



Framing consumer food demand responses in a viral pandemic

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Abstract

In this paper I explore several issues related to how the COVID-19 pandemic might impact consumer demand for food. These impacts relate to the structure of preferences in the context of a pandemic, income and time constraints, and price effects. Discussion includes accounting for differential impacts of COVID-19 on demand for food across sociodemographic characteristics, and several high-level issues and observations related to where and how consumers shop and what they buy. My own thinking leads me to conclude that demand-side factors will account for most of the changes we see in retail food market. These demand-side effects will be dominated by income effects, the opportunity cost of time, and longer planning horizons on the part of consumers.

Abstrait

Dans cet article, j'explore plusieurs questions liées à la manière dont la pandémie de COVID-19 pourrait influencer sur la demande de nourriture des consommateurs. Ces impacts sont liés à la structure des préférences dans le contexte d'une pandémie, aux contraintes de revenu et de temps et aux effets sur les prix. La discussion comprend la prise en compte des impacts différentiels de la COVID-19 sur la demande de nourriture selon les caractéristiques sociodémographiques, ainsi que plusieurs questions et observations macros concernant l'endroit et la façon dont les consommateurs achètent et ce qu'ils achètent. Propre raisonnement m'amène à dire que les facteurs qui déterminent la demande représentent la plupart des changements que nous voyons dans les marchés alimentaires au détail. La demande des marchés alimentaires sera dominée par les effets sur les revenus, les coûts d'opportunité de temps et les horizons de planification plus long de la part des consommateurs.

1 | INTRODUCTION

The COVID-19 pandemic is an unprecedented episode in the last 100 years of human history. All of Canadian society will feel the impact of this pandemic. Beyond the immediate threat to health, employment, and income, food is one area where we will see an impact across all Canadians. What is more, agents and economic actors across the entirety of our agrifood supply chains will feel this impact. Given that consumer demand pulls food through these agrifood supply chains, it is important to understand Canadians' food demand in the immediacy of the pandemic and related economic downturn, and likely through the shadow of both.

The disruption to society and markets arising from Black Swan events is not new. Examples from the last two decades include the 9/11 terrorist attacks on the World Trade Centre, the 2003 SARS epidemic, the 2003 North American BSE crisis, various food safety recalls,¹ the 2008–2009 financial crisis, and the 2009 H1N1 pandemic. COVID-19 is different. It is different because this

¹ To be clear, there is no evidence to suggest that the COVID-19 pandemic is a food safety issue.

is a highly contagious virus for which no known and proven vaccine yet exists. It is different because of the economic disruption arising from the shuttering of economic and commercial activity on an almost unparalleled scale. It is different because of the disruption to work, home, and personal routine (e.g., working from home, physical distancing, school closures, closure of nonessential business, the response by food service and grocery retail sectors). It is different because we are dealing with the concurrence of a viral pandemic and economic downturn. While the response to and impact of past Black Swan events are informative, they cannot help us fully anticipate the impact of the double-whammy of such a significant viral pandemic and economic downturn.

This paper explores how COVID-19 could impact consumer demand for food. The paper contains no literature review, no conceptual or empirical model, nor any empirical analysis. It offers some thoughts intended to stimulate discussion (and research). The paper is structured around five areas: the structure of preferences, household budgets, price effects, socioeconomic factors, and consumer behavior. It is important to emphasize that the impact of COVID-19 on consumer food demand (and shopping behaviors) will differ across the intersection of individual and household experiences, characteristics, and contexts. In understanding the impact of COVID-19 on demand for food, there is no average effect that carries meaning. Differential impacts and distributional consequences will be profoundly important in understanding the impact of COVID-19 on consumer food demand.

2 | STRUCTURE OF PREFERENCES

The structure of preferences will be an important issue in understanding how consumers respond to COVID-19. I see three immediate areas where the structure of the utility function should reflect the circumstances around COVID-19. The first concerns what is in a consumer's utility function. Beyond consumption quantities, one might imagine that in light of COVID-19, the wellbeing of others might enter into one's utility function. This gets at whether an individual is making decisions for themselves, or in a way that reflects the wellbeing of others (be they other members of the household, family, or broader society). In this respect, notions of altruism and interdependent utility functions become important. More broadly than this, one could think about incorporating the notions of personal and social capital in the utility function and defining these forms of latent capital as functions of choices made (Becker & Murphy, 2000). The idea here would be that an individual derives utility of services flowing from personal and social capital, while personal and social capital depend on the elements of choice and may well reflect the choice one makes for themselves, others, and conceivably others' choice.

