

IMPACT OF COVID-19 PANDEMIC ON THE FOOD SAFETY REQUIREMENTS IN THE FISH AND SEAFOOD CHAIN

Mihaela GEICU-CRISTEA, Elisabeta Elena POPA, Paul-Alexandru POPESCU,
Mihaela Cristina DRĂGHICI, Amalia Carmen MITELUȚ, Mona Elena POPA

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: elena.eli.tanase@gmail.com

Abstract

Producing safe and high-quality fish and seafood products, for both domestic and export markets must be considered a priority for the entire fish and seafood chain, from fishers and producers towards consumers and food safety competent national authorities, who should update the relevant food safety legislation and ensure compliance with it. The aim of this study is to highlight the rules of hygiene and food safety that are imposed on the fisheries and seafood sector in order to prevent staff illness with Covid-19 and ensure the safety of products. Several practical recommendations are given for completion and improvement of the current preventive measures such as good hygiene practices to which is added specific protocols to safeguard the health of the employees who works in the fish and seafood production and processing sector.

Key words: fish and seafood products, food safety, good hygiene practices, preventive measures, fish and seafood production and processing sector.

INTRODUCTION

Coronaviruses are a large family of viruses and a subset of *Coronaviridae* that include a group of viruses which are capable to induce disease in humans and animals, and consist of common cold virus up to more severe pathogens such as SARS-CoV that causes Severe Acute Respiratory Syndrome (SARS), MERS CoV that causes Middle East Respiratory Syndrome (MERS) and SARS-CoV-2 that causes Coronavirus disease (Covid-19) (Ranaei et al., 2020).

The recently coronavirus disease (Covid-19) that emerged in the Wuhan city and then in Hubei province in China has rapidly spread around the world, resulting in the declaration of a pandemic by the World Health Organization (WHO) on March 11, 2020.

After more than 2 years of pandemic, Covid-19 continues to spread and thousands of new cases occur every day worldwide due to the lack of specific antiviral treatments for this virus (Han et al., 2021). The best way to prevent and slow down transmission is to be well informed about the disease and how the virus spreads (WHO, 2022a).

At the time of this review, over 500 million confirmed cases and over six million deaths have been reported globally due to Covid-19 disease (WHO, 2022b). Therefore, many countries have implemented social distancing measures, or more stringent lockdown, doing great efforts to slow the spread of the virus and thus reduce the pressure on the public health system (by reducing the number of hospitalized humans).

The Covid-19 pandemic and subsequent lockdowns are creating health and economic crises, with extensive social and economic effects, changing our habits, affecting the way we live, work, shop, travel and interact (EFSA, 2022a). Some groups and sectors are highly susceptible and vulnerable to the rapid social and economic effects of the Covid-19 pandemic (Bennett et al., 2020). In addition, each country is facing adverse impacts on their economies due to the Covid-19 infection, with marketing problems throughout food supply chains, which is one of the worst-hit areas (Han et al., 2021).

This paper aims to give an overview of potential food safety requirements through additional good hygiene practices to which

some specific protocols could be added in order to minimize the risk of virus transmission and to safeguard the health of the employees who work in the fish and seafood production and processing sector.

MATERIALS AND METHODS

This paper is based on recently published articles, accessing Science Direct from Information platform, also on information available on Food and Agriculture Organization (FAO), Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDC), Occupational Safety and Health Administration (OSHA), World Health Organization (WHO), European Food Safety Authority (EFSA) websites as well as specific legislation in different countries. First, the used search terms were “covid-19 or coronavirus disease impact” and “seafood or fishery or aquaculture sector”, afterwards a selection was made and a database collection was created with the newest items which were focused on responses about Covid-19 pandemic and its effects on fisheries and seafood sectors.

This work could help the specialists from fishery and aquaculture sector to implement protocols necessarily for human health monitoring at the workplace as well as establishing new requirements for good hygiene practices in the fish and seafood processing factories up to the final consumer.

RESULTS AND DISCUSSIONS

The design and the implementation of strict working Procedures and Protocols are necessary so that the activity in the fish and seafood sector can be carried out in the best conditions that will ensure the maintenance of the workers' health and the reduction of virus spread.

