

Resilience and Vulnerabilities of the North American Food System during the Covid-19 Pandemic

Résilience et vulnérabilités du système alimentaire nord-américain pendant la pandémie de Covid-19

Resilienz und Krisenanfälligkeit des nordamerikanischen Lebensmittelsektors während der Covid-19-Pandemie

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The global coronavirus (Covid-19) pandemic and the illness, death and economic devastation it has wrought have provided the most severe test of the resilience of the North American food system since World War II. At the time of writing, officially recorded deaths in the United States had exceeded 100,000 despite much of the population being under stay-at-home orders during March–April to flatten the disease transmission curve and to manage hospital capacity. The economic cost has been severe, with unemployment skyrocketing in just a few weeks from less than 5 per cent to nearly 15 per cent and with GDP projected to decline by 12 per cent during April–

June 2020. To cushion the economic blow, more than US\$ 2.7 trillion of federal stimulus and health care spending received bipartisan political support, despite the future public-sector debt burden this will entail, and the Federal Reserve Bank launched aggressive anti-recession monetary expansion.

With deaths still averaging over 1,500 per day, but the spread of the disease apparently slowing, the United States entered a second stage of response to the pandemic in mid-May. States began to reopen their economies, at different rates and depths; all hoping that various health measures mandated or

recommended as social distancing eased would keep the virus at bay. Health experts warned of potential resurgence resulting from the easing or from a second wave of the pandemic in the autumn or winter, but the economic downturn was also seen as perilous.

“ Le secteur privé s’est largement montré à la hauteur, compte tenu de la gravité de la pandémie. ”

Unlike the zoonotic BSE or poultry-sector HPAI, the coronavirus, SARS-CoV-2 (the virus that causes Covid-19) is not food-borne. Yet the food system has faced enormous challenges. Agriculture and the food industry in the United States are dynamic sectors that feed a wealthy population with diversity and choice and are a bread and protein basket for the world. North American food systems, particularly in the United States and Canada, are highly integrated, and export many similar products. Mexico is also closely integrated into North American agriculture through product and labour markets. Effects of the pandemic and questions of resilience have been similar system wide (Ker and Cardwell, 2020).



The Covid-19 pandemic posed challenges to industry and governance throughout the North American food system.

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Pandemic onset and impacts

At the onset of the pandemic, the US food system held up well. There were some empty shelves in grocery stores as consumers stocked up, but supplies were rapidly replenished. Sustained gaps that would quickly raise fears and spark runs on food stores reminiscent of bank runs in the Great Depression of the 1930s did not occur. Pandemic news coverage focused on the health emergency and shortages of urgently-needed medical equipment and supplies. Any detected systemic food shortages would have been newsworthy – since next to health care no other life-sustaining system is as critical as the food sector. Yet, little news coverage was devoted to food availability. Steps were taken to protect supermarket workers and consumers and to keep retail food stores open. Grocery food distribution was not overwhelmed.

As the pandemic escalated, more substantial challenges emerged. Concerns arose about the needs of the poorest Americans – an issue intensified by the closing of schools where many children from poor families receive subsidised meals. These concerns expanded with the collapse of employment, which hit low-income households most severely. Even with the federal and most state governments acting at unprecedented speed to enact relief measures, delays in the distribution of aid created family income shortfalls and long lines formed at ‘food banks’ distributing free groceries.

Americans devote more than half of their food consumption expenditure on meals away from home. With restaurants suddenly shuttered, not only did employment plummet in the food-service sector, but a specialised and precisely-tuned food delivery system was disrupted. In a diverse and rich consumer food culture (what Orden and Paarlberg, 2001, call the century of multi-agriculturalism), dislocations occurred. A prosperous micro-sector that provided fresh and specialty products for restaurants and direct-to-consumer retail markets was hard hit. Difficulties occurred at the

wholesale level for some fresh fruits and vegetables, milk, pork and beef; these problems partly reflected structural adjustments such as consolidation of dairy production taking place within these sectors and partly cyclical effects, both exacerbated by the pandemic and its economic impacts. Disruption was severe enough that some crops were not harvested, milk was dumped and animals euthanised, all while food banks struggled to serve long lines of needy consumers.

