COVID-19 and food processing in Canada

Getu Hailu

Abstract

In this paper, I explore the economic activities of the food processing industry during the coronavirus disease-2019 (COVID-19) pandemic. One of the key lessons from food processing and related industries is that without being designated as an essential service and targeted stimulus packages, the food industry could have fallen victim to the COVID-19 crisis. Although the social and economic impacts of the interventions are not clear, being designated as an essential service was likely far more important to the food industry than the targeted stimulus packages. The pandemic and shutdown orders had a considerable production reallocation effect. Some processors have seen temporary closure and reduced capacity utilization. On the upside, disruptions in the food processing sector have not been as severe as in non-essential sectors. The food processing sector has proven to be relatively stable during the pandemic – food was still processed and delivered to consumers and food price increases were minimal in most cases given the scale of the shock. Moving forward, because COVID-19 is a global crisis, internationally targeted and coordinated efforts to tackle the virus could place the industry on a strong trajectory towards economic recovery and growth.

Résumé

Dans cet article, j’explore les activités économiques de l’industrie de la transformation des aliments pendant la pandémie COVID-19. L’une des principales leçons tirées de la transformation des aliments et des industries connexes est que sans être désignée comme un service essentiel et visée par des plans de relance ciblés, l’industrie alimentaire aurait pu être victime de la crise du COVID-19. Bien que les impacts sociaux et économiques des interventions ne soient pas clairs, être désigné comme un service essentiel était probablement beaucoup plus important pour l’industrie alimentaire que les plans de relance ciblés. La pandémie et les ordres d’arrêt ont eu un effet considérable de réallocation de la production. Certains transformateurs ont connu des fermetures temporaires et une utilisation réduite de leurs capacités. Les perturbations dans le secteur de la transformation des aliments n’ont pas été aussi graves que dans les secteurs non essentiels. Le secteur de la transformation des aliments s’est avéré relativement stable pendant la pandémie - les aliments étaient encore transformés et livrés aux consommateurs et les augmentations des prix des denrées alimentaires ont été...
minimes dans la plupart des cas compte tenu de l’ampleur du choc. À l’avenir, parce que le COVID-19 est une crise mondiale, des efforts coordonnés et ciblés au niveau international pour lutter contre le virus pourraient placer l’industrie sur une trajectoire solide vers la reprise économique et la croissance.

KEYWORDS
COVID-19, coronavirus, pandemic, food manufacturing, food retail, foodservice, financial market

JEL CLASSIFICATION
Q12, G14, H12, Q18

INTRODUCTION

In Hailu (2020), I provided economic thoughts on the likely effects of the coronavirus disease-2019 (COVID-19) pandemic on the Canadian food processing sector by focusing on the demand and supply-side effects. The demand-side effects of the pandemic depend on the extent of the losses in shipments to the foodservice industries, the increase in the shipments to food retailers, and the uncertainty in the thickening of international trade borders. The supply-side effects were identified as labor market disruptions and lost productivity, raw materials supply disruptions, cost of the new health and safety practices and personal protective equipment (PPE), and costs of reorganizing the production lines. In this paper, I provide a descriptive assessment of the performance of the food processing sector during the pandemic. I also document some of the major COVID-19 outbreaks in food processing plants and identify government responses relevant to the food and beverage processing sector that have been introduced during the pandemic.

I find that disruptions in the production activities for the food processing sector have not been as severe as those operating in the other manufacturing and service sectors.1 The food manufacturing sector has largely been insulated from the dire consequences of the pandemic observed in some non-essential sectors for a number of reasons. First, food is a necessity, as individuals need to eat to survive. Second, policies targeting the industry (e.g., deemed essential, change in packaging rules, open border, fiscal policy) enhanced the quick recovery of the food industry. Third, food and beverage processors with more capital- and knowledge-intensive production activities have seen fewer outbreaks. However, the sector has seen considerable reallocation of resources from foodservice shipments to food retailers. The reallocation of resources and measures to contain COVID-19 are expected to increase adjustment costs to food processors. The adjustment costs associated with the reorganization of production lines include setup or shutdown costs incurred in adjusting workforce, equipment, and raw materials between production lines. Further, as the new production reorganization may not be maintained permanently post-pandemic, a continuous adjustment cost may occur when food processors gradually revert to the pre-pandemic operations. Meanwhile, job reallocation during the pandemic may lead to productivity-accelerating activities such as technological upgrades (e.g., automation), reorganizations, and skill training (Blit, 2020). To reduce the risk of firm failures, some firm managers may shift their attention from growth to efficiency gains through an increase in automation during the economic crisis (Blit, 2020), in particular, in the labor-intensive subsector. The overall effect of the actions taken by food processing firms depends on whether the restructuring of production activities is productivity-accelerating or productivity-decelerating.

