

Impact of COVID-19 on the Supply Chain of the Food Industry: A Literary Analysis

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Abstract

The devastating impact of COVID-19 on different business functions cannot be undermined. This effect was highly disruptive for the food industry where a number of businesses closed down whilst a significant number of businesses had gone bankrupted. Considering this stance, this study explored the impact of COVID--19 on the supply chain of the food industry which was also the objective of this study. The research opted for interpretivism paradigm and qualitative research approach, following which literary analysis of the previous studies conducted within this domain was compared and analyzed. Findings of the study identified that COVID-19 directly hindered the food industry's supply chain in the times of seasonal employment where most of the migrant workers were unavailable due to sickness, lockdown restrictions, or any sort of travel restrictions. Besides that, streamlining and managing the flow of food ensuring that all the stages of the supply chain in the food industry are completed effectively was identified as another key challenge. Likewise, economic shrinkage and reallocation of resources paralyzed the economy of many countries and, hence, hindered governmental institutions' capacity to provide financial incentives to the companies. In addition, logistical efficiency was also affected due to prolonged lockdown, devastating the fine-tuned schedule and causing disruption in the food supply chain. Therefore, many food-producing companies either closed their operations or had to reduce their production or operational capacity, which further resulted in increased demand, less supply, and less sales or profitability of the food businesses. it is recommended for the food businesses to consider restructuring their business models specifically related to progressive investment in the domain of supply chain. Companies need to foster collaboration among different actors or stakeholders of supply chain including an integration of raw material supply, manufacturing of food products and a streamlined chain of their supply in the market.

Background to the Study

Effective supply chain management is one of the key determinants proclaiming the success of a business in the market (Alonso, Gregory, Field, & Kirchain, 2007; Bakalis, et al., 2020); however, its criticality and direct impact owing to natural calamities or any disastrous situations is another important aspect which cannot be ignored (Almena, Lopez-Quiroga, Fryer, and Bakalis, 2019). The world has witnessed several such instances which included Tsunami in Japan (2011), Gujarat earthquake (2001) and Indian Ocean Earthquake (2004) which disrupted the entire supply chain network impacting all the industries to a threatening extent (Alonso, Gregory, Field, and Kirchain, 2007; Hobbs, 2020; Nicola, et al., 2020). The currently prevalent pandemic of Corona Virus (2019) is no different to previous disasters bringing in a globally expanded tragic situation which has endangered not only the human lives but also economic activities and businesses through prolonged lockdown, closure of operational activities and disrupted supply chain and logistical systems of businesses (Douglas, 2020; Singh, Kumar, Panchal, & Tiwari, 2021). WHO (2020) has declared COVID – 19 as both public health and economic crisis posing every industry in a struggling situation, challenging their existence in their respective market?

The impact of COVID-19 on the food industry is not different from other industries specifically when discussed within the context of supply chain network. The only difference which makes the level of impact of the outbreak on food industry more worrisome is that the industry deals in the production and supply of the products which are daily essentials for the survival of people (Devereux, Béné, and Hoddinott, 2020; Bakalis, et al., 2020; Richards and Rickards, 2020). Staniforth (2020), in his research clearly evidenced the threatening impact of disease on the food supply chain stating that the closure of factories may pose certain percentage of workers to have reduced chances of survival; however, ineffective and unhealthy processing, distribution and supply of infected food products in the market may risk the lives of a considerable number of people. On the other hand, IATA (2020) and UNTWO Report (2020) highlighted the economic vitality of food industry stating that the pandemic has disrupted the supply chain schedule of food companies which has resulted in shortage of food products in the market, dropped income of companies and survival challenges for the businesses. Considering this stance, the present study was based on conducting a literary analysis summarizing the findings of previous studies in order to understand the impact of COVID-19 on the supply chain of food industry.

Methodology

The present study opted for an interpretivism paradigm and qualitative research approach following which literary analysis or archival study was selected as a research strategy. The studies related to COVID-19 and its impact on the supply chain of food industry were searched and compiled in a separate database which were extracted from “Google Scholar” and “Emerald Insight” search engines. Keywords searching strategy was used for the extraction of relevant articles and research papers ranging from 2019 to 2021 in order to find the latest information regarding the subjected topic. The research

papers were further analyzed for their results and a comparative analysis was conducted in order to summarize the determinants which were identified as key aspects of supply chain impacted by the pandemic of COVID-19. Content analysis was the primary strategy which was opted for literary analysis.

Literature Analysis

Research related to ascertaining the impact of COVID-19 on the supply chain of food industry has extensively been done from various perspectives. This chapter presents an analytical view of the findings from the research concerning the subjected topic. Majority of the researchers have identified that although COVID-19 had no direct connectivity with the production of food products; however, the prolonged lockdown and interrupted stream of resources impacted the supply chain of food industry including all processed food, livestock, and agricultural products to a great extent (FAO, 2020). However, the pandemic pushed the governmental authorities, globally, to impose restrictions on the transportation and supply of food products, where the risks which were associated to health posed issues related to the migration and availability of labor force (Bakalis, et al., 2020; Singh, Kumar, Panchal, and Tiwari, 2021; Rizou, Galanakis, Aldawoud, and Galanakis, 2020). Richards and Rickard (2020) also backed this stance and argued that COVID-19 directly hindered supply chain of food industry in the times of seasonal employment where majority of the migrant workers were unavailable due to sickness, lockdown restrictions or any sort of travel restrictions. Bakalis et al., (2020) clearly identified that the probability of using trucks for the supply of food products was reduced to 60% in France which were attributed to the uncontrolled expansion of the pandemic of COVID-19.