Second, the temporal nature of choice also needs consideration when thinking about consumer demand for food in a pandemic. The issue is whether food consumption occurs at the time of purchase. Under normal circumstances, most households separate the purchase and consumption decisions, leading to home inventories being held as a matter of convenience. Given changes to the retail grocery landscape (e.g., some stores having reduced hours or limits on the number of people in the store at one time, and transaction costs associated with on-line purchasing, etc.) it may be that some consumers continue to purchase and store inventories at home as a matter of convenience. It is also possible that some households increase their home inventories to reduce the number of future shopping trips (and thus limiting their perceived risk of exposure to the COVID-19 virus).

Purchasing now for later consumption introduces a dynamic inventory problem that reflects a discount rate for the future utility from consumption. This brings into to play two important issues—consumer discount rates and the time horizon in a consumer's mind when deciding how much to buy now for later consumption. I would hazard a guess that the planning horizon is longer in the COVID-19 environment, and discount rates smaller, thus making future consumption more of a concern, and leading to excess inventory holding. Temporal considerations could also affect what is purchased. Given a longer planning horizon, and potentially lower discount rates, one might expect to see a rise in demand for easily stored food items, and a fall in demand for not easily stored food items or foods whose quality falls with storage. In this respect we might see substitution between the form the underlying food good takes—for instance, substituting between fresh fruit and canned fruit.

Excess inventory holding leads to the third structure of preference issue, namely uncertainty. A longer time horizon and lower discount rates may lead to excess inventory holding compared to pre-COVID-19 periods, but so too could risk or uncertainty. In the absence of a definite end to the COVID-19 pandemic, some may undertake excess in-home food inventory holding as an insurance against future stockouts at the grocery store—a consumer version of the convenience yield in commodity storage if you will. In this sense, “hoarding” may be a rational response to expected future stockouts, with the cost of excess purchases viewed as a risk premium for informal insurance against grocery store stockouts. If true, then somewhat paradoxically, this form of self-insurance could lead to behaviors that create a stockout.

3 | HOUSEHOLD BUDGETS

While the structure of preferences is important to bear in mind, so too are limits on choice through income and time constraints. Continuance of income/cash flows is important in understanding consumer response to COVID-19. For those affected by a loss of income, an open and important question is whether and how participation in Canada's Employment Insurance program and the recently announced Canada Emergency Response Benefit (CERB) impacts their demand for food. Also important is whether and how demand for food changes by those whose incomes are partially supported by their employers accessing the federal government's Canada Emergency Wage Subsidy program. On both scores, the potential distribution effects will be important to understand. An individual's capacity to draw on saving or liquid assets, or rely on credit-based (e.g., credit cards or a line of credit) consumption smoothing, are also important factors to consider, and which carry broader distribution issues insofar as access to credit is concerned.

Demand for food and most food products in Canada tends to be income-normal. We would expect a proportionally smaller reduction in demand for a food product than the proportional reduction in income/expenditure. Despite this, lessons from the 2008/2009 financial crisis remind us of what we might expect to see—namely, a higher degree of economizing in the food purchasing decision in the face of income/expenditure reductions. This can take varied forms, including eliminating the purchase of foods not deemed essential in the consumers' mind, reduced consumption of some goods, or within-category substituting away from relatively higher-priced alternatives. In light of expected income reductions, we might also expect to see a fall in demand for some niche and premium priced food products as people substitute toward value-priced and nonniche equivalents. While not related to food, we might also see deferral or postponing of big-ticket purchases (e.g., vacation, durable goods, etc.) and mortgage/rent deferrals as a way to generate liquidity to support the purchase of necessities. Unlike the 2008–2009 financial crisis, large portions of the foodservice sector have closed or changed their business model in light of COVID-19—by circumstance, we are seeing fewer Canadians eating out of the home. What we do not know is whether the resulting reduction in household expenditures on services translates into greater liquidity when buying food for consumption in the home. We don't really understand the degree of substitutability between expenditure on food consumed in the home and food consumed out of the home, and especially so during an event like COVID-19.

