

# Maine Policy Review

---

Volume 30  
Issue 2 *Impacts of COVID-19 Pandemic*

---

2021

## The Response of the Maine Food System to the Onset of COVID-19 Pandemic

JG Malacarne  
*University of Maine, jonathan.malacarne@maine.edu*

Jason Lilley  
*University of Maine, jason.lilley@maine.edu*

Nancy McBrady  
*Bureau of Agriculture, Food and Rural Resources, Maine Department of Agriculture, Conservation and Forestry*

Follow this and additional works at: <https://digitalcommons.library.umaine.edu/mpr>

---

### Recommended Citation

Malacarne, JG, Jason Lilley, and Nancy McBrady. "The Response of the Maine Food System to the Onset of COVID-19 Pandemic." *Maine Policy Review* 30.2 (2021) : 34 -47, <https://digitalcommons.library.umaine.edu/mpr/vol30/iss2/5>.

This Article is brought to you for free and open access by DigitalCommons@UMaine.

---

## The Response of the Maine Food System to the Onset of COVID-19 Pandemic

### Cover Page Footnote

The authors would like to acknowledge the contributions and cooperation of Atlantic Corporation, Forager, Hannaford, Maine Farmland Trust, and Maine Organic Farmers and Gardeners Association. The authors are especially grateful to Bo Dennis, Catherine Durkin, Shae Horrigan, Kim Kuusela, Emily Lefebvre, and Anne Trenholm for their many contributions. This project was supported by the USDA National Institute of Food and Agriculture, Hatch project number ME022103 through the Maine Agricultural and Forest Experiment Station.

# The Response of the Maine Food System to the Onset of COVID-19 Pandemic

by JG Malacarne, Jason Lilley, and Nancy McBrady

## Abstract

The COVID-19 crisis had an immediate and extensive effect on food systems. Consumers suffered income shocks. Restaurants were forced to close. Wholesale markets for agricultural and seafood products disappeared. Retail food outlets had to balance increased demand, bottlenecks in their ability to resupply, and concerns for the health of their customers. Uncertainty about when these challenges would lessen contributed to the complexity of the decisions facing actors all throughout the system. In this article, we bring together data from various sources to describe the response of the Maine food system to the onset of this crisis. Our descriptive analysis includes the actions, concerns, and adaptations of food producers, consumers, and vendors as they sought to weather and adapt to a challenging situation. The purpose of this analysis is not to second-guess the actions of those who grow, distribute, or consume food in Maine. Rather, it is to better understand how the food system responded to an acute crisis and how to create a more resilient, efficient, and inclusive food system.

knocks out power, the price of an input goes up. Because systems are inherently interconnected, a shock to one participant can affect everyone. In resilient systems, these common shocks are not a problem. Food producers shift between markets, consumers substitute one product for another, distributors alter routes, and the food security network supports individuals experiencing income fluctuations and facing other barriers to food access.

Not all shocks, however, are created equal. In particular, it is useful to distinguish between idiosyncratic shocks (those that occur randomly and only affect individuals or an individual sector) and covariate shocks (those that affect many individuals or sectors simultaneously).

Because covariate shocks force large numbers of actors to seek support or change behavior at the same time, the resulting surge in activity often overwhelms both mutual support networks and formal assistance programs (Alderman and Haque 2007; Barrett 2011).

The COVID-19 pandemic served the food system with a massive covariate shock: reducing incomes, stressing supply chains, and creating and collapsing markets. Though the challenges associated with the pandemic are ongoing, this paper will focus primarily on the period between March 15 and September 1, 2020. The onset of the pandemic represented a period of rapid change in food systems, both in Maine and across the country. By focusing on how Maine producers and consumers responded to the initial shock, we hope to draw lessons that will help the Maine food system prepare for future challenges.

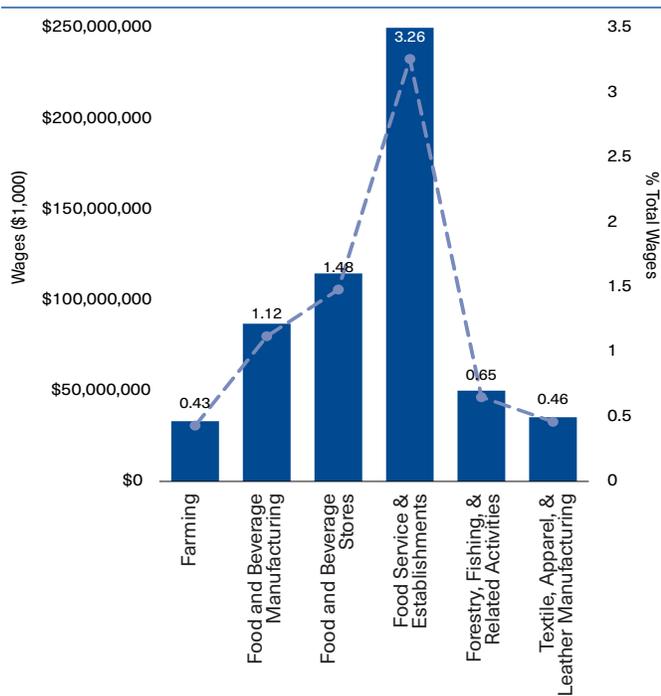
While the food system responded admirably to the onset of the pandemic—keeping food available, expanding the food security network, and minimizing price increases—many individual families and businesses

## INTRODUCTION

The food system is a complex web of actors and decision makers, from input suppliers to consumers. The 1.3 million residents of Maine obtain food not only from thousands of Maine farms, fisheries, and aquaculture operations but also from millions of such businesses across the country and around the world (Lowder et al. 2014; USDA-NASS 2017). On its way to the hands of Maine consumers, foodstuffs pass through a network of processors, distributors, and retailers, which provide essential services and employ a significant number of workers. Nationwide, agriculture and related industries, including food service, food processing, and food retail, support 22.2 million jobs or 11 percent of total employment (USDA-ERS 2020). The same sectors supported 13 percent of Maine jobs in the fourth quarter of 2019, with nearly 83,000 jobs paying out quarterly wages of \$572 million (Maine DOL 2020a) (Figure 1).

Complicated systems, like the food system, deal with shocks every day: a supplier goes out of business, a storm

FIGURE 1: **Maine Food System Wages**



Source: Maine Department of Labor.

experienced significant hardship. What’s more, the effects of the shock were not distributed equally across the system. While many businesses were forced to close, others saw sales boom. Still more made adaptations to their operations and product mix that may affect how we produce and consume food for decades to come.

To synthesize the challenges, adaptations, and effects of the onset of the COVID-19 pandemic on the Maine food system, this paper is organized in four parts. Part one summarizes the immediate impact of the crisis on the economy of the state and the nation, which put significant pressure on household incomes and food budgets. We discuss the loss of the restaurant market, the increasing importance of the food security network, consumer concerns, and behavioral responses. In part two, we discuss the challenges faced by Maine food producers, highlighting the role of uncertainty about the length and severity of the crisis and its impact on planning. We also discuss the rapid expansion of direct online marketing for food. Finally, in parts three and four, we summarize the early policy response to the

pandemic and reflect on what the present moment has shown us about our food system and how to make it more resilient to future shocks.