The effects of the pandemic on the economic activities of the food processing sector are quite heterogeneous - varying across food processing subsectors or product categories. Yet, for those food processing plants that have been significantly affected, the impacts were mitigated quickly. This heterogeneity is visible in extensive popular media coverage about outbreaks in certain food processing subsectors. For example, there have been several major COVID-19 outbreaks with hundreds of workers testing positive for coronavirus in beef, pork, and poultry and other labor-intensive processing plants in Canada and elsewhere (Lusk et al., 2021; Mallory, 2021; Middleton et al., 2020). Xiao and Fan (2020) note that labor-intensive businesses are affected the worst by the pandemic. Despite the widespread global shocks, food supply chains

1 Yet, not all the food processors in the sector were able to survive the shock from the pandemic. Small food processors may not be immune to the pandemic because of, for example, lack of financing or working capital. In particular, the least productive processors are likely to be disproportionately affected by the pandemic and consequently to exit the sector.
have demonstrated notable resilience as evidenced by the overall relatively steady supply of processed food and stable processed food prices, strong processed food exports and imports, limited cost-push inflation, and stronger food firms’ stock market performance. Moving forward with recovery planning, the global nature of the outbreaks, however, underscores the importance of coordinated actions (e.g., maintaining open trade and equal access to the vaccine, supporting low- and low-middle-income countries), and targeted policy responses to mitigate tail events like the COVID-19 shocks.

2 | SUPPLY SIDE EFFECTS

By February 2020, the COVID-19 pandemic had set in motion a worldwide disruption in economic activities, causing Canadian food manufacturing real GDP to fall by more than 8% in April and May relative to the same period in 2019 (Statistics Canada, 2021a). By the third quarter, the year-over-year growth of the GDP of food manufacturing was very small compared to other sectors. For example, for food services and drinking places, real GDP fell by 61% in April and 51% in May 2020 compared to the same period in 2019. The food and beverage processing sector depends largely on labor and is the largest manufacturing employer in Canada. The food processing sector employed more than 255 thousand workers (15.5% of manufacturing employment) in 2019 (Statistics Canada, 2021b, 2021c). Canada’s food processing sector as a whole saw a 24% year-over-year decline in employment in May 2020 compared to May 2019, and by November 2020 the year-over-year decline was approximately 5% (Statistics Canada, 2021c).

The year-over-year growth in aggregate food processing sales from 2019 to 2020 shows a 15% increase in March and a 2% decline in April (Statistics Canada, 2021d). Most of the food processing subsectors experienced growth in sales in March—driven by grocery chains’ massive sales spikes because of panic buying and shoppers stocking up—followed by a sharp decline in April. The decline in sales for food manufacturing may partially be attributed to business dynamics—that is, the increase in the number of business closures and the decrease in the number of active food processing businesses (Statistics Canada 2021e). By May 2020, however, the decline in sales for food processing had been reversed. The declines in April reflect the effect of the shutdown orders in March and April. The quick recovery of the sector may confirm the resiliency of the food processing sector to the pandemic shock. The industry quickly adapted to the shock and disruptions and regained sales faster than most manufacturing industries. It is also important to note that food processing was one of the industries with a strong performance during the 2008/09 global financial crisis.