One of the key challenging aspect which majority of the researchers identified was related to streamlining and managing the flow of food ensuring that all the stages of supply chain in the food industry are completed effectively. For instance, Rizou et al., (2020) conducted a research and evaluated the impact of COVID-19 on the efficacy of stages of food supply chain as being presented by Bendekovic et al., (2015). According to Bendekovic et al., (2015), the supply chain of food industry has five stages which included production of agricultural products, harvest handling, processing, retailing and consumption of the products. The researcher identified safety and quality of food products as key challenges to be managed for effective supply chain, where safety refers to compliance with the laws and regulations related to inspection being conducted by the state agencies and quality refers to the benchmarked standards being set by the international organizations as well as the local laws (Bendeković, Naletina, and Nola, 2015). However, the issue of financial pressure being faced by government could not be ignored. FAO Report (2020) clearly highlighted that prolonged lockdown and uncontrolled situation of pandemic posed challenges related to economic shrinkage and reallocation of resources which hindered the capacity of governmental institutions to provide financial incentives to the companies. Likewise, the constructive contribution of government in the social assistance programs was also reduced which added to the intensity and impact of the disrupted supply chain in the food sector. The report further clarified that although it is difficult for

the government to take initiatives related to improving productivity at farm level; however, the issue of inadequate funding may risk the level of agricultural production and supply in the market posing another challenge for the government other than COVID-19, which required an immediate and effective action by the government of various countries(Devereux, Béné, and Hoddinott, 2020; FAO, 2020).

Keeping in view these defined protocols of effective supply chain, Rizou et al., (2020) tested their efficacy in the times of COVID-19 and hence added multiple new protective measures which included personal hygiene of suppliers, the use of gloves and other protective equipment while carrying out different activities. Sanitization of all the workspaces and safe handling of food, followed by adhering to the social distancing protocols were identified as additional measures. The researchers further identified last stages of supply chain of food, to be the most critical and challenging steps because of the involvement of a lot of people in the process which was not safe in the times of pandemic(Rizou, Galanakis, Aldawoud, and Galanakis, 2020).

The next key aspect which was identified in majority of studies was the direct impact of COVID-19 on logistical efficiency. Alonso et al., (2007) highlighted logistical efficiency as one of the most important and mandatory responsibility of supply chain managers which gets intensified in the situation of global crisis. According to FAO report (2020), the increased dependency of agricultural activities on seasons and ensuring their compliance with weather could not be followed due to COVID-19 lockdown. This prolonged break period not only devastated the fine-tuned schedule but also hindered the ability of food producers to take any immediate actions on time. Since, all the activities or steps of supply chain management are interconnected, therefore, in the case where one activity was delayed, it posited a butterfly effect on all the stages of yielding output, supply in the market, wholesalers, retailers and the direct consumers. BBC (2020) report also highlighted this issue revealing the instance where farmers had no option but to burn or destroy their products because of the imposed restrictions on their supply to the urban market. Not only this, the quality, freshness and safety of food was also impacted negatively, posing challenges for both the producers and supply chain managers.

Devereux et al., (2020), expanded the scope of research in the food industry and identified that the impact of COVID-19 was not confined to the supply chain only, but it equally impacted all the stakeholders of the process which included consumers, distributors, producers, retailers as well as all the labor-intensive units specifically the plants which were specialized in food processing. The researchers clearly evidenced reduction in the level of production, discontinuation of food production and processing plants due to increased number of COVID- positive patients in the factory and reduced capacity of production. Flynn (2020) backed the research findings of Devereux et al., (2020) and proclaimed that the production capacity of majority of food-based units was reduced to 25 to 30% approximately. For this reason, COVID-19 also impacted the performance and the level of job security in the industry as well. Douglas (2020) further added to these research findings and presented statistical analysis of the food industry of the US. Results

of the study revealed the presence of 462 meat packaging companies in the country followed by 93 production facilities and 257 units which were specialized in food processing. All these units were impacted by the COVID-19 lockdown and restrictions after the COVID- positive results of more than 8300 food processing employees and 5700 farmers, amongst which, 184 packaging workers, 34 processing workers and 14 farm employees died. The situation was not different in several other countries which included Brazil, England, Wales, Ghana and France where slaughterhouses and meat factories stopped all their operational activities causing a ripple effect in all the stages and activities of supply chain (Douglas, 2020).

