958 г. в ст. Чу Жамбыльской области Республики Казахстан. С отличием окончил зооинженерный факультет Московской сельскохозяйственной академии им. К.А. Тимирязева (1981). В 1987 году в МСХА имени К.А.Тимирязева защитил кандидатскую диссертацию по специальности 06.02.04. – частная зоотехния, технология производства продукции животноводства. В 1993 году поступил в докторантуру МСХА на кафедру овцеводства. В 1996 году успешно защитил докторскую диссертацию на тему: «Пути и методы типизации тонкой шерсти овец (на примере хозяйств юга Казахстана)».

Вся научно – педагогическая работа непрерывно связана с животноводством. Работал зоотехником-технологом, младшим, старшим научным сотрудником (1981-1982) отдела генетики и разведения каракульских овец Джамбулского филиала Казахского НИИ каракулеводства. Старший научный сотрудник (1983 - по март 1989) Джамбулского филиала Московского ЦНИИ шерсти. Старший научный сотрудник (1989-1995), ведущий научный сотрудник (1996-1998), доцент (1999), профессор (с 2000 г.) кафедры овцеводства, заместитель проректора по научной работе (2003-2010), с июля 2010 г. – декан факультета зоотехнии и биологии, одновременно профессор кафедры частной зоотехнии Российского государственного аграрного университета – МСХА им. К.А. Тимирязева.

В 2016 г избран член-корреспондентом Российской академии наук по специальности «Зоотехния». Видный ученый в области овцеводства и козоводства.

Под Вашим руководством и при непосредственном участии изучены количественные и качественные признаки тонкой шерсти овец следующих пород: южноказахский меринос, казахская тонкорунная, североказахский меринос, архаромеринос, австралийский меринос, киргизская тонкорунная; грубошерстных пород: каракульская, гиссарская, эдильбаевская, казахская курдючная. На основе разработанных методов Вами выведены два новых внутривидовых типа овец породы

ожноказахский меринос – меркенский и куюкский. Теоретически обоснованы и даны практические предложения по созданию технологий первичной переработки шерсти.

Заслуженный деятель науки Республики Калмыкии (2014). Лауреат премии Правительства РФ в области образования за 2008 год. Почетный работник образования Республики Казахстан (2010), почетный доктор Кызылординского государственного университета (2012). Награжден двумя серебряными и одной золотой медалями ВВЦ, медалью «Лауреат ВВЦ», «За успехи в научно-техническом творчестве» (2009), медалью «400 лет добровольного присоединения Калмыкии к России» (2009), почетными грамотами Министерства природных ресурсов и экологии РФ (2012), Россельхозакадемии (2005), Министерства сельского хозяйства Республики Калмыкия (2010). Опубликовано около 500 научных работ, из них 23 монографии, 35 учебников и учебных пособий, 20 учебно-методических пособий, 23 методических рекомендаций и указаний, 15 программ и рекомендаций. Имеет 4 авторских свидетельства, 10 патентов на изобретения и 11 свидетельств на базы данных.

Ю.А.Юлдашбаев является членом редакционной коллегии научно-производственных журналов: «Овцы, козы, шерстяное дело», «Аграрная наука», «Аграрная Россия», «Главный зоотехник», «Зоотехния», «Акмешіт хабаршысы (Республика Казахстан)», «Вестник Национальной академии наук Республики Казахстан» и «Известия Национальной академии наук: Серия аграрных наук» (Республика Казахстан). Член секции овцеводства РАСХН, научно-технического совета «Шерсть» ГС РФ, а также член трех диссертационных советов, ученого совета НПК ЦНИИ шерсти, Ученого совета университета и факультета зоотехнии и биологии РГАУ-МСХА имени К.А. Тимирязева.

Ю.А. Юлдашбаев - член экспертного совета ВАК Минобрнауки РФ по сельскохозяйственным наукам. Результаты Ваших научных исследований опубликованы в более чем 450 работах, 30 учебниках и учебных пособиях, по которым обучается не одно поколение молодых аграриев Российской Федерации и Казахстан. Вами подготовлены 20 докторов и кандидатов наук.

Под Вашим руководством реализовано немало новаторских дел. Ваша высокая внутренняя культура, профессионализм, широта научных интересов, демократизм, гуманное отношение к коллегам будут служить примером для каждого, кто знает Вас.

Уважаемый Юсупжан Артыкович! В день Вашего славного юбилея желаем Вам крепкого здоровья и счастья, всего наилучшего Вашим родным и близким, благополучия и творческого долголетия!

