

A shock to the food system
Lessons learned from the
COVID-19 pandemic

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Introduction

The COVID-19 pandemic has challenged every fabric of modern society, and with it has also exposed some vulnerabilities in our global food system. A system whose modern roots had been developed over decades, has in a matter of weeks come under unprecedented pressure, and has had to rapidly adjust. And while it has not reached the breaking point yet, the changes this crisis has forced on the food system are considerable and have significant implications to consumers, governments, and corporations alike. Whether these changes are structural and here to stay, and whether they accelerate important trends we have witnessed in the past few years, remains to be seen. These are early days still—but what is clear is that this disruption to all stakeholders has dramatically increased the levels of uncertainty, and has scrambled forecasts and strategic plans.



Current state of the global food system

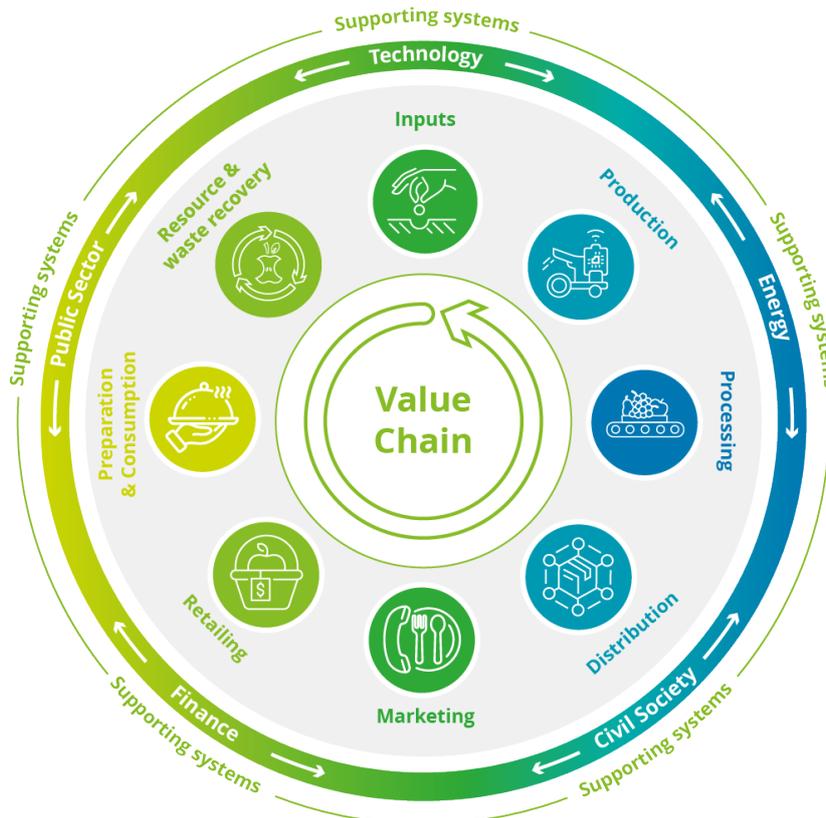
To understand just how much of an impact this pandemic has had on the food system, it is important to establish a picture of this massive undertaking. Valued at US\$8 trillion and equal to approximately 10% of global GDP, today's food system is a complex network of players working together to balance a delicate equilibrium of supply and demand.¹ See Figure 1.

This system has been designed to deliver calories at high levels of efficiency, an evolution supported by global commodification and trade in goods. One great success of this modern food system is the reduction of global malnourishment, which fell from 50% of the world's population in 1945 to just 10.8% in 2017.² This trend has been accelerated by global commodification and trade in goods. While the system is still far from achieving a just-in-time production model, it was "designed to handle, produce and deliver just as much product as consumers need at any point in time" without surplus.³ Value chain players globally have reduced inventory levels to conserve capital and have relied instead on unbroken supply chains to deliver the products they need when they need them.⁴ As a result, many large outlets now only carry four to six weeks of food supply, as opposed to six months' supply just 20 years ago.

That is not to say there is no waste in the food system, since an "estimated 30% of the food produced for human consumption globally is lost or wasted somewhere along the food supply chain."⁵ There are multiple reasons this occurs—some to do with infrastructure, others with the way we consume—but it has been on the radar of most value chain players for a number of years already.

What this crisis has exposed though is that while there are some sourcing benefits to this model, there are also major drawbacks to these long and complex food supply chains. While long supply chains provide inexpensive food, the rising environmental costs and obscure sourcing pose an ethical threat as well as a practical one. Unexpected surges in demand, as seen during this period, rapidly deplete inventories, leaving the system as a whole scrambling to make up the deficit.

Figure 1. Actors in the global food system



Cracks in the global food system during the COVID-19 crisis

Because the modern food system is so interlocked, disruptions to one link in the chain have a staggering effect on the others. We have looked at and analyzed the shocks to production and distribution, and their impacts to actors along the following groupings:

- **Production:** includes farm input suppliers, farmers, and food producers
- **Processing:** includes food processors and manufacturers
- **Distribution:** includes food distribution and retail
- **Consumption:** includes consumers at the individual and national level

