

PROBLEMS OF AGRICULTURAL LABOUR HYGIENE

Kosimov Kh.O., Nazarov J.-S.E.

Bukhara State Medical Institute named after Abu Ali ibn Sino

✓ *Resume*

In the state programs of the President of the Republic of Uzbekistan on agricultural reform, an integrated approach to the development of this industry, the acceleration and deepening of the progress of related industries and the achievement of the most effective outcomes are emphasized. The solution of these issues is directly related to the improvement of working and living conditions in rural areas. The development of agricultural production at a new level in the country where we live requires constant attention to rural workers, improving their working conditions, recreation, life, and strengthening their health. It should be noted that unprecedented reforms are being carried out in the agriculture of the Republic of Uzbekistan, improving the working and living conditions of agricultural workers. Remote rural settlements are developing not only economically, but also socially. At the same time, new, important and urgent problems have emerged in the field of hygienic science and sanitary practice in the agricultural sector. At this stage, a timely analysis of scientific achievements, automation, mechanization and occupational health of agricultural production over the past decades is important.

Key words: occupational health, agricultural production, seasonality, temperature factor, dust, biological factors, pesticides, zoonanthroposes.

ПРОБЛЕМЫ ГИГИЕНЫ СЕЛЬСКОХОЗЯЙСТВЕННОГО ТРУДА

Косимов Х.О., Назаров Ж.-С.Э.

Бухарский государственный медицинский институт имени Абу Али ибн Сино

✓ *Резюме*

В государственных программах Президента Республики Узбекистан по реформе сельского хозяйства делается упор на комплексный подход к развитию этой отрасли, ускорению и углублению прогресса смежных отраслей, и достижения максимально эффективных конечных результатов. Решение этих вопросов напрямую связано с улучшением условий труда и жизни в сельской местности. Развитие сельскохозяйственного производства на новом уровне в стране, где мы живем, требует постоянного внимания к сельским труженикам, улучшения их условий труда, отдыха, быта, укрепления их здоровья. Следует отметить, что в сельском хозяйстве Республики Узбекистан проводятся беспрецедентные реформы, улучшающие условия труда и быта сельскохозяйственных работников. Отдаленные сельские поселения развиваются не только экономически, но и социально. Вместе с тем, возникли новые, важные и актуальные проблемы в области гигиенической науки и санитарной практики сельскохозяйственной сферы. Важным, на данном этапе, является своевременный анализ научных достижений, автоматизации, механизации и гигиены труда сельскохозяйственного производства за последние десятилетия.

Ключевые слова: гигиена труда, сельскохозяйственное производство, сезонность, температурный фактор, пыль, биологические факторы, пестициды, зооантропонозы.

ҚИШЛОҚ ХЎЖАЛИГИ МЕХНАТ ГИГИЕНАСИНИНГ МУАММОЛАРИ

Қосимов Х.О., Назаров Ж-С.Э

Абу Али ибн Сино номли Бухоро давлат тиббиёт институти

✓ Резюме

Ўзбекистон Республикаси Президентининг қишлоқ хўжалигини ислоҳ қилиш бўйича давлат дастурларида мазкур соҳани ривожлантиришга интеграциялашган ёндашув, тегишли тармоқлар тараққиётини жадаллаштириш ва чуқурлаштириш ҳамда энг самарали яқуний натижаларга эришиш алоҳида таъкидланади. Бу масалаларни ҳал этиш қишлоқ жойларда меҳнат ва турмуш шароитини яхшилаш билан бевосита боғлиқ. Биз яшайётган мамлакатда қишлоқ хўжалиги ишлаб чиқаришининг янги даражада ривожланиши қишлоқ меҳнаткашларига доимий эътибор беришни, уларнинг меҳнат шароитини, дам олишини, ҳаётини яхшилашни, саломатлигини мустаҳкамлашни талаб этади. Таъкидлаш лозимки, Ўзбекистон Республикаси қишлоқ хўжалигида қишлоқ хўжалиги ходимларининг меҳнат ва турмуш шароитини яхшилайдиган мисли кўрилмаган ислохотлар амалга оширилмоқда. Олис қишлоқ аҳоли манзилгоҳлари нафақат иқтисодий, балки ижтимоий жиҳатдан ҳам ривожланмоқда. Шу билан бирга қишлоқ хўжалиги соҳасида гигиеник фан ва санитария амалиёти соҳасида янги, муҳим ва долзарб муаммолар пайдо бўлди. Муҳим, бу босқичда, ўтган ўн йиллар давомида қишлоқ хўжалиги ишлаб чиқариш илмий ютуқлари, автоматлаштириш, механизациялаш ва касб-хунар саломатлигини ўз вақтида таҳлил қилиш.

