



## Economic Thoughts on COVID-19 for Canadian Food Processors<sup>1</sup>

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### Abstract

In this paper, I explore the potential effects of the COVID-19 pandemic on Canadian food processors. First, COVID-19 may have an impact on food processing economic activities because of supply and demand shocks. Second, the impact of COVID-19 on food processing may depend on the type of products and the size of the processors. The effects of measures taken by the government to flatten the epidemiological curve on the economic activities of the food processing sector are uncertain.

Keywords: COVID-19, Food Processors, Retail, Foodservice, Export, Demand Shock, Supply Shock

### Résumé

Dans cet article, j'explore les effets potentiels de la pandémie de la COVID-19 sur les transformateurs alimentaires canadiens. Premièrement, la COVID-19 peut avoir un impact sur les activités économiques de transformation des aliments en raison des chocs de l'offre et de la demande. Deuxièmement, l'impact de COVID-19 sur la transformation des aliments peut dépendre du type de produits et de la taille des transformateurs. Les effets des mesures prises par le gouvernement pour aplanir la courbe épidémiologique sur les activités économiques du secteur de la transformation alimentaire sont incertains.

Mots-clés: COVID-19, transformation alimentaire, commerce de détail, restauration, exportation, choc de la demande, choc de l'offre

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<sup>1</sup> Disclaimer: The economic landscape engaged by the COVID-19 outbreak is changing constantly. Government and industry responses are chasing a moving target as it develops or unfolds. The information contained in this article is generalized and is not intended to represent specific economic policy recommendations. Many thanks to Natalia Piedrahita, Herath Deepananda, and David Worden for useful comments. I am also grateful for comments by a referee and the editor. This article reflects my perspective as of April 8, 2020. This manuscript was processed by Managing Editor, Alan Ker.

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## INTRODUCTION

The novel coronavirus (SARS-CoV-2, which causes COVID-19) is resulting in unprecedented health and economic crises. The pandemic may disproportionately affect various sectors of the economy. In this paper, I explore the potential effects of COVID-19 on Canadian food processors. I provide thoughts on how COVID-19 may impact the Canadian food processing industry, food manufacturers' response, and what may happen post-pandemic<sup>2</sup>. Despite the initial upsurge in the derived demand for processed food from retail grocery stores and a sharp decline in derived demand for processed food from foodservice establishments, the effect of COVID-19 on economic activities and employment in the food processing industry is unclear. Undoubtedly, the COVID-19 pandemic is not just a public health issue but a food supply issue as well.

The food manufacturing sector plays a fundamental role in Canada's economy. First, in 2018, the food and beverage processing industry contributed to approximately 17% of manufacturing revenue and 1.7% to the Canadian GDP (Statistics Canada, 2020). Second, the food processing industry is Canada's leading employer in manufacturing (approximately 19%) (Statistics Canada, 2020). Third, food manufacturing is the largest buyer of primary agricultural commodities (AAFC, 2016). In 2016, food processing used approximately 50% of raw agricultural products (AAFC, 2016). Also, the food and beverage processing industry supplies approximately 75% of all processed food and beverage products to the domestic market.

## DEMAND SHOCKS

First, at the onset of the pandemic, the demand shock for food manufacturing comes from a sharp increase in the derived retail demand and a sharp decline in foodservice demand for processed food. Many food processors supply their finished food products to retailers, bulk food ingredient suppliers (such as Sysco), and foodservice establishments. In this section, I will use a simple diagram to discuss the likely effect of COVID-19 and containment measures on the growth in derived demand for processed food. The variable of interest is 'short-term growth' in the derived demand for food processing outputs (or shipments) from retail grocery stores and foodservice establishments. The primary demand curves faced by retail stores and foodservice are for final consumers.

The effect of COVID-19 on the short-term growth of the derived retail and foodservice demands for processed food depends on a host of factors: the presence of non-pharmaceutical measures (NPMs), how stringent the NPMs are, consumers' confidence in and trust of people in market institutions, the government, and the private sector. In this paper, I explore two cases. **Case I:** there are reported cases of COVID-19 in the specific geographic location where the consumer resides, but there are no aggressive containment NPMs during the pandemic (e.g., take-out, drive-thru, and delivery services are allowed). **Case II:** there are reported cases of COVID-19 in the specific geographic location where the consumer resides, there are aggressive containment NPMs during the

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<sup>2</sup> It is difficult to make forecasts, as the spread of the disease, the complete policy measures, and individual behaviour are unknown.

pandemic, and there is a provision of accurate information early in the process about food logistics, supply chains, and the ability of retailers to deliver sufficient foods in future to ease concerns. Examples of aggressive NPMs include social distancing, isolation, and mandatory closure of non-essential services (e.g., restaurants and bars). Figure 1 summarizes the effect of NPMs on the growth in the retailer and foodservice demand for processed food. The curve takes on different shapes, depending on the presence and strictness of the NPMs and whether the industry is essential or non-essential. In the short run, the capacity of any food processing facility is limited. In the COVID-19 economy, regardless of the presence or absence of NPMs, COVID-19 will have positive effects on derived retailer demand for processed food and negative effects on derived foodservice demand for processed food. However, the magnitude of the effect depends on the nature of NPMs and the trust and access to accurate and reliable information about food supply.

