

## Food Trucks in Times of COVID-19: An Overview

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### ABSTRACT

Food trucks are one of the best performing segments in the foodservice industry. However, the exceptional circumstances of SARS-CoV-2 pandemic have induced disruption in the food truck system, creating ripple effects and impacting public health from socio-economic, nutritional, and socio-cultural perspectives. Food trucks need to advocate for strategies at the individual and community levels by adopting creative and multi-level approaches, aiming to minimize the negative impacts of the pandemic. Considering this scenario, we aimed to review the effects of the COVID-19 pandemic in the food truck sector and the potential approaches for its disruption management.

**Keywords:** Food trucks; Disruption; Food safety; SARS-CoV-2; COVID-19

### INTRODUCTION

The current coronavirus disease (COVID-19) outbreak, caused by the transmission of SARS-CoV-2, was first identified in December 2019 in Wuhan, Hubei Province, China. About three months later, it was declared as a pandemic by the World Health Organization (WHO) [1]. On January 24<sup>th</sup>, 2021, the COVID-19 had spread to over 98 million people in more than 192 countries, leading to over 2.1 million deaths [2].

Although initially a health crisis, the SARS-CoV-2 pandemic has evolved into a major socio-economic and environmental one. The current global outbreak of COVID-19 exposed multiple vulnerabilities of food systems and economies, creating a scenery of high uncertainty and, consequently, inducing disruption of these systems around the world. Food systems represent the entire range of actors and activities related to the production, processing, distribution, regulation, preparation and consumption of food, including their biophysical and socio-economic environments [3].

Disruption can be defined as “a state during the execution of the current operation, where the deviation from plan is sufficiently large that the plan has to be changed sub-stantially” [4]. In the food systems context, disruptions have caused significant breakdown in the chain node between the production and consumption activities [5] both in the external dimensions-food

availability, prices, vendors-as well as personal dimensions-geographical access, affordability, convenience and desirability.

The exceptional circumstances created by the SARS-CoV-2 pandemic represent an unprecedented challenge for food services, including the Food Truck (FT) business and its actors. The mandatory closures of food businesses and the ban on street food vendors have directly impacted trucks' primary income source and current business models. In addition, the reduction in power purchase along with the avoidance of the eating out practice have abruptly forced consumers to change their behaviors and consumption patterns during the COVID-19 pandemic, leading to a drastic shift in the eating habits.

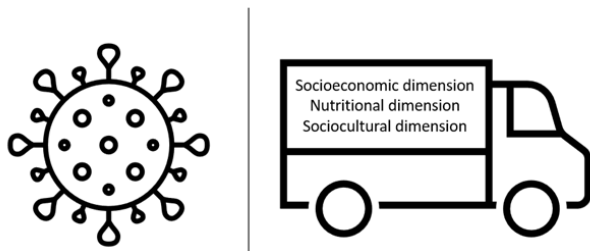
This article explores the COVID-19 disruption on the FT sector from a multidimensional approach (**Figure 1**). Firstly, the socio-economic impact on FT consumers' and vendors' concurrently by reducing employment rates and purchasing power of the former and the main source of income of the latter. Secondly, the nutritional issue, especially from the safety perspective, to ensure the adoption of precautionary measures to food safety and limit the spread of the SARS-CoV-2 virus. Thirdly, the emerging socio-cultural issues that have arisen with the imposition of social distancing measures and the avoidance of the social eating practice. Finally, the creative approaches, based on the most important issue FTs should address, to remain economically active and thrive amid adversity.

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**Figure 1:** Multidimensional impact of COVID-19 pandemic on the food truck sector.

**FOOD AWAY FROM HOME AND FOOD TRUCKS**

The eating patterns of the population worldwide have been changing due to urbanization and globalization [6]. The decreasing time spent on meal preparation and consumption, along with the increasing demand for food diversification, availability and accessibility, reflects the primacy of Food Away From Home (FAFH) in consumer’s routines [7]. According to a study published by IMARC Group, the global foodservice market size reached 3.4 trillion dollars in 2018, and is expected to reach 4.2 trillion dollars by 2024, spurred by increasing preference for convenience foods [8].

In parallel with the increase of FAFH, the FT industry has been facing rapid expansion and is one of the best performing segments in the foodservice sector. The global FT market is expected to grow from 1,846 million dollars in 2018 to 2,631 million dollars by the end of 2025 at a compound annual growth rate of 5.19% [9]. According to IBIS World report, their expansion in the USA, one of the countries with the largest volume of FTs, reached a growth rate of 6.8% between 2014 and 2019, with revenue generation of 1 billion dollars and a projection of 1.1 billion dollars in 2022 [10].