Nowhere were the challenges faced by an industrialised food system in a pandemic more evident than in US and Canadian meat processing. Unlike many other manufacturing sectors, where shutdowns allow time for reconfiguring and elaborating new health protocols, the

immediacy of livestock processing does not afford such opportunities. This is a low-wage industry, operating with dense production lines and higher than average illness rates among workers even in normal times. Cases of Covid-19 emerged in packing plants, labour shortages arose, and the industry was criticised for being slow to modify assembly lines or to provide protective gear (which was in short supply even for hospital workers). By late-April, weekly hog and cattle slaughter had declined more than one-third and the President issued an executive order instructing the US Department of Agriculture (USDA) to take action to ensure that meat and poultry processors continued operations. By this point, the vicinities of meatpacking plants had become hotspots of disease



At the onset of the pandemic, there were some empty shelves in grocery stores as consumers stocked up, but supplies were rapidly replenished.

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Table 1: Three new US payment programmes in 2018, 2019 and 2020

2018 Market Facilitation Program (MFP)

Initiated by USDA under Commodity Credit Corporation (CCC) authority

Payments of \$9.6 billion based on production of:

Soybeans: \$7.3 billion; *Cotton, sorghum, wheat and corn*: \$1.3 billion;
Cherries and almonds: \$0.2 billion; *Dairy and hogs*: \$0.8 billion (based on milk production history or live hogs owned)

2019 Market Facilitation Program (MFP)

Initiated by USDA under Commodity Credit Corporation (CCC) authority

Payments of \$14.5 billion made for:

Non-specialty crops: \$13.6 billion based on per-acre (0.4 ha) payments determined by commodity-specific payment rates and county-level historical average planted areas, yields and crop mix; eligible area determined by 2019 planted area of covered crops, not to exceed 2018 planted area. Non-specialty crops included, along with 20 others, alfalfa hay, barley, corn, rice, soybeans, upland cotton and wheat.
Specialty crops: \$0.3 billion based on 2019 area. Specialty crops included, along with six others, almonds, fresh grapes and sweet cherries, and walnuts.
Dairy and hogs: \$0.6 billion based on 2019 milk production history or live hogs owned.

2020 Coronavirus Food Assistance Program (CFAP)

Announced by USDA using funding and authorities of the Coronavirus Aid, Relief and Economic Security Act (CARES) enacted by Congress and signed into law 27 March 2020 and CCC authority

Payments of \$16 billion estimated (as of 19 May 2020) to be made for ten non-specialty crops and 42 specialty crops (USDA, 2020):

Non-specialty crops: \$3.5 billion based on 52.5 per cent of price decline and eligible inventory (minimum of unpriced inventories on 15 January or 50 per cent of 2019 production)
Specialty crops: \$2.4 billion based on 80 per cent of price decline and mid-January to mid-April level of sales plus certain other losses
Dairy: \$2.8 billion based on 80 per cent of price decline and January–March level of sales plus 25 per cent of price decline for anticipated April–June level of sales
Beef cattle: \$5.1 billion; *Hogs and pigs*: \$1.6 billion based on 80 per cent of price decline and mid-January to mid-April level of sales plus additional payments based on inventories
Other products: \$0.7 billion based on various criteria

per cent below a moving average of past levels (Agricultural Risk Coverage – ARC). The payments are based on historical ‘base’ production and are therefore somewhat decoupled from current planting decisions. Prior to the pandemic, total PLC/ARC payments ranged from US\$ 5–8 billion per year. These legislated payments will increase by US\$ 1–2 billion compared to earlier estimates for crops harvested in 2019 due to lower prices following the pandemic onset. Fruit and vegetables (termed specialty crops in the United States) and livestock and livestock products, except for milk, are not supported by commodity programmes. Crop insurance subsidies of roughly US\$ 7 billion per year provide additional protection against price and production risks (including for specialty crops). An insurance-type programme supports milk producers and there are various disaster relief programmes, including a Livestock Indemnity Program that compensates producers for excess animal mortality.