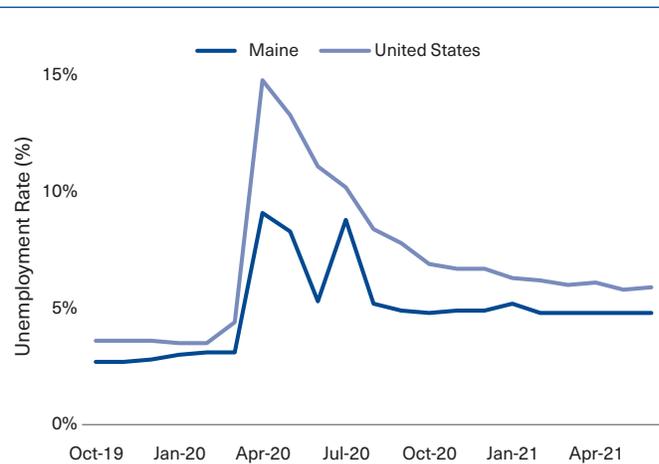
**PART 1: COVID-19 AND FOOD CONSUMERS**

The first diagnosed case in the United States of COVID-19 occurred on January 20, 2020. The major shock to the food system, however, occurred in the following months. On March 13, 2020, a state of national emergency was declared. All nonessential businesses in Maine were ordered closed on March 25, followed in quick succession by closure of public schools on March 31 and a stay-at-home order on April 2, 2020.

While select businesses began reopening a month later (May 1, 2020), the business closures caused a surge in unemployment and underemployment. Over 40 million initial unemployment claims were filed nationwide in the following months (Dorfman 2020), and unemployment spiked to nearly 15 percent. Like the nation as a whole, Maine saw unemployment spike from 3.1 percent in March 2020 to 9.1 percent in April (Maine DOL 2020b) (Figure 2).

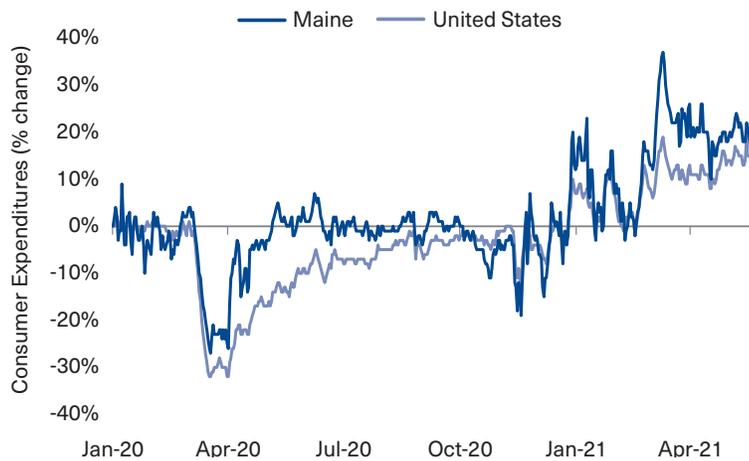
While many of these claims were for reduced earnings and expected to be temporary (Dorfman 2020), the shock to income was immediate and severe. By March 30, 2020, aggregate consumer spending in the nation was down 33 percent compared to January 2020. In Maine, consumer

FIGURE 2: **Unemployment in Maine and the United States**



Source: Maine Department of Labor.

FIGURE 3: Consumer Expenditure in Maine and the Country



Note: % change relative to January 15, 2020.  
 Source: <https://www.tracktherecovery.org/>.

spending was down by 27 percent (Chetty et al. 2020) (Figure 3).

The decline in spending and its impact on businesses was not shared equally across sectors, both broadly and within the food system (Figure 4). Americans typically spend over half their food budget away from home (Okrent et al. 2018). Restaurants and the producers supplying them took big hits immediately. With the closing of restaurants, this spending was redirected toward grocery vendors. By the middle of March, Maine consumer spending on restaurants and hotels<sup>1</sup> had fallen by 30 percent while grocery expenditure increased by 55 percent; both trends were similar to trends experienced around the country (Chetty et al. 2020). Expenditure on food at home peaked in April at over 65 percent of food expenditures and has only slowly declined, hovering near its Great Recession levels (52 percent to 55 percent) through the end of 2020 and the first half of 2021 (USDA-ERS 2021).

The sector-level trends in expenditures are also reflected in the perceptions of Maine businesses. In a weekly survey of Maine businesses, those involved in accommodations and retail saw the most frequent negative impacts. For businesses engaged in agriculture, the experience was more mixed (Crawley 2020). As we

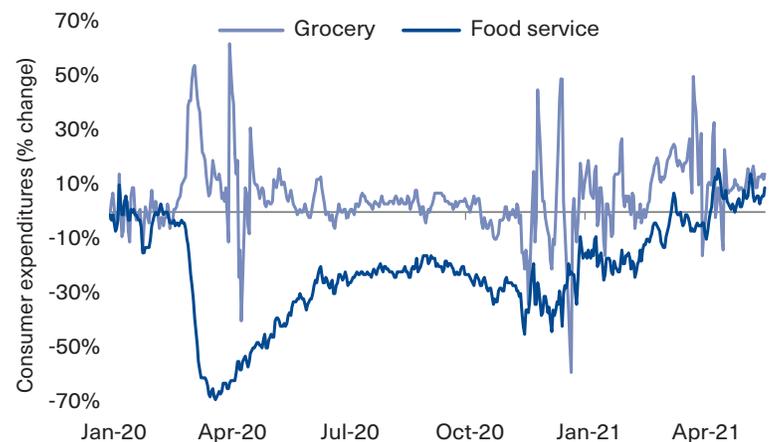
discuss in Part 2, the restaurant and institutional market’s disappearance was the largest negative shock to many producers. At the same time, the shift toward food at home offered an opportunity for many food producers who were, or were able to become, connected to food retailers and consumers directly.

The initial shock to employment and aggregate spending, shown in Figures 2 and 3, tailed off as the pandemic continued. This change reflects consumer and business adaptations as well the effect of various relief programs. While peak levels for new COVID-19 cases came later in Maine than in much of the country (hitting highs in January and April of 2021), these surges do not correspond to similar spikes in unemployment or the fall in aggregate consumer expenditure noted at the pandemic’s onset.<sup>2</sup>

*Food Consumer Concerns and Behavioral Response*

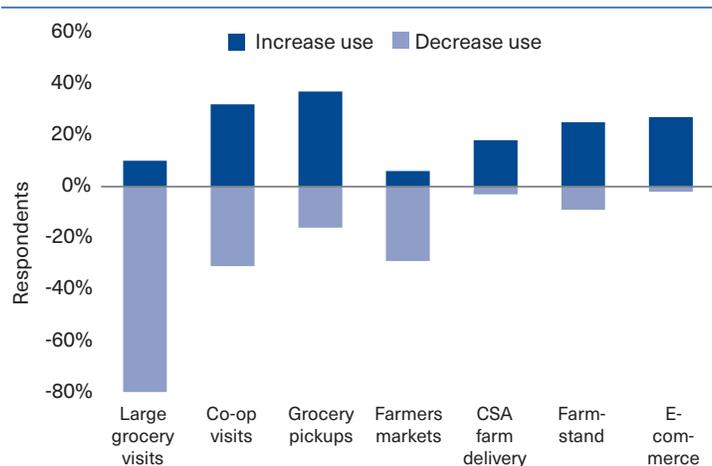
To provide a picture of how Maine food consumers dealt with the early months of the pandemic, we draw on data from a number of sources. Reports from the Hannaford supermarket chain illuminate food shoppers’ priorities and the realities they encountered once they

FIGURE 4: Maine Consumer Expenditure in the Food System by Sector



Note: percentage change relative to January 2020.  
 Source: <https://www.tracktherecovery.org/>.