One measure of the economic performance of an industry is labor productivity. The GDP per worker (and sales per worker) for food processing saw an increase in year-over-year growth in 2020 compared to 2019 (Figure 1). The question that remains is whether the COVID-19 shock is making permanent changes to the food processing sector labor market and labor productivity. “In recessions, firms shed unproductive workers, entering recovery with a greater ability to meet expanding demand without hiring additional workers” (Berger 2012, p. 2). di Mauro and Syverson (2020) argue that the COVID-19 crisis may have both productivity-decelerating and productivity-enhancing effects. On the one hand, the COVID-19 crisis may slow down productivity growth because of “… higher transaction costs, lower mobility, and a reduced scope of resource reallocation across firms, sectors, and countries.” Meanwhile, the pandemic shock-induced innovations and resource reallocation pressure may enhance productivity (di Mauro & Syverson, 2020). Further, the exit or temporary
closure of low productivity firms can contribute to an increase in labor productivity.\(^2\) Berger (2012) notes that the rise in labor productivity during recessions is a pervasive feature of business cycles because of business restructuring and that productivity growth explains jobless employment recoveries.

Another plausible explanation for the short-run rise in GDP per worker (and sales per worker) is the x-inefficiency theory—the existence of a non-allocative (in)efficiency due to the possibility of a differential degree of motivation or selective rationality. X-efficiency states that sufficiently greater internal and external pressures (e.g., competitive and other non-market pressures) may result in cost minimization (Leibenstein, 1980), leading to higher labor productivity. Leibenstein (1980, p. 98) uses a 1971 Coal Strike where the U.K. government restricted manufacturing working days to three for 6 weeks, and note that output was more than 80% higher than the normal level “... although labor and capital was utilized no more than 60% of the time.” Hence, x-efficiency arises when a firm has the incentive to increase production or reduce the cost of production, leading to higher labor productivity or a lower average cost of production. Labor shortage and other internal and external pressures to increase production during the pandemic might have forced management to reduce x-inefficiency or increase x-efficiency. As food processors face pressures because of the pandemic shocks, they are likely to pursue actions that will save costs or increase non-allocative efficiency by, for example, investing in preventive and corrective maintenance to identifying waste and bottlenecks within their facilities’ operations. Whether there was a gain in x-efficiency and the extent of the gain during the pandemic are, however, open empirical questions.

Establishment capacity utilization is also commonly used as a measure of the economic performance of a firm. Capacity utilization provides an insight into the total utilization of resources. In the economic literature, the capacity utilization rate is used as an indicator of the strength of aggregate demand, investment behavior, and to explain productivity measures, inflation/prices, and inventory behavior (Schultze, 1963; Winston, 1974). For example, the capacity utilization rate may change with the change in aggregate demand i.e., the capacity utilization rate increases if aggregate demand increases, but falls if the aggregate demand decreases. During the pandemic, we expected to see a drop in capacity utilization rate because of a fall in the aggregate demand as well as a shutdown of non-essential businesses.

The industrial capacity utilization rate in most manufacturing industries remained below the pre-pandemic levels. The food manufacturing capacity utilization rate declined by approximately 5.7 percentage points in the second quarter of 2020 (Statistics Canada, 2021). This may indicate a modest decline in capacity utilization for food manufacturing because of a modest fall in the aggregate food demand, and outbreaks in some major food processing plants. Given the strong recovery signs after the second quarter of 2020 and the COVID-19 vaccine rollout, the industrial capacity utilization rate may grow in 2021. During the 2008/09 financial crisis, it took close to 4 quarters for the food and beverage processing industry, and took close to 15 quarters for the manufacturing sector, to regain the pre-crisis (i.e., 2007) capacity utilization rate.

On the supply side, future research may explore the impacts of the COVID-19 pandemic on business dynamism (i.e., firm entry and exit) and performance. For example, what are the likely short-term and long-term growth impacts of the COVID-19 pandemic (e.g., labor productivity, multifactor productivity, export and import market performance, investment and output)?

3 | FOOD MANUFACTURING DERIVED DEMAND

“We saw a spike in retail sales and a dramatic drop in our food service sales, as some of our customers were going through financial difficulty,”

-Lino Saputo Jr., the Chief Executive Officer of Saputo Inc, BNN Bloomberg (Erlichman, 2020, June 4).