Калит сўзлар: касбий саломатлик, қишлоқ хўжалиги ишлаб чиқариши, мавсумийлик, ҳарорат омили, чанг, биологик омиллар, пестицидлар, зооантропонозлар.

Relevance

The agricultural worker spends most of his life doing socially useful work in production or agriculture. In recent decades, thanks to the introduction of new methods and modern technologies in various areas of production and agriculture, the negative impact of many harmful factors on the body of workers has decreased. In particular, this is facilitated by the use of multi-stage mechanisms for heavy physical work, comprehensive automation of production processes, equipment sealing, the use of closed and returnable technological cycles at chemical and raw material enterprises, remote control and monitoring.

The complex of widely used technological, sanitary preventive and curative activities reduce the number of occupational diseases at enterprises and changes their structure. Currently, some professional pathologies practically do not occur in practice due to the removal of hazardous and toxic compounds (for example, benzene and other organic solvents) from the production process. Occupational illnesses are often mild with mild symptoms.

At the same time, many new harmful factors appear in modern manufacturing enterprises. These include, for example, physically harmful

factors such as laser beams, plasma processes, infra- and ultrasound, as well as ionizing beams. New chemicals are being used. They have carcinogenic, mutagenic, allergenic and other types of negative effects on the human body. In connection with the widespread use of computer technologies, harmful psychophysiological factors are becoming increasingly important. Since computer operators are often physically inactive, they experience hypodynamics and its consequences. Creating a healthy and safe work environment is a key challenge for health care, hygiene science and sanitation.

Agrotechnical and sanitary-hygienic foundations of agricultural production.

Agricultural hygiene is a separate branch of occupational health. This scientific section studies the influence of labor processes and factors arising in agricultural production on the human body and on this basis develops measures to improve working conditions. The following features characterize agricultural labor:

The first feature: seasonality, extreme weather intensity at a specific time of year. This feature is more typical for the southern republics, with a sharply continental climate.

The second feature: work is carried out mainly in the field (outdoors), and work begins in early spring and continues until late autumn, and even in winter. This situation depends on the impact of complex meteorological factors on agricultural workers, on the climatic conditions of the area where agricultural work is taking place, on the season, etc.

The third feature is the frequent change of types of labor in agricultural production, which is more associated with manual labor.

The fourth feature is that the workplace is, as a rule, far from the place of residence. The hygienic significance of this is that the worker spends more energy on work. 25-30 years ago, considering the remoteness of the place of work, sheds were arranged in the fields, and the workers changed their place of residence seasonally. Today, due to the development of transport, there is no need for field sheds, which are used as temporary resting places for workers, and in some farms (Bukhara, Jizzakh, Samarkand, Andijan, Fergana regions) - as temporary medical centers to protect

