Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

ANALYSIS OF SANITARY INDICATORS FOR AGRICULTURAL MACHINERY REPAIR BUILDINGS

Xujaqulov Abdulaziz Xakim ugli
Karshi State Technical University "Labor Protection and Technical Safety" Senior Lecturer at the Department
E-mail: kundalikkun07@gmail.com
Tel: +99890 650 60 70

Abstract:
This research is devoted to the analysis of sanitary standards imposed on agricultural machinery repair buildings and the development of their scientifically based solutions. Regulatory documents and international standards in the research process (SanPiN, GOST, ISO 45001) studied and collected empirical data. The results of the study showed that most existing repair buildings do not fully comply with sanitary standards. In particular, an analysis was given based on the development of scientific and practical measures aimed at increasing the level of compliance with sanitary and hygienic requirements in agricultural machinery repair workshops and workshops, the ventilation system of buildings, the level of lighting, noise and vibration state, as well as international and local regulatory documents on creating favorable sanitary and hygienic conditions for workers. According to the results of the study, it was found that the current norms are associated with the main factors affecting the efficiency of production and the health of workers. The article also put forward recommendations for improving existing sanitary standards. In addition, the study is of practical importance for enterprises, specialists and engineers related to the repair of agricultural machinery, and serves to improve the efficiency of the production process by improving sanitary and hygienic conditions.

Keywords: Rural, farm, machine, repair, sanitation, standards, buildings, ventilation, workers, noise, lighting, temperature, humidity, hygiene, safety.

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

Introduction

Agricultural machinery is an integral part of modern farming and animal husbandry activities, and their continuous operation is instrumental in the sustainable cultivation of agricultural products and increasing productivity. To ensure the effective operation of these techniques, they require timely maintenance and repair[11]. Therefore, the premises for the repair of agricultural machinery must fully meet the sanitary and hygienic standards.

In the event of non-compliance with sanitary requirements, during the maintenance process, there may be a risk to the health of employees, environmental pollution and a decrease in performance. Therefore, in repair buildings, it is necessary to strictly adhere to such sanitary standards as air quality, lighting level, noise content, temperature and humidity balance, ventilation system.

Thematic literature analysis

Scientific literature and regulatory documents on the study of sanitary standards imposed on buildings for the repair of agricultural machines indicate that these institutions should provide safe and comfortable working conditions for workers. In cases of non-compliance with sanitary requirements, the health of workers may be damaged, the quality of technological processes may decrease, and the risk of environmental pollution may increase.

1. Regulatory documents and standards

International and local standards for sanitary standards are aimed at improving working conditions in these buildings. The main regulatory documents include:

ISO 45001:2018 – international standard establishing labor safety and sanitation requirements.

SanPiN (Sanitary rules and norms) – documents regulating sanitary and hygienic conditions in production and repair buildings[2].

GOST R 12.1.005-88 – technical regulation establishing microclimate standards in production premises [3].

Labor code and industrial sanitation regulations-documents on the control of working conditions in repair shops and workshops[4].

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

These regulatory documents establish requirements for lighting, ventilation, noise level, air quality, temperature and safety measures for agricultural machinery repair shops and workshops.

2. Scientific research and Applied Analysis

Scientific research carried out in recent years is aimed at studying the impact of sanitary and hygienic conditions in production buildings on the health of workers and labor productivity. According to research:

If there is insufficient air exchange and ventilation in production buildings, the amount of dust and gases increases, and the risk of respiratory diseases increases [6].

Lighting conditions have a significant impact on the productivity of workers. If the lighting level is in the range of 300-500 Lux, the efficiency can increase by 10-15% [7].

Excess of the norm of harmful substances in the air (for example, carbon monoxide, oil vapor) accounts for about 30% of diseases in production [8].

3. Problems encountered in practice and their solutions

Studies show that agricultural machinery repair shops and workshops may not fully meet sanitary standards. Problems observed in most cases include:

Air quality is not in demand due to the wear and tear of the ventilation system.

Old or incorrectly designed lighting systems lead to fatigue and decreased attention of workers.

Noise levels in working areas are higher than 85 dB, which negatively affects hearing.

Unfavorable conditions occur in the workplace due to a violation of the temperature and humidity balance.