In Case I, uncertainty and fear of supply disruption risk and mistrust in institutions may cause panic buying. Other factors that cause panic buying are loss aversion – i.e., the tendency to avoid future losses - and herd mentality. Depending on how much the consumers trust their government officials and the industry, I expect a sudden temporary spike in the short-term growth of retail demand under Case I (Figure 1, Retail, pink) compared to Case II (Figure 1, Retail, blue), leading to a spike in the derived retail demand for processed food under Case I. In this case, because retail and foodservice are substitutes, the derived demand for foodservice could see a slight decline because some people (risk takers) can still dine in the restaurants (and take-out service is still available). In Case II, when NPMs and food supply information are jointly provided because consumers are well-informed, the derived retail demand for processed food will see only slight growth. However, the effect on the derived foodservice demand for processed food will drastically decline (Figure 1, Foodservice, blue).

Figure 1 suggests that public measures that solve the health crisis can have both positive (retail) and negative (foodservice) effects on the demand for processed food. The net effect of NPMs depends on the relative magnitudes of changes in derived retail and foodservice demand for processed food. Figure 1 may help explain the effects of many food-related economic activities (e.g., online shopping) on the food processing sector and the threat of a second wave of the pandemic. Concerns remain about the second wave of infections. If the second wave of COVID-19 occurs, then panic buying will likely happen again. However, panic buying during the second wave (i.e., Figure 1, Retail, blue) may not be as drastic as the first wave of COVID-19 (i.e., Figure 1, Retail, pink) because of the fine-tuned control and preparedness measures.

A decline in processed food exports because of the thickening of the border is another demand shock. Many countries have imposed travel restrictions, closed borders, and closed factories, disrupting the global trade and supply chains. Canada exports processed foods to more than 180 countries. The Canadian food processing industry exported a total of more than \$37.50 billion in 2019 (Government of Canada, 2019). More than 71% of the processed food export was to the U.S., 8.4% to China, 6.4% to Japan, 2.2% to Mexico, and 12% to the rest of the world. The export market varies by subsector (see Figure 2). The pandemic may disproportionately slump sub-industries with higher export intensities. Figure 2 illustrates that the grain and oilseed milling, meat, and seafood subsectors constitute more than 50% of food processing exports.

In the face of demand slumps from restaurant closures and slowdowns in exporting, because of border measures by some countries, many food processing firms will inevitably switch supply efforts from foodservice to retail channels. I use the U.S. food expenditure data for 2018 to provide insight into how the switch from foodservice to retail may affect demand at the processing level.

Table 1 shows that U.S. consumers spent 46% of their food expenditure on food-at-home (FAH) and 54% on food-away-from-home (FAFH). In the extreme case, if we assume that all FAFH (Case II, Foodservice - Figure 1, blue) are completely closed, the retail orders/sales for processors must increase by 120% to offset for FAFH.<sup>3</sup> If we, however, assume that foodservices operate at 25% of their pre-pandemic capacity through take-out, drive-through, and delivery service (Case I, Foodservice, Figure 1, pink), this will require an increase in retail orders/sales by 90%.<sup>4</sup>

The switching strategy depends on whether the products are destined for export, retail, or food service, and whether they are perfect substitutes in production. The challenge to meet the surge in orders from the retail store is the amount of time, resources, and engineering required in a product assembly line change, new packaging, and factory floor-redesign for a different format of products. For example, to meet the temporary surge in retail demand for meat, meat processing plants could still process the same amount of poultry as before but with less further processing and cutting and fewer varieties. Instead of skinless breast fillets, meat processors could package and deliver whole chickens and drumsticks to retailers. Foodservice, which has seen a sharp decline in their operations amid mandated closures, on the other hand, orders more specialized further-processed cuts. For example, before the COVID-19 pandemic, Cargill had been supplying 60% of its products to the retail industry and 40% to the foodservice industry (Food Processing, 2020). By late March 2020, Cargill had switched to 85% to retail orders and 15% to foodservice orders. This strategy is unlikely for some processors because the process of switching entire production lines to processing new items to meet demand is hardly smooth. Switching may entail converting production lines from the larger-piece operation to the smaller-piece operation and a change in packaging to meet grocery store requirements. Diverting products destined for the export market or foodservice to retail instead is a much more nuanced process than repurposing the inventory. Saputo Inc. is another example where orders from retail stores for dairy products have spiked, while orders from foodservice have fallen or have been cancelled (Sagan, 2020). The management is looking into the possibility of repurposing the inventory destined to foodservice. The challenge for food processors is that orders from retail and foodservice are not perfect substitutes in production as they differ in terms of product size and formats.

