

Agri-Food Supply Chains and Covid-19: Balancing Resilience and Vulnerability

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The Issue

The international emergency presented by spread of the novel coronavirus that causes the Covid-19 illness has thrust food security concerns to the forefront. In Canada and the US, fear of shortages and lockdown has triggered some panic buying in grocery stores. In some areas, restaurant and foodservice facilities have been ordered shuttered, with the exception of food take-out and home delivery establishments. In turn, access to food has been largely focused on purchases in stores for preparation at home, resulting in some stockouts and empty shelves. At the same time, government and industry communications messaging has focused on the reliability and robustness of the food supply chain.¹

There is surely a need to reassure the public of our food security. Nothing fundamental has changed with regard to productive capacity in the agri-food system—no livestock or plant disease, or a natural disaster (flood, drought, pests, destruction of property) has occurred that destroys food output. Movement of agri-food product from farms through to consumers has been resilient to any number of past extremes.

Rather, as a human pandemic crisis, Covid-19 presents a different situation with regard to the agri-food system with its own risks, many previously unencountered. Agri-food operates with some relatively long supply chains with numerous intermediaries, in some cases containing significant lags in time and with few redundancies. This structure has been shaped by competitiveness and efficiency criteria, but can create points of vulnerability in a crisis such as Covid-19. Past

experience of robustness and integrity of our system should not abstract from the real risks we now must face.

The purpose of this policy note is to sketch out how the Covid-19 crisis poses a specific set of risks, and to put these in context to allow for improved focus and debate on needs in policy and emergency planning.

Human Disease Effects on The Agri-Food System

A human disease crisis like Covid-19 impacts the behavior and movement of people. For the agri-food system, disease- and disease fear-caused workplace absenteeism affects the feasibility and continuity of some operations. Disease status impacts the movement of people, notably across national boundaries and at critical control points where they undergo disease screening or notify screening results. In addition to creating inefficiencies, these effects introduce new bottlenecks into the system, perhaps in a manner that appears suddenly and is only vaguely predictable, but potentially highly consequential. Human disease pandemics affect consumer psychology and food purchasing behaviour.

Disease-Related Absenteeism

Risks posed by workplace absenteeism at critical points are potentially profound. For example, inspectors play a pivotal role in food processing plants. If food inspectors did not report to work—due

¹ See for example remarks from the US Food Marketing Institute “No need to stockpile food in the US” https://www.agweb.com/article/no-need-stockpile-food-us?mkt_tok=eyJpIjoiTVRaaFIURTROell6TnpJeCIsInQiOiJM

[eIBVXC95VzlcL1Y2RGpLY0FhVFhUVU1seFdTTIBCc08wSTFyNDdHWHA0YXJsQWxXcmcwUUJkNitBSkFsemMyOTFyTlVXQ3BldGkzSm50MFwvSnNzSnF3eG1sT3pRejc2OTI NbFloZEJuMmIydzJjdXZHRlo4TGUrRGYwbkxiZGpvTyJ9](https://www.agweb.com/article/no-need-stockpile-food-us?mkt_tok=eyJpIjoiTVRaaFIURTROell6TnpJeCIsInQiOiJM)

to falling ill with Covid-19, due to regional public health orders to stay in place at home, or out of fear that they will become sick from exposure at work- it could very likely be sufficient to shutter a plant. More generally, employee absenteeism related to Covid-19 undermines capacity and presents the prospect of shuttering plants. This could occur quite suddenly. This was recently illustrated at an auto assembly plant in Cambridge, Ontario; a single worker found to have tested positive for Covid-19 was sufficient to shutter the plant for several days.²

Absenteeism in the transport links- farm to plant truck transport, plant to retailer truck transport to distribution centre (DC), DC to store truck transport- are another source of risk. Qualified truck drivers have already been in short supply for some time; risk of absenteeism due to Covid-19 exacerbates the situation. Absenteeism of staff at truck wash bays are an additional risk, carrying the prospect of increased spread of livestock diseases.

The grocery retailer DC's themselves tend not to be setup to stockpile product; they move product through on a just-in-time basis, so in-bound or out-bound traffic disruptions affecting DC's feed back upstream quickly. Absenteeism in the DC's themselves is also a major source of risk, as the ripple effects could go far back the supply chain. Interruptions at further processing plants could have a similar effect. Shuttering of a rendering facility would have immediate backup effects on livestock supply chains.