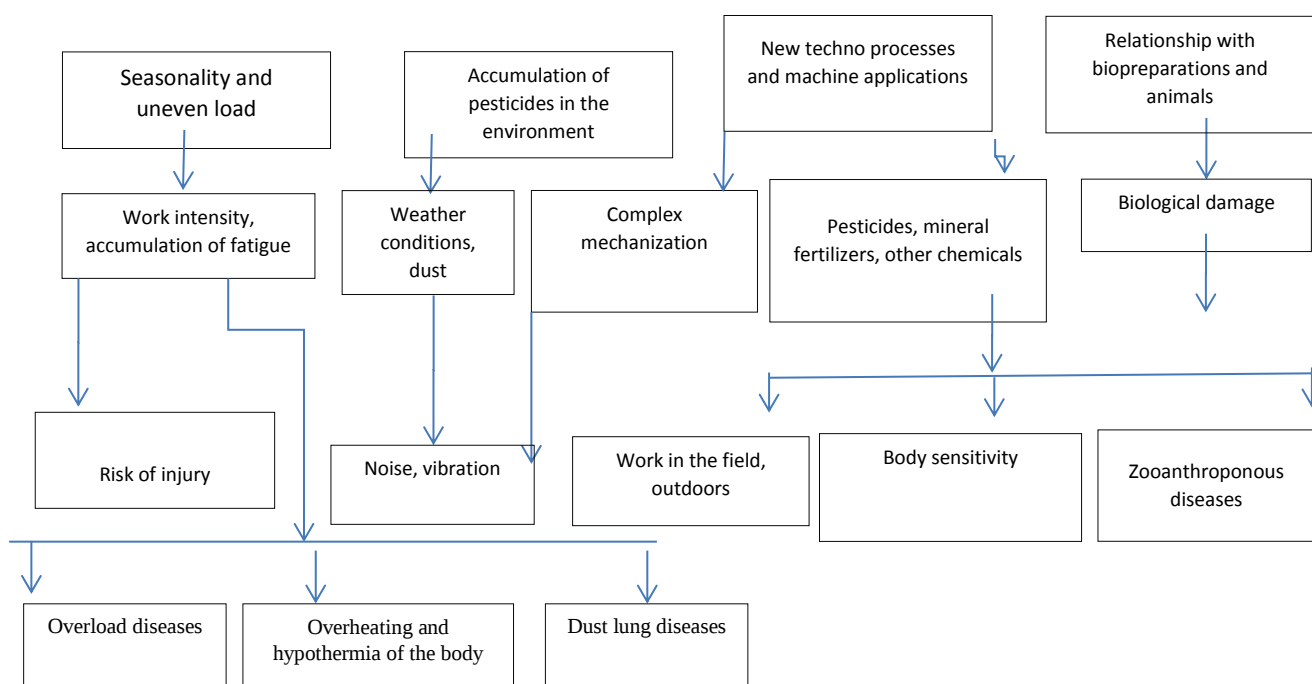
the health of field workers, especially machine operators.

Fifth feature: agriculture is characterized by the fact that many chemicals (pesticides) are used in the processing of crops. In turn, they irreversibly pollute not only workplaces, but also the entire biosphere [4, 5, 6, 13, 23]. Today, agriculture uses many biologically active substances, biofertilizers, plant growth stimulants, minerals, etc. [1, 10, 15, 35].

Advances in science and technology have changed the biological infectious risk in agriculture. At this stage, the risk of spreading diseases exists mainly from animals (livestock, poultry farms) to people (livestock, poultry, etc.) [8, 11, 15, 21]. It is also worth noting that the development of livestock and poultry farming leads to an increase in the production of a large number of various biological and chemical preparations (antibiotics, fungicides, yeast, amino acids, vitamins, etc.). This, in turn, increases the direct contact of agricultural workers with these substances [18, 19, 21, 22, 28].

Information on the characteristics of agricultural labor and the factors influencing them is presented in **Figure 1**.

Problems and their causes of modern agriculture:



Most agricultural work is done outdoors. In Uzbekistan, the climate is the main factor affecting the body of workers working in the open air. In the summer (non-calendar) months of the year (May-September), agricultural work is carried out in conditions of high air temperature. High air temperature and sunlight cause overheating of the body (hyperthermia) [4, 5, 7, 9, 13, 16].

According to the research of many scientists (T.I. Iskandarov, 2001, G.T. Iskandarova, 2003), when performing agricultural work in summer, workers are exposed to an air temperature of $+45$ $+50$ °C. In addition to the high temperatures in summer, the air finally becomes extremely dry, with high temperatures, a lot of dust, and other unfavorable natural factors.

Such climatic conditions have a very negative effect on the organism of agricultural workers. The machine operators are personally exposed to special temperature influences. The leakproofness of the cabins of some agricultural machines protects them to a certain extent from adverse weather conditions. However, the absorption of high temperatures by the roof and metal walls of the cabins causes the temperature inside the cab to rise above the outside temperature. In spring-autumn (March-November), agricultural work is carried out at a temperature of $+15$ $+25$ °C. In such climatic conditions, the air speed is 5-10 m/s, relative humidity 40-80% (our observations). It should be noted that in the spring and autumn months, the temperature in the morning drops to $+5$ $+8$ °C, and the wind speed is 12 m/sec.