Recommendations for primary production and processing sector

Coronavirus disease (Covid-19) is an infectious disease caused by the SARS-CoV-2 virus (WHO, 2022a). Despite some similarities to smaller shocks, the Covid-19 global pandemic has triggered larger, more unpredictable and synchronous impacts felt throughout the entire

food supply chains (White et al., 2020), which has been seriously disrupted with impacts occurring at multiple levels and across supply chains (Hobbs, 2020; Global Panel, 2020; Devereux et al., 2020; Chenarides et al., 2020). Fish and seafood chain has also been affected by the restrictive measures imposed in the context of this pandemic and its impact has been extremely strong (Baldwin & Tomiura, 2020; Zhang et al., 2021). Fishers, processors and sellers also face risks of Covid-19 spread and infection, and thus have to make difficult decisions - feeding their families or risking exposure (Bennet, 2020). Fishing communities and ports could potentially become “hotspots” for rapid infection due to the migratory nature of fishers and frequency of international visitors (FAO, 2020).

Guidance from the Centers for Disease Control and Prevention (CDC) advises that critical infrastructure workers may be permitted to continue to work following potential exposure provided (1) they remain asymptomatic, (2) they do not test positive, and (3) additional precautions are taken to protect them and the community. Factors that may increase risk include duration of contact, type of contact (respiratory droplets from talking, coughing, or sneezing) and housing or living quarters (CDC, 2020).

It is necessary to develop policies and to establish procedures within any onshore or offshore factory in order to minimize the risk of transmitting this virus to the workplace. For this purpose, the employer should identify a qualified worksite coordinator responsible for Covid-19 assessment and control planning. The Covid-19 coordinator must be aware of and follow all applicable regulations and public health guidelines. Covid-19 coordinator will have the responsibility to establish the communication channels for workers informing on the good hygiene practices and food safety procedures that are established in the unit as a result of the regulations and the public health legislative measures.

Communication in risk management is essential for carrying out the activity at work and can contribute to more efficient management of food safety and also more effective health education activities. Employers must ensure that all workers know how to contact and

communicate with the worksite coordinator via the communications channels that were previously insured. Risk communication is an element of risk analysis, but it also plays a central role in health education in food safety, which is a risk management option. Iterative risk communication takes place between regulatory risks assessors and risk managers in the context of their duties. It also takes place between these authorities and stakeholders of the food chain, including industry, consumers, and others (Motarjemi et al., 2014). One of the recommendations to prevent the disease from spreading is to even quarantine staff before boarding a fishing vessel for a period of time set by the authorities, which employers should consider paid leave or worktime.

In Alaska, seafood processors are implementing quarantines for incoming seasonal workers, modifying processing lines to increase social distancing, providing daily screenings, and procuring medical supplies. These actions are necessary to maintain operations and seafood production while protecting workers and communities (Campbell, 2020).

Some large fishing vessels that process fish at sea may be especially vulnerable to virus transmission, because workers live and work in close quarters for weeks at a time sometimes (CRS report, 2020).

Screening workers for Covid-19 symptoms before they enter the worksite or aboard the vessel as well as periodically monitoring their health status at regular intervals, could be a preventive measure. It is also recommended to test the new entrants into the worksite and those who are re-entering after an absence. This screening may include a questionnaire on symptoms, control of body temperature of employees, rapid tests for virus detection in order to receive results before entering the worksite and, if necessary, PCR tests. It is also necessary to appoint a person in charge of the screening activities of the workers.

An action plan is required when there are workers who have specific symptoms of Covid-19 as well as for employees who decline testing or who are unable to be tested. A number of

measures should be taken to this end, such as: (a) providing access to medical care or telemedicine for workers who have symptoms or a positive test result, (b) encourage workers to self-isolate when they have symptoms, (c) ensure communication with health officials, workers in quarantine or isolation and human resources department in order to ensure their replacement in the food factory, (d) providing rapid test for direct contacts at the workplace.

An important issue for employers is to ensure protection measures to reduce the virus spread at workplace, therefore actions like providing appropriate personal protection equipment (PPE) to workers and training them how to properly use it (put on, take off, dispose or clean if reusable) are really necessary. PPE must consist of gloves, gown, eye protection and face mask (an N95 filtering respirator face-piece or more protective ones are recommended), at minimum. Also, a safety measure to limit the virus spread is to ensure adequate ventilation in the work areas through minimizing the use of hard-mounted cooling fans, which can blow potentially infectious droplets from one worker to another. Another issue in designing the safety protocols for worksites is to ensure social distancing, at least 6 feet apart in all directions for workers inside working areas and physical barriers at the workplace. For this purpose, is allowed to use markings and signs to remind workers to maintain social distancing.