In this section, I turn to the demand side of food manufacturing – i.e., the food retail and foodservice consumer spending shocks and implications for food processing businesses. To do so, I exploit Statistics Canada’s monthly data on food retail and foodservice sales. As food is a basic necessity with generally inelastic demand (Hailu et al., 2014; Okrent & Alston, 2012; Pomboza & Mbaga, 2007), and is not particularly very sensitive to economic conditions, the level of aggregate food demand is less likely to be affected by the pandemic relative to the demand for other consumer goods and services. In response to the demand shock, food firms may adjust the range of products they offer to their customers, the frequency of delivery, price and/or production run length per setup, or temporarily close facilities. The food processing firms

\(^2\)The Schumpeterian process of creative destruction states that higher productivity firms replace lower productivity firms, leading to higher sectoral productivity. Unlike the usual Schumpeterian process, with COVID-19, however, we may only observe the destruction of low productivity firms.
generate revenue from the sale of processed foods to food retailers, food service, export markets, and others further down the processing chain. Even though the pandemic shock may affect food processors through the reallocation effect, total food consumption/sales may remain stable. According to Goolsbee and Syverson (2021), the shutdown orders had a significant consumption reallocation effect away from “nonessential” to “essential” sectors – for example, from restaurants and bars toward groceries and other food sellers. When the shutdown orders were imposed in March 2020, foodservice sales plummeted, but retail food sales grew as consumers swamped food retail stores to stock up. Panic buying and overall demand caused temporary shortages of certain products (e.g., bread flour). By April 2020, however, retail food sales started to see a significant decline from the peak in March, in many cases, because of the stockpiling in March.

In this study, we do not observe data on the level of processed food shipped to various customers. We, however, observe data on the sales of the customers of food processors. In 2019, expenditures on food purchased from restaurants per household constituted 27% of the total household food spending in Canada (Statistics Canada, 2021g). There has been a major structural change in the demand for food, with a fall in consumption at foodservice—e.g., restaurants, hotels and catering—and an increase in demand from food retailers during the pandemic. Figure 2 shows that the total foodservice sales fell by as much as 60%, and 85% for limited-service eating-places by April 2020. The drop in sales was particularly considerable for foodservice businesses that require physical interaction (e.g., restaurants, school cafeterias) and accommodation services. The fall in revenue is because of a much higher rate of business closure in foodservice than in other food-related businesses (Statistics Canada, 2021e). Foodservice recovered about 25 percentage points of its lost sales by the end of May, and 40 percentage points by the end of August 2020. The recovery on lost sales mirrors the changes in the stringency of the lockdown measures and compliance and voluntary social distancing by individuals because of fear of infection (Goolsbee & Syverson, 2021). Meanwhile, aggregate retail food sales have seen a surge of up to 25% in March 2020, remained higher than the pre-pandemic sales (Figure 2) – with some heterogeneity across product categories. The benefits of increased retail sales depend on the differences in the markup of price over marginal cost on sales to food retailers and foodservice. For example, selling more to food retailers is likely to be less profitable for food processors than selling to foodservice if markups on processed food sold to foodservice are higher, and vice versa. The markup of price over marginal cost also depends on the relative market power of food processors, retailers, and foodservice providers. It is also important to note that the non-negligible adjustment costs at the level of the firm of reorganizing the production activities and potential efficiency gains when shifting production from foodservice to food retailers. At the same time, reorganization of the production activities can provide value through identifying and addressing poor performance and creating new strategic or business opportunities (e.g., opportunities to make a profitable investment in a new production process). Reorganization of production activities involves, for example, shifting production capacity to retail from

![Figure 2](image-url)
production lines that have traditionally supplied restaurants and other foodservice businesses, scaling back production and reducing production at foodservice-focused plants.

The data from Canada show that, although food processors are diverting their shipments to retail stores to ease the impact of the pandemic, the increase in the retail demand is unlikely to be sufficient to offset the lost foodservice sales. In addition, as businesses lose revenue, they are likely to pass the shock on to their workers or layoff their unproductive workers, particularly low-wage workers. The observation regarding the contraction of the restaurant and other hospitality sectors, reducing many locations to takeout or delivery only, is consistent with Hailu's (2020, p. 164) thought that “… COVID-19 will have positive effects on derived retail demand for processed food and negative effects on derived foodservice demand for processed food” regardless of the stringency of the lockdown orders.

