Covid-19 and Food Safety

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Coronavirus Disease

(COVID-19)

Editors
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PREFACE

In the historical process, there have been pandemic periods that affect the whole world from time to time. According to the definition of WHO (World Health Organization), a pandemic is considered to have started only when the following 3 conditions are met:

- The emergence of a disease that the population has not been exposed to before
- The causative agent of the disease infecting people and causing a dangerous disease
- Spread of the disease factor easily and continuously among people

A disease or medical condition cannot only be considered a pandemic because it is widespread and kills large numbers of people, but must also be contagious. For example, although cancer is a disease that causes many deaths in humans, it is not considered a pandemic because it is not contagious. There have been major epidemics in world history. Antoninus (Galen) Plague (165-180 AD), Justinian plague epidemic (AD 541-542) Black Plague (1346 - 1350), Fifth Cholera Pandemic (1879 - 1881), Modern Plague (third plague pandemic) (1894-1903) , Sixth Cholera Pandemic (1899-1923).


It is also obvious that these pandemics, which affect the history and development of humanity, will cause bigger problems in the future with the increasing human population and the depletion of world resources. As scientists, this study aims to provide information to the public about the definition, development and spread of the virus that causes the current
Covid-19 pandemic and to present it as a book section to share with researchers.

We would like to thank the publishing house and our colleagues who contributed to the publication of this publication.

Best regards

Prof.Dr. Belgin SIRIKEN
Asst. Prof. Dr. Ayhan GULER
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Chapter V

COVID-19 and FOOD SAFETY

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1. Introduction

As a result of the genomic analysis performed by the World Health Organization in the seafood market in Hubei province of Wuhan city of China, it was understood that the factor was a new type of virus called “SARS-CoV-2”. SARS-CoV-2 infection has been named as Coronavirus (CoV-Coronavirus) Disease 2019 (COVID-19) by the World Health Organization (WHO). COVID-19 quickly spread to many countries and continents and was officially declared as a pandemic by WHO as it killed more than 4000 people till March 11, 2020. (Park, 2020; Tuba 2020).

This nomenclature naming was made based on the abbreviation of the word COVID-19, corona (corona-CO), virus (VI) and diseases (D). It has gained an international dimension, which first appeared in China and later spread to the world, especially Asian countries, and therefore this disease has been evaluated as an “epidemic” (TUBA, 2020).

Coronaviruses (CoV) are single chain, positive polarity, enveloped RNA viruses in the Coronaviridae family, which are located in the Orthocoronavirinae subfamily, causing
serious respiratory disease. Coronaviruses are positive single-stranded and enveloped RNA viruses, the RNA size ranging from 26 to 32 kb. Both α- and α-CoV strains are known to infect mammals.

2. Symptoms

Though many pathogenic coronaviruses for humans often cause mild clinical symptoms, Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) are zoonotic coronaviruses within the genus β-CoV and cause severe acute respiratory syndrome (Lu et al., 2020; Memikoğlu and Genç, 2020). Coronaviruses have been identified for several mammals including camels, bats, mice, dogs, cats in many birds (Cavanagh, 2007; Ismail et al., 2003) as well as humans. Today, mammalian coronaviruses have been regularly identified (Lu et al., 2003). For example, HKU2- bat coronavirus was blamed for fetal acute diarrheal syndrome in 2018 (Zhou et al., 2018).

They cause a wide variety of respiratory infections, ranging from the common cold to pneumonia (pneumonia) in humans. Incubation period is 3-5 days. The disease is self-limited within 4-6 days and patients recover quickly. In severe cases and in the risk group, pneumonia occurs. Symptoms of disease caused by coronaviruses are cold, with a 35% percentage sore throat, dry cough, runny nose, weakness and fatigue. It is generally seen every year in autumn and winter months (Tuba 2020). Lu et al. (2020) The most common symptoms of COVID-19 were determined as fever, cough and difficulty in breathing. Sore throat, diarrhea and nausea are observed in 5% of all cases where vomiting observed in 1-2%. Pneumonia, severe acute respiratory failure, multiple organ failure and death were observed in patients with advanced course. DUZELTİLMELİ.

3. COVID-19's Ability to Stay Alive in Outdoor Environments

SARS-CoV-2 (coronavirus 2), formerly referred to as HCoV-19, is a severe acute respiratory syndrome and the
ability of virus resistance in the external environment depends on many environmental factors such as ambient temperature, humidity ratio in the air and surface conditions (T.C.Ministry of Health, 2020), as well as it depends on the specific type of virus and amount of the virus. In general, the human coronavirus cannot survive on dry surfaces. Inactivation of the virus in dry environments usually ranges from a few hours to a few days. In a study conducted by the American Working Group it was reported that SARS-CoV-2-nn was able to survive for 3 hours in the air, 4 hours on copper surfaces, 24 hours on cardboard and 2-3 days on stainless steel and plastic surfaces, Up to 3 hours of survival in the air also indicates that the virus can be transmitted by inhalation. In laboratory studies, due to the controlled atmosphere and high contamination rate, it was observed that Corona virus SARS-CoV-2 is less resistant as compared to other pathogens and various non-enveloped viruses or bacterial spores In natural environments, due to changes in temperature and humidity, daylight and lower contamination levels, their durability in natural environments is much lower compared to studies conducted in laboratory environments. (American Working Group, 2020).