Impact of disruptions to production

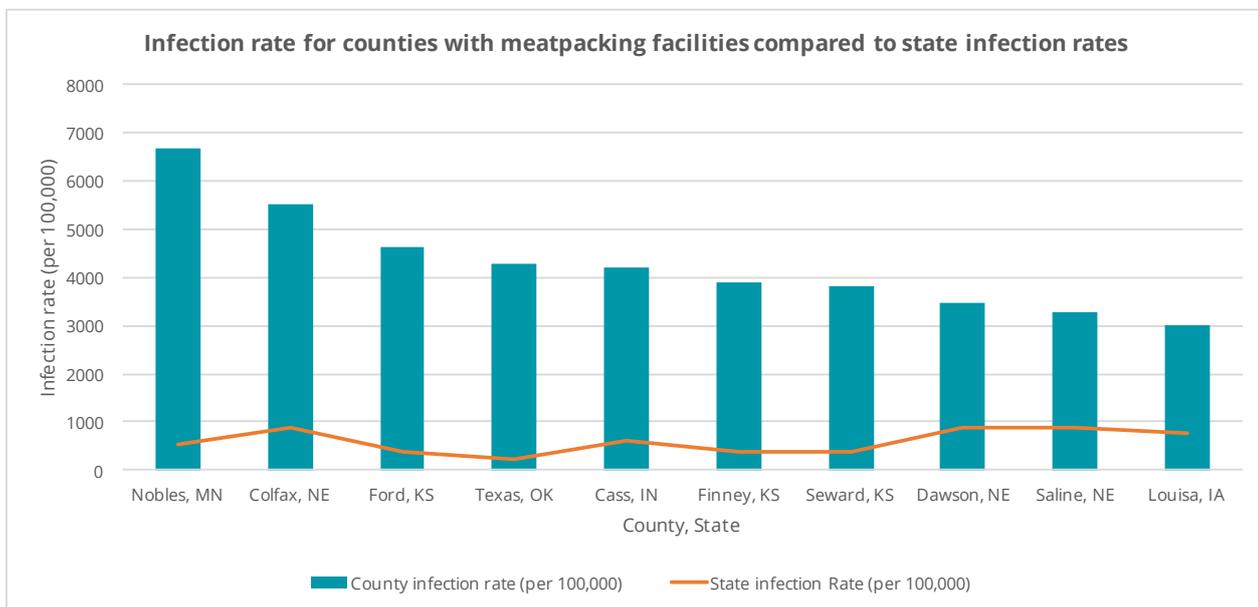
Farmers who rely on migrant workers to harvest crops have struggled to secure enough labor.⁶ In France and Germany, the ministries of agriculture reported that farms in both nations were missing over 200,000 workers.⁷ A similar dynamic occurred with farms in Spain, which had a shortage of 150,000 agricultural workers.⁸ Farmers in California, Florida, and other US states are dealing with similar migrant labor shortages. This labor shortage issue is further compounded by the virus spreading through fruit and vegetable packers.⁹

These challenges, compounded with reduced regulatory operations through the diversion of critical safety resources to other tasks, could severely impact the availability of certain crops and the safety of food products. According to the World Food Programme, COVID-19 restrictions had reduced locust control operations in countries where food production was already upended by the desert locust outbreak.¹⁰

Impact of disruptions to processing

Processors too are struggling to secure enough workers to continue labor-intensive production. Those dependent on lost crops may be unable to secure the inputs they need for processed foods (e.g., canned and frozen goods). Additionally, and very publicly, in the United States and Brazil, dozens of workers in meat processing facilities have fallen ill with COVID-19, forcing entire plants to shut down.¹¹ The shutdowns led to a 15% increase in the price of meat by the end of May. While most of the supply chains have recovered, moving forward prices may continue to remain high as greater attention is placed on worker safety and demand for more packaging increases, leading to increased production costs.¹² While these cases originally seemed contained and did not disrupt the food system dramatically as a whole, the influx of cases is generating concerns about the continuity and is highlighting the very real human and financial toll of this pandemic.

Figure 2. COVID-19 cases in meat processing communities in the US



Source: American Banker

Impact of disruptions to distribution

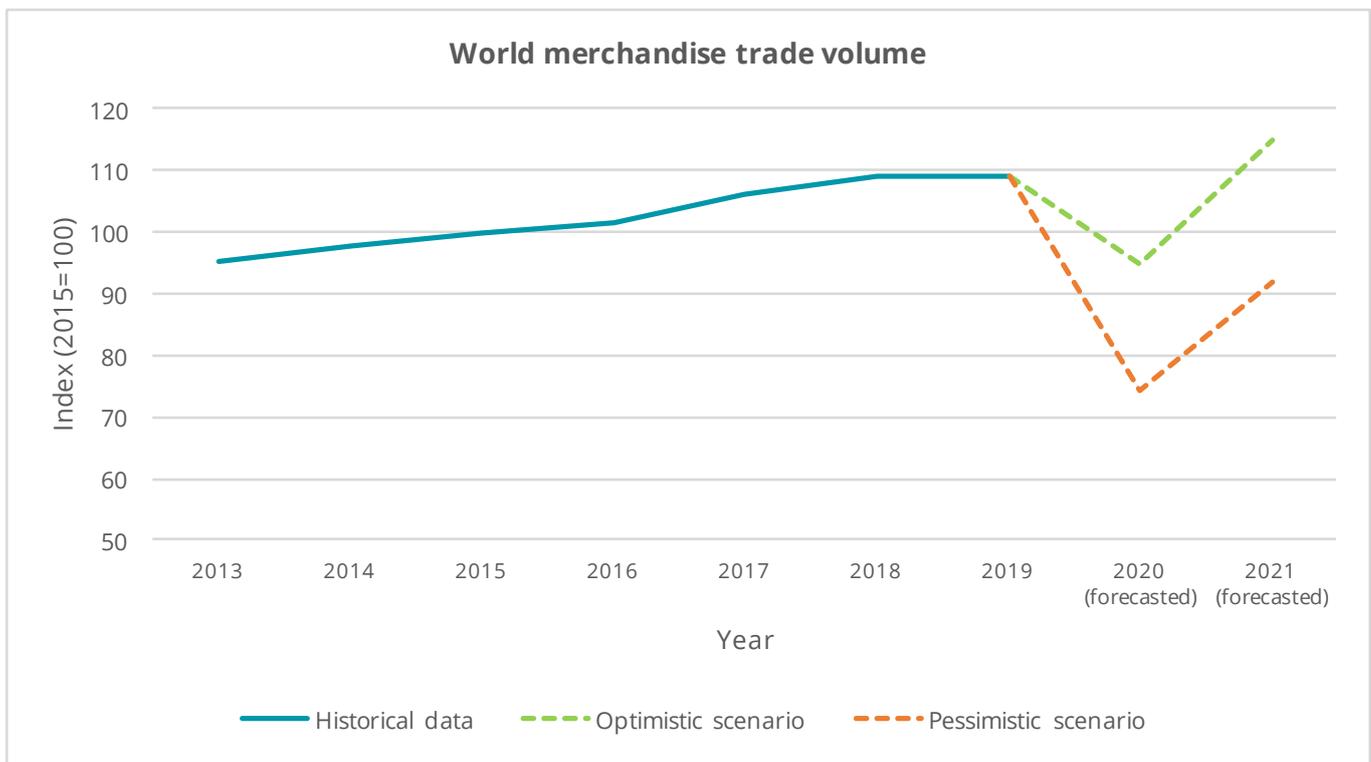
Many governments imposed restrictions on the flow of goods, including food, as part of their initial response to COVID-19. As many as 29 countries placed restrictions on the flow of food to protect domestic supplies causing further disruption.¹³ The flow of goods between countries has been disrupted and, in some cases, has ceased altogether. Governments are using the crisis to erect trade barriers and bring manufacturing home. Countries like Japan, France and the United States have made this a priority despite institutions like the EU claiming that it will be a lose-lose situation for countries as they compete over scarce resources driving prices up.¹⁴