International trade is an essential part of Canada’s food processing sector. In 2019, food and beverage exports accounted for 33% of production value shipped abroad (Agriculture and Agri-Food Canada, 2020). According to World Trade Organization (2020), nearly 80 countries and separate customs territories have introduced export restrictions in response to the COVID-19 pandemic, including 17 restrictions related to foodstuffs. However, most countries have designated food processing and their supporting sectors as essential services and exempt from lockdown requirements and the border crossings restrictions during the pandemic. In particular, the border between Canada and the United States, Canada’s major trading partner, remained open for essential goods and services. Year-over-year the aggregate food processing exports declined by 3.8% in April and 4% in May 2020 compared to the same period in 2019 (Innovation, Science and Economic Development Canada, 2021). However, from June through October 2020, processed food exports grew by more than 5% each month year-over-year relative to the same period in 2019. Year-over-year, imports of processed food into Canada were also up in 2020. These facts demonstrate the importance of keeping open borders for the processed food trade.

4 | FOOD MANUFACTURING FINANCIAL MARKET

The COVID-19 shock has inflicted harm on financial markets as well. Financial markets play key economic roles ranging from managing risk (Froot et al., 1993) to providing valuable price signals (Hayek, 1945; Holmstrom & Tirole 1993). The response of the stock markets has raised concerns during the COVID-19 pandemic. In the first quarter of 2020, especially after mid-February, stock markets across the world plummeted as the COVID-19 pandemic was spreading. Nevertheless, the effect of the pandemic on the stock market is not felt equally by all industries.

Based on data from Yahoo Finance, the stock price of Maple Leaf Foods decreased by more than 24% on March 12, and Saputo has seen a drop of 26%. On the other hand, Air Canada’s stock price plummeted by more than 75% by March 20, 2020. On the contrary, the food retail companies have seen a rise in stock prices. Metro Inc. and Loblaw Companies Limited have experienced, on average, a rise in their stock prices from March 9, 2020 to March 14, 2020. Several studies have shown that stock markets were effective in discounting the most exposed companies: firms that were more financially fragile (Fahlenbrach et al., 2020) and internationally-oriented firms, especially those more exposed to trade and subject to the disruption of international value chains (Ding et al., 2020; Ramelli & Wagner, 2020). Firms that are more resilient to social distancing outperformed those with lower resilience (Pagano et al., 2020). Fahlenbrach et al. (2020), for example, find that firms with high financial flexibility experienced a stock price drop of 26% or 9.7 percentage points lower than those with less financial flexibility. Ding et al. (2020) find that the drop in stock prices was milder among firms with less exposure to COVID-19 through global supply chains and customer locations. This is consistent with the stock market observations for Saputo and Maple Leaf Foods, where Saputo’s cumulative loss on the stock market is higher than that of Maple Leaf Foods. Saputo is the largest dairy processor in Canada and one of the 10 largest in the world. Besides, Saputo experienced an outbreak early at its dairy products facility in Vaughan, Ontario – with 1 death and 25 positive tests. Saputo is also more exposed to disruption of the international supply chain. On the other hand, Metro and Loblaw can be considered as being more resilient to social distance measures.

