УДК 613.2:614.3 doi: 10.20998/2220-4784.2022.02.07

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WAYS OF ENSURING FOOD SAFETY IN UKRAINE UNDER THE CURRENT EPIDEMIC SITUATIONS

The world faces an unprecedented pandemic threat caused by the SARS-CoV-2 virus. The Ukrainian food industry should have a food safety management and control system during pandemics. The paper considers the general principles of food hygiene, aimed at the introduction of hygienic control at each stage of the processing chain, production and sales of food products to prevent food contamination during epidemics. The main recommendations of the WHO and the Ministry of Health of Ukraine on preventing the spread of the virus in food enterprises and ensuring food safety in the world and their implementation during a pandemic in Ukraine were considered. Attention is focused on the recommendations on the use of disinfectants for the treatment of surfaces in contact with food, effective when used against viruses. Several classes of compounds recommended for use as disinfectants have been considered, their potential toxicity and mechanism of action were given. In the article it was analyzed the main measures that are effectively used to ensure the non-proliferation of the virus in the workplaces of food enterprises, retail chains and catering establishments. The use of Internet in case of receiving orders and delivering food from retail chains and catering is one of the most promising way out of the situation during a pandemic.

Keywords: food safety, hygienic control, disinfectants, coronaviruses

Introduction. Today, when the world is faced with the threat of a rapid spread of the pandemic, the issue of food security is more urgent than ever. Leaders of the international organizations FAO, WHO and WTO state: "As countries take measures to stop the rapid spread of the COVID-19 pandemic, they must proceed with extreme caution and minimize the potential impact on food products" [1].

Human health and ensuring the safety of food products are critically important for survival in the conditions of modern epidemic situations.

Food safety agencies have conducted several risk assessments to determine whether food, food contact materials and food packaging pose a potential food safety risk associated with SARS-CoV-2.

According to the authoritative literature, everyone agrees that there is currently no evidence that SARS-CoV-2 poses a food safety risk. Thus, in terms of hazard and risk, the overall potential risk of contracting COVID-19 through contaminated food or food packaging appears to be very low. Therefore, SARS-CoV-2 is not considered a foodborne virus. It remains predominantly a respiratory virus that can also enter the bloodstream through the mucous membranes of the eyes.

Considering that one of the symptoms of COVID-19 is diarrhea, there is still no exact answer to the questions: how well SARS-CoV-2 survives when passing through the human stomach; what concentration of SARS-CoV-2 is needed to infect people through the gastrointestinal tract; whether SARS-CoV-2 can actually enter the bloodstream through the gastrointestinal tract, food safety issues remain relevant and not well understood.

Analysis of literature data and problem statement. According to Peter Alexander, an expert on global food security from the University of Edinburgh, "panic buying" has become a common phenomenon in many areas, leading to shortages of goods on supermarket shelves. There were certain disruptions in the supply chain of a number of goods; which were imported to the US from China, due to their shortage. An increase in prices was observed in some regions. The U.S. Food Retail Group has advised retailers to expedite orders and consider rationing to prevent empty shelves

Food shipments to restaurants and cafes fell by 75% in Latin America, and markets in North America and the Middle East fell by 90% by the end of March. Later, when demand for certain agricultural products fell due to quarantines and restaurant closures, farmers reported surpluses of some commodities, including potatoes in the Netherlands and milk in the US state of Wisconsin [2].

During the pandemic, there has been a significant increase in the number of online grocery purchases. Small-scale farmers have started to use digital technologies as a way to sell their products directly, and agriculture has started to receive direct financial support from local governments, all of which have led to an increase in direct sales of agricultural products [3].

In such circumstances, maintaining the health and safety of all food production and delivery workers is critical to survival in the current pandemic. Keeping food moving through the food chain is the most important function to which all members of the food chain must contribute. It is also needed to maintain consumer confidence in food safety and availability [4].