“A top agenda for the central government is agriculture and resumption of agriculture activities.”

“The government provided agriculture machines to reduce reliance on labor.”

Partner, Deloitte China

Figure 3. World merchandise trade volume



Source: World Trade Organization

In the first two months of 2020, China's exports dropped 17.2% from 2019 levels.¹⁵ In both Shanghai and Los Angeles in February 2020, cargo volumes fell by 20% or more year-over-year.¹⁶ Major suppliers including Vietnam, Thailand, Russia and Kazakhstan recently barred exports of food products such as rice, eggs, grains and potatoes to retain sufficient domestic food supply.¹⁷

As a result of these restrictions, producers have output they cannot harvest, store, or sell while consumers face higher prices and uncertainty about supply.¹⁸ Food prices in China were more than 20% higher in January 2020 than a year previously, as the restrictions exacerbated pork shortages due to African Swine Fever and trade disputes.^{19,20} In the United States, prices at supermarkets rose while manufacturers and grocery stores offered 28% fewer discounts than normal.²¹

Prices for truck freight decreased as demand fell when the economy halted.²² These trends continue even as global economies

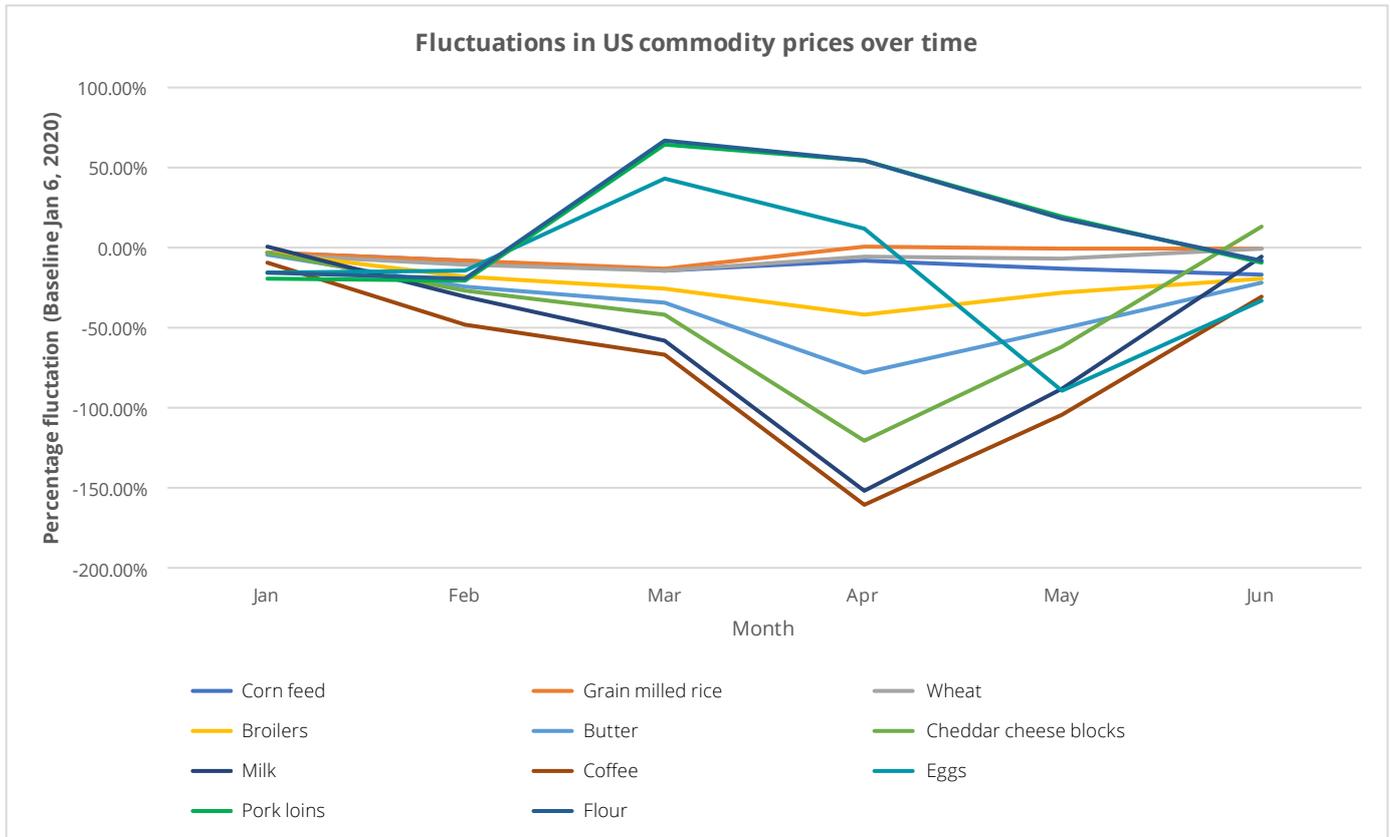
“Stronger relationships across the value chain are needed, in particular between retailers and suppliers.”

