applying organic fertilizers are autumn and spring-summer. Autumn fall plowing is also effective. When making manure as an organic fertilizer during the growing season, the waiting time from the time of the last application to the harvest of crops or its use should be observed.

The increase in productivity due to organic fertilizers should provide a recoupment of the costs of their use. The advantage of organic fertilizers compared to mineral fertilizers is their long-term aftereffect. Organic fertilizers affect the yield and quality of the crop within 3-4 years after their application, in contrast to mineral fertilizers, which have a positive effect on plants only one year, less often two years.

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ASSESSMENT OF THE RISK OF ACUTE AND CHRONIC INHALATION LOAD ON THE HEALTH OF THE POPULATION OF THE CITY OF BALKHASH

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Maintaining and strengthening the health of the population in the conditions of man-made environmental pollution over the past decades remains an urgent hygienic and medical-demographic problem [1]. Of particular importance, from the perspective of the Concept of development of the health system in the Republic of Kazakhstan until 2020, is the reduction of risks to public health based on the prevention and elimination of harmful effects of human environment factors [2, 3].

In the conditions of multi – component environmental pollution of the city of Balkhash with a developed mining and metallurgical industry, the role of hygienic research aimed at preventing health risks, predicting the environmental and hygienic situation and scientific justification of prevention directions is increasing.

In this regard, the most important area of research in the field of human ecology and environmental hygiene is the development of highly informative non-invasive methods for diagnosing early changes in human health that occur under the influence of adverse factors [4].

Keywords: risk assessment, public health, mining and metallurgical industry, diagnostic methods, factors.

The degree of pollution depends on emissions of harmful substances and their chemical composition, from the height at which emissions are made, and on the meteorological conditions that determine transport, dispersion and transformation of emitted substances. With constant emission parameters, the level of atmospheric pollution depends significantly on climatic conditions: the direction, conditions for the transport and distribution of impurities in the atmosphere, the intensity of solar radiation that determines photochemical transformations and the occurrence of secondary products of air pollution. Ensuring a normal environment from an

ecological and hygienic point of view requires constant improvement of organizational, scientific and engineering measures, as well as a flexible management system for their implementation [5]. To date, research aimed at assessing possible changes in the impact of such an environmental factor as pollution of the surface atmosphere of urbanized territories on the living conditions of the population remains relevant [6]. The industrial enterprise – "KAZAKHMYS SMELTING" LLP is located on one industrial site in the South-Western part of Balkhash, on the Northern shore of lake Balkhash.

Production Association "KAZAKHMYS SMELTING" LLP (formerly Balkhash mining and metallurgical combine), where copper, zinc, gold, silver, etc. are extracted. The development of new deposits of copper and zinc ores by underground method, including on the territory of " KAZAKHMYS SMELTING", the increase in the number of employees served as the basis for comprehensive clinical and hygienic research.

At the Balkhash mining and metallurgical combine, waste gases containing sulfur and sulfur anhydrides are formed during the smelting of copper ores. Previously, sulfur-containing gases were sent for disposal in a sulfuric acid shop to produce sulfuric acid. Due to the lack of sales of sulfuric acid and the moral and physical deterioration of equipment, this shop is decommissioned, and the construction of a new sulfuric acid shop is suspended. Taking into account the urgent need of the national economy for copper, part of the capacity of the copper-smelting production continues to work, releasing the incoming sulfur-containing exhaust gases into the atmosphere without cleaning. Therefore, the environment is experiencing an intense anthropogenic impact from emissions and waste that pollute air, water, and soil, and have a detrimental effect on biocenoses.

Research materials and methods

All analytical studies were carried out in certified and accredited laboratories using standard comparison samples. At the same time, internal and external control was carried out by parallel definitions of elements using different analytical methods. The error in determining most of the analyzed elements did not exceed 20%. The elements were calculated in mg / kg of air-dry mass. Statistical processing of the data obtained in the course of the study was carried out by N. A. Plokhinsky using the Microsoft Excel program.

The effects of physical and psychological discomfort are regarded as a fact of violation of health and cause complaints from the population. To predict the risk of reflex effects in atmospheric air pollution, depending on the hazard class of the harmful substance, the following formulas are used:

Hazard class 1: $Prob$=-9,15+11,66 x lg(C/$MPC_{m.s.}$)

Hazard class 2: $Prob$=-5,51+7,49 x lg(C/$MPC_{m.s.}$)

Hazard class 2: $Prob$=-2,35+3,73 x lg(C/$MPC_{m.s.}$)

Hazard class 2: $Prob$=-1,41+2,33 x lg(C/$MPC_{m.s.}$)

where *Prob* is the probability of an adverse effect (risk) in "probits", i.e. in the form of a normal probability scale;

C-concentration of harmful substance in atmospheric air;

$MPC_{m.s.}$ – maximum single maximum permissible concentration

The total risk of immediate action is determined by the maximum risk of a single impurity among all impacting harmful substances.

Risk assessment of non-specific chronic effects in atmospheric air pollution is carried out according to the formula:

$$Risk=1–\exp(\ln(0,84)x(C/MPC_{ad})^b/K_з)$$

where *Risk* is the risk of an adverse effect , defined as the probability of this effect occurring under specified conditions;

C – average concentration of the harmful substance in the air, mg/m^3;

MPC_{ad} – average daily MPC;

b – coefficient that allows to evaluate the ISO-effective effects of impurities of different hazard classes is defined in table 1;

$K_з$ - the reserve coefficient, determined by table 1.

Table 1.