The food industry must have food safety management systems based on the principles of hazard analysis and critical control to manage food safety risks and prevent food contamination. Food safety management systems in the food industry are supported by the necessary programs that include good hygiene practices, cleaning and sanitation, zoning of processing areas, supplier control, storage, distribution and transportation, personnel hygiene and fitness for work – all essential conditions and measures necessary to maintain the hygienic condition of the food processing environment [5]. coronavirus pandemic is the Guide for food enterprises "COVID-19 and food safety", developed by the World Health Organization and the Food and Agriculture Organization of the United Nations [1].

The main document that regulates the hygienic requirements for food products in the conditions of the This document consists of 10 paragraphs and contains key instructions and recommendations regarding the organization of hygienic safety of food products, the personnel of the food enterprise, in fact, the food enterprise itself and places of direct sale of food products.

In Paragraph I "Possible transmission of the COVID-19 virus through food". COVID-19 is a respiratory disease and the main route of transmission is person-to-person contact and direct contact with airborne droplets released when an infected person coughs or sneezes. To date, there is no evidence that viruses that cause respiratory diseases are transmitted through food or food packaging. Coronaviruses cannot reproduce in food; they need an animal or human body to reproduce. Personal protective equipment, such as masks and gloves, can be effective in reducing the spread of viruses and diseases in the food industry, but only if used correctly.

Paragraph II "Food workers: knowing the symptoms of COVID-19". Personnel working in the food industry should be aware of the symptoms of COVID-19. Food business operators need to provide written instructions to staff on reporting such symptoms and exclusion from the work process. The most important issue is to enable staff to recognize symptoms in a timely manner, seek appropriate medical attention and tests, and minimize the risk of infecting colleagues.

Paragraph III, "Preventing the Spread of COVID-19 in the Food Service Environment», requires food service workers to be provided with written instructions and training on how to prevent the spread of COVID-19. Food safety measures in food premises must continue to meet the highest hygiene standards in accordance with those established by the food safety management system. Paragraph III provides a list of personal hygiene rules.

According to paragraph IV of the "Guidelines for the Use of Disposable Gloves for Food Workers", food workers may use gloves, but they must be changed frequently and hands should be washed between and after removing gloves. Gloves should be changed after non-food activities such as manually opening/closing doors and emptying trash cans. Food workers should avoid touching their mouths and eyes while wearing gloves.

Paragraph V "Food Service Workers: Physical Distancing in the Work Environment" highlights the critical role of physical distancing in slowing the spread of COVID-19. According to WHO recommendations, this distance between employees should be at least one meter (3 feet).

Paragraph VI "Food Workers: COVID-19 in the Workplace" states that food service establishments have recommendations for treating food service workers' illnesses, as well as guidance on staff illness reporting and a return-to-work policy after recovery.

Staff should be aware that they cannot report to work with symptoms of COVID-19 but should report them by phone. Personnel who are not feeling well should not go to work and should seek medical attention.

The WHO recommends that a confirmed case be released from isolation as soon as they are symptom-free and have received two negative PCR test results within at least 24 hours. If testing is not possible, WHO recommends that a confirmed case be released from isolation 14 days after symptoms have resolved.

Paragraph VII "Employees of the food industry: transportation and delivery of food ingredients and products." The virus can enter the premises of the enterprise only when an infected person gets there or infected products or objects are brought there.

Drivers and other food delivery personnel must not exit their vehicles during delivery, must use hand sanitizer before handing over delivery documents to food premises personnel, be aware of potential risks, related to the contact transmission of COVID-19, about physical distancing when receiving and handing over goods to customers, as well as the need to maintain a high degree of personal hygiene and wear clean protective clothing, so that all shipping containers are kept clean and frequently disinfected, products are protected from contamination and stored separately from other goods that may cause contamination.

Paragraph VIII "Points of sale of food products." This paragraph contains practical measures that retailers can take to manage the number of customers and prevent the spread of the virus: regulating the number of customers entering the store to avoid crowds.