FIGURE 5: Changing Food-Shopping Behavior



Source: Forager 2020 COVID-19 Consumer Food Survey.

entered the store. Additional information on consumer concerns, motivations, and adaptations is provided by two surveys of Maine residents carried out by Forager, a Maine-based local food network company, and the Atlantic Corporation, a business and economic research and development firm based in Waterville, Maine.<sup>3</sup>

Responses to the Forager and Atlantic Corporation surveys, consistent with the broader economic data, show that the majority of Maine consumers maintained or increased their expenditure on food during the early months of the pandemic. Of the 600 respondents to the Forager survey, half reported holding their food budgets steady, while around 12 percent increased food budgets. The remaining 36 percent decreased their budgets. During the first months of the pandemic, the average expenditure at food stores among the 500 respondents to the Atlantic Corporation survey rose slightly from \$375 a month to \$385 a month. Reports from Hannaford, a major food retailer in Maine, confirm that total sales climbed during the period—with a particular focus on items with longer shelf lives and items for which there was concern about future availability.

While food demand remained strong, consumers indicated that they had shifted the way they acquired food (Figure 5). Use of various food retail outlets shuffled significantly in response to consumers’ food-related concerns. The majority of the respondents identified in-person visits to large grocery stores as their primary

method of obtaining food prior to the crisis. While this remained the dominant way that consumers obtained food, concerns about the availability of certain products and physical safety led to decreased store visits and increased use of a more diverse range of retail options, such as smaller stores, farm stands, and e-commerce. This snapshot of consumer behavior provided through the Forager data is consistent with Hannaford reports of increased basket values and decreased store visits during the early months of the pandemic.

#### Food Prices and Product Availability

The public discussion of COVID-19 and the food system largely centered on empty store shelves and rising prices. While these perceptions understandably drove consumer concerns and behavior, the phenomena themselves were fairly limited.

By September 2020, the consumer price index (CPI) for food at home was 4.1 percent higher than a year prior and had risen 3.1 percent since February. While this did outpace the rise in the CPI generally, which was up only 1.4 percent over the previous September and 0.5 percent since February, the rise was largely driven by temporary increases in meat prices resulting from well-documented issues in the processing sector (see Lusk, Tonsor, and Schulz 2020). Month-over-month meat prices rose sharply in March (4.5 percent) and April (3.4 percent) before beginning to decline again in July. This trend—slightly larger increases in the cost of food at home relative to consumer goods broadly—would carry on through the end of 2020 and the first half of 2021. Compared to February of 2020, the June 2021 CPI for all goods had risen 4.7 percent compared to 5.4 percent for food at home, with increases in the cost of food at home being once again driven by rising meat prices.<sup>4</sup>

Both perceived shortages and the desire to make fewer trips to the store led to surges in demand. Hannaford reported heavy increases in demand for products like vitamins, pain relievers, sanitizers, and cleaning supplies, as well as a 300 percent increase for paper products in the first few months of the pandemic. Sustained, higher-than-projected demand for dairy products and eggs also resulted in temporary restrictions on the quantity that could be purchased by a single consumer. Such policies gave food stores time to work with suppliers to overcome limitations

in available storage, truck, warehouse, and cooler space while ensuring that as many customers as possible had the opportunity to purchase products.

At the same time, food per se was never really in shortage. Individual products, such as flour and baking supplies, temporarily disappeared from shelves, but remained available through online retailers, local mills, and food-buying clubs. A number of manufacturers, like Frito-Lay and Mondelez, decreased the variety of their product mix by 20 percent to bolster availability of core products (Lusk et al. 2020). One report, citing data from Nielsen, suggests that firms reduced their number of distinct products by around 7 percent—trimming less efficient and less profitable products developed as part of the sharp rise in stock keeping units (SKUs) over the past few decades (Banker 2020). The average American grocery store carries over 30,000 SKUs, only a small fraction of which were unavailable for an appreciable length of time.

Still, the presence of blank spots on shelves led to real and palpable feelings of scarcity. Consumers responded by stocking up on items they feared would not be available in the future, furthering pressure on logistics systems. Eventually, food that would have been destined for the restaurant and hospitality sector was diverted to food stores. This took time, however, as the product mix and packaging requirements differ across sectors. For some products, including Maine’s larger commodities such as potatoes, blueberries, and dairy, these changes will require substantial infrastructure investment and are yet to come.

### *A Rise in Food Insecurity*

Substantial increases in food insecurity can be attributed to the pandemic, but not because the food system failed to produce and distribute sufficient quantities of nutritious food. While the logistical challenges faced by food vendors caused fear and frustration among consumers, it was the loss of income resulting from the surge in unemployment and underemployment that significantly affected food insecurity in Maine and around the country during the second half of 2020.

Nationwide, 45 million people, including 15 million children, are estimated to have been food insecure in 2020. This represents a substantial rise over the 35.2 million food-insecure individuals in 2019—ending nearly 10 years of decline (Hake et al. 2021). In Maine, already the most food-insecure state in the region, it is estimated that 14.6

percent of Mainers suffer food insecurity, up from 12.4 in 2019.<sup>5</sup> The Atlantic Corporation survey results from consumers in Maine track closely to these projections. While only 10.5 percent of respondents reported concerns about having enough food to eat when asked about 2019, the number jumped to 18.7 percent during the early months of the pandemic.