The FT movement is an increasingly prominent feature of the urban landscapes due to its relevance in developed and developing countries. They are itinerant miniature commercial kitchens, similar to brick and mortar restaurants regarding the special attention needed to time/temperature control during the food process chain and street food when considering their selling points and exposure to the environmental conditions [11]. FTs have a multidimensional contribution to the country’s environment that transcends the nutritional sphere: they play an important role in the socio-economic and socio-cultural dimensions. For owners and employees, the FT activity offers economic and logistic advantages, besides representing a source of income, employment, and opportunity to start up their own business [11]. For consumers, beyond offering accessibility and convenience, FTs have become a powerful trend due to their hedonic and social values they offer affordable and high-quality dining options and represent a moment of leisure and celebration at which people can establish group bonds [12]. Auad et al. [12] The FT movement also reflects social values and interacts with urban spaces, activating and shaping cities’ cultural and spatial gentrification processes [13,14].

**THE COVID-19 DISRUPTION ON THE FOOD TRUCK SECTOR**

The current global outbreak of COVID-19 exposed multiple vulnerabilities of food systems and economies, creating a scenery of high uncertainty and, consequently, inducing disruption of these systems around the world. In fact, the adverse impacts of the COVID-19 pandemic created a visible crisis scenario on food services businesses, including FTs. In March 2020, the adoption of lockdown and mobility restrictions imposed by local and/or national authorities to reduce virus transmission and decelerate the pandemic progression forced restaurants to close their dining rooms and food vendors off the streets. In addition, the social distancing measures resulted in event cancellations, affecting trucks’ primary source of income and their current business models. It is estimated that the pandemic has affected FTs revenues by 80 to 90% [15-17], and that between 30 to 40% of vehicles have temporarily or permanently closed [18,19]. FTs are mostly small and family businesses [11], which means that a crisis typically hits their owners twice; as private citizens and business owners [20]. The downturn in profits during the pandemic has created ripple effects by threatening the livelihood of dozens of vendors, decreasing consumers’ purchasing power, refraining people from social eating and other related social-bonding occasions and, consequently, disintegrating the FT scene. Therefore, the COVID-19 pandemic is multidimensionally impacting the FT sector from the socio-economic, nutritional, and socio-cultural perspectives.

The major direct effect of the disruption induced by the pandemic in the FT sector is the socio-economic impact. The fall in the FT business profitability is a direct consequence of the lockdown and mobility restrictions, as well as the decline in consumer demand and the decaying in the street-level retail. These are, in turn, consequences of the increased unemployment rates, reduced incomes and loss in associated purchasing power. According to the International Labour Organization (ILO), the estimated total working-hour losses in the second quarter of 2020 (relative to the fourth quarter of 2019) are now 17.3%, or 495 million full-time equivalent (FTE) jobs, revised upward from the estimate of 14% (400 million FTE jobs); estimates of labour income losses suggest a global decline of 10.7% during the first three quarters of 2020 (compared with the corresponding period in 2019), which amounts to US\$3.5 trillion [21]. The associated impact on the purchasing power of FT actors induced by this scenario indicates the addition of millions to the vulnerable groups to food and nutrition insecurity in the world.

The adverse impact of the coronavirus crisis also affects the FT sector from the nutritional perspective. The reduction on consumers’ purchasing power is linked to an eventual depreciation in food quality, with the shift to cheaper, less nutritious food, as well as the reduction on food purchase. The pandemic has also awakened food safety concerns and the need of adaption to changes in food safety protocols. Although there is no evidence of SARS-CoV-2 transmission from food or food packaging thus far [22], the environment where food is consumed and the eventual contact with surfaces, food handlers and/or other consumers may pose a risk for COVID-19,

since the virus transmission is generally airborne or by person-to-person contact [23].

Besides affecting the socio-economic and nutritional aspects of human life, the COVID-19 pandemic has caused a major disruption in consumers' habits, including in the social and cultural context of food purchase and consumption patterns. Food and eating have numerous non-nutritional associations and meanings since they are embedded in a social context. Food is traditionally incorporated in rituals and festive events shared by members of communities and groups. Communal meals are a ubiquitous and regular social activity worldwide, usually composed by family members and/or friends. Communal eating provide social, health and emotional benefits from personal and communal levels, including a sense of belonging and companionship, sensory stimulation, caring for others, making and reinforcing friendship and family relationships and building wider community and inter-community relationships [24,25]. FTs are considered both a social practice and a social innovation. The eating out practice with the advent of FTs constitutes a social event, in which people gather to eat, talk and socialize [26]. The FT movement is also permeated by diverse cultural elements and a major contributor to urban livability and vitality, playing a key role in urban processes of gentrification [14]. Therefore, the exceptional circumstances created by the SARS-CoV-2 pandemic have significant impact on social eating by restricting individuals' ability to meet in groups and exacerbating their experience of loneliness and social isolation.