Based on the above, it should be noted that during the summer months, the body of agricultural workers is exposed to high temperatures that cause it to overheat. In early spring and late autumn, under the influence of low temperatures the opposite process, cooling is observed. This, in turn, has a negative effect on the heat exchange process of the body [12, 27]. Another way to protect the tractor driver from the heat is to properly organize the work and rest mode. In our hot climate, work should be continued from 5:30 am to 11:00 am and 4:00 pm. until 20:00. At the same time, it is important to provide agricultural workers with cotton fiber work clothing. This fabric is sweat-wicking, breathable and dries quickly. Proper drinking management is essential to protect workers from the heat. For this, it is advisable to organize green tea, various tinctures, liquids enriched with vitamins (A, B, PP, C) for workers engaged in outdoor work [40, 41].

For operators of agricultural machinery, it is advisable to create facilities on farms for outdoor

activities, food and showers. It is also important to create heated (30-32°C) rest rooms in the autumn-winter and spring periods [39, 41].

Most agrotechnical activities are carried out in spring (preparation of land for crops, sowing crops, etc.), in autumn (harvesting, clearing land from plant residues) and in winter (plowing, leveling, flushing of saline soils). At this time of the year, under the influence of low temperatures (as a rule, 5-10 °C), the body of workers is cooled [20, 24, 27].

It should be noted that cooling the body reflexively leads to contraction of blood vessels in any organ or part of the body, which leads to pathological changes in this organ [12, 15, 20, 26].

According to I.P. Pavlova, cold and humidity have a short-term stimulating effect on the human body. With long-term action, the activity of certain organs, for example, the lungs and kidneys, is weakened. As a result, the infectious agents present in the body cause bronchitis, nephritis, pneumonia and other diseases. The onset and development of colds is based on the reflex process of vascular movement, which occurs as a result of the difference between the cooled part of the body and the temperature of the outside air. Based on the foregoing, the implementation of measures to protect agricultural workers from meteorological environmental factors throughout the year is the basis for preventing heat stroke (overheating) and freezing of the body.

Dust is one of the factors of production that occurs in the process of farming in the fields (plowing, planting, growing seedlings, harvesting, livestock farming, vegetable growing, etc.). Dust can cause laryngitis, pharyngitis, chronic bronchitis and pneumoconiosis in the body of agricultural workers through the respiratory system [2, 13, 15, 26, 30, 33]. The main constituents of dust generated during agricultural production is a mixture that includes plant and animal parts (mixed dust), this dust contains strong allergens for the human body [36,37]. Organic components of dust, which contains mineral and metallic impurities, are a good breeding ground for fungi and bacteria. For them, growth and reproduction in conditions of moderate temperature and humidity can become an additional harmful factor for the organism of agricultural workers [16, 26, 31].

According to V.M. Perelegin (1992), V.P. Small (1993), 59-98.9% of agricultural dust is a fine dispersion up to 4 microns in size and penetrates deep into the upper and lower respiratory tract. Therefore, they pose a threat to human health at high concentrations in the air, and the permissible level of such powders based on

silica II should not exceed 2 mg / m³ (cotton fiber, animal dust).

In agriculture, soil dust is generated during plowing, row spacing, harvesting, storing animals and birds, as well as clearing land. Soil dust contains Al₂O₃, Fe₂O₃, K₂O, Na₂O₂, MgO, and CaO. In addition, soil dust contains pesticides from chemical soil treatment.

Soil dust also contains vegetable and mineral salts, as well as many different types of bacteria, helminth eggs and molds. Fungi are present on the soil surface [28, 32, 36, 38].

In agricultural production, plant dust also affects the body of agricultural workers. Plant dust is formed as a result of plant life and processing of industrial plants. The cultivation and processing of raw cotton in our republic is increasing every year. This, in turn, increases the exposure of workers to plant dust. According to (T.I. Iskandarov-1998), N.I. Smetanina (1997), V.M. Perelegin et al. (1992), plant dust containing cotton fiber leads to diffuse sclerotic and nodular changes in the lungs. According to the scientific research of V.M. Perelegin (1998), fibrous plant dust from organic and cotton-processing plants does not have allergic effects.

Plant dust from cotton processing plants retains most bacteria and molds. Experts from the World Health Organization (1999) have proven that prolonged exposure to plant dust causes the pathology of byssinosis.

Byssinosis disease is mainly caused by the formation of histamine (with a very weak development of connective tissue), as the primary reaction of the body during its production (pathogenesis), in response to the irritating effect of fibrous plant dust [1, 11, 14, 26]. S.A. Provernitsyna et al. (1996) found that workers with prolonged contact with dust accumulate a large amount of cholesterol in the blood and produce a large amount of glycoproteins in the blood serum, as well as excreted vitamins B1 and B2 in the urine.