When a sick or symptomatic person is on board the vessel, a special procedure should be followed which implies immediate isolation in a specially arranged area with single occupancy quarters and a separate bathroom, if available. In this case a safely transportation of sick workers at home or at hospital, if needed, is recommended as well as cleaning and disinfection of the work areas, equipment, respectively common areas; the access of the other workers in these areas being allowed only after cleaning and disinfection procedures are finished. Workers with Covid-19 must return to work when their state of health allows it and when compliance with all the recommendations imposed by the authorities is ensured.

Table 1. Action plan for food safety requirements to protect fishery and seafood workers from Covid-19

Actions	Measures	Comments
Appoint a qualified employee as coordinator responsible for Covid-19 assessment and control planning	<ul style="list-style-type: none"> - Ensuring a risk communication procedure; - Ensure that Covid-19 coordinator is up to date with the regulations; 	Adequate/Inadequate
Develop specific protocols and procedure for worksite	<ul style="list-style-type: none"> - Hygiene Protocols; - Personnel Training Programme; - Covid-19 Testing Procedure; - Worksite Cleaning and Disinfection Procedures; - Action plan for sick workers; - Action plan for close contact workers with someone with confirmed or suspected Covid-19. 	Adequate/Inadequate
Develop and implement a testing plan	<ul style="list-style-type: none"> - Preventive testing of all employees once a week; - Testing of new entrants into the worksite and those re-entering after an absence/a holiday; - Establish a procedure for employees who refuse testing or are unable to be tested; - Choosing a quick detection test to be supported by a PCR test when needed. 	Adequate/Inadequate
Establish the Priorities by which workers will be tested	<ul style="list-style-type: none"> Priority for testing workers with symptoms Immediate testing of direct contacts or suspected cases (within 6 feet for a total of 15 minutes or more) 	Adequate/Inadequate
Monitoring the health of employees	<ul style="list-style-type: none"> - Testing the body temperature before every work shift; - Conducting screening interviews; - Conducting rapid test. 	Adequate/Inadequate
Develop and implement an action plan for Covid-19 confirmed or suspected workers	<ul style="list-style-type: none"> - Protect confidentiality of suspected or confirmed Covid-19 workers - Provide an isolation room for sick workers. 	Adequate/Inadequate
Manage the health status of the sick workers	<ul style="list-style-type: none"> - Ensure access to health care system, to hospitals if needed or telemedicine for sick workers; - Provide isolation or quarantine rooms at the worksite (on board fishing vessels for example) if needed, for confirmed or suspected Covid-19 workers. 	Adequate/Inadequate
Develop and implement measures to assure social distancing in the workplace	<ul style="list-style-type: none"> - Assure 6 feet distance between workers in all working areas; - Establish safety protocols during the mealtimes, break times, etc.; - Ensure good airflow in common working areas. 	Adequate/Inadequate
Emphasized the important measures for personal hygiene	<ul style="list-style-type: none"> - Provide regularly good hygiene practices training; - Provide hand washing/sanitizing materials; - Provide personal protection equipment (PPE) for workers (Gloves, face masks, etc.); - develop and implement cleaning, disinfection and sanitation protocols for working areas; - Displaying posters with specific information for safety and hygiene practices. 	Adequate/Inadequate
Conducting regular monitoring	<ul style="list-style-type: none"> - Identify human health exposure risks; - Checking the compliance with hygiene rules; - Ensure implementation of hazard controls. 	Adequate/Inadequate