Paragraph IX "Open grocery counters in commercial premises". mandates hygiene around open food stalls such as salad bars, fresh produce and baked goods. Consumers should always be advised to wash fruits and vegetables with potable water before consumption. Both customers and staff are required to maintain strict personal hygiene around open food stalls at all times.

Paragraph X "Food industry workers: canteens for staff." Worker canteens in major service centers such as food processing and food retail must remain open when there are no practical alternatives to obtain food [1].

In Ukraine, the manufacturer is responsible for the safety of food products for the public, and the state controls it within the framework of the functions and competences of Ukraine on food safety issues and the State Consumer Protection Service.

Staff working in food premises must be provided with written instructions and training to prevent the spread of COVID-19. Normal fitness-for-work procedures used by food businesses as part of their food safety management system should ensure that infected workers are excluded from food premises.

These measures are expected to protect staff from the spread of COVID-19 among workers, maintain a healthy workforce, and identify and exclude infected food handlers and their direct contacts from the workplace [13].

Ways of development of this direction. From the time the virus emerged until today, there is no evidence that people can become infected with the virus through food. Most often, the Covid-19 virus can be transmitted from person to person through sneezing or coughing. But droplets containing the virus can remain on the surface for some time. A person who touches a contaminated surface of food or packaging and then touches their own mouth, nose, or eyes is at risk of contracting the virus [6]. According to research [7, 11], coronaviruses can survive up to two years at -20°C and are sensitive to heat treatment. Therefore, eating raw or undercooked animal products should be avoided. At cooling temperature t (4°C) MERS-CoV can remain viable for up to 72 hours [7]. In food products, virus inactivation occurs during heat treatment. Kampf et al. [8] reported that coronaviruses, including SARS-CoV-1, can be reduced by at least 4 log by heat treatment such as 60°C for 30 minutes, 65°C for 15 minutes. minutes or 80°C for 1 minute. Chin et al. [9] found that SARS-CoV-2 decreased by about 7 logs after heat treatment at 70°C for 5 minutes. In addition, ANSES [10] concluded that food exposure to 63°C for 4 minutes would be sufficient to kill coronoviruses.

Low freezing temperatures preserve viruses. Fisher et al. [12] found that SARS-CoV-2 did not decrease in titer and was able to survive for 3 weeks in inoculated chicken, pork, and salmon cuts stored at 4, -20, and -80°C. In addition, Mullis et al. [13] demonstrated that bovine coronavirus present on lettuce stored at 4°C retained its infectivity for at least 14 days. In addition, the coronavirus survived well for 2 days on lettuce leaves stored at 4°C, but did not survive on the surface of strawberries, possibly due to their acid content. [7, 14].

At cooling temperature (4°C) Rabenau et al. [11] found no loss of infectious titer for SARS-CoV-1. Given that freezing is not generally seen as a method of killing viruses in food, but rather as a preservation method. Fisher et al. [12] found that infectious SARS-CoV-2 did not decrease in titer and was able to survive for 3 weeks in inoculated pieces of chicken, pork and salmon stored at 4, -20 and -80°C. In addition, Mullis et al. [13] demonstrated that bovine coronavirus present on lettuce stored at 4°C retained its infectivity for at least 14 days. In addition, coronavirus survived well for 2 days on lettuce leaves stored at 4°C, after which it rapidly declined, but did not survive on the surface of strawberries, possibly due to acidity [7, 14].

The effect of acidity on the inactivation of coronoviruses has been noted: it is stable at pH (3–10) at room temperature, but at alkaline pH>12 or acidic pH<3 and ultraviolet radiation, the virus can be inactivated [7].

Alternative non-thermal physical disinfection methods include ultraviolet (UV) light, pulsed light, ionizing radiation, and high-intensity ultrasound [15].