Based on the foregoing, it is extremely important to develop and implement measures to protect workers' health from dust generated in agricultural production.

The industrial organization of livestock and poultry farms and the increase in the number of livestock and poultry in them led to the emergence of biological factors in agricultural production. The production of biological nutrients (mixtures) for livestock and poultry is developing. Areas for food and industrial crops are also expanding. At the same time, biological agents are widely used to protect crops from pests (instead of pesticides).

Thus, in livestock, poultry and vegetable farming, the interaction of workers with biological factors is enhanced [29, 31, 34].

Biological factors can be conditionally divided into:

1. Various organic components (plant fiber, wool, fluff, leather, extracted ether, oil, etc.) from plant and animal parts.
2. Essential oils containing aromatic compounds of plants.
3. Saprophytic opportunistic microbes, pathogenic microflora, viruses, fungi contained in the air, on the surface of objects, in food, etc.
4. Microorganisms causing zoonoses.
5. Biologically active substances obtained from various organic components, as well as biological protection agents, etc.

Biologically harmful factors that have to be faced in the process of agricultural production are allergens, pathogens of infectious and fungal diseases, as well as toxic substances. Biological factors include microorganisms that cause zoonoses (occupational) diseases that can occur in people engaged in agricultural production.

Zoonoses are a group of infectious and invasive diseases common in animals and humans. Zoonoses include about 100 diseases of various etiologies. The source of the causative agents of zoonoses for human are, first of all, those animals with which a person often comes into contact in the course of economic activity and in everyday life: agricultural and indoor animals, rodents, as well as wild animals hunting objects. Due to the development of globalization processes, the deterioration of the ecological situation, close contacts between human beings and various animal species occur much more often than before.

The control of plant pests, diseases and ectoparasites of livestock plays an important role in agricultural technology. This important agronomic process is carried out through the use of pesticides in agriculture.

Pesticides are internationally recognized plant protection products, consisting of two Latin words: "pestis" - infection, "caedo" - to kill. Globally, the use of pesticides in agriculture is 4.5-5 billion dollars per year. However, the use of pesticides in agriculture not only destroys pests, but can also cause significant damage to the environment and human health.

In agricultural technology, the use of pesticides is the basis for protecting plants from pests and diseases. It should be noted that in our country it is prohibited to use chemical preparations in agriculture until they pass a thorough

toxicological and sanitary-hygienic examination [4, 12, 18]. In addition, today, in agricultural practice, low toxic and environmentally friendly chemicals are used [5, 21, 25]. Recently, the amount of pesticides used in the agriculture of the republic, including the Bukhara region, has been decreasing from year to year (in 2018 - 14 drugs were used in the country, in the region - 6). However, with the decrease in the amount of pesticides used in agriculture, these biologically active substances remain a factor that negatively affects the health of field workers. Many pesticide preparations are highly toxic, resistant to degradation under natural conditions, poorly soluble in water, exhibit bioaccumulative properties in adipose tissue, mobility in food links and a pronounced ability to accumulate in living organisms. All these properties make pesticides dangerous substances that pose a threat to health not only for humans, but also for many types of other organisms. Many pesticides are very persistent and spread far from the application site. So, for example, in the mid-1960s. DDT has been found in the liver of penguins in Antarctica, far from where the chemical was used [3, 4, 7, 18].

Among other things, various toxic substances contained in pesticides, for example, non-ferrous metals invariably end up in different water sources. Thus, when using the water of contaminated reservoirs for irrigation, non-ferrous metals are carried to the fields and concentrated in the upper most fertile humus-containing soil layer. The concentration of metals in this layer leads to a decrease in the nitrogen-fixing capacity of the soil and the yield of agricultural crops, the accumulation of metals above the permissible concentrations in feed and other products [17]. In the second half of the 20th century, another problem became relevant: a decrease in the content of vitamins and microelements in crop production and the accumulation of harmful substances (nitrates, pesticides, hormones,

antibiotics, etc.) in both crop and livestock products. As a consequence, pesticides and other harmful substances accumulated in various foodstuffs strongly affect the immune system, especially the immune system of children, which leads to a higher incidence of various diseases. Thus, children with frequent illnesses are a problem that has not only a medical but also a socio-economic aspect, which requires an integrated approach to its solution in the implementation of therapeutic, rehabilitation and preventive measures [42].