The rise in food insecurity in the early months of the pandemic, however, was not as severe as initially expected, thanks in part to food and income assistance programs that met growing needs. Between March and April of 2020, the number of Maine households receiving benefits through the Supplemental Nutrition Assistance Program (SNAP) increased from just under 154,000 to just over 173,000 (a 12 percent increase), and the average benefits received by a household increased by 64 percent, from \$198/month to \$325/month. While the maximum benefits available to a household did not increase, SNAP’s typical three-month eligibility limit was waived and efforts were made to lower barriers to applying for, updating, and using benefits—including the expansion of pilot programs for online purchasing in which Maine participated.<sup>6</sup>

Food distribution efforts also increased sharply. Good Shepherd Food Bank of Maine reported distributing 31.7 million meals during the first year of the pandemic, including 118,500 boxes (nearly 3 million pounds of food) as part of the USDA’s Farmers to Families Food Box Program. Internal tracking by the Maine Bureau of Agriculture, Food and Rural Resources estimates that over 330,000 such boxes were distributed to Maine residents during the program’s four rounds. In addition to moving a higher volume of food, efforts were made to lower barriers to food distribution in areas without reliable access to food pantries by using mobile distribution strategies or *truck-to-trunk* distribution events (GSFB 2021). Food insecurity estimates for Maine in 2021, however, remain elevated relative to their levels in 2019 (13.5 percent vs 12.4 percent).<sup>7</sup>

The sudden closure of schools, childcare centers, and institutions that routinely provide meals to children also raised concerns that the pandemic would exacerbate food insecurity among children. Despite efforts to be flexible—including meal pickup/drop-off programs—the total number of lunches served by USDA’s National School Lunch Program dropped by 34 percent in 2020. In Maine,

this number fell further, declining by 45 percent or nearly 7 million meals.<sup>8</sup>

To offset decreased access to meals at school, the USDA announced the Pandemic Electronic Benefits Transfer Program (P-EBT), which was funded through the Families First Coronavirus Response Act. P-EBT allowed the households with children facing school closures to access resources through a state's EBT card system. The program began distributing benefits in Maine in May of 2020 and is set to continue through the summer of 2021.<sup>9</sup>

Still, food insecurity among children increased significantly in Maine in 2020. Across the state, one in five children is estimated to have been food insecure in 2020. While increases in food insecurity were estimated for all counties, the highest rates were expected to occur in Piscataquis, Somerset, and Washington Counties, where nearly one in three children is believed to have faced food insecurity in 2020.<sup>10</sup>

#### *Consumers and Food Stores Look to Local Sources to Shore up Food Access*

Stress to any system induces adaptation and innovation. The food system is not different. Both food consumers and sellers shifted behavior rapidly to overcome supply delays. Uncertain supply from national and global supply chains created an opportunity for local vendors to engage directly with consumers and food stores. Hannaford reported that purchases from Maine vendors were up 33.5 percent overall in March of 2020 compared to a year prior. In many cases, this reflected local suppliers who were able to provide more frequent, flexible, direct-to-store deliveries than were available through other avenues. Procurement from Maine vendors remained elevated as 2020 progressed, starting to level out to expected levels in November, but ending the year 21 percent above 2019 in dollar value (14 percent in units).

A farmer-led effort was also launched early in the pandemic and found an eager audience. The Maine Farm and Seafood Directory became active on March 19, 2020, with a goal of increasing farm visibility to the public and sharing the strategies that farms were adopting to meet CDC guidelines for safe direct-to-consumer sales. By the end of March, 337 farms and seafood vendors had listed their operations and available products on the directory. In its first few weeks, the directory was viewed nearly 47,000 times by consumers looking to access food in a safe and direct way from local producers. By the end of September,

the Maine Farm and Seafood Directory listed 483 farmers, fishermen, and other food producers and had been viewed 91,910 times.<sup>11</sup>

Typically, a very small fraction of food nationwide is obtained through direct channels. Of \$1.7 trillion in food purchased by consumers in 2017, less than 0.2 percent was purchased through direct contact with farmers (Holt et al. 2020). While the events of 2020 are unlikely to radically change this balance, there are signs that some of the adaptations in food marketing and procurement may persist. In the Atlantic Corporation survey, 82 percent of respondents expressed a desire to continue prioritizing locally sourced food after Maine's Stay Healthy at Home order was lifted. Respondents also reported a willingness to pay a price premium for food sourced from Maine across a wide variety of product categories.

## PART 2: COVID-19 AND MAINE FOOD PRODUCERS

In this section, we summarize the experiences and concerns of Maine farmers by drawing on a series of surveys organized by the Beginning Farmer Resource Network of Maine and conducted by University of Maine Cooperative Extension, Maine Organic Farmers and Gardeners Association, and Maine Farmland Trust.<sup>12</sup> We also draw insight from Hannaford reports on the company's ongoing relationships with Maine food producers and the opportunities and challenges of growing these relationships during 2020.

At the onset of the pandemic, many Maine farmers were making plans and investments for the coming growing season. While the demand for food at home rose sharply, the disappearance of the restaurant market, restrictions on face-to-face marketing, and extreme uncertainty about labor availability and the tourist market greatly complicated this process. The year that followed was a rollercoaster, with outcomes varying hugely across operations. Early projections of a substantial decrease in farm incomes (Dorfman 2020) were reversed by two rounds of government payments totaling \$23.8 billion. The government payments, which were only weakly tied to pandemic-induced losses, resulted in 2020 recording one of the highest real net farm incomes since 1950<sup>13</sup> (Smith 2021). As is often the case, however, the average hides widely divergent experiences of gain and loss among individual farm businesses.

### *Early Financial Impact and Labor Concerns*

In the second half of March 2020, the University of Maine Cooperative Extension, Maine Organic Farmers and Gardeners Association, and Maine Farmland Trust, representing the Beginning Farmer Resource Network of Maine, came together to survey farmers across the state regarding the current and perceived effects of the pandemic on their businesses. The initial survey ran from March 18 to March 27 and collected responses from 179 farmers spread evenly across the state. A second and third round of this survey were conducted over the periods April 21–May 7 and September 11–October 2. The April round of the survey received 79 responses and the September round received 69 responses.

Even though the surveys took place early in the agricultural season, respondents were already expressing fears that the anticipated loss of tourism in the heavily trafficked summer months, as well as loss of agricultural fairs, would result in large economic losses. The widespread uncertainty about product markets for the year left farmers reluctant to add extra labor expenses. At the same time, farmers faced increasing labor demands to keep pace with new sanitization and safety protocols and new packaging requirements for safety as a result of the pandemic. These increased costs further stressed already thin profit margins even for operations that managed to maintain sales level. As one respondent noted, “No change (in sales), BUT the labor and packaging costs of distribution are much higher under new improvised retail markets that are keeping income stable.” Fifty-three percent of respondents with employees reported having to rescind offers of employment to previously hired workers, reduce employee hours, lay off employees, delay start dates, or hire fewer employees that year. Farms also noted postponing planned capital investments and equipment upgrades.

Relief packages would reach farmers later in the year,<sup>14</sup> but as of May 6, 2020, about 70 percent of respondents had not received financial support from any program. At the time of the first survey, farmers were not eligible for the Small Business Administration’s Economic Injury Disaster Loan. While many were eligible for the Payroll Protection Program (PPP), a combination of factors contributed to low participation numbers. Notably, the program experienced varying funding swings and many respondents simply had not applied for support, either believing they were ineligible or that they were not yet experiencing their

greatest need. Additionally, respondents expressed issues accessing unemployment benefits for sole proprietors, which was not available to sole proprietor farmers until May 1, 2020.

Due to the significant uncertainty of markets for the season and the unstable economy, producers expressed a reluctance to participate in loan programs, instead favoring grants. Those respondents who were in favor of loan programs expressed a preference for those programs to focus on loan repayment deferment and 0 percent loans. Producers also expressed a desire for future programs to provide reimbursement for sales loss and donations to food security outlets.