“Distributors and retailers need to diversify sourcing and increase local business to reduce risk.”

Partner, Deloitte Spain

re-open. Paradoxically, there is still a shortage of truck drivers to service essential businesses including grocery stores. As a result, distribution centers cannot send enough trucks per week. As retailers face insufficient ground transportation, there is a risk of reducing shipments to lower density and margin locations.

Figure 4. Commodity price fluctuations



Source: Wall Street Journal, Deloitte analysis

Impact of disruptions on consumption

The COVID-19 pandemic has brought about significant changes in the way consumers acquire and consume food. Most countries have instituted some form of isolation measures to restrict the movement of individuals, thus reshaping demand. COVID-19 has sped up the adoption of non-traditional food distribution models, as demand for restaurant-based food decreases while demand for online purchases and groceries increases, as shown in Figure 5.²³ Despite these changes in purchasing behavior, consumption patterns have remained largely constant in select geographies (e.g., Europe). This stands to reason since food consumption is generally seen as inelastic.

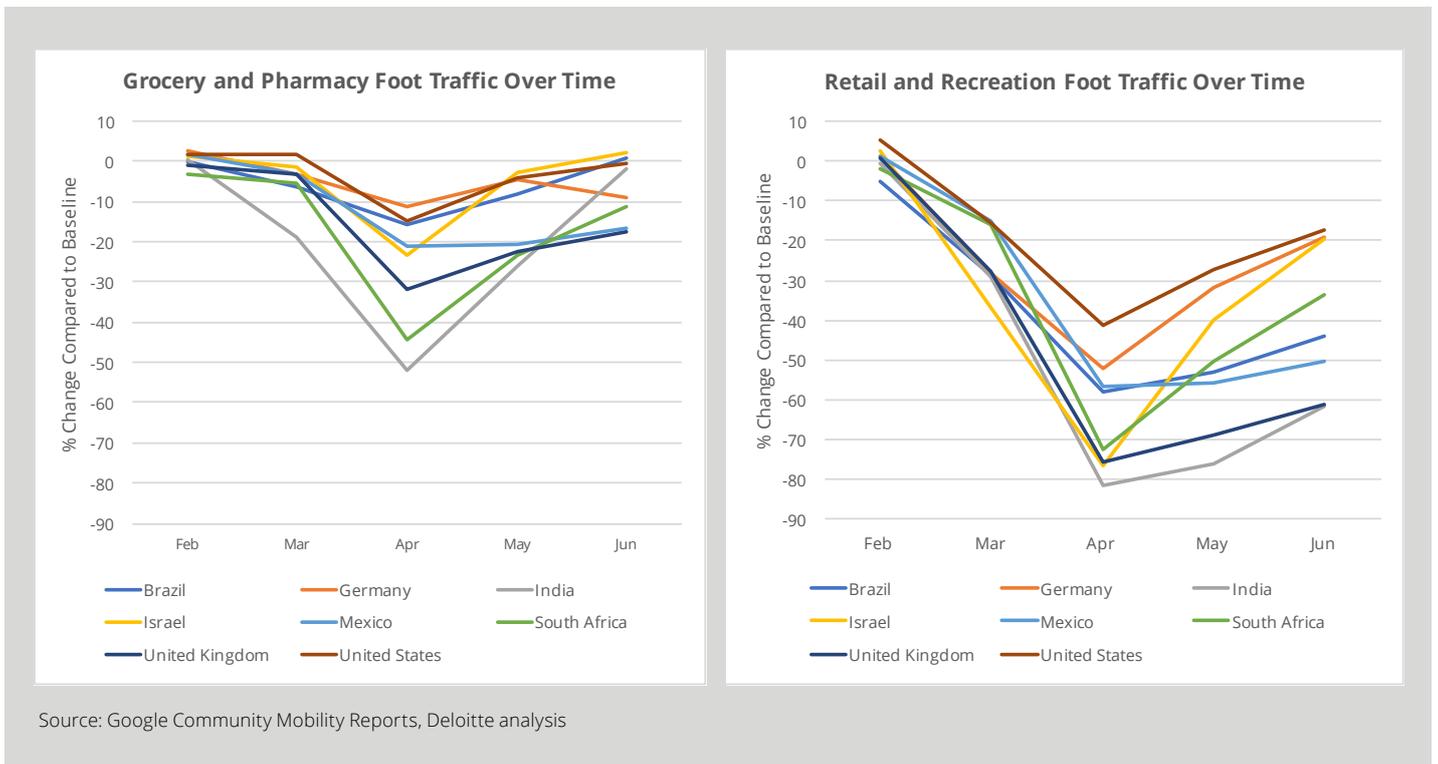
This manifestation of aversion behavior has affected primary purchasing modalities, thus, while COVID-19 may have restructured how consumers acquire food, it did not dramatically alter how much they consume.

These new patterns of consumption have disrupted the delicate balance between supply and demand. For one, bulk food buyers, such as education institutions and hospitality businesses, have shuttered and stopped buying food almost completely. This has resulted in severe challenges to reallocate the products bound for bulk buyers to grocery stores, food banks or directly to

consumers. The scrambled supply-demand signals have generated a paradoxical situation: grocers are limiting shoppers for fear of shortages on certain food products and urban consumers are struggling to access fresh produce, meat and fish, while farmers are struggling to find an outlet for the very same products.²⁴ The plowing of millions of pounds of vegetables back into fields, the disposing of over 750,000 eggs weekly, and the dumping up to 3.7 million gallons of milk daily are the grim result.²⁵

Consumer spending on food and household goods increased with isolation measures. As countries enter the second wave of the pandemic, the financial toll has the potential to get worse and food as a share of wallet is slated to increase for the first time in decades.²⁶ Between mid-April and mid-May, weekly consumer spending on non-discretionary goods increased by 24% in China and by almost 10% in South Korea.²⁷ During the same time period spending on discretionary items like dining out fell by 22% in South Korea.²⁸ Evidence from the Great Recession suggests that what we are experiencing currently may stay with us for some time. From 2006 to 2010, spending at food-away-from-home establishments in the United States dropped by 18% and did not recover to the 2005 level until 2016.²⁹ If the Great Recession is a guide, consumers may continue eating primarily at home long after the crisis ends.