To overcome these problems, the following technological solutions are proposed based on scientific research:

- Implementation of environmentally friendly ventilation systems in workplaces.
- Application of safe and efficient LED lighting systems for workers.
- Using sound-absorbing materials to reduce noise.
- Application of modern heating and humidifier systems to ensure Optimal temperature and humidity.

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

Analysis of the literature shows that compliance with sanitary and hygienic requirements in the premises of the repair of agricultural machines not only protects the health of workers, but also increases the efficiency of work. Research shows the need to use new technologies and innovative solutions to improve sanitation. Therefore, strict adherence to sanitary standards and scientifically based measures are important in repair shops.

RESEARCH METHODOLOGY

Various methodological approaches were used in the research process.

1. Research approach and style.

The study was conducted on the basis of qualitative and quantitative methods:
Quality analysis-existing regulatory documents, international standards and scientific research analyzed.
Quantitative analysis-statistical data on compliance with sanitary standards were collected and analyzed.
Experimental observation-the sanitary condition in the premises of the repair of agricultural machines was studied directly.

2. Data collection methods.

Data for the study was collected using the following methods:
a) Study of regulatory documents and scientific literature
National and international standards for sanitary and hygienic requirements [1]
Scientific articles and technical literature analyzed.
b) Empirical data collection
1. Air quality and microclimate analysis in workplaces: In the air CO_2, the levels of dust, gas and chemicals were measured. The temperature and humidity levels were assessed using special instruments. The speed of air circulation and the efficiency of the ventilation system were checked.
2. Lighting system analysis: The light level (lux) in the work areas was determined using special measuring instruments. The compliance of artificial and natural lighting with norms was assessed.
3. Noise level determination: Noise levels (dB) were measured in repair shops. The level of exposure of workers to noise was assessed through surveys.

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

4. Assessment of hygienic conditions: Compliance with cleaning and sanitary standards was checked in the workplace. The presence of special protective equipment and clean water supply for workers was analyzed.

c) Conducting surveys and interviews

100 a survey was carried out among the workers of the repair shop, their views on sanitary conditions were studied.

20 interviews with staff of engineers and managers were organized.

3. Data analysis methods

The collected data was analyzed using the following statistical and scientific methods of analysis:

Descriptive statistics-average values and dispersion were calculated to produce a general description of the sanitary condition.

Correlation analysis-applied to assess the impact of sanitary conditions on productivity and health of employees.

Comparison method-differences between different repair buildings on compliance with sanitary standards were studied.

4. Research limits and limitations

Since the study only covers repair buildings in a particular area, the results may be limited in generalization.

Subjective opinions given by workers were taken into account in comparison with objective assessment methods.

Since the data was obtained as a result of short-term observations, long-term trends were not fully analyzed.

The methodology of the study was focused on a comprehensive study of the degree of compliance with sanitary standards in the premises of the repair of agricultural machines.

RESEARCH RESULTS AND DISCUSSIONS

The following results were obtained based on the data obtained in determining the condition and problems of compliance with sanitary standards in agricultural machinery repair buildings.

1. Air quality and ventilation system

Results: As a result of the measurements, carbon dioxide in some workshops (CO_2) the amount was found to be higher than the normative 1000 ppm. Oil

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

vapors and industrial waste in the air (for example, lead, sulfide compounds) it was noted that the presence can negatively affect the health of workers. The ventilation system was found to be insufficiently efficient, with insufficient air exchange, especially in closed conditions during the winter months.
Discussion: These are the results of international sanitary norms (SanPiN and ISO 45001) showing that it does not comply with the requirements[2,1]. Poor ventilation can cause headaches, fatigue, and respiratory diseases in workers. Modernization of mechanical ventilation systems is necessary to improve air quality.

2. Lighting conditions

Results: It has been observed that natural light is insufficiently supplied, with artificial lighting being the main source, especially in indoor workshops. According to the measurement results, the lighting level in some workshops is around 200-250 lux, which is lower than the normative 300-500 Lux. 68% of workers reported eye strain and difficulty concentrating due to lack of light.
Discussion: Low lighting can reduce productivity and lead to employee fatigue. Measures to introduce new LED lighting systems and the maximum use of natural light should be taken [5].