*Президиум Национальной академии наук,
Редакция издательства НАН РК «Гылым»,
Редакционная коллегия журнала
«Вестник Национальной академии наук
Республики Казахстан»*

Памяти ученого

ПАМЯТИ АКАДЕМИКА
НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН
ДАУРЕНА ХАМИТОВИЧА СЕМБАЕВА
(85 лет со дня рождения)



Один из выдающихся ученых в области окислительного катализа в Казахстане академик НАН РК Сембаев Даурен Хамитович родился 3 октября 1933 г. в городе Алма-Ате.

После окончания школы в 1951 году Д. Х. Сембаев поступил в Московский химико-технологический институт им. Д. И. Менделеева на факультет технологии органических веществ, который закончил в 1956 году и был направлен в Институт химических наук АН КазССР. В лаборатории химии нефти им впервые были проведены исследования окислительного аммонолиза α -олефинов в непредельные нитрилы и в 1965 году Д. Х. Сембаев защищает кандидатскую диссертацию на тему «Исследование парофазного каталитического окисления и окислительного аммонолиза некоторых α -олефинов». Эти исследования получили широкое признание и были процитированы в монографиях известных специалистов в области окислительного катализа.

В 1972 году Даурен Хамитович возглавляет организованную им лабораторию синтеза мономеров, затем после реорганизации с 1996 и по 2010 год лабораторию нефтехимического синтеза.

Основные направления научных исследований, возглавляемых Д. Х. Сембаевым: разработка новых подходов к синтезу оксидных катализаторов, обладающих высокой эффективностью в окислении и окислительном аммонолизе ароматических соединений в кислоты, ангидриды, нитрилы и имиды, необходимые для синтеза полимеров, ионообменных смол, биологически активных веществ, лекарственных средств.

Полученное в МХТИ им. Д. И. Менделеева технологическое образование позволило ученому создавать прецизионные лабораторные каталитические установки, моделировать, конструировать и собирать укрупненные пилотные установки и контролировать высокоточную работу оборудования. Исследовательский талант в сочетании с глубокими знаниями позволил ему выдвигать и воплощать в жизнь смелые идеи каталитического синтеза востребованных химических соединений, доводя их до промышленного производства.

Совместно с НПО «Витамины» Д. Х. Сембаевым была создана опытно-промышленная установка синтеза никотиновой кислоты через стадию нитрилоксида мощностью 40 тонн кислоты в год (г. Умань, Украина) (1981г.). им разработан эффективный катализатор окисления аценафтена в нафталевый ангидрид, который в 1980 году был внедрен в единственное производство нафталевого ангидрида в СССР в ПОО «Краситель» (г. Рубежное).

По результатам многолетних исследований в 1982 году Д. Х. Сембаев блестяще защищает докторскую диссертацию на тему «Каталитическое окисление и окислительный аммонолиз некоторых метилбензолов и полициклических углеводородов на модифицированных оксидованадиевых катализаторах», которая была высоко оценена экспертами ВАК СССР в письме, направленном руководству специализированного совета. В 1986 г. ему было присвоено ученое звание профессора.

Д. Х. Сембаевым с сотрудниками выполнен большой цикл исследований по окислению и окислительному аммонолизу метилбензолов и полициклических ароматических углеводородов, проведены систематические исследования по окислению и окислительному аммонолизу аценафтена и цианпиридина на оксидных катализаторах.

Профессором Д. Х. Сембаевым совместно с академиком НАН РК Б. В. Суворовым и членом-корр. АН СССР, академиком НАН РК С.Р. Рафиковым была впервые открыта роль воды в парофазном каталитическом окислении и окислительном аммонолизе органических соединений. Впервые доказано химическое участие воды в реакциях парофазного контактного окисления в качестве сорреагента, способного поставлять катализатору и окисляемому веществу атомы водорода и гидроксильные группы и, благодаря этому, не только оказывать существенное воздействие на кинетические характеристики процесса (например, повышать скорость), но и принципиально изменять состав продуктов реакции. Развитые представления вносят значительный вклад в теорию парофазного окисления и открывают новые пути управления процессами окислительного катализа для целенаправленного синтеза практически ценных соединений. Многочисленные публикации исследователей из различных стран подтверждают суть открытия и свидетельствуют о его признании.