Figure 5. Fluctuations in global foot traffic



Scenario analysis: Future of the food system

The fact that this crisis exposes material vulnerabilities in the food system has become clear and widely publicized. And while many entities have risen to the occasion, adapting their business models and adjusting supply chains to meet the challenge, there is a great deal of uncertainty as to what the food system will look like in the future. This is in part a confirmation of the difficulty in foreseeing the duration, severity, and long-term effects of the current health and economic challenges and their impact on the food system. It is also a tacit acknowledgement that this is a system that was in need of reform before this crisis emerged. Perhaps it was inevitable that a significant shock like this would shine a light on a system that had for the longest time prized efficiency over resiliency, sustainability, and health. The tensions between these competing objectives has existed for some time, mostly below the surface. But no longer. And so, many food system stakeholders are forced to contend with what the future might bring. Will the food system bounce back to its pre-COVID state? How long before it returns to a steady state and what will the new normal look like? Will other priorities, such as making it more nutritious, regenerative, and equitable, advance and force a change in consumption, production, and distribution?

Globally, decision makers in every organization along the food

value chain have already responded in myriad ways to the COVID-19 pandemic crisis. The next 6–18 months will be just as critical for these leaders to determine their organizations' path towards recovery and thriving in the long-term. Attempting to assess what the future might hold is always fraught with risk, which is why a scenario analysis of the crisis and the food system can help illustrate the options facing these entities among the uncertainty. Key questions on the leaders' minds include:

- What is the new external business environment, and how is it likely to change? As importantly, what structural changes (if any) might we see?
- What does this environment mean for the food system, and how are these changes likely to influence the sectoral landscape?
- What changes do we need to make as an organization? What do we need to suspend and simplify? Conversely, what should we speed up and strengthen?

The answers to these questions will vary based on the future that emerges.

"Consumers will demand more transparency and visibility to ensure food safety. I expect that multi-national corporations will lead this change."

Partner, Deloitte Brazil

"The agricultural industry in Mexico is working, but we expect problems because Mexico has a large informal economic sector. Mexico imports agricultural inputs and pays for these inputs in US dollars, so depreciation of the peso will hurt farmers and a lot of employees will not have money to buy crops."

Partner, Deloitte Mexico

A scenario analysis, while not exhaustive, allows us to identify potential futures based on the following two critical uncertainties:

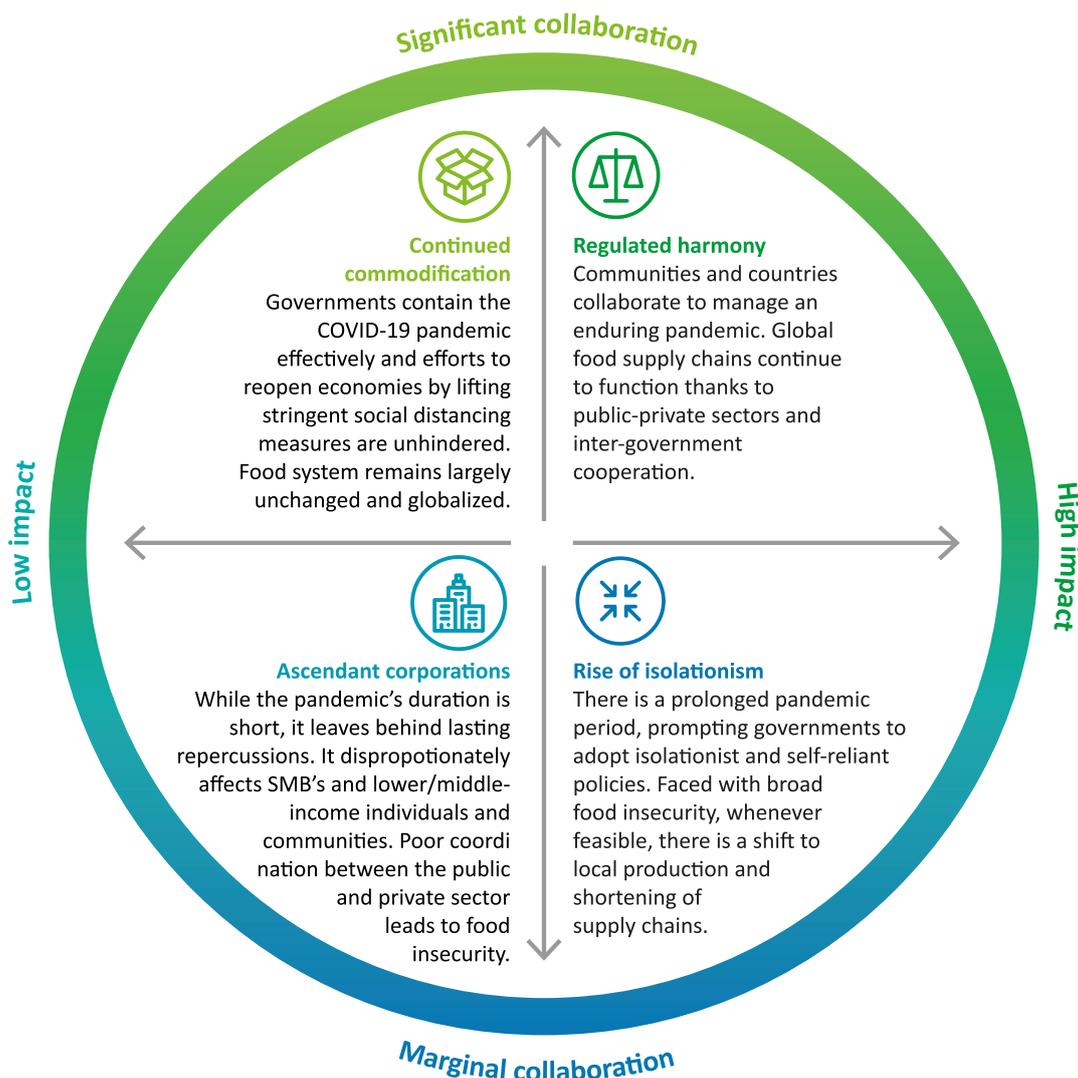
• **Situation:** The impact of the pandemic in terms of disease severity and associated economic disruption