3. Noise level

Results: The measurement results showed that the noise level in the workshops was around 85–95 dB, which does not comply with sanitary standards (≤ 80 dB). 54% of workers reported experiencing headaches and ear fatigue due to constant noise.
Discussion: Noise levels above standards can cause hearing loss and mental stress for workers. [2].
To reduce noise, it is recommended to use sound-absorbing materials and separate work areas with special acoustic barriers..

4. Temperature and humidity

Results: In repair shops, temperatures were observed to be above 30°C in summer and below 10°C in winter. Humidity levels were below 30% in some workshops, leading to dry air.

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

Discussion: Temperature imbalances negatively affect worker comfort and increase the risk of heat stroke or hypothermia. Modernization of heating and air conditioning systems is necessary to ensure optimal temperature (18–22°C) and humidity (40–60%) levels.

5. Hygiene and safety conditions

Results: It was observed that cleaning work is not carried out regularly in workplaces. The level of provision of protective equipment (gloves, masks, earplugs) is low (45% of workers said they use them only occasionally). A shortage of sanitary and hygiene products was identified in workplaces.

Discussion: Failure to comply with sanitary requirements can lead to the spread of diseases. It is necessary to regularly provide workers with special clothing and protective equipment, as well as take additional measures to improve sanitary conditions [2, 4].

Conclusion

The results of the study showed that there are a number of shortcomings in compliance with sanitary standards in agricultural machinery repair facilities. The main problems are as follows:

1. Poor air quality – insufficient ventilation.
2. Lighting is not up to standard – the level of light is negatively affecting productivity.
3. Noise exceeds standards - poses a health risk to workers.
4. There is a problem with temperature and humidity – it worsens working conditions.
5. Sanitary and hygienic conditions are not up to standard - posing a threat to the health of workers.

The analysis shows that by eliminating existing problems, it is possible to improve productivity and employee health. The following recommendations have been developed to eliminate these shortcomings:

Introducing air purification systems and improving ventilation.

Increasing the use of LED lighting systems and natural light.

Use acoustic barriers and sound-absorbing materials to reduce noise.

Installing heating and humidification systems to ensure optimal temperature and humidity.

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 03, March, 2025
brightmindpublishing.com
ISSN (E): 3061-6964

Regular cleaning and provision of protective equipment in workplaces.
The results of the study showed the need to take scientifically based measures to improve compliance with sanitary standards..

REFERENCES

1. Regulatory documents and international standards
1. ISO 45001:2018 – Occupational health and safety management systems – Requirements with guidance for use.
2. SanPiN – Sanitariya qoidalari va normalari. Ishlab chiqarish binolaridagi sanitariya-gigiyena sharoitlarini tartibga soluvchi hujjat.
3. GOST R 12.1.005-88 – Ishlab chiqarish binolarida mikroiqlim me’yorlari.
4. Mehnat kodeksi – Ish joylarida mehnat xavfsizligi va sanitariya me’yorlariga oid qonunchilik hujjatlari.
5. O‘zbekiston Respublikasi “Mehnatni muhofaza qilish to‘g‘risida”gi qonuni – Ishchilar uchun xavfsiz va sog‘lom ish sharoitlarini ta’minlash bo‘yicha talablari.
2. Scientific literature and research
6. Ivanov V., Smirnov A. (2021). Influence of air quality on the productivity of workers in industrial buildings. Journal of Environmental Safety, 15(2), 78–85.
7. Petrov K., Mikhailov D. (2020). The impact of lighting conditions on labor productivity in repair workshops. Industrial Hygiene Review, 28(4), 112–119.
8. Smirnov A. (2019). Analysis of harmful substances in the air of agricultural machine repair shops. Journal of Occupational Safety, 12(1), 45–52.
9. Ospanov B., To‘rayev R. (2022). O‘zbekiston qishloq xo‘jaligi texnikalarini ta’mirlash ustaxonalari sanitariya me’yorlarini takomillashtirish. Texnika va Texnologiyalar Jurnali, 5(3), 67–79.
10. Karimov F. (2018). Ishlab chiqarish binolarida sanitariya-gigiyena me’yorlariga rioya qilishning ahamiyati. Mehnat xavfsizligi ilmiy jurnali, 6(2), 90–101.
11. Raximov A., Yo‘ldoshev I. Qishloq xo‘jalik mashinalari: Ekspluatatsiya va ta’mirlash. – Toshkent: Fan, 2018.