## SUPPLY-SIDE SHOCKS

The first supply-side shock is the effects of the thickening of the border on imported raw material causing a supply disruption. Food processors in Canada rely, in part, on imported raw materials from the U.S. and other countries. The claim that “there is no food shortage” globally and locally does not mean that the pandemic does not pose a threat to the food supply chain, which is a much more nuanced phenomenon than strictly “volume of food”. Food processors can replenish the empty shelves at the grocery stores – with a temporary interruption – only if there is not a supply chain disruption. Any major supply chain disruption may cause real distress on the entire industry – e.g., shortage of

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<sup>3</sup> This analysis ignores marketing margins – i.e., the difference between the prices paid by a final consumer and the prices received by a food processor.

<sup>4</sup> Anecdotal evidence suggests that an increase in demand for certain products ranges from as low as 30% to over 500%.

ingredients and packaging materials. Depending on the severity and the length of the pandemic, travel restrictions and border closures are likely to disrupt processors' access to imported raw materials.

Second, as the pandemic persists, the shortage in the supply of labour for transportation and logistics, for food processing, and for other areas of the supply chain could prove to be a challenge. Border measures that limit the free movement of people might hurt food processing. Besides, the shortage of truck drivers may threaten the North American food supply chain. Firms could collaborate using trucking fleets efficiently to avoid the 'empty miles problem' (non-revenue miles) – i.e., empty trucks driving long distances. The closure of non-essential businesses because of COVID-19 restrictions, however, has worsened the empty miles phenomenon for truckers (Woods, 2020).

Food processors facing a labour shortage may be forced to implement various practices including an increase in shift hours, overtime, and incentive packages and a scaling down of operating hours. For instance, "Maple Leaf will be providing hourly staff with an \$80 per week additional support payment in addition to regular overtime and pay" (Skerritt, 2020). "Cargill ... is paying an additional \$2 an hour for employees that complete all their weekly shifts as well as a \$500 bonus to the ones that work all their schedules through May 3. It's also offering paid leave for 2 weeks for employees affected by the coronavirus through March 31" (Skerritt & Almeida, 2020). Small- and medium-sized enterprises (SMEs) - with limited cash flow flexibility - may struggle to survive the added cost of disruption to support themselves and their employees. Food processors face new cost categories, such as increased employee screening, staggering shifts, safety, and sanitation practices. In food processing plants, employees often have to perform tasks in close proximity to others. The extra costs of social distancing measures to isolate people - including creating workspaces that maximize physical distance - on production activities and employment in the food processing sector are far from clear.

While social distancing measures can considerably reduce the number of new COVID-19 cases, they will also reduce household labour supply, which limits the ability of food firms to produce at maximum capacity and could further limit their ability to meet orders from retailers. Further, employee absenteeism can place significant stress on food processing and trucking. These positions could be filled with people who have lost their job in non-essential industries as long as they have transferable skills. Individual food processors have to make a trade-off between meeting increased demand and slowing down production or lowering labour productivity to prevent a COVID-19 outbreak at their facilities, which could temporarily shut down production altogether.

Anecdotal evidence suggests that some production plants have adopted lengthy screening protocols before employees can even enter the facility to prevent an outbreak. If over 50% of food processing output is concentrated in 5% of the food processors, then an outbreak in one of them could cause significant supply chain disruptions. For example, Olymel, a meat processor, has temporarily shut down and ceased operations for 14 days in its slaughterhouse and cutting plant in Yamachiche, Quebec, after nine employees tested positive for COVID-19.<sup>5</sup> The temporary closure of the facility affected nearly 1,000 employees, and the company directed employees to government assistance programs during the plant's closure.

