

Divide and conquer: How segmentation helps with food security

To meet surging demand, one food bank created specific plans for separate food sources and drop-off sites in order to get resources into the community as fast as possible with a minimum of waste.

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Photo source Greater Chicago Food Depository

A hint that the Greater Chicago Food Depository had a supply-planning issue came when a new distributor sent a semitrailer truck filled with emergency food boxes to one of their neighborhood food pantry partners.

The truck driver arrived expecting a loading dock and pallet unloader to deliver several thousand tons of food boxes. What they got was a church parking lot and a handful of volunteers.

When COVID-19 hit and put millions of people out of work, it created a monumental surge in demand at the Food Depository and hundreds of other food banks across the country. The scramble to meet increased demand tested the Chicago food bank's management systems, which forecasted how much fresh and shelf-stable food was needed, and tracked how and where the food deliveries were stored.

In the initial days of the crisis, many of those systems fell short. It wasn't just delivery logistics. Fresh food arrived at warehouses that lacked appropriate cold-storage space. Food banks passed up donations because they did not have time to reorganize their inventory to make room for the new stock. Trucks with food boxes showed up too early at mobile pickup events where there was no place to store perishables, or too late, after everyone had gone home.

But failing to plan adequately wasn't an option for the long term—not when the crisis had placed up to 54 million Americans in danger of being food insecure.

Bringing the tools of commercial distribution to nonprofit food banks

As the COVID-19 pandemic continues to unfold, food banks have worked to address the problems with their management systems, and other challenges. They've upgraded warehouse practices to manage a substantial increase in food supplies. They've adopted more data analytics to improve forecasting and staffing. And some started working with new community partners to tackle some of the drivers that contribute to food insecurity, including housing, healthcare, and job skills.

The Greater Chicago Food Depository, which is an affiliate of the nonprofit Feeding America network of foodbanks, addressed its delivery mismatch problems by segmenting supplies and distribution for its clients in the Chicago and the surrounding Cook County areas. The food bank divided its food and supplies donations by source, including allocations from the United States Department of Agriculture's Farmers to Families Food Box program that was launched to respond to the pandemic. The Food Depository also segmented its distribution according to the needs and capabilities of the approximately 700

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food pantries, soup kitchens, and other partnerships it serves, which, in normal times, help feed around 812,000 people. Since the onset of the coronavirus, though, the Food Depository estimates that number may have doubled.

The Food Depository is still upgrading its supply-chain practices, but initial outcomes have been positive. As the crisis stretched from spring into summer and fall, segmentation helped it provide nearly double the normal amount of food while keeping waste to a minimum.

“We have risen up and responded like never before—working around the clock to ensure our neighbors have the food they need during this terrible crisis,” said Kate Maehr, the food bank’s executive director and CEO.

Realities force an update of supply-planning practices

The crisis was a signal to food banks that ordinary planning methods wouldn’t suffice when dealing with the magnitude of increased demand and other unpredictable variables. In the past, food banks’ distributions were largely driven by donations. In many cases, agencies had little choice but to distribute what they were given, regardless if it was needed. More recently, they’ve begun to operate more strategically, planning the types and quantities of foods that the populations they serve need, proactively sourcing those supplies, and then planning the best methods to store and distribute them.

To accomplish these efforts, the Food Depository and other food banks have borrowed best practices from corporate supply-chain operations, including doing more sophisticated forecasting of community needs based on past distributions, and of current demand based on unemployment and economic data. In some cases, planning takes into account the specific needs, physical layout, and other idiosyncrasies of the smaller organizations that larger food banks work with.

As food banks improve their practices, a secondary benefit has emerged, in that their personnel are learning new and highly relevant skills. This includes training for operations and warehouse staff, whose work with nonprofits may not have had offered them experience with this level of forecasting and other supply-chain practices that are common in the corporate world.

A surplus of apples leads to major rethinking of supply planning

The Food Depository had already begun to confront its need to rethink supply-planning methods well before the COVID-19 outbreak. In 2019, an unusually large delivery of “nearly 12 truckloads of apples” it received through a separate USDA food program was a “wake-up call” that things had to change, said Sheila Creghin, the organization’s vice president of operations. That amount “was never something we would order, but when government food comes, we can’t say no,” Creghin said.

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In response, one of the first steps the Food Depository took to upgrade their supply planning was to remodel its 268,000-square-foot warehouse to expand its cold storage, which helped with the influx of fresh foods and dairy products from government programs and donations. The Food Depository worked with McKinsey to hold capability building workshops on supply chain best practices for its 100-person operations and warehouse staff. The food sourcing director, operations director, planning, and inventory staff and some front-line warehouse workers were briefed on inventory and other key supply-chain concepts.

“Any knowledge we can get to be more efficient can only make us better and help us move more food in the system,” Creghin said.

The staff quickly put their training to use. In learning about inventory management, they realized that better inventory tracking could help them avoid buying produce that was already in stock or could be acquired via donations. It also could prevent them from unnecessarily turning down donations for lack of space, as they had a better sense of when deliveries would leave the warehouse and open up room. They learned how to use forecasting to plan for different scenarios, such as gaining or losing a major supplier, for example.

