

Supply chain innovation can reduce coronavirus food shortages

June 1 2020, by Martin Scanlon, Rene Van Acker and Rickey Yada



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Food security is an essential issue brought to light by COVID-19.

The Canadian government recognized this [by deeming workers across](#)

[the food supply chain as an essential service](#). More importantly, [in early May, the federal government announced \\$252 million](#) in funding to farmers, food processors and food businesses to get through this pandemic.

Of the funding, \$77.5 million is earmarked for food processing. This is a critical juncture: we are at a time when we need to examine food processing technology pre-COVID-19 and deploy it to make us more food secure and ready to withstand the next big challenge.

Relying on old approaches

With COVID-19, we've fallen back to 19th-century food technology to make us feel safe—[stocking our pantries with canned foods and shelf-stable dried foods, including grains and pulses](#).

When considering a post-COVID-19 food system, we must focus on building resilience using modern innovation. Cutting costs should not be the only factor that [informs our supply chains](#).

Most Canadians have lifestyles that demand the convenience of processed foods while valuing nutrition. The carbon footprint of food preservation done at the industrial scale is low: life-cycle analyses of foods show that the carbon footprint of home cooking is [2.5 times that required to process the food](#).

Food supply innovation tools

In designing this post-COVID-19 food system, [the innovation tools are remarkably like the technology-focused terms of the pre-COVID-19 food system](#). Some examples are:

- Blockchain: The incorruptible traceability features of blockchain

permit agricultural commodities and food ingredients to be actively traced throughout the supply chain. Therefore, if, [as happened recently in Alberta](#), production workers get sick, preceding parts of the [supply chain](#) can be reconfigured. Products can also be readily recalled, limiting further spread of the sickness (regardless of whether the sickness stems from a pandemic virus or a food pathogen). [The technology can also protect consumers from food fraud](#).

- Sensors, robotics and automation: Even prior to the pandemic, an industry consortium, partnered with Industry, Science and Economic Development Canada and Agriculture and Agri-Food Canada, had recognized the need to better automate Canada's \$105 billion per year food processing industry in order to [incentivize the growth of small- and medium-sized processors](#). With COVID-19 affecting skilled and semi-skilled workers on process lines, the impetus for sensor-driven, on-line quality and safety assurances, coupled with hygienic robotic automation of production lines, will solve [food security](#) fears. Cheap sensors embedded in packages can also [provide quantitative assessments of food spoilage](#). Such innovations reduce the amount of food sent to landfills because of [consumer confusion about best before dates](#).
- Boutique food process operations: Megaplants producing large volumes of a limited range of products have cheaper production costs, [but are intrinsically inflexible](#). Food processors who can respond with agility to a variety of seasonal food preservation demands can better serve local food system needs. Some of these boutique processors can address agricultural food waste issues while also [innovating with third generation aseptic processing technologies](#). This can produce nutritious high-quality foods that are shelf-stable for up to two years to deliver resilience capacity to our food system.

Refrigeration and transportation

Because most foods are perishable, [refrigeration or freezing is required to preserve the food from production to consumption](#)—a continuous system of temperature-controlled environments known as the cold chain. All of this cold chain, including the limited amount of cold-space in a consumer household, is completely reliant on uninterrupted power for refrigerant recycling.



Credit: AI-generated image ([disclaimer](#))

Developing nutritious shelf-stable food innovations also addresses the cold chain's carbon footprint. As much as [80 percent of the emissions profile of a food product is its refrigeration footprint](#). More than half of

all supermarket energy consumption is associated with their fridge and frozen aisles. [Innovative drying practices](#) can replace these cold chains to preserve fruits and vegetables, at the same time maintaining quality and nutrients.

Finance Minister Bill Morneau noted that [Canada's agricultural sector is interconnected](#).

As we enter the post-COVID-19 world of the 21st century, our call to action is to renovate our food supply chains so that they readily absorb the effects of the next big challenge. It's now up to all the [food](#) system actors represented on the [Canadian Food Policy Advisory Council](#) to ensure the new investments make a positive and lasting change across the production chain to benefit both consumers and the environment.

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