“ Angesichts der Schwere der Pandemie hat sich gezeigt, dass der private Sektor der Aufgabe im Wesentlichen gewachsen war. ”

With counter-cyclical PLC, ARC and other legislated programmes in place, the United States implemented additional support programmes in 2018 and 2019. Two of these, titled the 2018 and the 2019 Market Facilitation Program (MFP), were initiated by the President under executive branch authority of the Commodity Credit Corporation (CCC) – a government owned corporation created in 1933. The MFPs were to compensate producers for revenue declines resulting from tariffs imposed by China and several other importers in

outbreak. Counties within 15 miles (24 km) of a meatpacking plant had nearly double the Covid-19 infection rate compared to the US average. All of this suggests an industry in need of investments in health and safety.

Emergency farm aid

The unfolding economic crisis is the second consecutive collapse in which agriculture will not be the hardest hit sector. The deep recession in 2007–2009 saw high farm incomes, whereas in contrast, agriculture was badly hit during the 1930s Great Depression and again in the recession of the mid-1980s. Still, most agricultural prices dropped 10 to 30 per cent in

March/April 2020 compared to pre-pandemic levels (the declines for ethanol, milk and hogs were the highest), while wheat and rice prices increased. Thus, the farm policy safety-net will be important for farmers.

Traditionally, US farm support payments have targeted grains, oilseeds and cotton and have been counter-cyclical: rising in periods of low prices and falling when prices are higher. Under the 2018 Agriculture Improvement Act, payments are made through commodity programmes when market prices fall below legislated reference prices (Price Loss Coverage – PLC) or when revenue falls more than 14

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retaliation for tariffs imposed by the United States under the aggressive 'America First' unilateral trade policies of the Trump administration.

The 2018 MFP provided US\$ 9.6 billion in additional support to a limited set of products, primarily soybeans (see Table 1) for which PLC and ARC provided no or little support despite falling prices and revenue. The 2019 MFP made payments of US\$ 14.5 billion to a broader set of products. The bulk of the payments went to grains and oilseeds (non-specialty crops). A single per-acre payment rate for each county within each state was determined by historical average area, yields and crop mix. Payments were based on area planted in 2019 to any of the eligible crops (not on the area of specific crops), up to a limit of the 2018 planted area. Each MFP included about US\$ 1 billion of support for specialty crops, milk and hogs. Thus, even prior to the pandemic, the US government was providing more farm support than legislated in 2018 and to a broader set of products.

The two trillion dollar Coronavirus Aid, Relief, and Economic Security (CARES) Act, signed into law on 27 March 2020, provided financial assistance to large industries, small businesses, state and local governments, hospitals, and individuals and families. Food and agricultural support programmes account for only a small fraction of the expenditures. The CARES Act provided US\$ 24.8 billion for food assistance programmes and a similar level of new support to agricultural producers. This set the stage for pandemic relief to replace trade-policy relief under a new Coronavirus Food Assistance Program (CFAP) launched in April/May. The CFAP provided US\$ 16 billion in additional support to farmers and US\$ 3 billion for purchases of agricultural products to be distributed through food banks and other humanitarian programmes. Authority was included for further farm support through the CCC after June 2020 even if Congress did not



Shop workers donned protective gear to reduce Covid-19 risk. © CC BY-NC-ND 2.0/Gilbert Mercier

enact additional emergency programmes.