Reduced sales was another key factor which paralyzed the streamlined working of supply chain in the food industry. There is a great deal of research, all of which have highlighted similar aspects. For instance, Hobbs (2020) stated that COVID-19 restrictions forced the producers to suspend their farms. Besides that, the demand of meat reduced as a result of which frequent culling of the farm animals occurred leading to emptied shelved, decreased supply and hence the prices of all the meat products were considerably increased. Likewise, Rude (2020) and Murphy (2020) backed the points raised by Hobbs (2020) and further revealed that many grocery markets imposed limits of food products to be taken by one customer which not only impacted the food services, but also hampered the chain of demand and supply, but also hindered the efficient operationalization of the supply chain in the food industry. In addition to that, Nicola et al., (2020) argued that disrupted supply chain caused the trend of panic buying which, despite several governmental re-assurances could not be controlled even after the introduction of free delivery services, specific shopping hours and limiting the number of people in the stores to avoid overcrowding.

The next key aspect which has been identified by majority of research discussing the impact of COVID-19 on supply chain of food industry was disrupted centralization of food manufacturing which further left a negative impact on the entire food chain. Although centralization of food manufacturing was introduced to increase the pace of food production and processing intending to reduce the costs. However, it also possesses certain drawbacks which were quite evident during the pandemic outbreak. Almena et al., (2019) conducted a research and identified issues which were accredited to centralization of food manufacturing and hence disrupted supply chain during the outbreak. The factors which were identified in the research included rigidity of the system and prolonged system of supply chain where large production facilities and less number of employees or prolonged period of lockdown hindered the manufacturing units to cater the increasing demand of food products. The issue was quite intensely prevalent for the products which had less alternatives, considering which the high level of disruption in supply chain activities, not only impacted their sales and productivity but also posed negative image of the businesses in the relative market (Almena, Lopez-Quiroga, Fryer, and Bakalis, 2019).

In addition to that, literary researches repeatedly identified distorted information as a key abruption to the supply chain of food products. For instance, Hua and Cadell (2020), conducted a research concerning the provision of information in Xinfandi market related

to the encounter of infection. The research referred to WHO Report (2020) which indicated direct contact and respiratory droplets as key reasons for the transmission of coronavirus; however, questions were raised concerning the spread of virus through food in the Xinfandi market. The virus of diagnosed in more than 100 employees or workers in the market who were the direct servers of mutton, beef and seafood, specifically salmon. The primary reasons identified by the analysts, in the market, included high levels of humidity and reduced temperature which paced up the transmission of virus among workers.

Considering this stance, several other researches were conducted in order to identify the key reasons of spread of virus in the largest food market. For instance, Feng and Cheng (2020) highlighted contamination of surface equipment and its exchange between healthy and infected people as primary reason of the uncontrollable spread of virus in the market. Likewise, Reuters (2020), in his research evidenced non-sanitized work modes specifically related to the preparation of food which led to spreading of virus among workers in the market. These research based evidence pushed the Chinese government to close the market on temporary basis fearing another episode of the pandemic as a result of which the salmon import was stopped causing a break between the production and supply of food products in the Chinese market. On the other hand, Norwegian researchers and officials negated the spread of virus of importation of food and its relationship with salmon. However, the impact on the level of sales, profitability and demand and supply of food in the market which was attributed to broken chain of supply of food due to closure of Xinfandi market was unreversible (Dalton, 2020; Arellano, 2020).

Recently, Singh, Kumar, Panchal and Tiwari (2021) conducted a research where they opted for a different approach and presented a simulation model which was entitled as public distribution system (PDS), facilitating an effective chain of supply chain management specifically in the food sector. The researchers developed the modelled network, based on three scenarios demonstrating disruptions caused into the supply chain network of food, specifically within the context of supply and demand cases. The researchers highlighted the vitality of resilient supply chain system along with discussing its efficacy during the pandemic stating that the developed model possesses the capacity to cater the variable demand patterns of food products while providing assistance in the decision making specifically related to rerouting of vehicles and managing travel restrictions (Singh, Kumar, Panchal, & Tiwari, 2021). However, the researchers defined the PDS model to be at a very initial stage which needed further improvement pointing out the need of conducting more research in this domain.

Conclusion

This research paper presented a literary analysis of the findings of previous studies concerning the impact of COVID-19 on the supply chain of food industry. Logistical inefficiency, reduced sales, prolonged lockdown, temporary closure of factories and governmental pressure in terms of financial limitations and economic instability have, so far, been identified as key influencers. Considering the prolonged prevalence of COVID-

19, it is recommended for the food businesses to consider restructuring their business models specifically related to progressive investment in the domain of supply chain (Bakalis, et al., 2020). Companies need to foster collaboration among different actors or stakeholders of supply chain including an integration of raw material supply, manufacturing of food products and a streamlined chain of their supply in the market (Alonso, Gregory, Field, and Kirchain, 2007). Besides that, the businesses, need to focus on developing effective information and communication structure to facilitate an undisrupted flow of information among the stakeholders at all levels of supply chain (Nicola, et al., 2020). However, there is a need to conduct more research specifically related to the development of new models providing a guideline to the food industry managers to deal with disastrous situations in future.

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