

Ministry of Education and Science of Ukraine

National University of Food Technologies

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**92<sup>th</sup>  
International scientific conference  
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**"Youth scientific achievements  
to the 21st century nutrition  
problem solution"**

**April, 20–24 2026**

**Part 2**

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**Kyiv, NUFT, 2026**

# Section 16

## **Physical and mathematical principles of technological processes**

# Секція 16

## **Фізико-математичні основи технологічних процесів**

# **16.1.**

## **Physics and occupational safety**

# **16.1.**

## **Фізика та професійна безпека**

## Prospects for the use of emerging technologies in occupational health and safety management at food industry enterprises

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**Introduction.** The occupational health and safety management system (OHSMS) of food industry enterprises is the basis for ensuring occupational safety in the food industry of Ukraine. The implementation of new models and principles in the information provision of OHSMS at a food enterprise with the involvement of modern information technologies plays a decisive role in the soundness and timeliness of management decisions made.

**Materials and methods.** The research was based on analyzing literature sources and summarizing scientific results.

**Results and discussion.** Digital technologies used in the information provision of the OHSMS of a food enterprise must perform the tasks of occupational risk assessment. Let us consider modern technologies based on the implementation of advanced methods: robotic systems [1] – robots can perform various tasks: lifting heavy loads, welding, and assembly, which minimizes physical strain on workers, reduces the risk of human error and exposure to hazardous conditions, thereby improving occupational safety and hygiene; artificial intelligence and machine learning [2] – artificial intelligence algorithms can analyze vast amounts of data to identify patterns and predict potential hazards, transforming workplace safety based on real-time monitoring and risk reduction strategies, and they also allow for the optimization of emergency response plans, ensuring a safer working environment; exoskeletons – devices that support and enhance workers' physical abilities, reducing the risk of injury during physically demanding tasks (lifting heavy loads) by decreasing the strain on muscles, lower limb joints, and the back, thereby providing mechanical support and improving overall workplace safety; unmanned aerial vehicles (UAVs) – can monitor large facilities, inspect structures, and assess hazardous zones without exposing workers to danger, while also being utilized for aerial mapping, surveillance, and tracking moving objects, helping to maintain occupational safety standards and prevent accidents; the Internet of Things (IoT) – involves a network of interconnected devices that collect and exchange data to enhance workplace safety, where sensors enable the real-time monitoring of environmental conditions, equipment status, and workers' health; virtual and augmented reality (VR/AR) – serve as powerful tools for safety training and management capable of simulating hazardous scenarios, allowing workers to practice safety protocols in a controlled environment, improving hazard identification, personnel training, and ensuring compliance with occupational safety standards.

**Conclusion.** Thus, an improvement of the OHSMS of food industry enterprises in terms of occupational risk management is proposed, which enables the identification of appropriate tools to address these risks, taking into account established objectives and necessary resources, which, in turn, will increase the efficiency of the preparation, adoption, and implementation of occupational safety management decisions.

### References

1. Rania Gihleb, Osea Giuntella, Luca Stella, Tianyi Wang, Industrial robots, Workers' safety, and health, *Labour Economics*, Volume 78, 2022, 102205. <https://doi.org/10.1016/j.labeco.2022.102205>.
2. The role of artificial intelligence in predicting workplace hazards: a deep dive into safety management systems. <https://lnk.ua/LQ9PkAsdO>