Initial estimates of payments under the CFAP total US\$ 5.1 billion for cattle, US\$ 3.5 billion for non-specialty crops, US\$ 2.8 billion for dairy, US\$ 2.4 billion for specialty crops, US\$ 1.6 billion for hogs and pigs, and US\$ 0.7 billion for other products (USDA, 2020). Payment rates are generally based on price declines between mid-January and mid-April 2020. The quantities to which payments apply are eligible inventories of non-specialty crops or market sales of other products during mid-January to mid-April plus some additional payments for related or anticipated subsequent losses. These are substantial remunerations for losses for which the onset of the pandemic is the main proximate cause. The emergency support seems reasonable in the context of the unprecedented speed and depth of the pandemic-related economic collapse and the level of economy-wide outlays under the CARES Act. But in the context of the 2018 and 2019 MFP, the new payments raise concern about the increase and persistence of farm support beyond regularly legislated programmes over three consecutive years. The support has involved expanded product coverage and been closely tied to market

conditions and current production, raising US support close to or possibly above its WTO limit (Brink and Orden, 2020).

Medium and long-term issues

As this article was being written, the optimistic scenario was that the worst of the challenges to the North America food supply and farm sector have passed. Hindsight may suggest that more timely response to the pandemic could have lessened its impact, as has been seen in some other countries. But going forward, pragmatism is needed from government and the private sector, and experience across the states suggests there will be a lot of this – necessity is the mother of level-headed decisions that are better informed than when the presence of the virus was first detected. In this hopeful scenario, disruption of the food system has mostly been managed and contained. When the scale of the emergency was first recognised in the United States there was talk of going to a wartime footing against the pandemic. But disruptions large enough for the food system to break down have been avoided without coming close to deploying all of the civilian and military resources available at the federal and state levels to address potential food



Food banks struggle to keep up with skyrocketing demand © CC BY 2.0/Georgia National Guard

availability of labour is a substantial issue for fruit and vegetable producers, who depend on both domestic and temporary immigrant guest workers, mostly from Mexico, with some from Canada and elsewhere. Resilience of the meatpacking sector in the face of labour supply issues remains in question. Labour supply constraints could stimulate innovations resulting in further mechanisation within the fruit and vegetables and meatpacking sectors.

“ The private sector has largely proved to be up to the task, given the severity of the pandemic. ”

shortages. The private sector has largely proved to be up to the task, given the severity of the pandemic. Looking forward, with relatively short supply chains, the integration of Canada, Mexico and the United States within the North American food system will confer a competitive advantage compared to chains with longer links, and existing system linkages may be further strengthened.

In terms of food supply, grain and livestock inventories were at reasonably high levels going into the crisis. Planting intentions for 2020 signalled a projected increase in US corn, soybeans and wheat acreage of 14 million acres (5.7 million ha) from last year's 211 million planted acres (85.4 million ha). A record 20 million total acres (8.1 million ha) were prevented from being planted in 2019 due to extreme weather. Consequently, return to a more 'normal' planted area will enhance grain and oilseed supplies if yields follow trend levels. Futures markets are signalling lower prices, given expectations of slow post-pandemic economic recovery and lower domestic and international demand. Based on calculations using February (pre-pandemic) and early-May (post-pandemic) futures prices, Zulauf *et al.* (2020) find that combined corn-soybean market revenue for 2020 crops might be US\$ 12–18 billion below the pre-pandemic

expected level of US\$ 101 billion. Such a drop would be partly offset by increased PLC/ARC payments of US\$ 4–7 billion, putting the net revenue loss in the range of US\$ 8–11 billion. The authors suggest caution about providing further emergency support until these effects are better known. A second preliminary study (Westhoff *et al.*, 2020) estimates smaller losses for corn and soybeans in 2020 due to pandemic effects, but total net farm income losses of nearly 20 per cent (resulting from revenue losses of US\$ 11 billion for crops and US\$ 20 billion for livestock, offset by US\$ 11 billion lower production costs and US\$ 2 billion in support payments). Neither study takes into account the support provided by the CFAP.