The reason for the decrease in the content of vitamins and microelements in crop production is soil degradation and the intensification of production, especially in animal husbandry. There are certain methods and technologies of farming that mitigate or completely eliminate negative factors, for example, precision farming technologies.

Agricultural production in Uzbekistan occupies 44 percent of the labor force and covers 17.6% of the country's GDP. In this regard, hygiene science constantly pays attention to the problems that people working in agricultural production may face. Moreover, the main goal of agricultural hygiene is to eliminate the negative factors that affect the health of agricultural workers. The latest scientific advances and the experience of advanced agriculture are aimed at making it easier for workers in agricultural production and to achieve high productivity in agriculture. Advances in biology, chemistry and other fundamental sciences make it possible to effectively care for and grow various agricultural crops, develop livestock, invent new methods of farming, create new chemical and biological means of protecting plants from pests, etc. The rapid introduction of such innovations and technologies into agriculture will reduce the probability that inappropriate agricultural inputs will affect workers' health and the environment.

LIST OF REFERENCES:

1. Akulov K.I., Shishkova A.P., Savlievna V.A. Hygiene problems in the countryside in connection with the concentration and transfer of livestock breeding to an industrial basis, - Hygiene and sanitation. 1999, No. 5, p. 31-35.
2. Astashov P.K. Organization of labor in dairy complexes - Moscow "Kolos". 1999, 122 p.
3. Andreeva –Galanina E.Ts., Artamonova V.G., Usenko V.R., Lutai A.V. On the issue of etiology, early diagnosis and prevention of vibration disease in drivers of heavy vehicles - Issues of sanitary protection of the external environment, occupational hygiene and disease prevention. Leningrad "Medicine". 1990 P. 22-24
4. Atabaev Sh.T., Kundiev Yu.I., Danilov VV, - "Agriculture, VGKN: labor and health in developed countries" -1999, p. 265-279.
5. Atabaeva Sh.T., Iskandarov T.I. Problems of hygiene and toxicology of pesticides in connection with the widespread chemicalization of agriculture. The medicine. Tashkent-1983.