A likely explanation for the rebound in the stock market is the unprecedented stimulus packages provided to the economy by governments (Cox et al., 2020). The stock market reaction at the onset of the pandemic is attributed to COVID-19 developments in late February and early March, which mostly involve reactions to the news about the course of the pandemic in the United States and elsewhere. The reactions later in March and through the end of April 2020 reflected the policy responses to the pandemic, including news about actual or prospective fiscal and monetary policy actions (Baker et al., 2020).
Next to the nursing home or long-term care home outbreaks, the meat and poultry processing sector has probably obtained more popular media coverage and has been significantly affected by COVID-19 outbreaks (Middleton et al., 2020), but these impacts were mitigated\(^3\). In Canada, several meatpacking plants experienced major COVID-19 outbreaks: Cargill plants in Alberta and Ontario, JBS plant in Alberta, Conestoga plant in Ontario, and Olymel plants in Quebec and Alberta, Harmony meat plant in Alberta, and others. Canada’s meat processing subsector is the largest contributor to the food processing real GDP. In 2020, the meat product manufacturing subsector contributed over 21% to the food processing real GDP, the next largest being fruit and vegetable preserving and specialty food manufacturing (11%) and dairy product manufacturing (11%). Based on popular media sources, in total, as of February 2020, more than 4,500 workers tested positive for COVID-19 in major meat processing plants in Canada, leaving the workforce sick and unable to operate at full capacity. For example, Maple Leaf Foods reported short-term increases in absenteeism (Yahoo Finance, 2020). Note that more than 80% of Canada’s beef comes from three processing plants - two of them have experienced COVID-19 outbreaks in April 2020 and one in December 2020. The meatpacking plants with outbreaks took various actions – some plants temporarily reduced shifts, closed for up to 2 weeks, while others suspended, or reduced production capacity. Most of the plants invested in additional safety measures such as the adoption of personal protective equipment, screening of workers, and greater physical separation in plants where employees are working shoulder-to-shoulder, barriers between workers and staggered breaks to prevent congregated employees. Others provided financial incentives in the form of temporary pay raises, bonuses, advance pay, and paid leave. Providing advanced pay is meant to encourage workers not to hide their symptoms or come to work when they are sick.

The investments in safety measures, the financial support to employees, and the reduced capacity or temporary shutdowns had important short-term implications for the meat supply chain. In the spring of 2020, for example, meat plant closures or reduced capacity in Canada left cattle and hog producers with few options, causing excess inventory of livestock (Nickel, 2020). This has forced industry groups to appeal to the federal and provincial governments to provide support to cover the cost of feeding cattle longer when slaughter capacity is limited. The industrial product price index (IPPI) for meat products, which measures price changes for meat products sold by meat processors operating in Canada, rose by more than 15% in May 2020 compared to January 2020, and 15% year-over-year compared to May 2019. In June 2020, it was 5% higher than in January 2020, and 5% higher year-over-year compared to June 2019. By July and August, the industrial product price index was lower than in January (Statistics Canada, 2021]). In the meantime, the raw materials price index for cattle on a year-over-year basis from the processors’ perspective decreased by about 10% in April and May of 2020 compared to the previous year. For hogs, the raw materials price index declined by 17% to 28% year-over-year from April to August, which could be explained by the large inventory of animals (Statistics Canada, 2021k). In sum, the outbreak has caused a temporary spike in the retail prices of meat, a backlog in the inventory of live cattle and a decline in the prices of live cattle. However, in the later months, the meat prices were not as high as they were in the second quarter and at the beginning of the third quarter.

The outbreaks at meat processing plants across the world brought some questions to the forefront of policy discussions. While the current concentration in the meat packing industry has the advantage of lower per unit meat processing costs leading to lower consumer prices, some question the resilience of the industry to a pandemic like COVID-19. This has led to a discussion about supporting small- and medium-sized processing plants to build resilience in the system. Nevertheless, capacity expansion through supporting small and medium plants should pay attention to the nature of the industry. First, one needs to distinguish between processing capacity and capacity utilization. The temporary plant closures and slowdowns in April and early May led to capacity underutilization but did not reduce long-term plant capacity. Thus, a reduction in capacity utilization because of a tail event like COVID-19 does not necessarily suggest the need for more food processing capacity. In the second quarter of 2020, the food processing sector ran at only 74.6% of capacity (Statistics Canada, 2021f). Second, the Canadian food processing sector, in general, and the meat processing sector, in particular, are sectors with thin margins where the benefits of economies of scale are important. Third, the Canadian food processing industry exports more than 30% of processed food products (Agriculture and Agri-Food Canada, 2020).