At the time of writing, a plausible optimistic scenario is one of ample supplies, reopening of the restaurant sector, increasingly well-functioning supply chains that have adjusted for virus risks (which will raise costs), and the need for less support for agriculture (which will depend in part on the effectiveness of economic stimulus and the opening of the economy). However, there are significant downside risks. Covid-19-related input supply or labour availability problems at the farm level could constrain production in 2020 and be a risk to the food supply over the medium term. The

A larger risk in the medium term is pandemic-based disruption in the developing world. Supply chain disruptions or production shortfalls abroad could raise international prices, as already seen in early-2020 for rice and wheat. After an initial delay, China moved effectively to bring Covid-19 under control in four months, although secondary outbreaks remain a threat. India, Brazil and many other developing countries were under lockdown during March–May and have limited health system capacity. The world anxiously hopes that the pandemic will not spread widely in these countries, which could cause untold deaths, political crisis and economic disruption including to their agricultural and food systems. Developing and middle-income countries do not have the economic safety-net and stimulus capacities of the United States, Canada or Europe. A weakened international community rising to provide massive financial aid seems unlikely. Supplemental international assistance in the CARES Act is less than 1 billion dollars. Meanwhile, US monetary expansion could eventually inflate dollar-denominated commodity prices, exacerbating upside price risk for food importers.

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Food banks were set up providing free groceries as unemployment increased and family incomes fell during the Covid-19 pandemic.

Adverse international developments raise the risk of adverse food policy responses. The 2007 global food price increases showed how unilateral decisions to restrict exports or to subsidise imports can be domestically appealing and internationally damaging (Martin and Anderson, 2011). There are significant concerns about what one observer calls 'sicken-thy-neighbour' export restrictions and

import hoarding for medical equipment and supplies (Evenett and Global Trade Alert Team, 2020). Seventeen countries, including Russia and Vietnam, had imposed temporary export restrictions on agricultural products by mid-May. There were also numerous calls for international cooperation to lessen trade barriers for crisis-related goods and to keep international markets open.

Long term there is risk of policy responses in the aftermath of the pandemic that are not beneficial or benign. The pandemic has underscored inherent fragilities in an integrated world. Already, this fragility is being called upon to support conflicting views of globalisation. Calls for reshoring economic activity will be substantial. Setting xenophobia and political posturing aside, the future of globalisation will be subject to serious debate. To the extent that international supply chains, including the North American food system, prove resilient to the Covid-19 pandemic, 'circle-the-wagons' views may be dampened. But depending on who occupies the White House in the future, the struggle over trade and agricultural subsidy policies could intensify. Shuttering and erecting barriers are not long-term answers to the risks posed by globalisation. Stronger international institutions and cooperation, including for contagious disease detection and containment, are viable options for enhancing food security and agricultural sector dynamism.


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Summary


Resilience and Vulnerabilities of the North American Food System during the Covid-19 Pandemic

 The coronavirus pandemic and consequent economic disruption have tested the resilience of the North American food system. The poorest Americans were put at risk of food deprivation as their incomes fell. Disruptions reverberated through the food supply chain as the pandemic escalated; meatpacking plants became disease hotspots. The Coronavirus Food Assistance Program (CFAP) provided US\$ 16 billion of aid to farmers and ranchers based on falling prices. CFAP added to the counter-cyclical safety-net programmes legislated in 2018 and *ad hoc* support authorised for two years by the Trump administration. The CFAP support is reasonable in the context of the pandemic-related economic collapse, but also raises concern about increased support tied to market conditions and current production, including support linked to unilateral US trade policies that have invoked retaliation by trading partners. As of early June, the hopeful scenario was that the worst challenges to the food system had passed. Grain and livestock inventories were relatively high and spring planting intentions were strong, but supply constraints in North America or internationally remained a risk. The pandemic has underscored the inherent fragility of an integrated world and the high stakes in the debate about globalisation that will inevitably follow.