One of the structures of Canada's food processing industry is a high proportion of SMEs. There are approximately 6,210 food processing establishments in Canada, where 26% of the

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<sup>5</sup> After three employees tested positive for COVID-19, Maple Leaf Foods suspended operations temporarily on April 8, 2020, to conduct a thorough investigation and a deep clean at the Brampton Poultry plant. The Harmony Beef slaughter plant at Balzac (Alberta) stopped processing on March 27, 2020, after an employee who works at the facility tested positive.

establishments have less than 5 employees, 64% have between 5 and 99 employees, 9% have between 100 and 500 employees, and only 1% of the establishments have more than 500 employees (Government of Canada, 2020). Most importantly, micro and small businesses account for 90% of employment in Canada's food processing industry. Pandemics such as COVID-19 may affect small and large firms disproportionately. For many SMEs, with higher liquidity risk and limited working capital, the survival rate may only be counted in days or weeks. As a result, SMEs will tend to go out of business more than larger businesses. The laying off of workers by SMEs will only exacerbate the economic downturn brought on by the pandemic and lead to a further negative demand shock for processed food. For many SMEs, the squeeze in cash flow because of a partial or complete closure of their business operations could quickly lead to bankruptcy because of liquidity constraints. In 2018, the interest coverage<sup>6</sup> of food processors was 4.2 on average, with -0.7 for the bottom revenue quartile and 5.7 for the top revenue quartile (Government of Canada, 2020). This is worrisome because at least 25% of the food processing firms are already unable to meet their short-term financial obligations. With COVID-19 shocks, low-interest loan measures are aimed at easing such short-term liquidity issues for firms. However, considering the current low-interest rate environments and the unprecedented supply and demand shocks, low-interest loans may have a limited impact.<sup>7</sup> Other targeted measures that are taken by governments, such as tax breaks, the extended deadline to pay taxes, and a deferral to pay customs duties that reduce operational costs, may be more effective in reducing or preventing bankruptcies of SMEs (Government of Canada, 2020).

In a crisis, it is important to provide targeted financial relief for those individuals losing their jobs and incomes and provide targeted support for SMEs. Both federal and provincial governments rolled out several fiscal and monetary measures and non-pharmaceutical measures to safeguard the health of Canadians and support businesses. The Government of Canada's emergency package for small business owners, that includes loan guarantees and a 75% wage subsidy for qualifying businesses to cope with the economic consequences of the COVID-19 outbreak, recognizes the vulnerability of SMEs and their importance to the Canadian economy. Additionally, the government provided a \$5 billion support to increase the lending capacity of Farm Credit Canada (FCC). FCC will use the extra fund to provide support to food processors with lost sales because of the financial downturn related to the pandemic. The economic measures are expected to help Canadian businesses cope with financial risks, reduce layoffs, and prevent bankruptcy during the COVID-19 pandemic and to help businesses rebound and encourage business investments following the pandemic. Ultimately, what is unclear is how severe the economic impact of COVID-19 would have been in the absence of government emergency support. This would be an interesting future research area. Evidence from the Spanish Flu pandemic suggests that timely containment measures that mitigate the severity of the pandemic can simultaneously reduce mortality and be beneficial to the economy (Correia, Luck, & Verner, 2020).

Post current-pandemic, public institutions and industry need to equip themselves for the danger of subsequent waves of infections. The Spanish Flu came in three waves from 1918 to 1920 in

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<sup>6</sup> The interest coverage is the ratio of earnings before interest and taxes to interest expenses (Ross et al 2005). The interest coverage measures the ability of the firm to generate enough income to cover interest expenses. A higher ratio is preferred to allow for any unexpected shortfalls in the projected cash flow because of extreme events.

<sup>7</sup> Bernanke (2020) argues that the presence of an effective lower bound on nominal interest rates constrains the amount of 'space' available for traditional monetary policies.

most countries. This second wave of the 1918 Spanish Flu caused 90% of the deaths that occurred during the pandemic in Canada (Parks Canada, 2020). In light of this, in the second stage of the national effort - reopening the economy and preventing a second wave of infections in the recovery program - public institutions must consider the food supply as a critical part of disaster preparedness and establish resilience planning for a potential second wave. Empirical evidence on manufacturing activity for the 1918 Spanish Flu shows that the U.S. economy performed better in areas with more aggressive NPMs after the pandemic (Correia, Luck, & Verner, 2020). While reducing negative economic effects is first order, the main task now is saving lives. That is exactly what the food processors are doing. “This common economic shock requires a common economic policy effort” (Baldwin & Mauro, 2020, p. 19).

## SUMMARY

The COVID-19 pandemic has already had and will continue to have effects on food processors. The industry has seen a growth in retail demand for processed food, a decline in foodservice demand for processed food, a slowdown in food processing activities because of labour and raw material inputs shortages, and a decline in export and import activity. Also, the impact of the pandemic may depend on the type of products and the size of the processors. The overall effect of the pandemic on food processing economic activities and its GDP depends on the magnitude and persistence of the consequences of COVID-19 on economic activities of food processors, and the initiatives and investments processors undertake to manage disruptions.