The Ministry of Health of Ukraine noted: "Current data on other strains of coronaviruses show that although coronaviruses appear to be stable at low and freezing temperatures for a certain period, food hygiene and proper food safety methods can prevent their transmission through food. In particular, coronaviruses are heat-labile, meaning they are sensitive to normal cooking temperatures (70°C). Therefore, generally, consumption of raw or undercooked animal products should be avoided. Raw meat, raw milk, or raw animal organs should be handled with care, to avoid cross-contamination of raw food". The virus can enter food production only from an infected person, and then through infected raw materials, ingredients, materials or objects. Personal protective equipment against viruses among food workers, such as masks and gloves, has shown to be effective. Food businesses also used physical distancing and strict hygiene measures during production, frequent and effective handwashing and sanitizing at every stage of production [16]. In addition, effective in spreading the virus was a 14-day quarantine of people since the last contact with a confirmed case. The hygiene recommendations followed by the staff are as follows: proper hand hygiene - washing hands with soap and water for at least 20 seconds; frequent use of alcohol-based hand sanitizers; covering your mouth and nose when coughing or sneezing; frequent disinfection of work surfaces and places of possible contact; avoiding close contact with people who have symptoms of a respiratory disease [1].

Food retailers have been supplying the population on a daily basis during the pandemic and have faced challenges in maintaining the highest standards of hygiene. Measures were taken to protect personnel from the risk of infection (the use of masks, goggles, protective shields, and rubber gloves), physical distancing was observed in queues when working with a large number of customers, shopping baskets, containers, carts, door handles, conveyor belts were treated with disinfectants. One of the important aspects of providing retailers with food is their delivery. To avoid transmission of the virus through surface contact, food vendors ensure frequent handwashing, use of hand sanitizers, and protective clothing. As an additional level of personnel protection, plexiglass barriers have been installed at the cash desks and counters, and customers are encouraged to make contactless payments. To reduce the risk of disease transmission, food retailers are managing queues according to physical distancing guidelines both inside and outside stores (keeping a distance of 2 meters).

Disinfectants, hand sprays and disposable paper towels are installed at the entrance to the shopping facility for visitors. Inside retail establishments, floor markings are provided to facilitate physical distancing, especially in large trading floors and the busiest departments, counters and cash desks [17; 18].

Anti-epidemic measures in public catering establishments for the quarantine period due to the spread of coronavirus disease (COVID-19), approved by the Decree of the Chief State Sanitary Doctor of Ukraine №13 dated 06.10.2021. To ensure safety in public catering establishments, the following measures were taken: queues were not allowed; monitored the availability of antiseptics, detergents and paper towels in

the bathrooms; wet cleaning of production premises and surfaces, places of contact between the hands of staff and customers (door handles, seats, sinks, tables) was carried out using detergents and disinfectants at least once every 2 hours.

Masks and rubber gloves are used for personal protection. The body temperature of visitors was measured by a non-contact method in a restaurant. When a person appeared with an increase in body temperature above 37.2°C or with signs of acute respiratory syndrome, such a person was not allowed into the restaurant. There were markings for standing in accordance with the distance between buyers near crowded places; accommodation of visitors is carried out in accordance with the requirements established by the Cabinet of Ministers of Ukraine; the menu was placed for contactless reading near the entrance or place of ordering; the issuance of orders was carried out in reusable dishes only if there are conditions for mechanized washing of dishes using a dishwasher; used disposable tableware made of cardboard or paper. Dishes and accessories for drinks (sugar, stirrers, straws, etc.) must be in individual packaging; the possibility of non-cash payment is provided [19].

Coronavirus can survive on surfaces PTFE, PVC, ceramic tiles, glass and silicone rubber for at least 5 days, metal and plastic up to 9 days, at 21 to 23°C and 40% humidity SARS-CoV-2 can survive up to 72 hours on plastic and stainless steel , up to 4 hours on copper and up to 24 hours on cardboard [7]. Surface disinfection is one of the methods used to inactivate viruses. For disinfection, agents from various chemical groups are used [20].