An action plan for food safety requirements to protect fishery and seafood workers from Covid-19 was design and provided in Table 1. Safety protocols must be implemented in order to reduce crowding in all common areas and keep the social distance during work shifts, mealtimes and break times. Employees must be periodically trained to respect the safety and

hygiene protocols and to comply with it during the work time and as much as possible after that. To remind them of the instructions learned during the training the employees can provide visual cues such as floor makings, signs, posters, etc. Posters can be placed at the worksite entrances and in all common areas to reinforce training. The information provided by

the posters can be written in all preferred languages, easy to understand and it can include: (a) information about Covid-19 symptoms, how it spreads, how workers can protect themselves; (b) proper handwashing and use of hand sanitizer; (c) social distancing practices at the worksite; (d) cough and sneeze etiquette; (e) clear instructions about putting on and taking off PPE, gloves, goggles, face shields and face masks; (f) how to proceed if workers become ill, presents Covid-19 specific symptoms or if they are close contact with someone with confirmed or suspected Covid-19. If the employer provides transport for the workers, then he should coordinate this activity so as to ensure their movement in compliance with the conditions of social distancing. While traveling, both the driver and the employees must be encouraged to wear face masks and follow the coughing and sneezing etiquette. Good hygiene practices implemented must be further supported and adapted to the new epidemiological conditions. Regarding the hygiene rules of the staff, regular training for workers should be organized and their awareness in multiple ways, such as the instructions displayed in visible places on washing hands as often as possible with soap and water at least 20 seconds. It is recommended, if possible, to increase the number of hand washing stations, also to provide access to temporary stations equipped with hand sanitizer containing at least 60% alcohol or other appropriate sanitizer, which can be placed in multiple locations including entry, exit, changing rooms, smoking place, time clock stations. In this sense, the permanent supply and availability at work of hygiene products (soap, sanitizer, single-use towels, etc.) and protection materials (gloves, gown, eye protection, face masks, etc.) must be ensured. Employees can conduct additional training in order to educate workers to adopt a behavior that limits the spread of the virus such as: (1) to avoid touching their faces, including their eyes, nose and mouth, until after washing hands thoroughly; (2) to wash and sanitize their hands after completing work, removing PPE, removing face coverings, and before and after eating, smoking or touching their face; (3) to ensure that face masks fit over the nose and mouth and fit snugly and comfortably against

the side of the face, are secured with ties or ear loops, include multiple layers of fabric, allow for breathing without restriction; (4) to wear clean face masks, do not use if they become damaged, wet or contaminated and change them whenever needed; (5) to handle the face masks as little as possible to prevent transferring it infectious materials.

Best practices recommended for shopping food

Prevention of SARS-Cov2 transmission during shopping of food must also be a priority for retailers and stores. Therefore, they have to implement safety measures for their employees as for customers. A longer operating schedule could prevent stores from crowding along with procedures that prioritize vulnerable consumer segments such as the elderly.

During this pandemic, consumers are getting most of their food from grocery stores, and many stores have modified their operating hours to allow for more time to restock shelves and clean. In addition, many stores are providing special hours for seniors or other high-risk individuals to shop and are offering pick-up and delivery services (FDA, 2020).

In order to limit the transmission of the virus authorities recommend to consumers to follow a few rules such as: (1) to prepare a shopping list in advance so as to shorten the time they spent in the store; (2) to wear a face covering or mask while they are in the store; (3) to wipe down the handles of the shopping cart or basket with their own wipes, or use the ones provided by the store; (4) to practice social distancing while shopping, keeping at least 6 feet from other shoppers, and store employees; (5) to wash their hands with warm water and soap for at least 20 seconds when they return home and again after putting away their groceries; (6) before eating, to rinse fresh fruits and vegetables under running tap water, including those with skins and rinds that are not eaten; (7) to regularly clean and sanitize kitchen counters using a commercially available disinfectant product.

CONCLUSIONS

The Covid-19 pandemic has raised a lot of issues regarding the public health systems capacity and the food chain sustainability

which has led to economic and food crisis all over the world. There was a lack of collaboration and actions between government, agencies, industries and individuals which causes disruption along the food chain from primary producers to final consumers. It is desirable that national and international agencies have a comprehensive and integrated approach through combined and complementary knowledge, skills and expertise, as well as their agility to deliver scientific advice for policy makers. Also, these agencies could be a source of expertise and networks for foresight activities in crisis management for future threats of any kind. These guidelines could be a useful tool in designing a better risk management system for seafood or fishery workplaces and consumers in order to keep under control the risk assessments and risk communications in crisis like pandemics.

ACKNOWLEDGEMENTS

This research work was carried out through a common contribution of all authors. The results and conclusion highlight the authors opinion regarding the safety requirements for seafood, fishery or aquaculture workplaces and also for retailers and consumers in order to minimize the virus spread in context of the Covid-19 pandemic.

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