The allocation of individual and household time is also changing, and this might impact the demand for food. School closures, the closing of nonessential businesses, work-from-home arrangements, and closing of recreational facilities, churches, and other civic venues, and their programs, means more Canadians are at home. Some have more time available for new uses, while others will have new and competing demands on their time. This new organization of households and decisions concerning an individual's allocation of time could have a bearing on demand for food. On the one hand, I could imagine individuals and households undertaking a more concerted effort to consume food prepared in the home, and which offer potentially enhanced health and nutrition profiles. On the other hand, I can see the new challenges of household organization and individual time use leading to a rise in demand for prepared, heat-and-eat food products, as well as meal kits. Both carry an expectation of an increase in demand, but demand for ingredients on the one hand, and convenience foods on the other. What we actually observe will depend on the lifecycle and composition of the home, and the duration of the pandemic and closure of foodservice establishments offering dine-in options. A longer pandemic might lead some to invest in human capital by learning new food preparation skills that enable them to create meals from base ingredients, rather than relying on prepared foods. But, the time pressure for those working-from-home and with children (or other dependents) in the home will be different from those who are not working and/or do not have children (or other dependents) in the home. The opportunity cost of one's time (and within the context of the household) will be very important in understanding how consumer demand for food changes in response to COVID-19, and in understanding a decision to invest in new food preparation skills.

4 | PRICE EFFECTS

At the time of writing, we cannot attribute COVID-19 to widespread, persistent changes in the price of food. While stockouts have occurred, the price impact of these stockouts appears muted by a responsive supply chain. Unlike legislated or regulated rationing and price controls implemented during WWII, we have not seen institutional rationing or price controls outside of pre-existing conditions in some regulated agricultural markets. This is not to say that price gouging has not happened in the face of spikes in demand, but we have the ability to protect consumers through established Federal and Provincial consumer protection and emergency legislation. For instance, using the *Emergency Management and Civil Protection Act*, the Province of Ontario recently announced new fines and penalties for those found guilty of price gouging. Other means of “policing” pricing

behavior also exist—for instance, using social media to publicly shame establishments undertaking such practices, and firms self-policing their pricing policies as a matter of good public relations and corporate governance.

Supply chain responsiveness is key to the short-run price stability we have seen thus far. However, longer-term effects are less clear, especially as the first expected wave of COVID-19 is accelerating at a time when much of North American agricultural is begin its planting season. We may well see price increases in the future if there are systematic and sustained disruption of distribution channels or agricultural production.² Demand for many groups of commodities tends to be price inelastic, meaning the expected proportional impact on demand would be less than the proportional increase in price. As well, given the variety of quality, selection and varying price points in most grocery stores, I would expect the between and intragroup substitutability to be an important part of how consumers economize in the face of relative price increases.

5 | SOCIODEMOGRAPHIC FACTORS

Preferences, prices, and income are important considerations in understanding how demand for food responds during the COVID-19 crisis. But so too are sociodemographic factors that reflect the lifecycle of the individual and household. This is not to say that sociodemographic factors drive changes in demand; rather, that changes in food demand arising from COVID-19 may have a differential effect across individuals and households with different characteristics. Ignoring these sociodemographic effects robs us of understanding the deeper insights of how COVID-19 may affect consumer demand for food in Canada. But what sociodemographic factors do you consider? A variety of observables come to mind: gender and identity, age, education, migrant status, employment status, ability status, and household composition are all important. So too is the intersection of these characteristics insofar as defining broader segments of consumers that might lend itself to insights about common responses across subgroups of the population at similar stages of their lifecycles.

Additional consideration should be given to sociodemographic characteristics which capture those in vulnerable groups. These groups include those who face precarious employment (and income), the homeless, those who face food insecurity, and those who are immune compromised or for whom it would be unwise to leave their homes in light of the COVID-19 virus. While not at all exhaustive, I hope this underscores the fact that there are groups with precarious socioeconomic status who may be marginalized, and whose food demands may be particularly affected by COVID-19.

6 | SHOPPING AND CONSUMPTION BEHAVIORS

COVID-19 is affecting where and how people shop, and may well influence what people buy and consume. Weeks into the COVID-19 pandemic and we are seeing changes in the channel and venue that people use to acquire food. Restaurants are almost universally closed for order-in or sit-down service, and those that remain open are doing so with reduced hours, a limited menu selection, and delivery or drive-thru/curbside pick-up options. This means Canadians have likely reduced their frequency of eating out of the home. Interestingly, restaurants that only offer drive-thru/curbside pick-up options point to the role of transport and the intersection of access to transport and socioeconomic status. For some, transportation needed to access food may be a limiting factor. Reductions in public transport services in some locales (as a means to limit the risk of exposure to COVID-19) potentially magnifies this effect. Nonetheless, as mentioned previously, reduced food-away-from-home options could alleviate income effects in that a dollar now spent in a grocery store may go further than a dollar previously spent in a foodservice establishment. Admittedly, this comparison omits a time and skill element; planning and preparing a meal takes time and knowledge—account needs to be taken of the in-sourced services now provided by the consumer (or in-home food preparer) that the foodservice establishment provided previously.