**FLEXIBILITY TO SURVIVE: THE POTENTIAL APPROACHES FOR DISRUPTION MANAGEMENT OF THE FOOD TRUCK SECTOR**

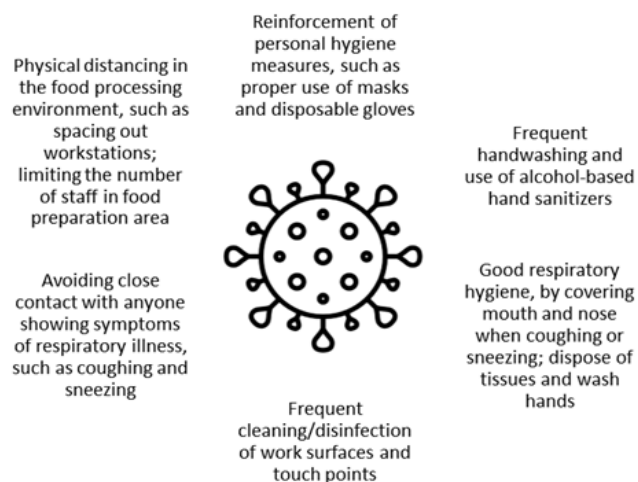
In addition to the pre-pandemic scenario's challenges, FTs are currently facing the implications generated by the coronavirus crisis. Despite this adverse scenario, which many FTs operating until recently will not be able to recover from, the demand for food services remains high, just now in different formats. In fact, FTs may be a feasible solution to the uncertain future of sit-down dining and communal eating services. Essentially, FTs are configured not to offer sit-down services, which is a particularly relevant concept given the social-distancing protocols and the potential future of traditional brick and mortar establishments. Another intrinsic characteristic of FTs is mobility, which also enables them to take advantage of adapting to takeout or delivery services. Therefore, the FT industry is challenged to adapt and creatively incorporate new approaches to ensure its survival.

FTs must innovate their business model to remain economically active during the pandemic in response to the safety policies and the risk of permanent closure. Some strategies may include the creation subscription boxes, with kits weekly delivered to customers; the implementation of online order-ahead services; the possibility of scheduling picking up orders; the provision of delivery services by the registration in application services such as iFood and Uber Eats; rotating operation in residential, hospital areas or regions where delivery services are not available. These potential approaches are also valid to ease the pandemic social-cultural burden, as well as the development of

recipes or meal kits to be prepared at home, with entertainment and interactive take-home activities for family members.

From the health security perspective, FTs strategies should address both food security and food safety issues. These vehicles can make several efforts, such as food menu modifications and adjustments to more straightforward options, according to food supplies' availability and considering criteria such as the durability and ease of transportation of their meals and customers' demand. It is also possible to increase the offer of nutrient-dense food options at affordable prices by including healthy and long shelf-life ingredients in their meals, like whole grains and dried vegetables and fruits.

From the safety perspective, trucks should apply practices along the production chain to keep workers and consumers safe. The World Health Organization (WHO) has published a guide that highlights the hygiene measures to be adopted by food businesses during the pandemic, aiming to protect food workers from contracting COVID-19 caused by SARS-CoV-2, prevent the exposure or transmission of the virus and strengthen food hygiene and sanitation practices (Figure 2) [23]. The hygiene measures to ensure the protection of customers' and workers' health should include the adoption of both long-established practices as well as new practices to prevent the exposure or transmission of the virus and strengthen food safety. For example, employees should be instructed regarding frequent and effective hand washing and sanitation, the constant monitoring and cleaning/disinfection of surfaces, proper use of masks and gloves, and avoidance of close contact with customers and other staff members. The use of single-serve packets and prepackaged plasticware and napkins, the upgrading of touchless payment systems and menus, the presence of hand sanitizers for customers should also be enforced. The social distancing practices could be ensured by providing outdoor seating, physical guides to ensure distancing among customers and physical barriers, like shields or glass partitions, where maintaining the distance is difficult.



**Figure 2:** Proposed public health recommendations for food businesses in the context of the current COVID-19 outbreak [23].

## CONCLUSION

Although the repercussions of the SARS-CoV-2 pandemic are still unfolding, actors in all parts of the food system have already been affected. The disruption induced by the pandemic have significant multidimensional implications on the FT system. Nonetheless, many of these negative impacts can be minimized by creative and multi-level approaches, leading FTs to protect public health from the socio-economic, nutritional and socio-cultural perspectives and ease the pandemic burden.

## AUTHOR CONTRIBUTIONS

Conceptualization, L.I.A; V.C.G. and R.P.Z; methodology, L.I.A; V.C.G and R.P.Z; writing-original draft preparation, L.I.A; V.C.G and R.P.Z.; writing-review and editing, L.I.A; V.C.G; A.R.; and R.P.Z; supervision, V.C.G and R.P.Z; funding acquisition, A.R All authors have read and agreed to the published version of the manuscript.

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