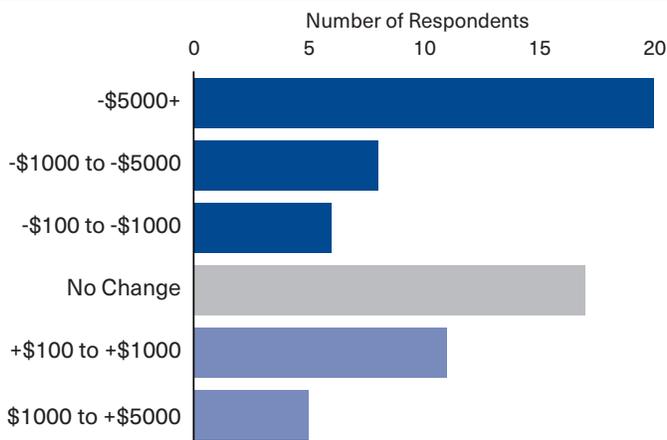
### *Shifting Market Channels*

Concerns for the future, particularly related to the uncertainty of summer markets, were shared broadly among producers. The immediate impact of the pandemic on sales, however, was more variable. The BFRN survey occurred early in the season, at which point 50 percent of respondents had marketable products. Of these, 57 percent noted decreases in sales, 18 percent noted increases, and 25 percent reported no changes. Producers who noted increases in sales were primarily meat, egg, and dairy producers. These reports are consistent with later responses to the Maine Rapid Business Response survey, in which 70 percent to 75 percent of agricultural businesses reported negative effects during three waves of surveys in June (Crawley 2020), and the BFRN follow-up survey in September, where 46 percent of respondents reported decreased sales (and 30 percent, increased sales) when comparing August 2019 to August 2020 (Figure 6).

At the onset of the pandemic, there were widespread efforts by individual farmers for collaborative, aggregated, and direct-to-consumer marketing. Some survey respondents expressed a desire for help organizing these aggregation efforts. However, in the weeks following the survey, this effort was largely and successfully executed by the producers themselves. Many of the producers who had historically sold primarily to institutional and restaurant markets were able to use this collaborative marketing to take advantage of the increased consumer demand for local products.

As noted in connection to the Maine Farm and Seafood Directory, interest from both food producers and consumers surged into the online space in the early months

FIGURE 6: Changes in Sales as a Result of COVID-19



Data: BRFN (2020).

of the pandemic. Among direct-to-consumer farms, there was widespread adoption of online sales platforms (41.8 percent of respondents), curbside pickup, and low- or no-touch farm stands and CSAs. These innovations were driven by concerns for customer, farmer, and farm employee safety. Movement into online marketing continued throughout 2020 and the first half of 2021. Forager<sup>15</sup> reports that, over the period between June 2019 and June 2020, the number of suppliers on their online marketing platform increased 58 percent across all geographies and 34 percent in Maine specifically. In the second half of 2020, growth in Maine suppliers increased 19 percent, with a further 12 percent increase in the first half of 2021.

The changing landscape of farm sales not only reflected innovations, but also the evolving use more established market channels (Figure 7). Farms that prior to the pandemic were primarily focused on wholesale were significantly more likely to lose sales (77.3 percent) than were farms that primarily sold directly to consumers (41.9 percent). In addition to changing sales channels, farms also shifted their product mix to reflect the outlets they anticipated would be available throughout the summer. Some farms noted changing production plans to favor vegetable and seedlings for consumer sales rather than flower and specialty vegetable crops, which are commonly sold to the restaurant industry and special events.

While direct-to-consumer marketing saw the most rapid growth, Maine food producers were also engaging with supermarkets and other food stores to shore up the availability of various products. This sales channel is not new. Reports from Hannaford show that in the pre-COVID period their stores regularly stocked in excess of 1,750 items from nearly 300 Maine producers and farmers. Still, the growth in Maine-produced food sales is significant. Hannaford reports that in March of 2020 sales of Maine produce were up 24 percent, Maine bread sales were up 26 percent, and Maine egg sales had risen 362 percent all relative to March of 2019. Growth was particularly rapid in Maine meat sales, which doubled in the second part of 2020 relative to earlier in the same year.

Integrating local farmers and producers into food store procurement networks presents both opportunities and challenges. According to the Forager survey, large grocery stores are the primary food source for most people. While most food products remained available throughout the pandemic, integrating local producers into the primary delivery mechanism for food provides a steady market outlet and increased resilience to shocks to the transportation and storage sectors of the supply chain.

The changes reported by Hannaford represent a combination of working with existing vendors to the grocery store chain as well as bringing in new vendors. Local vendors may have more flexibility in adjusting quantities and delivery dates than wholesalers, who may be locked into existing contracts. At the same time, it can be challenging for smaller producers to become compliant with certifications that might go beyond their operation's existing FSMA (Food Safety Modernization Act) or organic certification. Similar challenges exist in meeting packaging standards, such as UPCs, ingredient lists, and nutritional information. Food stores also have to manage their long-term relationships with existing vendors, who might be able to provide year-round access to products only seasonally available from local vendors. While none of these challenges are new, the early months of the pandemic drew them quickly into the spotlight.

FIGURE 7: Impact of COVID-19 on Sales by Primary Sales Channel



Data: BRFN (2020).

### PART 3: POLICY RESPONSE IN SUPPORT OF MAINE'S FOOD PRODUCERS AND CONSUMERS

The programs that support farmers, protect consumers, and seek to ensure the food security of individuals in Maine and across the country make up a complicated web. Like everyone, policymakers were forced to innovate and adapt in their response to the challenges presented by the COVID-19 pandemic. In this section, we discuss some of the programs, activities, and initiatives that have been undertaken in support of Maine's food producers and consumers since the pandemic began.

Regardless of the level at which initiatives begin, much of the responsibility for their administration in support of the Maine food system is coordinated through the Bureau of Agriculture, Food and Rural Resources. As part of Maine's largest natural resource agency, the Department of Agriculture, Conservation and Forestry (DACF), the bureau supports Maine's overall agriculture infrastructure through a variety of functions spanning technical assistance and business support, marketing and promotion, on-farm and consumer quality assurance, targeted loan and grant programs, and animal and plant health oversight. The bureau also plays a critical role in ensuring that the food consumers purchase and receive are available and safe and also oversees a number of statewide food assistance programs.

The programs overseen by the bureau, and its stakeholder relationships, have remained a priority as the COVID-19 pandemic has progressed. The bureau works within a network of stakeholders of the food system and, as such, is constantly engaging with farmers and food producers, commodity groups, agriculture service providers, nonprofits, the general public, elected officials, and the University of Maine and Cooperative Extension. It also fosters relationships and information sharing with additional Maine state agencies, other departments of agriculture nationwide, Maine's congressional delegation, and federal counterparts at agencies such as USDA and FDA.