Most retail grocery venues remain open but with reduced hours (to give staff a break and allow for re-stocking) and, in some cases, with limits on the number of people in the store at any given time (as a means of ensuring physical distancing), and limits on how much of an item one may buy at one time. In some locales, farmers' markets have been closed as a means of limiting the risk of exposure to the COVID-19 virus, potentially having an impact on buying locally. We have also seen dedicated hours for those in more vulnerable groups at some retail grocery chains. As I mentioned above, we are likely seeing less frequent trips to grocery venues—likely due to heightened concerns of exposure to the COVID-19, directives by various levels of government, or competing demands on time arising from new home-based activities (e.g., care of dependents). At

² One issue which might be particularly important in Canada in this regard is access to seasonal agricultural workers.

the same time, we are seeing a rise in online grocery shopping (Robertson, 2020), and I would expect to see a rise in home meal kits. The timing of online grocery services is an issue, with longer lead times for orders than before the COVID-19 pandemic, thus requiring more planning and potentially placing greater demands on the time needed for food choice in the household.

I believe it would be a fool's errand to predict changes in demand for a particular food or food group. Too much is changing too fast. But, two observations come to bear in the context of what people are buying. First, we are seeing evidence that the food manufacturing sector is changing their product runs to focus on more basic product forms (Baum & Robertson, 2020). Second, we are seeing a rise in demand for the ingredients used in baking (Strong, 2020). The former might point to market responsiveness in the context of firm's expectation of consumers economizing behavior. The latter might point to Canadians seeking self-sufficiency in light of the pandemic (i.e., in-sourcing the preparation of what we otherwise buy in a prepared form, e.g., making bread at home instead of buying it at a store), or an inclination toward foods that bring comfort in a time of stress, anxiety, and uncertainty. It will be interesting to see if the demand for foods or food ingredients that contain "comfort" attributes will rise during the pandemic.

Several other issues arise in the context of shopping behavior and what people buy. As it appears some people are stocking up, will there be an unintended rise in food waste related to perishable products, or products which exceed their best before date prior to consumption? Relatedly, how will people use leftovers to make their food dollar go further and potentially limit the number of trips they make to a grocery venue (or limit the number of orders they make online). Lastly, how will changes in consumption behaviors manifest themselves in a movement along an Engel curve (pointing to the greater importance in food expenditure during a recession) and translate into a change in farmer's share of consumer's food dollar?

7 | CONCLUSION

This paper explores several issues related to the potential impact of COVID-19 on food demand. It offers casual observation with no analysis. Moving beyond a static, certain approach to the structure of preferences will help us understand observed behavior (e.g., stockpiling) and possibly understanding future behaviors in a COVID-19 world. Income and time constraints will matter. Tighter incomes will likely lead to substituting behaviors within and between food groups. However, people shifting food expenditures from away-from-home to in-home consumption will temper this effect. New routines forced by work-from-home requirements, school closures, and physical distancing will impact the opportunity cost of time, and may lead to new food behaviors. Muted short-run retail food price effects are evident. However, how the agricultural sector fares in light of physical distancing and possible disruptions to agricultural labor markets and production practices lends itself to the possibility of higher food prices in the long run (and possibly increased price volatility). It will be important to understand the impact on food demand arising from policy interventions related to wages and income. This understanding should take account of sociodemographic factors, and the intersection of these factors. Lastly, where and how people shop has and will continue to change as the COVID-19 pandemic evolves in Canada. Whether these changes persist will depend on the duration of the pandemic and associated economic downturn.

Like all countries, Canada has groups vulnerable to and affected by food insecurity. However, as a nation, Canadians have come to expect an assured supply of food. While recent spikes in demand at the food retail level have led to stockouts, the responsive nature of our food supply chains means these shortages have been short-lived. Given that COVID-19 has not led to restrictions on food and agricultural trade, and given the resilient nature of our agricultural sector, I remain optimistic about the continuity of the food supply. Barring significant disruption to agricultural production, my thinking leads me to conclude that demand-side factors will drive most of the changes we will observe in food markets. In this respect, income/expenditure, the opportunity cost of time, and longer planning horizons will account for the lion's share of these demand-side drivers. I hope these musings will stimulate discussion amongst the broader community and lead to empirical analysis that improves our understanding of whether and how a Black Swan event like COVID-19 affects consumer choice.

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