Résilience et vulnérabilités du système alimentaire nord-américain pendant la pandémie de Covid-19

 La pandémie de coronavirus et les perturbations économiques qui en ont résulté ont mis à l'épreuve la résilience du système alimentaire nord-américain. Les Américains les plus pauvres ont été en danger de manquer de nourriture à cause de la baisse de leurs revenus. Les perturbations se sont répercutées sur la chaîne d'approvisionnement alimentaire à mesure que la pandémie s'intensifiait; les usines de conditionnement de viande sont devenues des foyers intenses de la maladie. Le programme d'aide alimentaire lié au coronavirus (PAFC) a fourni 16 milliards de dollars d'aide aux agriculteurs et aux éleveurs au titre de la baisse des prix. Le CFAP est venu en supplément des programmes de filets de sécurité anticycliques légiférés en 2018 et d'un soutien ponctuel autorisé pendant deux ans par l'administration Trump. L'aide apportée par le PAFC est d'un montant raisonnable dans le contexte de l'effondrement économique lié à la pandémie, mais soulève également des inquiétudes concernant l'accroissement du soutien fondé sur les conditions du marché et la production actuelle, y compris le soutien lié aux politiques commerciales unilatérales des États-Unis qui ont entraîné des représailles de la part des partenaires commerciaux. Début juin, le scénario encourageant était que les défis les plus difficiles du système alimentaire étaient surmontés. Les stocks de céréales et de produits animaux étaient relativement élevés et les intentions de semis de printemps étaient fortes, mais les contraintes d'approvisionnement en Amérique du Nord ou à l'étranger demeuraient un risque. La pandémie a souligné la fragilité inhérente à un monde intégré et les enjeux importants du débat sur la mondialisation qui s'en suivront inévitablement.

Resilienz und Krisenanfälligkeit des nordamerikanischen Lebensmittelsektors während der Covid-19-Pandemie

 Die Coronavirus-Pandemie und der daraus resultierende wirtschaftliche Einbruch haben die Resilienz des nordamerikanischen Lebensmittelsektors auf die Probe gestellt. Aufgrund von sinkenden Einkommen bestand für die ärmsten Amerikanerinnen und Amerikaner die Gefahr, sich nicht mehr ausreichend Lebensmittel leisten zu können. Als die Pandemie eskalierte, kam es zu Störungen in der Lebensmittelversorgungskette; unter anderem auch dadurch, weil Fleischverpackungsbetriebe zu Corona-Hotspots wurden. Aufgrund fallender Preise erhielten Landwirtinnen und Landwirte sowie Viehzüchterinnen und Viehzüchter 16 Milliarden Dollar aus dem Coronavirus-Nahrungsmittel-Hilfsprogramm (CFAP). Das CFAP stellt eine Ergänzung zu den 2018 gesetzlich verankerten antizyklischen Sicherheitsnetzprogrammen und der von der Trump-Administration für zwei Jahre genehmigten Ad-hoc-Hilfe dar. Die CFAP-Hilfe ist vor dem Hintergrund der mit der Pandemie verbundenen Wirtschaftskrise vernünftig. Sie gibt aber auch Anlass zur Sorge über eine verstärkte, an die Marktbedingungen und die laufende Produktion gebundene Subventionierung. Dies schließt Subventionen in Verbindung mit der einseitigen Handelspolitik der USA mit ein, die bei den Handelspartnern Vergeltungsmaßnahmen hervorgerufen haben. Anfang Juni bestand noch die Hoffnung, dass der Lebensmittelsektor die schlimmsten Herausforderungen überstanden haben würde: Die Getreide- und Viehbestände waren relativ hoch, und es gab starke Absichten, im Frühjahr mit der Aussaat zu beginnen. Allerdings blieben Versorgungsengpässe in Nordamerika oder auf internationaler Ebene ein Risiko. Die Pandemie hat die Zerbrechlichkeit einer vernetzten Welt und die große Bedeutung der Debatten über die Globalisierung, die unweigerlich folgen werden, unterstrichen.