Values of the *b* coefficient and the reserve coefficient ($K_з$) for substances of different classes

Hazard class of the substance	Coefficient b	Reserve cofficient ($K_з$)
1	2,35	7,5
2	1,28	6,0
3	1,00	4,5
4	0,87	3,0

The total risk of adverse health effects is determined using the formula:

$$Risk_{cum}=1–(1-Risk_1)(1-Risk_2)(1-Risk_3)…(1-Risk_n)$$

Where $Risk_{cum}$ — cumulative risk of the action of impurities
$Risk_1…Risk_n$ — risk of action of each impurity.

The risk assessment of immediate action shows the annual probability of an individual having adverse reflex reactions (smell, eye pain, throat irritation, cough), implicated with the achievement of the maximum level of air pollution in the city during the year.

Table 1.1

Impurity	Maximum single concentration (g m.s..)		Hazard class	Limiting indicator of harmfulness	Risk of immediate action	
	mg/m^3	$MPC_{m.s.}$			prob	risk
Nitrogen oxide	0,0692	0,4	3	reflex	-5,192	0
Hydrogen sulphide	0,2222	0,008	2	reflex	5,303	1
Ammonia	0,3701	0,2	4	reflex-resorptive	-0,787	0,212

The total risk of immediate action is determined by the maximum risk of a single impurity among all impacting harmful substances. Thus, if hydrogen sulfide is detected in the air at a concentration of 0.22222 mg/m^3, 1000 people out of 1000 in the affected area will experience

adverse reflex effects (smell). *Risk*=1 which indicates an extremely dangerous level. Extremely dangerous — close to 100% (or 1) - environmental pollution has moved to a different qualitative state (the appearance of acute poisoning cases, changes in the structure of morbidity, a tendency to increase in mortality, etc.), which should be evaluated using other, more specific models.

The risk of chronic intoxication was defined as the lifetime probability of an individual acquiring one or more chronic diseases induced by air pollution over a long period of time (provided that the level of pollution does not change).

Table 1.2

Impurity	Average concentration ($g_{ad.}$)		Hazard class	Limiting indicator of harmfulness	Risk of chronic effects
	mg/m^3	$MPC_{ad.}$			Risk

Continuation of the table 1.2

Carbon oxide	0,9448	3	4	resorptive	0,021
Ozone	0,039	0,03	1	resorptive	0,042
Ammonia	0,0097	0,04	4	reflex-resorptive	0,017

When determining the total risk of adverse health effects, the risk was $Risk_{cum}$=0.078. With constant exposure to atmospheric air polluted with carbon monoxide at a concentration of 0.9448 mg/m^3, ozone at a concentration of 0.039 mg/m^3, and ammonia at a concentration of 0.0097 mg/m^3, 78 people out of 1000 permanently residing in the study area may experience symptoms of chronic intoxication throughout their lives. When assessing the risk, it was found to cause concern — from 5 to 16% (0.05–0.16 in fractions of a unit), which means there is a tendency to increase in non-specific pathology.

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MYCOTOXINS AND HEAVY METALS IN GRAIN CROPS

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Cereals have long occupied an important place in human nutrition, being an affordable source of trace elements, proteins, carbohydrates and vitamins. The most common cereal crop in many countries of the world is wheat, which has been widely used in the manufacture of various types of food, cosmetics, medicines, feed for farm animals. Due to the presence of a large number of substances useful for the human body, wheat helps to strengthen the immune system, creates a powerful barrier to the development of cancer. The main food products of most residents of Kazakhstan are bread, bakery products, flour, cereals, pasta. In Kazakhstan, wheat is the leader in sown areas, harvested and exported. Depending on the soil, natural and climatic conditions of a particular region, there are priorities in the cultivation of this grain crop. With a large fund of agricultural land, Kazakhstan forced to take into account adverse climate conditions, geographical location and other features of the environment, which significantly complicates the successful development of agriculture. To achieve a high yield, high-quality soil preparation before sowing is of great importance. Having a weak root system, wheat is moody about phytosanitary condition of the soil and crops cultivated in front of it. Preferably, the precursors will be corn, buckwheat or leguminous plants that saturate the soil with nitrogen, contributing to the accumulation of easily digestible nutrients. Compliance with a two-year hiatus in wheat rotation, autumn tillage tillage also increase the soil's resistance to moisture accumulation, reduce the number of weeds and harmful insects, which favorably affects crop yields.[1]

To ensure food safety, it is necessary to achieve the use of environmentally friendly and harmless raw materials for their production, and especially grain, which is the basis of the population's nutrition. In many countries of the world, monitoring systems have been developed and operate to monitor the contamination of food raw materials and food products with foreign substances, the content of which is strictly regulated. However, on this issue, many issues require additional study, development and implementation in practice. This is especially true for mycotoxins - especially dangerous contaminants of food products found in natural conditions. Mycotoxins, widely distributed in grains, oilseeds and legumes of most countries of the world, pose a real danger to public health.[2]

The introduction and improvement of the system for protecting grain crops in Kazakhstan, in which the biological method plays the main role, is promising. The high resistance of some microorganisms to high temperatures and chemical elements makes it advisable to carry out preventive measures that exclude their synthesis and accumulation.

The article discusses the main sources of pollution of the crops of major crops by harmful elements of various nature, methods for assessing the level of contamination[3]

Characteristics of grain safety indicators.

The safety of crops is ensured by identifying the maximum acceptable levels of safety indicators, which include toxic elements, mycotoxins, radionuclides and pesticides.