To remain competitive in the global market, the industry has to either supply to niche international markets through a product differentiation strategy or achieve cost leadership through economies of scale. Recognizing the potential loss

\(^3\) A study conducted in the US show significant spillover effects of outbreaks in food processing facilities to the nearby communities - e.g., “the presence of a slaughtering plant in a county is associated with four to six additional COVID-19 cases per thousand, or a 51 to 75% increase from the baseline rate” (Taylor et al., 2020, p. 31707).
of jobs and that meatpacking is a very difficult task to automate, another option is to enhance the productivity of the processing facilities through the adoption of process innovations that allow for physical distancing while reducing the need for a large number of production workers. For example, food processors may invest in (1) redesigning the facilities’ layouts and (2) labor-saving process innovations such as sensors, robotics, the internet of things (IoT), blockchains, and other forms of process, organizational, and logistics innovations. Automation may have the added benefit of creating higher-paying quality jobs. Koch et al. (2019, p. 1) find that “… robot adoption generates substantial output gains in the vicinity of 20%–25% within 4 years, reduces the labor cost share by 5%–7%-points, and leads to net job creation at a rate of 10%.” Acemoglu and Restrepo (2020), on the other hand, find negative effects of industrial robots on employment and wages across U.S. commuting zones.

A 2014 KPMG report notes that Canadian firms operating in the meat, fish, and seafood subsectors were generally less automated than other subsectors. For example, dry food and other packaged food and ingredients subsectors were characterized as partially to more automated operations across all types of applications (KPMG, 2014). The report cites, among others, the lack of capacity and infrastructure to support automation, seasonality, profit margins, Canada’s market size for processed food, and the limited availability of proven technologies as the reasons for the gap in the adoption of automation in Canada.

6 | POLICY RESPONSE

The COVID-19 pandemic forced policymakers to make urgent decisions to ensure essential services such as food supply chains continue to function efficiently. In May 2020, the federal government announced a $252 million funding to the agri-food sector. The most significant economic policies directly targeting firms in food processing are: (1) the $77.5-million Emergency Processing Fund (EPF)4; (2) exemption to relax provincial trade restrictions to permit the sale of provincially-inspected meat and poultry across provincial borders; (3) $62.5 million in assistance for fish and seafood processors. The Emergency Processing Fund provided support to 32 projects worth $10.5 million (September 2020); $8.25 million to increase efficiency and capacity in Ontario’s meat processing sector (February 2021); $7.8 million for 24 meat processing firms across Prairies to help keep workers (March 2021); $2.6 million for 40 food processing firms in Nova Scotia (March 2021); up to $12.8 million for 135 meat processors in Ontario (March 2021); and up to $12.2 million for 42 meat processors in Ontario (April 2021). As of July 30, 2020, 201 applications have been received and 41 have been approved under the fish and seafood processors assistance package (The Standing Committee on Finance, 2020). Other examples of economic stimulus programs that targeted the broader agri-food and other sectors that may benefit food processing include:

23-a $125 million in federal support for cattle, hog, and other sectors, access payment deferrals.
23-a credit and liquidity support of up to $500,000 through Farm Credit Canada (with an additional $5 billion in lending capacity)5. Based on the Standing Committee on Finance bi-weekly report, as of August 6, 2020, on implementation status and take-up rates, since mid-March, Farm Credit Canada extended $3.5 billion in new loans with just over half used for capital investments, 4,351 customers have taken advantage of new payment deferral options on loans totaling $5.07 billion. It is unclear whether the new loans are from the additional $5 billion lending capacity, and how much of the new loans went to the food processing sector.
23-$50 million (in 2020–21) to provide relief to food system firms for incremental health and safety costs incurred with respect to the use of Temporary Foreign Workers (maximum of $1,500 per temporary foreign worker). As of June 26, 2020, 1,446 applications have been received and 652 applications have been approved (The Standing Committee on Finance, 2020).
23-up to $3 billion in support for wage top-ups for essential workers (not specific to food).
23-access to funding for personal protective equipment (PPE), adapt to health protocols or automate or modernize facilities, processes, and operations, a fish or seafood processor, funding to safely and efficiently process, store, package, and distribute products.

