

## Chapter 23

# Effect of the COVID–19 Pandemic on Food Safety and Nutritional Behaviors

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### ABSTRACT

*Global events like pandemics or climatic changes have an important influence on food systems. Taking into account consumer requirements during the pandemic, nutrition and food safety are very significant for individuals' well-being. Lockdowns, quarantine, and social distancing changed daily routines as well as nutritional behaviors from shopping for food to eating habits. Direct transmission of coronavirus through food was not observed. Food safety and food sustainability are strongly affected due to the COVID-19 pandemic. Unfortunately, the pandemic is still ongoing. For this reason, novel treatments of COVID-19 and immune-boosting food products will remain on-trend. Food loss and food waste should be avoided to achieve a sustainable food future. This chapter reveals a basis for the pandemic about the changes on nutritional behaviors, eating habits, and aimed to highlight the importance of food handling and food safety issues to create awareness. Future studies should investigate the sustainability, innovative technologies, mechanisms, and changes on nutritional behavior and food safety aspects during the pandemic.*

### INTRODUCTION

Increased population density and the ease of international transportation allowed the spread of infectious diseases across the world. The world is currently experiencing unusual times due to the pandemic. The ongoing pandemic presents an exceptional and unprecedented challenge for people. The novel Coronavirus belonging to the *Orthocoronavirinae* subfamily was first detected in Wuhan, Hubei, China, in December 2019 (Dey et al., 2020). The coronavirus disease, a severe acute respiratory syndrome Coronavirus 2 (SARS-CoV2), defined as COVID-19, is a worldwide pandemic as declared by the World Health Organization (WHO) that has several emotional, psychological and economic impacts (Zhu et al., 2020; Dey

DOI: 10.4018/978-1-7998-8674-7.ch023

et al., 2020). The pandemic has pointed out once more the importance of food security and food safety (Ayseli et al., 2020). The most noticeable effect was on consumers' behaviors in terms of the shopping for food products and change in eating habits (Ayseli et al., 2020; Aday and Aday, 2020). The objectives of this chapter is to examine the effects of COVID-19 pandemic on nutritional behaviors and the changes in consumers' eating habits, and to present scientific perspectives on the impact of the COVID-19 on alternative nutrition types, food transportation and food safety issues.

## **NUTRITION AND HEALTH DURING THE COVID-19 PANDEMIC**

COVID-19 continues to affect the world. The novel virus has already infected more than 188 million people and caused over 4 million deaths until July 2021 (CSSE, 2021). Multiple vaccines were developed rapidly giving hope for controlling the outbreak. Vaccines introduce antigens into the body to create an immune response. Eight vaccines were approved up until June 2021 (Zimmer et al., 2021). COVID-19 has no borders, age, wealth, ethnicity, or indeed nationality. Immune response of vaccines may change according to the health status and nutrition types of populations. With the use novel technologies such as real-time vaccination, big data analytics, Internet of Things (IoT) and block chain technologies, attempts are made to manage the current pandemic and get prepared for any other possible future pandemics (Michie and West, 2021). Although there are several phase III trials, the authorities and scientific community are still trying to find out the treatment for the disease (Galanakis, 2020; Zimmer et al., 2021). There are several clinical trials of FDA approved medications on the treatment and prevention of COVID-19. These include azithromycin, hydroxychloroquine, tocilizumab, remdesivir, dipyridamole, and baricitinib. Beigel et al. (2020) found that remdesivir shortened the time of recovery from a median of 15 days to 11 days in a randomized, placebo-controlled trial leading to its FDA approval.

Besides clinical treatments, proper nutrition is very important for the immune system (Di Renzo et al., 2020a). Alternative nutrition types can be used in immune-boosting (Mcintosh et al., 1970). In the last decade, nutritional behaviors have changed to improve the immune system, physical and mental health. However, stress induced due to quarantine, lockdowns, social distancing and media news on COVID-19 affected individuals' nutritional behaviors. In this context, stress led people to increase the consumption of food containing high fat and simple carbohydrates (Di Renzo et al., 2020a; Ammar et al., 2020; Martinez-Ferran et al., 2020; Haleem et al., 2020). These kind of food products increase serotonin secretion that reduce stress and lead to positive feelings e but also increase the risk of obesity, diabetes, inflammation, cardiovascular diseases, and COVID-19 (Wu et al., 2020; Muscogiuri et al., 2020a).

Muscogiuri et al. (2020b) discuss that there is an interaction between lifestyle factors such as nutrition, sleeping quality and Body Mass Index (BMI). Muscogiuri et al. (2020b) studied the effect of Mediterranean diet on the sleeping quality of adult people and concluded that the BMI of good sleepers were significantly lower than poor sleepers. Mediterranean diet had lower body mass index and waist circumference. Food consumption had a direct effect on sleeping quality (Muscogiuri et al., 2020b). According to literature, Mediterranean diet may reduce the risk of cancer, Alzheimer, diabetes, Crohn's disease and depression (Cani and Van Hul, 2020; Sofi et al., 2008). People at higher risk of COVID-19 are older adults, people having chronic health conditions and severe obesity (body mass index of  $>40$  kg/m<sup>2</sup>) (CDC, 2020a).

During the pandemic, great attention has been paid to dietary supplements, (minerals such as zinc, magnesium, and selenium, vitamins such as vitamin C and D), bioactive compounds and nutraceuticals

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