Responding to a new crisis

When COVID-19 began to spread through the Chicago metro area in March, the number of additional people suddenly at risk of being food insecure ballooned. As one of Illinois' largest food banks, the Food Depository was tapped almost immediately to take part in the Farmers to Families Food Box program, wherein the federal government provides COVID-19 relief funds to distribute emergency provisions. These included fresh meat, dairy products, and produce. As of late September, the Farmers to Families Food Box program had distributed close to 100 million boxes through food banks around the country.¹

Given its existing constraints on storage, the Food Depository had to get creative to partner with new suppliers to help assemble the aid boxes. Instead of taking delivery of the provisions, the Food Depository opted to act as a go-between, and directed the state-contracted suppliers to deliver the food boxes directly to their food pantry and soup kitchen partners.

However, because the Food Depository hadn't worked with these suppliers before, it led to some awkward moments, such as when the supplier's truck driver arrived at the church expecting to see a commercial loading dock. To make sure that didn't happen again, the Food Depository started sending staff to distribution sites to oversee initial emergency food box deliveries, so the partners knew what to expect.

Moreover, the Food Depository had to adapt to shifts in the sources of supply. Two years ago, food donated or purchased by government constituted a third of the Food Depository's supply base. But since the start of the pandemic, the Farmers to Families Food Box programs and other government-run food assistance have grown to account for half of the food and supplies that the Food Depository distributes—reason enough for the food bank to customize plans for how to manage and deliver those resources.

They also created plans for supplies from other sources. Another 30 percent of its supply comes from food it purchases with donated funds and stores on-site for distribution partners to “shop” based on their needs. The final 20 percent of food is donated or rescued from grocery chains, Walmart stores, and Amazon Go locations. The Food Depository has more than ten drivers working six days a week to rescue food from local grocery stores and deliver it to assigned agency partners as quickly as possible to avoid spoilage. Other crews work from 9 p.m. to 5 a.m. daily visiting 200 Starbucks locations throughout Cook County rescuing food that goes to shelters, soup kitchens, and other food bank partners. At 4 a.m.,

¹ See <https://www.ams.usda.gov/selling-food-to-usda/farmers-to-families-food-box> (calculated from USDA numbers for 3 rounds of food box deliveries as of Sept. 18, 2020).



another driver collects food from Amazon Go outlets in downtown Chicago.

“I cannot tell you how impressed I am with the dedication and commitment of people who work here,” Creghin said. “There were guys in my warehouse from 4 a.m. to 6 p.m. Whatever it was going to take, they were going to get food out to those in need.”

Since March, Creghin figures the Food Depository has distributed about 3 million pounds of food per week, roughly double the normal amount. That includes 21 million pounds of food that it has delivered through the Farmers to Families Food Box program as of the end of August 2020. Only 150,000 pounds—less than 1 percent—couldn’t be delivered because of spoilage, expired sell-by dates, or other reasons. “It tells me we didn’t waste anything,” Creghin said.

The Food Depository continues to work on upgrades. They launched a pilot project with ten partners to shorten the current turnaround time needed to fill produce orders. Although work stopped when the pandemic started, Creghin hopes to restart it sometime soon. The food bank also has an eight-month grant to improve processes and assess how it documents information.

Takeaways: Options for improving planning processes

Other food banks can apply the lessons that the Greater Chicago Food Depository learned while adopting segmentation to improve planning:

- ***Establish a regular planning cadence.*** Create a weekly and monthly schedule to review community partners’ food needs, determine the available food supply and logistics capacity, plan purchases, and assign deliveries accordingly. As part of the planning process, apprise all stakeholders of delivery schedules and contents, including details of internal inventory, transportation plans, and communicating this information to community outreach teams as well as agency partners and suppliers.
- ***Segment customers based on demand patterns.*** Try grouping customers, delivery, and/or mobile drop-off spots by demand patterns, e.g., by days of the week that they are open or by times of day that they can take deliveries. Take into account when and how demand varies for each group, for example, if demand at a neighborhood food pantry tends

to spike at the end of the week or month when households run out of money for food before payday. When mapping demand patterns, consider physical characteristics that could affect deliveries, including factors such as whether the recipient has a loading dock, room for larger delivery trucks, and enough freezer storage space.

- **Create forecasts and plan for exceptions.** To create a forecast, start with baseline demand—the 80 percent of total food and other supplies for which demand is the most stable or predictable—and calculate how much would be needed over the following 30 to 60 days. Use weekly check-ins to review how plans are playing out, address exceptions, and finalize the last 20 percent of the plan.
- **Manage inventories by segment.** Keep more of the food on hand that is always in demand and less of products for which demand isn't as great. To calculate target stocking levels, look at historical data for average demand and

demand surges, and stock enough of each segment to cover variations. Use standard processes to track inventory levels and age to ensure as much food as possible is distributed before it goes bad or passes its sell-by date.

- **Adopt lean warehousing.** Organize inventory by type to maximize space and reduce time spent finding goods. Create distribution schedules to minimize wait times between when donations arrive and when they're delivered. Match capacity planning and workforce allocation to need.
- **Update operations performance management.** Identify key metrics to improve food bank performance, such as on-time delivery and throughput, or the difference between total food supplies taken in and distributed. Find ways to enable warehouse managers to discuss supply-chain performance and how to drive continuous improvement.

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