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4 An additional $10 million is expected to be added from internal funds, bringing the Emergency Processing Fund to $87.5 million (AAFC 2021).
5 The federal government’s liquidity support to Crown Corporations reached $422 billion through August 2020.
23-the Canadian government has created a ministerial exemption to relax provincial trade restrictions to permit the sale of provincially-inspected meat and poultry across provincial borders to offset possible meat shortage due to COVID-19.

23-allow retailers to sell foods labelled for restaurants, hotels, and schools – produced for the U.S. or Canada.

23-$50 million for the Surplus Food Rescue Program initiative to support food processors, food producers. Under this initiative, eight Projects (e.g., $11 million for Second Harvest, $1.43 million for Les Fermes Dani, more than 11 million for Food Bank of Canada) are approved (Gordon, 2020).

The stimulus measures are diverse both in terms of scope and execution and have had and continue to have a substantial economic and social impact on the food processing sector. While short-term policies can assist food processors, there is uncertainty as to how the effects of the pandemic and government interventions will shape the future landscape of the sector and need careful future assessment of the return on government spending. The COVID-19 policy measures will continue to be a key area of research – ranging from understanding the trade-off between different levels of stimulus measures to the importance of targeted measures. Note that not all of the health and financial stimulus measures were targeted to food processing, thus, any attribution of the measures should be examined with caution.

7 | CONCLUDING REMARKS

In this article, I provided an overview of what happened in the food processing sector in 2020 during the COVID-19 pandemic. Every food processing firm faced a similar exogenous shock but different outcomes. COVID-19’s economic burden is not equal across food processing sub-sectors. The pandemic and shutdown orders had a significant reallocation effect from foodservice toward food retailers. As anticipated in Hailu (2020), the food processing sector has experienced significant reductions in sales to the foodservice and restaurant and a significant increase in shipments to food retailers. COVID-19 has also resulted in supply-side disruptions – as some processors temporarily halted production, operated at reduced capacity – with a negative impact on food supply chains, labor demand and supply, and employment. The effects are strongest in labor-intensive industries with high densities of workers though disruptions in food processing are not as severe as in non-essential businesses. Overall, the food processing industry has proven to be relatively stable during the pandemic – food was processed and delivered to consumers, food price increases were minimal in most cases given the scale of the COVID-19 shock, and those food processors that closed or reduced their capacity did so temporarily for a limited number of days.

The experience from the food processing sector underscores that targeted public health measures played an important role concerning the differential impact of the COVID-19 pandemic – e.g., essential vs non-essential businesses or population subgroups (Acemoglu & Restrepo, 2020), and food is a necessity. Targeted financial and health measures and lower border restrictions for essential goods have helped the food processing sector to run “smoothly,” restore consumer confidence in the food supply chain and financial markets. Moving forward, Public Policy Forum recognizes food manufacturing as one of the key sectors for a manufacturing recovery for a post-COVID-19 economy (Gingrich & Rowlinson, 2020). The path to recovery, however, depends on addressing the virus itself (e.g., size and duration of multiple lockdowns, vaccine rollout, social behavior, mutation, and new variants). Despite the rollout of the vaccines, prospects remain uncertain with the surge in infections in recent months and the re-imposition of lockdown measures in many countries. Experts emphasize the importance of a coordinated global strategy to accelerate the rollout of the COVID-19 vaccine and supporting low- and low-middle-income countries. A report from the World Economic Forum by Masterson (2020) suggest that equal access to COVID-19 vaccines for low- and lower-middle-income countries could be worth more than $460 billion to 10 major economies by 2025, and leaving these countries without access to vaccines will cause significant economic damage to the global economy including the food industry. Finally, future work may explore the long-term economic and social effects of the high stimulus packages and the exit strategies in moving from policy-driven recovery to self-sustained business growth. One area that needs university, government, and private companies’ partnership is the development of publicly available disaggregated timely high-frequency data (with limited lag in availability) for tracking the performance of the economy (see Chetty et al. (2020) for an example).

6 In August 2020, Maple Leaf Foods Inc., one of the largest Canadian meat processor, has voluntarily suspended exports of pork to China after an outbreak of COVID-19 in a Manitoba plant (Johnson, 2020).
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ORCID

Getu Hailu https://orcid.org/0000-0003-1257-5939

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