6. Belonozhko GA, Zorieva TD, Hygienic aspects of the use of pesticides in greenhouses, - Hygiene and sanitation 2000, No. 1 p. 74-76.
7. Buzilev Yu.G., Burobkin I.N. Livestock complexes: labor organization management Moscow "Rosselkhozizdat". 2003, 199 p.
8. Grateful Ya.A. Tuberculosis as antroozoonosis. - Almaty "Kainar" 2000, 200 p.
9. Beglyarov G.A. Biological method of pest control of vegetable crops in greenhouses. "Protection of vegetables, melons and potatoes from pests, diseases and weeds. Moscow 1978 p.52-64.
10. Balsunova M.Ya. Daily and seasonal changes in the regulation of heart rhythm in agricultural machine operators V.K.N. - human physiology. 1998 - 141 p.
11. Hygienic classification of working conditions according to indicators of harmfulness and danger of factors of the working environment, the severity and intensity of the labor process: SanPiN RUz No. 0141-03 Tashkent, 2003, 180 p.
12. Galanin N.F. "Radiant energy and its hygienic value" - Leningrad "Medicine" 1989. 182 p.
13. Hygienic standards. Maximum permissible concentration (MPC) of harmful substances in the air of the working area, SanPiN Ruz No. 0294-11-125 p.
14. Reznik Ya.B., et al. Occupational hygiene in modern agriculture, ed. Ya.B. Reznik, Kishenev. Shitintsa 2008 105 p.
15. Izmerov N.F. et al. "Occupational Hygiene" edited by N.F. Izmerov and V.F. Krylov; Geotar Media 2008 584 p.
16. Hygienic prediction of occupational morbidity of dust etiology depending on dust load (Method.recommendations) Tashkent. 2002 10 p.
17. Ginatullina E.N., Zhumaeva Sh.B., Sagdullaeva B.O., Nazarov Zh. E. "Indicators of the ecological state of drinking and recreational water sources in Uzbekistan". Uzbek Biological Journal. # 1. 2020 year. P. 39-44.
18. Izrailet L.P., Eelite M.E. "Industry and the immunological state of the organism" M. /VNIIMI. 1988 45 p.
19. Iskandarov T.I., Iskandarova G.T. Methodological guidelines for the comprehensive assessment of new pesticides. (Method.indication). Tashkent. 1997 45 p.
20. Kairansky B.B. "Cooling hypothermia and their prevention" - Leningrad "Medicine" 2000, 245 pages.
21. Kaloyanova - Simonova F. "Pesticides, toxic effects and prevention" - Sofia, Bulgaria. Bulgarian Academy of Sciences. 1997 - 308 p.
22. Kasimov Kh.O., Ataeva M.A., Kabilova G.A. "Hygienic examination of working conditions of workers engaged in growing up vegetables in open ground" Samarkand Doctor's herald 2019 No. 2 pp. 71-75.
23. Kasimov Kh.O., Zhumaeva A.A. Hygienic aspects of labor protection at industrial livestock complexes and milk production farms. Tibbiyotda yangi kun No. 1 p. 39-42.
24. Kikolov A.I. "Mental work and emotions". - Moscow "Medicine" 1982 - 312 p.
25. Koschikh Yu.I., Raiko V.I. Design and construction of livestock complexes - Kiev, Budtvelnik. 2001 112 p.
26. Lukanova B.Kh. Occupational hygiene in poultry farms - VKN Hygiene in production. Sofia. 1988 p. 355-36.
27. Leshenko K.S. Some aspects of occupational morbidity among workers in agriculture in Belarus - Hygiene and Sanitation 1993 No. 5 pp. 57-58.
28. Methodology for a special assessment of working conditions (attachment No. 1 of the Ministry of Labor and Social Protection) RF dated January 24, 2014 No. 33.
29. Methodological recommendation for determining the concentration of harmful substances in the air, Moscow 1981, p. 14-21.
30. Mironenko M.A., Rybin V.V., Polyakov A.G., Bryushkova S.A. "Hygienic issues of regional planning of agricultural areas" - VKN: Hygiene of populated areas. Kiev. 2005 no. 14.P. 22-23.
31. Mishenko Z.I. "On the causes of the development of lumbosacral radiculitis in agricultural workers" - Doctor. A business. 2001, No. 3 S. 129-13.
32. Nikolov S.Kh., Kalicheva S.S. "Hygienic issues related to the production of feed used in industrial livestock breeding" - Hygiene and Sanitation No. 4 p. 161-164.
33. New and improved technologies for the prevention of health disorders of workers during cotton processing (Methodical guidance) No. 012-3 / 0123. Tashkent-2008.
34. Rebrova R.N. "Fungi of the genus Candida in bacterial infections." -Moscow "Medicine". 1989 - 252 pages.
35. Sorokin G.A. "The difference between the age and seniority dynamics of health indicators of workers as a criterion for comparing occupational and non-occupational risks." Hygiene and sanitation 2016 No. 4 355-361 p.

36. Stepanov S.A. "Etiology, pathogenesis and morphogenesis of pneumoconiosis caused by grain dust" Saratov, Saratov University Press. 2004 159 p.
37. Fedoseev G.B., Gerasin V.N. "Chronical bronchitis". "Guide to Pulmonology". Leningrad "Medicine". 1988 p. 337-364.
38. Chabanova O.V., Golovan V.P., Bystrova L.Ye. "Hygienic assessment of the main design solutions for poultry farms" - Occupational Hygiene 2001 No. 7 p. 11-14.
39. GOST 12.1.012-90 Occupational Safety Standards System (OSSS). Vibration safety. General requirements.
40. Little V.P. "Disability of agricultural machine operators due to respiratory diseases". Medical business. 2005. No. 9. P. 92-94.
41. Kasimov H.O., Manasova I.S., Nazarov S.E., Jumaeva Z.J., Nurova Z.H. "Occupational hygiene in field farming". "International Journal of Psychosocial Rehabilitation". United Kingdom. Volume 24, Issue 09, 2020 year. (ISSN: 1475-7192) p. 3830-3838.
42. Sagdullayeva G.U., Nazarov J.-S.E., Suleymanov S.F., Olimova N.I. "Comparative analysis of the immune system at often and rarely ill children depending on the stage of disease". Academia: An International Multidisciplinary Research Journal. Volume 9, issue 12, 2019 year. ISSN: 2249-7137. P. 22-25.

Entered 09.01. 2021