4. Foodborne COVID -19

Food-borne microorganisms such as bacteria, viruses and parasites in Germany cause about 100,000 cases every year. Coronaviruses that infect animals can occasionally spread to humans, though rarely. Coronovirus cannot grow in food as it needs a live host for reproduction and development (BfR 2020a, b, WHO, 2020). Just like SARS, no data on the foodborne spread of CoVID-19 among humans and an no outbreak caused by oral-faecal transmission have been identified (Mullisa et al., 2012).

Coronavirus factor; turns to be inactive after 10-15 minutes at 56 ° C, a few days at 37 ° C, and a few months at 4 ° C (Siddell et al., 1983). However, the agent is resistant to freezing and can survive for years without losing its infection ability at -60 ° C (Andries et al. 1978; Siddell et al., 1983).
The human coronavirus is highly sensitive to the dry surface and stays alive for up to 3 hours on the dry surfaces of the hospital (Sizun et al., 2000).

**Bakery products:** Bakery products (such as pastries, pies) or vegetables and fruits can be directly contaminated by Coronavirus during sneezing or coughing of infected people. However, viruses cannot reproduce in foods. Retail bakery products are generally prevented from contamination often prevented by using a splash barrier (protective equipment) from contamination caused by sneezing or coughing consumers (BfR 2020a, b).

**Vegetables and fruits:** When vegetables and fruits are prepared, general hygiene rules, such as direct washing of food or frequent hand washing, should be followed (BfR, 2020a).

**Frozen foods:** To date, there is insufficient evidence for SARS-CoV-2 contamination by food infection. Previous coronaviruses, SARS and MERS, are cold-resistant and can remain intact in frozen-form for up to 2 years at -20 ° C and even -60 ° C. Therefore, the general hygiene rules must be observed (BfR 2020a).

**Imported foods:** Limited data are available regarding the spread of this virus to foods, imported products (such as mobile phones and toys), tools such as door handles and tools, and plates and tableware (such as knives and forks) (BfR, 2020b). There is no evidence to suggest that imported animals or animal products pose a risk for the spread of the 2019 novel coronavirus in the USA (BfR 2020a).

**Food packaging:** COVID-19 factor SARS-CoV-2's duration of staying alive outside the living organism may change depending on the environmental conditions. Despite the fact that SARS-CoV-2 lives on cardboard for a maximum of 24 hours and in experimental environments under controlled relative humidity and temperature for steel, plastic and similar hard surfaces virus can remain live for a few days, no data available for contaminated packages exposed to
different environmental conditions and temperatures transmit the infection. However, there is no risk of contamination of the respiratory system by contact with the mucous membranes of the virus found in the skin of contaminated people (for example, by touching the face). Concerns can be raised if people who intervene in packaging, including consumers, comply with regular and effective handwashing and effective general hygiene rules by public health officials (European Commission, Cyprus, 2020).

The European Commission has published an Internet document on the subject “Cyprus, Food Safety and COVID-19” (European Commission Cyprus, 2020). In this, document following information was revealed.

**Food workers:** Food operators are responsible for the implementation of adequate hygienic measures by their employees, according to EU food safety legislation. General hygiene practices should be applied by food companies and food workers. Additional measures must be taken by business owners and relevant authorities under COVID-19. Within the scope of these measures, keeping the social distance between people or using plexiglass, preventing contact between truck drivers and food facility, prevention of excessive usage of hand disinfectants may be stated. The number of employees should be minimized also. Precautions should be taken against being an asymptomatic carrier working in the food business. Within the scope of these precautions, high personal hygiene (none hygienic behaviors such as sneezing or coughing while producing or processing food must be prevented and regular hand washing must be observed), including wearing appropriate, clean and protective clothing when necessary and consistently applying good proper hygiene rules, while handling food products minimize the risk of transmitting viruses. In addition, if an employee's virus test is positive, additional sanitary measures should be taken, depending on the level of risk. In general, food workers should wash their hands frequently with soap and, if necessary, use antiseptic. Food operators should train their employees on how to properly use personal protective
equipment and remind how important it is to comply with the rules for personal hygiene and social distancing rules. (European Commission, Cyprus 2020; Galanakis 2020).