Важная заслуга Д. Х. Сембаева с сотрудниками состоит в нахождении путей регулирования состояний катализатора путем воздействия реактантов, вводимых в зону катализа. Эти принципиально новые факторы определяют конкурентоспособность его разработок по сравнению с зарубежными. Практическая значимость этих исследований состоит, например, в создании нестационарного модифицированного оксидованадиевого катализатора, обеспечивающего прямое окисление 3-метилпиридина в никотиновую кислоту с выходом более 75%. Поиск практической пользы проводимых разработок и их внедрение являются неизменными чертами научного стиля Даурена Хамитовича Сембаева.

Д. Х. Сембаевым созданы катализаторы нового поколения, один из которых стал предметом лицензионного и патентного соглашений между Институтом химических наук им. А. Б. Бектурова и швейцарской фирмой «Лонза» (г. Базель) для окислительного аммонолиза алкилпиридинов в нитрил никотиновой кислоты (витамин РР). Даурен Хамитович в течение ряда лет сотрудничал со швейцарской компанией «Lonza» по усовершенствованию промышленного катализатора синтеза никотиновой кислоты, лично проводил лабораторные, пилотные и полупромышленные испытания. По технологии, разработанной Д. Х. Сембаевым, катализатор был изготовлен в Италии и работает с 1998 года в промышленном производстве амида никотиновой кислоты на заводе компании «Лонза» производительностью 4000 тонны в месяц в г. Гуанчжун (Китай).

Катализатор, разработанный Д. Х. Сембаевым, запатентован в 50 странах мира, в том числе в США, Евросоюзе, России, Франции, Германии, Англии, КНР, Канаде, Японии и других странах.

Д. Х. Сембаев являлся признанным в мире специалистом в области каталитического окисления и окислительного аммонолиза ароматических и полициклических соединений в карбоновые кислоты, ангидриды, имиды и нитрилы. Под его руководством защищены 13 кандидатских и одна докторская диссертация.

Д. Х. Сембаев в разные годы являлся членом Ученого совета Института биоорганической химии АН Узбекской ССР по защитах докторских диссертаций (1986г.), Ученого совета Института органической химии Киргизской ССР по защитах кандидатских диссертаций (1987 г.), Ученого

Совета Института химических наук АН КазССР по защитах докторских диссертаций (1990 г.), Ученого Совета химического факультета КазНУ им. аль-Фараби по защитах докторских диссертаций (1998-2002 гг.) В 1996-1999 гг. Д. Х. Сембаев являлся членом Экспертного Совета по химическим наукам Высшей аттестационной Комиссии Республики Казахстан.

Результаты творческих поисков Д. Х. Сембаева и его учеников обобщены в монографии, более 500 научных статьях, защищены более чем 50 авторскими свидетельствами СССР, РК и 50 патентами зарубежных стран. Д. Х. Сембаев широко представлял свои работы и выступал с докладами на Всесоюзных, Республиканских и Международных конференциях по катализу, органической химии, химии гетероциклических соединений, окислительному катализу, а также на Международном конгрессе по катализу и Европейских конгрессах по катализу (1993, 1995, 1999) и др., поддерживал творческие связи с ведущими катализаторами из Института катализа СО АН СССР, Института химической физики АН СССР, НПО «Витамины», Латвийским Институтом органического синтеза, Азербайджанской государственной нефтяной академией.

В 1994 году Д. Х. Сембаев был избран членом-корреспондентом НАН РК и в 2003 году академиком НАН РК.

Д. Х. Сембаев в 1994-1996 гг. возглавлял Отделение химико-технологических наук и являлся членом Президиума НАН РК. С 1999 года был Председателем секции химико-технологических наук Высшего научно-технического Совета при Министерстве науки и высшего образования РК, а с 2000 года Председателем секции химико-технологических наук рабочей группы Высшей научно-технической комиссии при Правительстве РК.

За успешную научную работу он награжден нагрудным знаком «За заслуги в развитии науки в Республике Казахстан», медалью за «Доблестный труд в ознаменование 100-летия со дня рождения В. И. Ленина», грамотой Верховного Совета Казахской ССР и грамотами Президиума НАН РК. Ему была присуждена Государственная стипендия для ученых и специалистов, внесших выдающийся вклад в развитие науки и техники.

Д. Х. Сембаев был не только талантливым химиком и высокопрофессиональным технологом, но и широкообразованным человеком, который привлекал к себе молодых людей своей заинтересованностью в практическом использовании научных результатов, преданностью науке и творческим долголетием. В нашей памяти он останется талантливым ученым, который много сделал для развития химической науки Казахстана, мудрым учителем и наставником, добрым и надежным другом.

Ученики, коллеги, друзья

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