Many of the bureau's existing responsibilities, such as maintaining inspection services for meat and poultry and ensuring that Maine's farmers' markets remained open, became both increasingly important and increasingly difficult as the pandemic unfolded. To ease meat- and poultry-processing bottlenecks, 90-day grants of inspection were issued to three Maine-based custom slaughter operations. Collaborations with the Maine Department of Health and Human Services, Center for Disease Control and Prevention, Maine State Housing, Maine Mobile Health Program, and other service providers also helped ensure a structured roll-out of COVID-19 testing and housing support for seasonal, migrant, and local farm workers. Additional efforts also helped ensure the safety of individuals on farms through the distribution of 4,000 free cloth face masks to farms and farm organizations (provided by the Maine Department of Corrections). Maine perennially faces a lack of adequate agricultural labor, which was exacerbated by the pandemic. The bureau worked with the Maine Department of Labor and other stakeholders to launch the Farming for ME agricultural awareness campaign to educate Mainers about agricultural employment opportunities.<sup>16</sup>

As highlighted previously, the COVID-19 pandemic introduced tremendous uncertainty into the decision-making processes of food system actors in addition to its impact on physical needs. Providing up-to-date information regarding financial support opportunities, changing regulations, and emerging best practices was crucial in

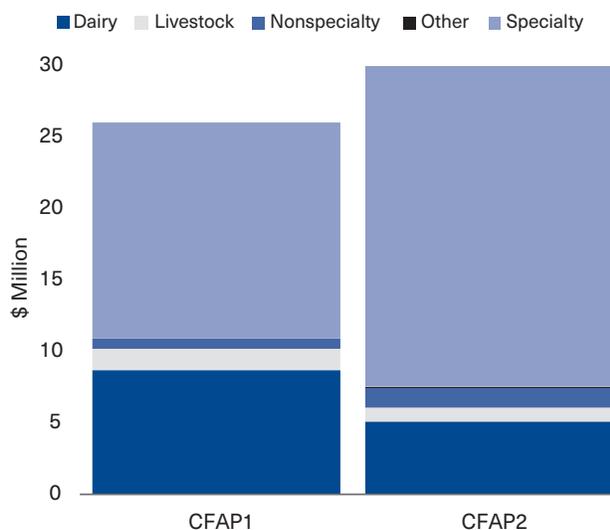
allowing food sector actors to make informed decisions. To this end, the bureau created *essential service* designation guidance to clarify what agricultural businesses and activities could remain open and launched a COVID-19 website specific to agricultural constituents. The website allowed for centralized dissemination of COVID-19 guidance, including information on Maine registered disinfectants for use against COVID-19; best practices for physical distancing at agricultural businesses and farmers’ markets; and guidance related to migrant and seasonal farmworkers, employers, and housing provider safety. In response to the shift toward online marketing, the bureau launched the On-Ramp to Online Sales, a comprehensive resource for farm businesses considering moving to online platforms.<sup>17</sup>

The physical and informational response from policymakers and agricultural service providers in Maine targeted the unique and varied challenges introduced by the pandemic. As was clearly demonstrated in the producer surveys—and can be inferred for the restaurant and hospitality sector from the earlier economic data—there was also a strong need for financial assistance.

At the federal level, enormous resources have been directed towards agriculture through a variety of programs administered through the US Small Business Administration (Paycheck Protection Program, Economic Injury Disaster Loan, SBA Express Bridge Loans, SBA Debt Relief) and the USDA (Coronavirus Food Assistance Program). The bureau has continuously engaged with Maine’s congressional delegation regarding the pressing need for robust federal support for farms and food producers, including encouraging federal funding of block grants to allow states to respond to particular agricultural sector needs, additional CARES act funding for personal protection equipment (PPE), and revenue reimbursement support. It also advocated for enhancements to USDA’s Farmers to Families Food Box program and successfully advocated for maple syrup and cut flowers to be included in the Coronavirus Food Assistance Program (CFAP).

Of the programs mentioned above, CFAP has been particularly important in allowing USDA to assist producers. The first round, CFAP 1.0, was designed to support growers who experienced losses between January

FIGURE 8: Payments by Commodity Type



Data: USDA. 2020. Coronavirus Food Assistance Program 1 Data. <https://www.farmers.gov/cfap1/data>.

15 and April 15, 2020. In Maine, CFAP 1.0 payments were made to 690 applicants, for a total of \$25,948,001 in support. Maine dairy farmers and potato producers received much-needed help from this program (\$8.6 million and \$15.1 million, respectively). Given that many Maine farmers did not have crops in the ground or products in storage to sell, they were unable to access CFAP 1.0 funding. CFAP 2.0, announced in September 2020, expanded the loss time frame to the end of 2020, and added payments to producers of commodities without documented price drops and payments to producers in specialty crops, aquaculture, and other practices more common in Maine. Payments to Maine farmers from both rounds of CFAP funding totaled \$56.3 million, or 7.2 percent of 2019 gross cash income (Figure 8). For reference, this places Maine between New York (7.33 percent) and Minnesota (6.99 percent) in terms of CFAP funding relative to gross cash income.

Enhanced federal disbursements also necessitated an increase in warehouse and distribution capacity for The Emergency Food Assistance Program (TEFAP) and Commodity Supplemental Food Program (CSFP). As mentioned earlier, COVID-19 has made food assistance programs all the more critical in the state. Prepandemic,

Maine was already the most food-insecure state in New England. Under the CFAP program, USDA created and rolled out the Farms to Families Food Box Program to provide fresh produce, meats, and dairy products to Americans in need. Initially, Maine’s distributors, as well as nonprofit organizations, were excluded from the program. In the second round of applications, two Maine-based distributors applied and were successful, with one sourcing some products from Maine farms and the other sourcing 100 percent from Maine farms. However, for rounds three and four, boxes from the program were distributed in the state, but no Maine distributors were selected.

In addition to federal programs, a variety of Maine-based programs and initiatives also provided vital support to farm businesses. Maine Farmland Trust (MFT) and Maine Organic Farmers and Gardeners Association provided grants of up to \$2,000 through the Maine Farm Emergency Grant program to cover unexpected costs, lost sales or sales outlets, and losses due to delayed production or delayed hiring. In the first round, 79 farms received \$141,000 in emergency assistance. This was followed by an additional \$48,000 in funding to 38 farms through a second wave of awards. At the state level, the DACF CARES Act E-Commerce Reimbursement Program helped farm businesses make the transition to online sales by providing up to \$5,000 to reimburse expenses on e-commerce infrastructure, such as online sales management platforms, services to process online payments, website design services, and program/app integration services. Under this program, DACF awarded a total of \$247,000 to 84 farmers.

Efforts to strengthen and support food production, distribution, and access have continued even as the pandemic has lengthened. In December of 2020, the Maine DACF in collaboration with the Maine Department of Economic and Community Development created the CARES Act Agriculture and Food Processing Infrastructure Reimbursement Program (administered by Coastal Enterprises, Inc.) to help food system actors make infrastructure upgrades. In December 2020, the program awarded \$17.3 million in grants to 437 farms, processors, and food supply chain businesses to make COVID-19-related infrastructure upgrades, including nearly a million dollars to expand meat-processing capacity. Investment was also directed to projects that increased automation in response to labor shortages, helped operations manage

higher stock volumes, and allowed farmers and processors to more easily pivot between retail and wholesale markets. Importantly, as will be discussed in the next section, the priorities of ongoing projects in support of the food system reflect the challenges and opportunities highlighted by the lengthening pandemic. While early programs focused on immediate relief—lost sales, reimbursing expenditure on PPE, keeping the doors safely open—later programs have had a strong focus on investing in the future.