Logistics relating to farm deliveries are also a critical source of risk. Late winter and early spring are periods in which seed, fertilizer, fuel, and deliveries of other inputs typically occur in the countryside; as spring tillage and planting proceeds custom fertilizer and pesticide application occurs. Trained driver/operators are already in short supply in these segments; disease-related absenteeism in these

positions can serve to locally delay or impair seeding and crop tending operations. Disruptions in supply logistics due to absenteeism are also critical risks for livestock- the provision of feed and veterinary services are equally critical matters of animal health/welfare, livestock disease prevention/treatment, and economic value.

Movement of People

The agri-food workforce is comprised of both domestic and foreign workers. In either case, the current crisis will require notification by employees of any contact with known or suspected cases, return from foreign travel, symptoms of the virus or results of coronavirus testing. Food plants already meet high standards of cleanliness. Nevertheless, management will be endeavoring to increase sanitation and improve where possible social distancing, tracking, and communication of potential exposure to workplace personnel. This is costly for employers to administer and also disruptive to workplaces, with the risk that poorly handled workplace communications could scare workers away and exacerbate absenteeism.

The situation for foreign workers in agri-food is more complex. There are foreign workers currently in Canada whose work visas are set to expire. The difficulty under the current situation with countries closing their borders is that it stands to be very difficult to facilitate the return of foreign workers if they depart, or to replace departing foreign workers with new arrivals. Moreover, there is an extended process in which employers must demonstrate having sought Canadians for employment positions prior to approval for foreign worker positions- a requirement that could appear distinctly odd if significant portions of the Canadian populations are sick, or perceive risks of illness from working.

² <https://www.guelphtoday.com/coronavirus-covid-19-local-news/cambridges-toyota-plant-confirms-one-case-of-covid-19->

[2179790?utm_source=Email&utm_medium=Email&utm_campaign=Email](https://www.guelphtoday.com/coronavirus-covid-19-local-news/cambridges-toyota-plant-confirms-one-case-of-covid-19-2179790?utm_source=Email&utm_medium=Email&utm_campaign=Email)

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Horticultural industries that depend upon extensive farm labour- local help as well seasonal and temporary foreign workers- are especially at risk from absenteeism, complicated by tying immigration and public health rules together in the current crisis. Access to labour in some horticultural segments is such an overwhelming consideration that the prospect of interruption in the accessing workers place farms, and even whole industries, at risk.

Solutions on foreign workers appear to be underway, both for entry and renewal of work permits for those already within Canada- specifically for agriculture and food.

Consumer Behaviour and Demand

Demand conditions can be segregated into domestic and export markets.

Domestically, the immediate reaction to social distancing in Canada generated a run on grocery stores, and a surge in demand for specific staple products which continues at the time of writing. This behavior has generated stockouts of products in some stores.

Considerable anxiety is created among some consumers by the appearance of empty grocery store shelves; however, once the panic buying ceases and the meaning of social distancing sinks in, there will be fewer grocery store visits and thus dampened demand, to some degree. The limitations imposed on restaurants across provinces will result in excess inventories of foodservice pack product. This can be

redirected (with some difficulty) and could temporarily add to retail food supplies.³

The export demand situation under coronavirus threat appears complex. We need to assume that, as a practical matter, export market access for Canadian product has effectively tightened due to absenteeism throughout international logistics systems. One indicator is the tight availability of ocean containers accessible for export shipments, with many awaiting return from China⁴. Another aspect is Covid-19 related absenteeism of dock workers and others in the international trade logistics system- both in Canada and abroad. This has also been compounded in Canada by the port and rail backlog created by the blockades earlier in the year.

Consumers staying home from grocery shopping in export destination countries out of fear of the contracting the virus also dampens export demand. Elsewhere, east Asia is desperately short of meat and other products; this could be a buffering or offsetting factor- if the logistics channels for agri-food products can hold up under the coronavirus strain.