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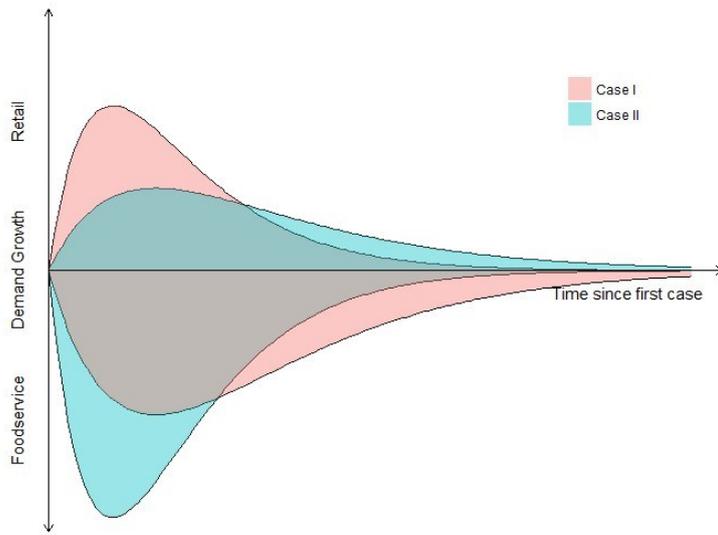


Figure 1. Demand shock to food processors and the effects of non-pharmaceutical measures

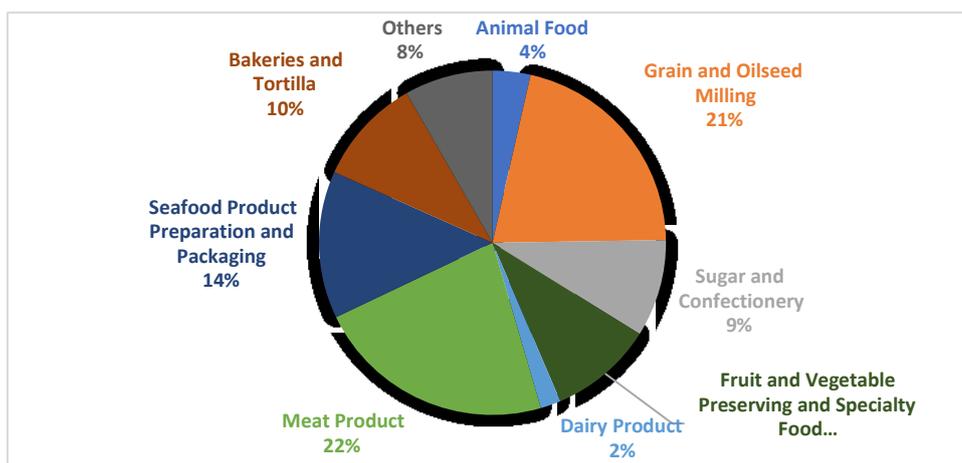


Figure 2. Share of export by food processing subsectors

Data Source: Government of Canada (2020)

Table 1. Nominal food and alcohol expenditures, with taxes and tips, for all purchasers (billion US\$) for 2018 by type of outlet and purchaser

Food at home (FAH) - Retails		Food away from home (FAFH) – Foodservices	
Grocery stores	460.01 (59%)	Full-service restaurants	337.82 (36%)
Convenience stores	14.01 (1.8%)	Limited-service restaurants	340.17 (37%)
Other food stores	18.52 (2.4%)	Drinking places	5.18 (0.6%)
Warehouse clubs and supercenters	167.96 (22%)	Hotels and motels	34.94 (3.8%)
Mass merchandisers	9.18 (1.2%)	Retail stores and vending	38.64 (4.2%)
Other stores and foodservice	78.89 (10%)	Recreational places	33.78 (3.6%)
Mail order and home delivery	24.84 (3.2%)	Schools and colleges	70.15 (7.5%)
Direct selling by farmers, manufacturers & wholesalers	5.23 (1.2%)	Other FAFH sales, NEC	24.36 (2.6%)
Home production and donations	2.29 (0.7%)	Food furnished and donated	45.58 (4.9%)
<b>Total FAH</b>	<b>780.93 (46%)</b>	<b>Total FAFH</b>	<b>930.62 (54%)</b>

Data Source: U.S. Department of Agriculture (USDA), Economic Research Service (2020).