#### PART 4: THE WAY FORWARD

The COVID-19 pandemic has shined an intense spotlight on the food system. While always a topic of interest for many, the extent to which public discourse has focused on the production, distribution, and consumption of food since the March 2020 wave of stay-at-home orders swept the country has been astounding. For many food consumers, the expectation that grocery store shelves will be well stocked, that restaurants will be open and available, and that prices will remain relatively constant is largely unexamined. The just-in-time supply chain that backs the nation’s food system is a finely tuned machine. Its focus has been on providing safe products to a large number of consumers at as low a cost as possible. Both this system and individual choices of what and where to eat are extremely robust to idiosyncratic shocks—shocks that only affect one individual, one product, one restaurant, or one store at a time. Covariate shocks—shocks that affect large groups simultaneously—are much harder for systems to handle.

The COVID-19 pandemic served the world, the country, and the state of Maine a covariate shock of historic proportion. The effects of this shock collected in the food system, affecting consumers, producers, business owners, and those who rely on the food system for employment. Reflecting on the response of consumers, producers, and policymakers to the early months of the pandemic helps us ask, “What would help consumers and producers deal with the next large shock?”

From the consumer side, the clear needs are for a robust food security safety net and investments in storage, processing, and transportation infrastructure that minimize the likelihood of staple products disappearing from shelves. Maine food producers, processors, and vendors can and should play a significant role in making this a reality. Doing so, however, will require agricultural infrastructure investments that allow for two things to happen.

First, there is a vital need for investment in agricultural storage, processing, and packaging infrastructure in the state. In a recent survey of Maine’s heritage industries conducted by the Maine Departments of Agriculture, Conservation and Forestry; Marine Resources; and Economic and Community Development, respondents engaged in agriculture strongly identified these areas as top priorities for investment (Maine DACF et al. 2021). Traditionally, many of Maine’s producers have had to send their products out of the state to be processed. As shut-downs and curtailment of services among out-of-state food, livestock, and dairy processors spread with the pandemic, Maine farmers were left vulnerable to severe economic loss and unable to move to support Maine consumers, who were increasingly looking to local food markets. This played out with particular effect in dairy and meat products, where some local processors were experiencing bottlenecks at precisely the moment that local demand for Maine-grown foods was rising. The investments enabled by CARES Act Agriculture and Food Processing Infrastructure Reimbursement Program discussed in the previous section are a positive step in the right direction.

Second, packaging and processing infrastructure needs to be flexible enough to shift across the restaurant, institutional, and consumer-facing markets. While some producers were able to quickly pivot their business models toward new outlets as institutional and restaurant demand collapsed, others struggled to repackage and redirect their products. Even for those producers who were able to pivot their model toward other opportunities, such as direct-to-consumer sales, not all of these adaptations will be sustainable without near-term investment in scale-appropriate production and processing infrastructure.

It is more important than ever for the state of Maine to seriously consider action that enhances resilience within our state’s food system. An immediate opportunity, and demonstrated need, is to enhance Maine’s food system resilience through investment in local agricultural infrastructure. As it stands now, most food produced and consumed locally consists of fresh, perishable food. Maine lacks sufficient processing infrastructure to extend the shelf life of its fresh foods or to create shelf-stable value-added products.

This is not, however, an argument for a primarily local food market. Maine consumers demand a range of

products that cannot be viably produced in the state. Similarly, Maine food producers—particularly in some flagship Maine agricultural products like wild blueberries and potatoes—are integrally involved in national and global markets. Resilient systems, however, include a measure of flexibility and redundancy. Maine can maintain, even enhance, its integration into the broader food system while increasing the prominence of its own agricultural products. By investing in local agricultural infrastructure, Maine can provide market opportunities to its producers, increase the reliability of the supply of important staple goods for its consumers, and provide sources of employment and income to its workforce.

## ACKNOWLEDGMENTS

The authors would like to acknowledge the contributions and cooperation of Atlantic Corporation, Forager, Hannaford, Maine Farmland Trust, and Maine Organic Farmers and Gardeners Association. The authors are especially grateful to Bo Dennis, Catherine Durkin, Shae Horrigan, Kim Kuusela, Emily Lefebvre, and Anne Trenholm for their many contributions. This project was supported by the USDA National Institute of Food and Agriculture, Hatch project number ME022103 through the Maine Agricultural and Forest Experiment Station.

## NOTES

- 1 These data, obtained through <https://www.tracktherecovery.org/>, use accommodation and food service (ACF) merchant category codes to categorize consumer spending on restaurants and hotels. This does not allow for disaggregation of the accommodation and food service. Grocery expenditures are those associated with grocery and food store (GRF) merchant category codes.
- 2 It may be the case that, having adjusted to the state of the world, consumers and businesses took the added risk of infection in stride. Support programs, both in terms of assistance to businesses and consumers, may also have helped avoid additional negative effects. This period, however, deserves careful analysis in its own right and is beyond the scope of the current discussion.
- 3 Hannaford operates over 180 stores in Maine, Massachusetts, New Hampshire, New York, Vermont. The Forager survey took place between March 27 and April 8, 2020. It received 600 responses representing all Maine counties. The Atlantic Corporation survey took place between April 29, and May 6, 2000 and recorded 500 responses; the survey is available here: <https://www.atlanticcorporation.com/maine-food-covid19-report>.
- 4 Bureau of Labor Statistics, Consumer Price Index: <https://www.bls.gov/cpi/>.

- 5 <https://feedingamericaaction.org/resources/state-by-state-resource-the-impact-of-coronavirus-on-food-insecurity/>
- 6 Data available here: <https://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap>.
- 7 <https://feedingamericaaction.org/resources/state-by-state-resource-the-impact-of-coronavirus-on-food-insecurity/>
- 8 Data available here: <https://www.fns.usda.gov/pd/child-nutrition-tables>.
- 9 <https://www.fns.usda.gov/snap/state-guidance-coronavirus-pandemic-ebt-pebt>
- 10 <https://feedingamericaaction.org/resources/state-by-state-resource-the-impact-of-coronavirus-on-food-insecurity/>
- 11 The directory is hosted by the University of Maine Cooperative Extension: <https://extension.umaine.edu/agriculture/farm-product-and-pickup-directory/>.
- 12 The COVID-19 pandemic also had large impact on aquaculture farmers and those participating in Maine's fisheries. Our data allow us to speak most directly to the experiences of farmers, so we focus our efforts there. The survey results are available on the University of Maine Cooperative Extension's website: <https://extension.umaine.edu/maine-farmer-resource-network/covid-19/>.
- 13 Exceeded by 1973/74 and the period between 2011 and 2014.
- 14 In the October follow-up survey, 45 percent of respondents indicated that they had applied for and received some form of assistance. The majority of respondents who had not received support had either not looked for support or found confusing messaging and paperwork to be too large a barrier.
- 15 Referenced earlier with regard to their consumer survey, Forager is a Maine-based local food procurement platform that streamlines buying and selling fresh, safe, locally sourced food online. More information is available at <https://goforager.com>.
- 16 More information about this program is available on the DACF website: <https://www.maine.gov/dacf/ard/farmlabor/farming-forme/index.shtml>.
- 17 <https://content.govdelivery.com/accounts/MEDACF/bulletins/28af3c8>