Canada is also a significant importer of agri-food products, and access to wide range of imports- coffee, orange juice, certain feed ingredients, etc., is taken for granted; no changes in trade policy have been made by Canada or its trading partners in this regard. However, we need to be aware of the tendency, in times of crisis, to satisfy one's own needs first. If the crisis deepens, it can be expected that some products Canada imports will be somewhat less available as a result.⁵

³ The continuing issue is that with about 25% of all meals in Canada attributed to Food Service a significant percent of these have suddenly had to move to retail which is straining the ability of retail to restock some key items

http://www.ufcw.ca/index.php?option=com_content&view=article&id=3582:by-the-numbers-food-consumption-in-canada&Itemid=6&lang=en

⁴ See for example "There Aren't Enough Containers to Keep World Trade Flowing, *Bloomberg*, March 18, 2020

[https://www.bloomberg.com/news/articles/2020-03-18/there-](https://www.bloomberg.com/news/articles/2020-03-18/there-aren-t-enough-containers-to-keep-world-trade-flowing?utm_medium=social&utm_content=economics&utm_campaign=socialflow-organic&utm_source=twitter&cmpid=socialflow-twitter-economics)

[aren-t-enough-containers-to-keep-world-trade-flowing?utm_medium=social&utm_content=economics&utm_campaign=socialflow-organic&utm_source=twitter&cmpid=socialflow-twitter-economics](https://www.bloomberg.com/news/articles/2020-03-18/there-aren-t-enough-containers-to-keep-world-trade-flowing?utm_medium=social&utm_content=economics&utm_campaign=socialflow-organic&utm_source=twitter&cmpid=socialflow-twitter-economics)

⁵ This issue is also tied to that of the farm workforce elsewhere. The U.S. makes extensive use of Mexican temporary agricultural workers, and Mexico is far behind in implementing measures to curb Covid-19. Managing the health/immigration status of Mexican workers in the US could

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Implications

For several supply chains that operate consistently throughout the year- notably dairy, pork, beef, poultry, and eggs- the immediate concern is the prospect of employee absenteeism reducing the workforce available in various segments of the supply chain, and suddenly creating new bottlenecks. The most obvious worry is the prospect of processing plant employee absenteeism shuttering a plant. Plant closures have already begun to occur in Brazil in some meat plants due to Covid-19; the fear of this occurring in the US appears to have roiled livestock futures markets. The effects of a plant closure could back up very quickly to the farm level in terms of much lower pricing and animal welfare considerations.

Disruptions in agri-food supply chains fragments themselves on a plant by plant basis, with the prospect that lost capacity in a given plant could result in redirection of farm product to a different plant. However, this requires extensive coordination and flexibility. Processing plants mostly operate at a large scale compared to the farm product supply, and operate routinely near capacity, so the shuttering of a single facility could be highly disruptive and require immediate action- with unclear prospect of finding a home for the displaced farm product. Contingency planning for these situations is an urgent matter.

Export as a home for displaced product (or more generally) could become increasingly difficult due to border measures enacted to restrict the flow of people, even if market access rules for product have not changed.

prove difficult. The implication is that we may not be able to rely on abundant produce from either Mexico or the US later this year- placing further pressure on Canadian supplies.

⁶ “China’s farmers fear food shortages after coronavirus restrictions”, *Financial Times* March 17, 2020

The situation for crops is driven by the urgency of the season. Distribution of planting supplies is occurring, but under the mounting risk of absenteeism among truck drivers and workers in the crop services segment. The risk of absenteeism also extends to the workforce involved in putting the crop in- on farms, custom application services, etc. Horticulture in particular needs seasonal labour. Spring is coming, the crops will need to be planted, and the capacity to support this to occur needs to be secured.

Access to farm inputs and workforce is largely taken for granted; in the current situation it is an important source of risk. The situation currently unfolding in China is instructive, where production of fertilizer, distribution of inputs to farmers, and access to farm workers was impeded by the coronavirus lockdowns. On March 17th, one industry analyst warned “China’s agricultural industry has collapsed without the free flow of labour and raw materials”.⁶ The coronavirus movement restrictions on feed and marketing in some regions of China has similarly impacted the Chinese poultry industry.⁷

Prospective Directions

There are potential shifts in the Canadian agri-food system that can be made to mitigate these risks.

Governments need to designate the “agri-food system” as a critical industry whose functioning has to be supported in all aspects of regulatory oversight. This designation has been established in the US by Homeland Security. The risk of inaction on this is that provincial or local authorities may unintentionally take regulatory actions that fail to recognize the need to keep the food system (especially for basic food stuffs) functioning.

<https://www.ft.com/content/cafb828e-6423-11ea-b3f3-fe4680ea68b5>

⁷ How Covid-19 has hurt China’s poultry industry, *Watt Ag Net* March 20, 2020 <https://www.wattagnet.com/blogs/23-poultry-around-the-world/post/39865-how-covid-19-has-hurt-chinas-poultry-industry>

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In order to protect safety of employees and security of the food supply chain, all participants must be proactive in following public health guide lines and plan with their supply chain partners for interruptions in the supply chain.