Tables 1. Means of surface disinfection in contact with food products

Connection class	Active speech	Release form
Acid	Citric Acid	Disinfectant wipes
	Hydrochloric Acid	Solid drug for breeding
	Dichloroisocyanuric acid	Tablets for dissolution
	Lactic acid	Ready to use disinfectant 8.25%
	Hypochlorous acid	Rostvor is ready to use
	Dodecylbenzenesulfonic acid	Rostvor is ready to use
Salt	Sodium chloride	Solid drug for breeding.
	Sodium hypochlorite	Ready to use 2.2% sodium hypochlorite solution
Quaternary Ammonium	Quaternary Ammonium	Ready to use 20% solution
Peroxide	Hydrogen Peroxide	Rostvor is ready to use
	Potassium peroxomonosulfate	Rostvor is ready to use
Alcohol	Ethanol	Wet wipes 60-90%
	Isopropanol	Rostvor is ready to use 70%
Phenols	Thymol	Ready to use solution
	Phenol	Rostvor is ready to use (spray)

The choice of a disinfectant for the treatment of surfaces in contact with food is determined by the type of contamination, the recommended concentration of the working solution and the time of contact with the surface, the resistance of the surface material to the disinfectant, toxicity parameters, ease of use and stability of the agent.

The choice of disinfectant should be guided by the requirements of local health authorities. Use of chlorine-containing products Hypochlorite-based products are available in liquid form (sodium hypochlorite, hypochlorous acid). These reagents are dissolved in water to form a chlorine-containing aqueous solution required concentration, in which the antimicrobial agent is undissociated hypochlorous acid (HOCl). Hypochlorites have antimicrobial activity against a wide range of microorganisms, at a concentration of 0.05% (inactivation time 5 minute) hypochlorite solution is active against viruses. In the context of COVID-19, it is advisable to use working solutions at the recommended concentration of 0.1%. Chlorine-containing products have an odor that can adversely affect people's well-being, for example, provoke attacks of bronchial asthma. At high concentrations, chlorine can cause irritation of the skin and mucous membranes [20].

The use of phenols is effective against microbes, fungi and viruses. The composition of these substances includes hydroxyl and aromatic groups. Often carbolic acid and thymol are mainly used. However, phenols are toxic compounds and people with hypersensitivity can harm them. It is very quickly absorbed and can lead to toxic poisoning of the whole organism. Phenols are due to the negative effects of phenol on the central nervous system, heart, blood vessels, lungs and kidneys.

Hydrogen peroxides, being strong oxidizing agents, which are based on the formation of free radicals that damage cell membrane lipids, DNA and other important components of a microbial cell, easily decompose to form non-toxic products (inactivation time 1 minute). However, peroxide has a high tissue toxicity (class II) with a pronounced local irritant effect [20].

Of the group of alcohols for disinfection, ethyl and isopropyl alcohols are most widely used. The mechanism of their action is the denaturation of microbial proteins [21]. Alcohols in a concentration of 60-90% for 1-3 minute inactivate active relatively vegetative forms of bacteria and fungi, mycobacteria and enveloped viruses. However, they do not have detergent properties, fix organic contaminants and can damage plastic and rubber products, are highly flammable and evaporate quickly

In addition, the composition of many disinfectants includes reactions, the action of which is associated with the required pH. Disinfectants often include hydrochloric, lactic, hypochlorite, and citric acids.

Thus, disinfectants should only be used that are approved for use, established by the legislation of Ukraine, in accordance with the instructions for their use. Detergents and disinfectants should be effective for use in a pandemic, but should not pose a food safety hazard [20, 22].