- Lower impact: Following the rapid peak associated with the virus's spread, the current decline in cases and their severity diminishes as rapidly
- Higher impact: As more economies open up, additional waves of viral infections emerge, with even more severe consequences to health and economies

• **Response:** The level of collaboration between actors at a community, country, and global level

- Significant collaboration: Collaboration within and between countries to contain the virus's spread through coordinated strategies and best practices (e.g., testing and quarantines)
- Marginal collaboration: Lack of accountability and breakdown in communication leads to distrust and insufficient coordination within and among governments and institutions to prevent the virus's spread

Figure 6. Four global scenarios for the food system



Impact of the four scenarios on the food system

Continued commodification

Producers	Processors	Distributors	Consumers
<ul style="list-style-type: none"> • Governments provide economic relief for farmers, helping many farmers survive the crisis and return to normal. • Smaller farmers, including producers of specialty food items, struggle to bounce back as quickly as farmers with more diversified operations. • Many smallholder farmers do not get the same level of support and backslide into poverty. 	<ul style="list-style-type: none"> • Processors of shelf-stable items are able to accommodate rising demand. • Short-term shortages of workers in labor-intensive processing (e.g., meat, poultry) require processors to raise wages in order to retain workers. • Smaller processors struggle to recover but some are able to survive with government support. 	<ul style="list-style-type: none"> • Combination of private and public support enables distributors to transition goods from food service to retail during and following the pandemic. • Distributors alter their operating models to meet growing demand for online purchases and delivery. 	<ul style="list-style-type: none"> • Consumers for the most part have adequate food supply but fewer choices. • Many of the behaviors adopted by consumers during the crisis wane, but a preference for online purchasing and delivery remains. • Once restrictions are lifted, consumers return to more typical behaviors, but continue to economize due to the economic aftermath. Prices for select goods, such as labor-intensive processed foods, increase.

Regulated harmony

Producers	Processors	Distributors	Consumers
<ul style="list-style-type: none"> • Private sector and government coordinate to support repackaging and rerouting products intended for retailers and institutions, reducing food waste. • Prioritization of strong partnerships across the value chain endures. Local and regional production increases, as governments and private sector companies work to stimulate the economies of local communities. • Producers of specialty products find some relief as government supports the sector, though smallholder farmers continue to struggle. 	<ul style="list-style-type: none"> • Persistent social distancing measures lead to shortages of workers in labor-intensive processing (e.g., meat, poultry). These shortages are alleviated due to private sector and government coordination to protect the industry and support worker safety but are not entirely eradicated. • Processors dependent on imported inputs maintain access to supply as governments continue to allow imports. 	<ul style="list-style-type: none"> • The demand for traditional distribution (e.g. ground) remains intact as consumers purchase more shelf stable goods and increase online purchases. • International trade continues as governments coordinate to maintain the flow of goods, but transit is slower due to enhanced safety measures. 	<ul style="list-style-type: none"> • Consumers maintain long term habits formed during the pandemic, such as online shopping and cooking at home. • Governments collaborate to provide aid for vulnerable populations at home and abroad. • Net importer nations maintain access to imported goods.

Ascendant corporations

Producers	Processors	Distributors	Consumers
<ul style="list-style-type: none"> Producers of specialty products oriented towards exports face falling demand. Continued labor shortages lead to large-scale crop losses, as farmers are unable to harvest or produce, dairy and other fresh products. More automated and financially secure organizations seize the opportunity, leading to further consolidation. 	<ul style="list-style-type: none"> As a result of scarcity due to ongoing trade disruptions, processors dependent on imported supply are unable to secure key inputs for their products. Larger processors increase inventories to mitigate supply chain disruptions, but smaller processors cannot afford to stockpile. 	<ul style="list-style-type: none"> Distributors with automated and organized supply chains adapt to new circumstances. Labor-intensive distribution is slow to adapt to shifts in demand, thus increasing the supply-demand gap. As border closures continue, variability of transport time remains a challenge for importers and exporters. Freight prices increase, leading retailers and consumers to absorb prices. 	<ul style="list-style-type: none"> Consumers face rising food prices, particularly on imported goods. Consumers with limited purchasing power struggle as limited food production and challenged distribution increase the cost of food, contributing to greater food insecurity. Consumer demand shifts towards domestically-available products. Net importing countries face food shortages.

Rise of isolationism

Producers	Processors	Distributors	Consumers
<ul style="list-style-type: none"> There is continued scarcity and supply-demand gaps. Producers, particularly in developing nations, do not have the capital or access to critical inputs and technology to produce or market their products. 	<ul style="list-style-type: none"> As governments aim to re-launch local food supply, processors must adapt product mix to incorporate new inputs and develop relationships with new suppliers. 	<ul style="list-style-type: none"> Food importers and exporters see declining demand as countries further restrict food exports to retain national stockpiles. 	<ul style="list-style-type: none"> Consumers retain preferences for home cooking and consumption of local products. Consumers continue to value convenience and taste, but put increased weight on price, which encourages cheaper, less healthy eating alternatives. Availability of fresh perishable produce is limited to what is available regionally within the country. Some farming areas have year-round access to produce while others have limited, seasonal access to produce. Net exporter countries restrict food exports to retain national stockpiles, which affects net importers, particularly low income countries, disproportionately. Net importing countries struggle as the pandemic and associated restrictions persist, leading to rising food prices and shortages.