## REFERENCES

- Alderman, Harold, and Trina Haque. 2007. Insurance Against Covariate Shocks: The Role of Index-Based Insurance in Social Protection in Low-Income Countries of Africa. World Bank Working Paper No. 95. Washington, DC: World Bank. <https://doi.org/10.1596/978-0-8213-7036-0>.
- Banker, Steve. 2020. "COVID-19's Beneficial Effects on the Consumer Goods Supply Chain." *Forbes*, July 9, 2020. <https://www.forbes.com/sites/stevebanker/2020/07/09/covid-19s-beneficial-effects-on-the-consumer-goods-supply-chain/>.
- Barrett, Christopher B. 2011. "Covariate Catastrophic Risk Management in the Developing World: Discussion." *American Journal of Agricultural Economics* 93(2): 512–513. <https://doi.org/10.1093/ajae/aaq134>.
- Chetty, Raj, John N. Friedman, Nathaniel Hendren, Michael Stepner and the Opportunity Insights Team. 2020. *The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data*. National Bureau of Economic Research Working Paper 27431. <https://doi.org/10.3386/w27431>.
- Crawley, Andrew. 2020. *Maine Rapid Business Climate Survey*. Orono: University of Maine, School of Economics. <https://umaine.edu/soe/maine-rapid-business-climate-survey/>.
- Dorfman, Jeffrey H. 2020. "Macroeconomic Impacts and Policies in the Face of COVID-19." In *Economic Impacts of COVID-19 on Food and Agricultural Markets*. Ames, IA: Council for Agricultural Science and Technology. <https://www.cast-science.org/publication/economic-impacts-of-covid-19-on-food-and-agricultural-markets/>.
- GSFB (Good Shepherd Food Bank). 2021. "Good Shepherd Food Bank's Assessment of CFAP Sunset." <https://www.gsfb.org/blog/2021/05/07good-shepherd-food-banks-assessment-of-cfap-sunset/>.
- Hake, Monica, Adam Dewey, Emily Engelhard, Mark Strayer, Sena Dawes, and Tom Summerfelt. 2021. *The Impact of the Coronavirus on Food Insecurity in 2020 and 2021*. Feeding America. <https://www.feedingamerica.org/research/coronavirus-hunger-research>.
- Holt, Matthew T., John Bovay, Jennifer Friedel, Olga Isengildina Massa, Patrick Kayser, Jonathan van Senten, Jason H. Grant, et al. 2020. *Impacts of the COVID-19 Pandemic on the US and Virginia Farms and Businesses*. Virginia Cooperative Extension. <https://doi.org/10.21061/AAEC-275NP>.
- Lowder, Sarah K., Jakob Skoet, and Saumya Singh. 2014. *What Do We Really Know about the Number and Distribution of Farms and Family Farms Worldwide?* ESA Working Papers 14(2). Agricultural Development Economics Division, Food and Agriculture Organization of the United Nations. <http://www.fao.org/family-farming/detail/en/c/281544/>.
- Lusk, Jayson, John D. Anderson, Diane Charlton, Keith Coble, Alison Davis, Adam Dewey, Jeffrey H. Dorfman et al. 2020. *Economic Impacts of COVID-19 on Food and Agricultural Markets*. Ames, IA: Council for Agricultural Science and Technology. <https://www.cast-science.org/publication/economic-impacts-of-covid-19-on-food-and-agricultural-markets/>.
- Lusk, Jayson L., Glynn T. Tonsor, and Lee L. Schulz. 2020. "Beef and Pork Marketing Margins and Price Spreads during COVID-19." *Applied Economic Perspectives and Policy* 43(1): 4–23. <https://doi.org/10.1002/aep.13101>.
- Maine DACF, MF, and ECD (Departments of Agriculture, Conservation and Forestry; Marine Fisheries; Economic and Community Development). 2021. *Heritage Industry Infrastructure Survey*. <http://legislature.maine.gov/doc/6726>.
- Maine DOL (Department of Labor). 2020a. *Quarterly Census of Employment and Wages: Industry Employment and Wages*.

Augusta: Center for Workforce Research and Information, Maine DOL. <https://www.maine.gov/labor/cwri/qcew.html>.

Maine DOL (Department of Labor). 2020b. *Unemployment and the Labor Force*. Augusta: Center for Workforce Research and Information, Maine DOL. <https://www.maine.gov/labor/cwri/laus.html>.

Okrent, Abigail, Howard Elitzak, Timothy Park, and Sarah Rehkamp. 2018. *Measuring the Value of the U.S. Food System: Revisions to the Food Expenditure Series*. USDA, Economic Research Service Technical Bulletin No. (TB-1948).

Smith, Aaron. 2021. "COVID-19 Relief Programs Have Kept U.S. Farm Income High but Shortchanged California Producers." *ARE Update* 24(3): 5–8. University of California Giannini Foundation of Agricultural Economics. <https://giannini.ucop.edu/filer/file/1613691580/19988/>.

USDA-ERS. 2020. *Ag and Food Sectors and the Economy*. <https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/>.

USDA-ERS. 2021. *ERS Food Expenditure Series*. <https://www.ers.usda.gov/data-products/food-expenditure-series/>.

USDA-NASS. 2017. *Census of Agriculture*. [https://www.nass.usda.gov/Publications/AgCensus/2017/Full\\_Report/Volume\\_1,\\_Chapter\\_1\\_State\\_Level/Maine/](https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Maine/).



**JG Malacarne** is an assistant professor of agricultural economics in the University of Maine School of Economics. Malacarne's research focuses on risk and resilience in rural communities. Through his research and teaching, Malacarne seeks to better understand the challenges facing underserved communities in rural areas and improve the design programs and policies that seek to create opportunities and minimize risk.



**Jason Lilley** works as the sustainable agriculture professional in Cumberland County with the University of Maine Cooperative Extension. His work focuses on supporting local farmers to identify and connect with strong markets, to build resilient farming systems, and to develop long term holistic planning. When not working,

Lilley tends fruits, veggies, and a backyard poultry flock with his wife and dog or explores Maine's woods and waterways.



**Nancy McBrady** is the director of the Maine Bureau of Agriculture, Food and Rural Resources, which provides farmers with technical assistance, loan and grant support, and agricultural marketing and promotions, among other services, to help bolster Maine's vibrant food and agriculture economy and rural communities. McBrady and

her family have a big backyard garden, and her goal is to one day grow peppers successfully.