Tables 2. Advantages and disadvantages of various groups of disinfectants

Group of disinfectants	Advantages	Disadvantages
Halogenated compounds	A wide range of antimicrobial activity: bactericidal, tuberculocidal, virucidal, fungicidal, sporicidal properties; multipurpose; good solubility in water; fast action; relatively low cost	High aggressiveness towards construction materials. High toxicity, pungent odor, irritating effect on the mucous membranes of the respiratory system and eyes. Bleaching effect on fabrics. Ability to form environmentally hazardous compounds. Sensitivity to the action of inorganic and organic substances, temperature, light, pH.
Peroxides, peroxy compounds, additives and other oxidizing agents	Environmental Safety	Relatively low stability; Aggressiveness towards corrosion-resistant materials; Strong irritating effect of concentrated solu-tions on the mucous membranes of the respiratory system
Alcohol-containing preparations	A wide range of antimicrobial activity; Environmental Safety; Short exposure during disinfection; No sediment after evaporation;	The possibility of fixing organic contaminants. Easy flammability. Swelling and hardening of plastic, rubber, their further deterioration due to prolonged contact. Inactivation by organic materials. Rapid evaporation, which leads to a dec-rease in concentration and makes prolonged contact impossible.
Surfactants	No harsh odors. Low level of toxicity. Proper level of detergent properties.	Narrow antiviral spectrum of action. Inability to inactivate RNA-containing hydrophilic viruses that do not have a lipid shell (for example, poliomyelitis viruses, enteroviruses, etc.). The presence of pronounced foaming, which does not allow their use in aerosols.
Phenols	Strong fungicidal, virucidal, bactericidal action.	Poor solubility in water
Acids	A wide range of antimicrobial activity.	Irritating effect on the mucous membranes of the respiratory organs and skin;

However, the use non-optimal disinfectants, reduced exposure time of disinfectants, improper dilution disinfectants, sometimes as a result of ignoring manufacturers' recommendations and non-compliance with hygiene standards, may be ineffective. The effectiveness of chemical disinfectants can be influenced by various parameters, including target microorganism, features of the surface of materials on which microbes are located present, composition of disinfectants, concentration of disinfectants and cleaning and pre-cleaning protocols. Compared to liquid disinfectants, UVC has some advantages because it can be used automatically and remotely, and can be applied to liquids and solids, as well as decontamination air in different types of rooms. Research [23] is focused on the ability of UVC disinfect surfaces contaminated with various microbes, including a coronavirus surrogate SARS-CoV-2 using standard protocols. MUVi-UVC was able to kill 99.999% of all bacteria, fungi, coronaviruses. within 5 minutes.

Ultraviolet (UV) C light (wavelength 200–280) has long been known for its antimicrobial and disinfectant efficacy. It damages DNA, causing dimerization of pyrimidines [23]. The bactericidal effect of UV is used for sanitization and disinfection of various environmental objects - air, water, food and packaging. However, there is no WHO regulation on the use of UV-C sources in food establishments and retail chains to inactivate Covid 19. UV irradiation, which is a progressive method of disinfection, does not change the physical and chemical composition of the product, acts quickly and has a low cost. This method can be recommended as the main method of sterilization and disinfection in the food industry during epidemics.

Conclusions and ideas for further investigation.

During the pandemic, the Internet began to be widely used to receive orders and then targeted delivery.

Most often, this delivery method was used by restaurants and cafes. Some changes in the food supply chain are likely to remain post-pandemic – online food ordering and delivery, e-commerce, and new food safety risks and concerns that need to be carefully analyzed and acted upon [24].

In addition to selling more food online, food service operators can continue to adapt or even change their business models.

As quarantine restrictions ease, the food industry sector will recover and adapt, and physical distancing measures and increased sanitation and hygiene measures to protect staff health will become part of the daily routine.

Thus, compliance at food industry enterprises with the recommendations of the international organizations FAO, WHO and WTO, the Ministry of Health of Ukraine, as well as the correct use of disinfectants, ultraviolet radiation, and the replacement of work methods using the Internet are quite important. valid and effective anti-epidemiological methods.