Leaders should use these scenarios as a way to pressure test their current strategy, and to create contingent strategies for the different scenarios to best prepare for an uncertain future. Across all four scenarios, the following themes are expected to continue and accelerate:

- Increased focus on the link between food and health
- Continued consumer expectation for digital engagement with food through e-commerce
- Continued fragility of small-scale producers and processors
- Rising food insecurity in both developed and developing nations

In addition to putting measures in place to address the eventuality of certain scenarios, leaders should consider the following “no regrets” solutions in the short term.

Short-term actions

While there is no doubt that the COVID-19 pandemic has been an exceptional shock to the system, certain vulnerabilities existed in the food ecosystem well before the crisis happened. And despite the fact that the dust has not settled yet, it is becoming clear that significant measures are required to make the system more resilient. Food security—the very reason this system is in place—depends on the system’s ability to collectively plan for and respond to volatility. Just as the pandemic has disproportionately affected the more vulnerable populations, it has disadvantaged them with food. We are witnessing a significant crisis made worse by the inability to provide equal access—availability and affordability—to healthy and nutritious food.

In the short term, actors in the food system should take the following steps to address the exposed misalignment between supply and demand, making the adjustment—as one executive remarked—from Just In Time to Just In Case.

Improve planning

Scenario planning

While these scenarios are not meant to be exhaustive and do not embody the only futures that can emerge, they can be useful for leaders to understand what contingencies they may need to prepare for. More specific and detailed scenario planning generally allows these leaders to build core and contingent strategies, as well as risk mitigation protocols that allow their organizations to react and adapt more quickly to changing conditions.

Integrated planning

Maintaining transparent and integrated partnerships is critical to sustaining a well-functioning and agile food value chain.

To enable this, companies may turn to integrating select suppliers and distributors into a more coordinated sales and operations planning. Increasing transparency between partners and aligning on performance tracking are some of the mechanisms that have shown high effectiveness.

In addition to regular operational updates, sharing information with partners on everything from strategic vision, innovation pathways, and lessons learned will drive alignment and enable future-oriented planning along the value chain. Companies that invest in supplier improvement often promote quality and loyalty.²¹

Increase flexibility

More flexible food value chains can adapt production and sourcing to absorb supply and demand shocks. As this pandemic demonstrated, greater visibility, automation, and standardization enabled some actors within the food value chain to respond more nimbly than others to fluctuations in demand. During this crisis, we have seen this occur by quickly bringing about direct-to-retail instead of food service distribution, or more recently—direct-to-consumer offerings whereas previously you had only direct-to-retailer production and distribution capability.

Digital supply networks

Adopting technologies that enable supply chain visibility is essential. Improved visibility enables organizations along the value chain to anticipate vulnerable points in the supply chain, shifting from a reactive mode to one that is more predictive. This allows these organizations to implement risk mitigation measures quickly and allocate resources to areas most under stress before they break.

“Collaboration across the value chain is needed in order to meet demand, especially where infrastructure capacity becomes end-point agnostic. The key is getting food to people versus getting food to restaurants versus to retailers.”

“A resilient supply chain is a network of performers each executing their operations effectively. One COVID outbreak at any constriction point in the chain, disrupts the entire chain. The United States is witnessing this in meat processing, but other areas (like field harvest) are at equal risk. Now, more than ever, the trend for more supply chain transparency is in high demand.”

Partner, Deloitte US

Pressure testing the supply chain to identify vulnerabilities with inventory positions or certain suppliers is yet another risk mitigation approach. Digital tools such as AI and IoT can be used to identify areas of distress along the value chain by providing insight on supply and demand discrepancies, thereby reducing food losses and optimizing last-mile logistics.

Supply chain transparency requires tracking data from all links in a supply chain and sharing that information with key stakeholders.³⁰ And while the idea of digitally enabled track and trace solutions is not new, Deloitte industry thought leaders believe that consumers may demand more transparency and visibility to ensure food safety following COVID-19. While this may seem as a limiting measure to some, the technology presents an opportunity for consumers to better understand the value of food and for suppliers to present differentiating production quality and dynamically control price for quality.

Increased efficiency

Despite the focus on efficiency within the system as a whole, there is room for increased efficiency driven by standardization and automation. Automated warehouses can more easily pivot to prioritize products in high demand. In processing plants, where workers are often shoulder to shoulder, greater automation reduces the risk of virus transmission and protects employees against infection.

An additional area that has shown benefits during this crisis, is addressing stock keeping unit (SKU) mix. Whereas in the past, the ability to provide product variety to meet every segment's unique preference was viewed as a source of competitive advantage, the pandemic has demonstrated that a simpler SKU mix allowed for more nimble and efficient production and distribution.

"One of the outcomes of this crisis may be more regional supply for groceries...the consciousness to support local communities and local farmers has increased dramatically during the crisis."

Partner, Deloitte Germany

Increase diversification & simplification

Companies can increase resilience by taking additional steps to increase diversity of sources—sourcing from suppliers that vary in terms of size and location as well as product mix—and distribution channels to maintain the effective functioning of supply chains. Conducting the above, while simplifying products and product formulations and recipes, will help reduce risk even further.

Sourcing diversity

Sourcing locally can not only meet a growing consumer trend, but also reduce dependency on long supply chains and exposure to trade risk.

Production diversity

Diversity of production and processing provides protection for companies against the risk of interrupted supply of a key ingredient or reduced demand given the changing consumer preferences or access as seen during this pandemic.

Distribution diversity

Farmers and other producers may consider partnering with various types of distributors and retailers to provide direct-to-consumer channels to supplement traditional channels. USDA data from 2007 to 2012, during both the Great Recession and subsequent recovery, indicates that farmers using direct-to-consumer sales have a higher survival rate.³¹

"There may be an increased focus on local farming practices and native species to increase resilience."

"There may be an acceleration of ethical, local sourcing because this is correlated with sanitary shocks."