To date, there is no data on the presence of the COVID-19 spreading on food products. Likewise, there is no evidence that food is a source or tool of infection. However, theoretically, as door knobs or other surfaces touched by infected people may cause spread of virus, food products if handled by infected people may cause contamination (European Commission, Cyprus, 2020; Galanakis 2020; WHO 2020). Therefore, everyone should follow the advice of public health officials on washing hands. General hygiene rules should be followed when retailers treat food products. Personnel who need to contact food at the supermarkets (for example, cutting meat, slicing meat or dairy products, cleaning fish, packing fruits and vegetables) should wear gloves and change gloves frequently or otherwise wash their hands frequently. Consumers should also fulfill their responsibilities. As a good practice of hygiene in general, customers in stores should not touch food other than what they want to buy to avoid contamination with any pathogens they may have (European Commission, Cyprus, 2020; Desai and Aronoff, 2020).

At home, food should be properly stored and contact between cooked food and raw food must be avoided, food should be stored after removing the outer packaging, fruit and vegetables should be systematically cleaned and washed thoroughly, cross-contamination between knives, forks, plates and foods should be avoided, and foods to be cooked should be exposed to necessary temperature during enough time period, hands should be washed thoroughly with soap after contact with food and refrigerator and kitchen surfaces should be cleaned frequently (European Commission, Cyprus, 2020; Galanakis 2020).

As a result, in line with current information, the oral-digestive system, in other words, the esophageal-gastrointestinal tract does not play a role in SARS-CoV-2
outbreaks. The main source of transmission is through droplet infection during coughing and sneezing. These droplets are absorbed by the respiratory system, mouth and eye mucous membranes of other people and contamination occurs. In the laboratory studies of SARS coronavirus it was proven that virus has become fully inactivated after 5 minute-contact with conventional detergents at room temperature. Although it is unlikely that this virus will be transported with contaminated food or imported products, regular hygiene rules must be observed every day, such as regular hand washing and compliance with hygiene rules during food preparation (BfR, 2020a). Since this virus is heat sensitive, the risk of infection can be reduced by applying heat to foods (BfR 202b). Widespread hygienic measurements, proper and frequent washing with soap and regular surface cleaning, washing and cleaning of standard home surfactant-based door handles should be practised (BfR 2020a). In enveloped viruses, the surrounding of the genetic material is covered with a layer of fat. Therefore, an enveloped virus is highly sensitive to degreasers such as alcohol or surfactants containing soap and dishwashing detergents. These substances inactivate the virus, causing damage to the envelope layer of the virus. Although no work has been done in this regard, if the dishes or cutlery, are washed in the dishwasher at 60 °C or above, this virus will most likely be inactivated (BfR, 2020b). In washing with cold water, dense and suitable detergent should be used but detergent should not be applied for long time, and washed materials should be dried immediately (Lai et al., 2005).

5. Methods of Protection from COVID-19

1. Frequent washing of hands: Hands should be washed frequently. This washing procedure should be done especially after cleaning your nose, when you cough or sneeze, when you go to the bathroom and before eating or preparing food (BfR 2020a, b).

Wash your hands immediately with soap and water for at least 20 seconds. If there is no soap or water, your
hands should be cleaned with an alcohol-based hand sanitizer containing at least 60% alcohol. Eyes, nose and mouth should not be touched with unwashed hands (BfR 2020a, b).

2. Cleaning and disinfection: If the surfaces are dirty, they should be cleaned. Detergent or soap and water should be used before disinfection. The use of the most common EPA registered home disinfectants should be preferred and the surface suitable-disinfectant should be selected. Bleach should be diluted. For example; Use 5 tablespoons (1/3 cup) of bleach for 3,785 liters of water or 4 teaspoons of bleach for a quarter of water. Alcohol solutions should contain at least 70% alcohol. Surfaces used on a daily basis should be disinfected frequently (tables, door handles, light switches, countertops, handles, tables, phones, keyboards, toilets, taps and sinks) (BfR 2020a, b). For surface cleaning, 62-71% ethanol, 0,5% hydrogen peroxide, 0,1% sodium hypochlorite should be applied for 1 minute for SAES, MERS and HCoV. But it is not known for COVID-19. However, these agents can be used (Kampf et al.2020).

3. Item sharing: Dishes, glasses, food containers, towels or bedding in your home should not be shared with other people. After using these materials, they should be washed thoroughly with soap and water or put in the dishwasher and washed (BfR 2020a, b).

4. Laundry and textile products: No concrete information is available as to how long the SARS-CoV-2 virus remains live in the textile or washing machine. Textile products such as clothes, bed linen, bedding, towels and underwear of the sick people contaminated with the body fluids of infected people, should be washed in the washing machine with a dense detergent at least 60 ° C and then should be dried. While hand-washing textile products of contaminated people, the textiles touching directly to the skin or exposed to body fluids of sick people should be avoided (Robert Koch Institut, 2020). Widespread hygienic measurements, proper and frequent hand-washing with soap
and regular surface cleaning, disinfecting standard house surfactant-based door handles should be applied (BfR 2020a).

References