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Надійшла (received) .30.10.2022

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Е. А. ЧЕРНУШЕНКО, А. В. НОВИК , Ю. М. ГРИЩЕНКО-МОРОЗ

ПУТИ ОБЕСПЕЧЕНИЯ БЕЗОПАСНОСТИ ПИТАНИЯ В УКРАИНЕ В УСЛОВИЯХ СОВРЕМЕННЫХ ЭПИДЕМИЧЕСКИХ СИТУАЦИЙ

Мир столкнулся с беспрецедентной угрозой пандемии, вызванной вирусом SARS-CoV-2. Пищевая промышленность Украины должна иметь систему управления и контроль безопасности пищевых продуктов в периоды пандемий. В работе рассмотрены общие принципы пищевой гигиены, направленной на внедрение гигиенического контроля на каждом этапе цепи обработки, производства и реализации пищевых продуктов для предотвращения заражения пищевых продуктов в период эпидемий. Рассмотрены основные рекомендации ВОЗ и Министерства Здоровья Украины о предотвращении распространения вируса на пищевых предприятиях и обеспечении безопасности питания в мире и их реализация во время пандемии в Украине. Акцентировано внимание на рекомендациях по использованию средств дезинфекции для обработки поверхностей, контактирующих с пищевыми продуктами, эффективными при использовании против вирусов. Было рассмотрено несколько классов соединений, рекомендуемых для использования в качестве дезинфекционных составляющих, учитывая их возможную токсичность и механизм действия. Показаны преимущества использования УФ-С облучения для дезинфекции в пищевой промышленности во время эпидемий. В статье проанализированы основные меры, эффективно используемые для обеспечения нераспространения вируса на рабочих местах пищевых предприятий, торговых сетей и заведений общественного питания. Использование сети интернет для получения заказов и доставки продуктов питания из торговых сетей и общепита является одним из перспективных при условиях пандемии.

Ключевые слова: безопасность пищевых продуктов, гигиенический контроль, дезинфицирующие вещества, короновирусы

О. О. ЧЕРНУШЕНКО, Г. В. НОВІК, Ю. М. ГРИЩЕНКО-МОРОЗ

ШЛЯХИ ЗАБЕЗПЕЧЕННЯ БЕЗПЕКИ ХАРЧУВАННЯ В УКРАЇНІ В УМОВАХ СУЧАСНИХ ЕПІДЕМІЧНИХ СИТУАЦІЙ

Світ зіткнувся із безпрецедентною загрозою від пандемії, спричиненої вірусом SARS-CoV-2. Харчова промисловість України повинна мати системи управління та контроль безпеки харчових продуктів в періоди пандемій. В роботі розглянуті загальні принципи харчової гігієни, спрямованої на впровадження гігієнічного контролю на кожному етапі ланцюга обробки, виготовлення та збуту харчових продуктів для запобігання зараженню харчових продуктів в період епідемій. Розглянуто основні рекомендації ВОЗ та Міністерства Здоров'я України щодо запобігання розповсюдження вірусу на харчових підприємствах та забезпечення безпеки харчування у світі, їх реалізація під час пандемії в Україні. Акцентовано увагу на рекомендаціях щодо використання засобів дезінфекції для обробки поверхонь, що контактують з харчовими продуктами, які є ефективними при використанні проти вірусів. Були розглянуті декілька класів сполук, що рекомендують для використання в якості дезінфекційних складових з огляду на їх можливу токсичність та механізму дії. Показано переваги використання УФ-С опромінення для дезінфекції в харчовій промисловості під час епідемій. В статті проаналізовані основні шляхи, які використовували щодо ефективного забезпечення нерозповсюдження вірусу на робочих місцях харчових підприємств, торговельних мереж та закладів харчування. Використання мережі інтернет для отримання заказів та доставки продуктів харчування з торговельних мереж та закладів харчування є одним із перспективних при умовах пандемії

Ключові слова: безпека харчових продуктів, гігієнічний контроль, дезінфікуючі речовини, короновіруси