"Processing may have to adapt to deal with diverse sources (e.g., organic wheat)."

Partner, Deloitte France

Conclusion

Health experts assert that COVID-19 is one in a long line of pandemics to come in our rapidly globalizing society that is faced with environmental pressures, population growth, and strained health systems.³²

COVID-19 has taken a human as well as an economic toll, and even amid the opening of countries and cities at the time of this writing, the virus continues to have a significant impact. Some scenarios point to ongoing resurgence of the virus and a multi-year health and economic recovery. With more uncertainty and risks ahead, now is the time to address fundamental flaws in the food system so that it can continue to function and set itself up to thrive. That is why this crisis must not be wasted and should serve as a catalyst for assessing the food system, in a bid to continue to meet future shocks with resilience.

Addressing some of the systemic challenges of the food system will take time and a coordinated approach that involves governments, the private sector, consumers, NGOs, and civil society. There are many forums that have brought these ecosystem partners together over time, with some successes, but the coordination of activities among them will become more important going forward. The scenarios with increased collaboration result in more efficient and effective responses to food system challenges. And while some of these circumstances were there long before the COVID-19 crisis emerged, there are a number of lessons from the current crisis for all of us to take away.

We have learned that securing food supply, especially for the most vulnerable populations, must remain a critical priority as the number of people facing acute food shortages may almost double to 265 million people globally by the end of 2020.³³ This is enabled in the short-term by reducing restrictions to trade and making the availability of supply more predictable for all players along the value chain. Moreover, this includes reducing restrictions on stockpiles, enhancing productivity measures, and addressing post-harvest loss more effectively than we have in the past.

While seemingly evident, the link between food and health is not as obvious as it should be. Diets are one of the leading contributors to non-communicable diseases that affect the quality of life for billions of people and are a major drain on healthcare systems. Yet changing the nature of demand has been an almost intractable challenge due to a host of cultural, educational, political, and business reasons. In yet another bitter twist of food-health irony, the alleged origination of COVID-19 was linked to the consumption of food from lightly regulated food markets and spread due to the highly infectious nature of the virus. Additionally, the pandemic seemed to disproportionately affect those with pre-existing medical conditions, at least some of which are significantly linked to diets. A renewed conversation about the impact of what we eat is needed to address and support population health. This would be consistent with what we know about protective foods, more personalized nutrition, and a modern approach for healthcare that looks at food as an important element in a preventative care model.

“Suppliers need to shift gears into new market segments and determine how to optimize existing sales force from outside to inside.”

“The crisis is demonstrating problems with single sourcing and dependency in the supply chain. In the future, sustainability, traceability, and digitization in the supply chain will become increasingly important.”

Partner, Deloitte Netherlands

“Small restaurants, local cafes, bars, etc. are all at risk. I think the governments will intervene to keep these businesses alive in Europe, but only rich countries can afford that, and poorer countries cannot.”

“Countries will have to now consider national food supply as a security issue, and net importers will be in trouble.”

Partner, Deloitte Ireland

These changes would require the support of governments that already bear the brunt of the cost for healthcare. Through updated policy, governments can modify the incentive structure to also focus on additional crops beyond the staples—which are not eligible for subsidies (or nearly as much) but only receive crop insurance in the case of disasters, making them far less lucrative to produce.^{34,35} Similar support systems exist globally, whether for production of livestock and dairy in the EU, or soybean production in China.^{36,37}

Another area that garnered significant attention prior to the crisis, but much more publicly during the pandemic, has been food loss and waste. It's not a new challenge to the food system, and it's one that many companies have sought to undertake for both societal and financial benefits. And while there has been some progress, by all accounts this remains a stubborn issue accounting for more than 30% waste and loss post-harvest. The images of farmers in the United States pouring milk, breaking eggs, and ploughing under harvestable crops during the pandemic, has brought this topic back to the forefront for many to confront head-on. Data availability, transparency, supply chain visibility, sophisticated modeling, and improved coordination and knowledge transfer between actors along the value chain are critical tools. While this will not address all the factors leading to food loss and waste—some of which are infrastructure related, while others behavioral—it would tackle a significant element of it. Here too, there is a role for the government to play in ensuring that supply-demand disconnects are addressed. Whether at the national or at the community level, during a crisis or normal course of business, safeguarding vulnerable populations by providing access and affordability to surplus production is another important function.

Minimizing food loss and waste also has a significant impact on one more dimension that this crisis has brought into focus, the environment and sustainability of how we produce food. Regenerative production practices that rebalance the intensity with which we consume nature's resources will increase the resilience of the food system as a whole. Farmers, keenly aware of the impact of climate on their harvests, and of the symbiotic relationship with the natural elements, will be the immediate beneficiaries of that focus. Business models that reward more transparent, sustainable production in collaboration between farmers and other value chain players, would allow farmers to alter production in ways that are both commercially viable and economically sustainable.

This pandemic has been a real shock to the food system, but there might be some good coming out of this crisis, if we use it to establish the foundation for much needed improvements. The crisis has already brought with it significant changes to what, where, and how we eat, and all the modes of production and distribution it takes to get food to get to our homes. Whether these changes remain with us for the next six months or six decades remains to be seen. In a way, this is the stress test for the system, and while the system did not break per-se, we should not neglect addressing the vulnerabilities it has exposed. Making it more resilient in its ability to address severe shocks like the one we are witnessing is critical, as is the ability to produce and make available more nutritious, equitable, and sustainable food for all.

“We may see more of a portfolio mindset for supply and distribution channels. Players within the value chain realize that if a link does not work then the whole chain does not work. Our clients have started to support Tier 1 and Tier 2 suppliers, and this may be a trend.”

“Australia has not had mass dumping of products because some retailers reached out to local producers to promote local growers and some retailers expanded the number of suppliers. In some instances, there were packaging challenges because products were packaged for bulk export and not for individual retail. People have become comfortable with less packaging.”

Partner, Deloitte Australia

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