As the food supply chain can anticipate staffing challenges it would be prudent to offer incentives to employers to create a trained pool of temporary plant workers, warehouse workers and transport drivers who will both assist with the surge in retail fulfillment and be able to fill in as cases appear in a plant requiring a number of employees to stay home and self-isolate. This could be further extended to establish a broader pool of accredited individuals available to fill positions temporarily in the event of absenteeism, across firms.

Similarly, it would be prudent for CFIA and Provincial inspection agencies to recruit and train auxiliary staff to work under inspectors to build redundancy immediately.

Within the food system, and specifically with respect to CFIA inspection services, there is a need to prioritize inspection services for the meat, poultry, dairy, and egg industries, for both domestic and export production. Prioritization of only production for the domestic market in pork and beef cannot work, given the huge proportion that is exported which supports the domestic production. At a minimum, poultry and livestock slaughter, egg grading/processing, and dairy plant operations have to be fully supported to avoid a catastrophic animal welfare situation and farm-level impact.

As necessary, inspection services should be prepared to drop non-essential compliance verification and enforcement activities that do not have immediate impact on food safety. This would include temporarily reducing or stopping visits to very low risk factories to ensure back-up staffing; these resources can be redeployed for meat/fish/dairy/poultry inspection. Companies with GFSI-benchmarked private food safety

certification/audit procedures in place could safely operate temporarily without “continuous presence” of CFIA inspection, at least with respect to production for the domestic market.

Food companies and inspection services should be working to utilize all available plant capacity to restock the supply chain, while they can, as a hedge against the potential risk of plant closures in the future from Covid-19.

Food processing plants, DC’s, and other establishments that handle food, should consider immediately the processes they have in place and how they operate with reduced staffing levels under the pressure of Covid-19 related absenteeism. This could entail cross-training of staff on a variety of jobs, and other redundancies put into plant operations.

Recently introduced regulations on maximum periods for livestock transportation and withdrawal from feed and water could severely limit options to redirect animals from slaughter facilities that must suddenly shutter. These should be temporarily suspended.

Given the time of the year, the other priority is making sure crop inputs are cleared quickly through border inspection, and the massive backlog in exports keeps moving- otherwise there will be a reduced crop and no room to store more food products.

The lessons learned from past crises need to be reviewed and applied to today. The BSE experience of the mid-2000’s can be instructive, particularly in terms structuring policy to address effects across a long and complex supply chain, with sudden bottlenecks appearing simultaneously at a number of points. BSE recovery programs illustrated that programs can effectively push livestock for slaughter forward in time. However, each program was put in place for a short period of time and had to be renewed for another short period. Greater continuity, clarity and certainty to markets would have occurred from a program that is in place until it is no longer needed- based upon a defined end point of market

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conditions- rather than a fixed date. This could be particularly critical for industries as they plan labour requirements, and the additional costs of assuring labour during the coronavirus problem.

The above policies and more should be developed into a supply chain resilience plan incorporating the best suggestions from the supply chain members and inspection services. Governments can be expected to find the plan helpful as it may be required to act to maintain food supply and a productive industry.

Conclusions

It is not an indictment of our Canadian agri-food system and its supply chains to observe that potent new risks exist, in the face of the stark social and economic changes suddenly implied by the Covid-19 crisis. With food so intrinsic to our daily lives, and a grassroots-based farm production system, it would be genuinely surprising if there were not sobering challenges we now need to face up to. Rather, it is a testament to the integrity of the existing system that requirements for changes can be identified and brought forward within our existing systems to target specific issues and mitigate risks.

In this regard, there is a need for a continuously operating dialogue among governments, industry leaders in all aspects of the agri-food chain, with policy research capacity attached to it. The dialogue must lead to the setting of priorities, immediate, short term, intermediate term, and long term/recovery. Governments will require continuous interaction with a wide range of people from involved industries, with their breadth of knowledge, to make this effective.

The immediate task for industry and government is to acknowledge that there are significant potential risks, and to be prepared to act on them. The message of reassurance for the public should be that our system's resilience lies in our ability to recognize the risks posed by an emergency, and to work together and expedite the changes needed to secure it.

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