

# F<sup>o</sup>odMap NY

Leveraging Private-Sector Innovation  
and Investment for Food Security

## Executive Summary of Background Research

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November 2024



Center for  
Sustainable Business



Mother Cabrini  
HEALTH FOUNDATION



Cornell  
SC Johnson College of Business  
CENTER FOR SUSTAINABLE GLOBAL ENTERPRISE

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# Summary

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More than 44 million Americans experience food insecurity today, including more than 2.2 million people in New York State alone. Despite decades of government and philanthropic efforts, levels of food insecurity continue to rise, depriving millions of a decent quality of life, and costing our nation billions in preventable health care expenses.<sup>1</sup> In response to this crisis, federal and state leaders are urging collaboration with the private sector to improve food access and affordability; integrate nutrition and health services; empower consumers to make healthy choices, insure access to those choices; promote physical activity; and advance research on food and nutrition security.<sup>2</sup> The NYU Stern Center for Sustainable Business, in partnership with Cornell University, and supported by the Mother Cabrini Health Foundation, sought to explore how private sector interventions and investments could enhance food and nutrition security in New York State (NYS).

The initial phase of FoodMap NY focused on a landscape analysis of the New York State food system, looking across the food supply chain. This research, conducted from April 2022 to May 2023, included extensive literature reviews and interviews with over 150 stakeholders and experts in agriculture, sustainability, food processing, manufacturing and distribution, food access, public policy, and financial markets.

This executive report summarizes phase one of the FoodMap NY work, and describes many areas where research has indicated that private sector support could catalyze collaborative partnerships to create a more sustainable, equitable, and resilient food system in NYS. FoodMap NY has focused on these six areas:

**1. Controlled Environment Agriculture (CEA)**

Indoor hydroponic and aeroponic growing practices (e.g., greenhouses, vertical farming) are designed to optimize crop production, improve quality, expand local production capacity, and enable the application of year-round farming methods. Private investment holds the promise of expanding CEA in NYS to increase commercial agriculture that improves access to and availability of locally grown produce for food insecure populations.

**2. Supply Chain & Infrastructure**

Food hubs serve to connect local producers (e.g., wholesale buyers, processors) to markets through a range of functions, including product aggregation, storage, processing, and distribution; technical assistance to farms and food businesses; and farm-to-institution programs involving schools and hospitals. Investments in food-hub capacity and coordination, as well as the food supply chain, have significant potential to both address the needs of farmers and producers, and improve access to nutritionally rich regional food products.

**3. Healthy Food in Retail Environments**

Addressing small and geographically isolated retailers' needs could create innovative new forms of wholesale, distribution, and retail enterprises that expand access to and availability of healthy food.

**4. Food and Nutrition Assistance Programs**

Opportunities for private-sector engagement exist to impact the uptake, access, and scaling of, and technologies associated with, various public sector and philanthropic initiatives that are designed to improve access and affordability of fresh produce (e.g., Supplemental Nutrition Assistance Program (SNAP), Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)), and a range of nutrition incentive programs.

**5. Food as Medicine**

Food as medicine solutions (e.g., medically tailored meals, preventative produce prescription programs) that increase the flow of healthy food to in-need populations could be funded by private interests, including health insurers or nutrition start-ups.

**6. Food Finance**

Access to capital is a persistent challenge for small farmers and food businesses that are unable to reach larger markets and/or marginalized communities. Innovative or non-traditional sources of capital (e.g. CDFIs, impact investors) could address this barrier.



Based on these results, pilot projects involving food enterprises, farms, and mission-driven intermediaries were developed as part of phase two to highlight and test the key barriers and catalysts for private sector investment and innovation to address food insecurity in NYS.

The other FoodMap NY reports, including 1) a summary of the FoodMap NY initiative, including a brief synopsis of the landscape analysis and proposed pilot projects, 2) full spotlight reports on the background research completed on each of these topics, and 3) full project proposals that were developed based on the background research and outreach, are all available here:

[view resources](#)



## FOODMAP NY TIMELINE

- **August 2021**  
MCHF invites NYU Stern CSB to propose a two-year special initiative that advances thinking and helps develop strategies to address food insecurity in NYS through private-sector engagement and investment, with a special focus on rural and upstate areas of NY
- **December 2021**  
MCHF awards NYU Stern CSB \$2 million to fund a two-year research and incubator project
- **March 2022**  
FoodMap NY launches
- **April 2022**  
NYU Stern CSB partners with Cornell University to launch FoodMap NY's research and landscape analyses
- **April 2022 – May 2023**  
FoodMap NY teams research the NYS food supply chain and reach out to over 115 key stakeholders throughout the state
- **May 2023**  
FoodMap NY organizes and retains project teams to develop concrete opportunities for private investment and engagement
- **June 2023**  
FoodMap NY kicks off the work of project teams at a meeting of key stakeholders convened at Cornell
- **April 2024**  
FoodMap NY partners with the Federal Reserve Bank of New York and hosts the Food Finance Forum
- **May 2024**  
FoodMap NY passes the baton to engaged organizations to take on project leadership
- **June 2024**  
FoodMap NY project teams complete project proposals and support lead organizations in seeking philanthropic and impact investment

# Introduction

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Food insecurity is a pervasive, multidimensional problem impacted by factors that range from local context (e.g., availability and affordability of fresh produce, presence of retailers, transportation infrastructure, employment opportunities) to individual dynamics (e.g., income, employment, mobility, education).

As of 2019, roughly one in 10 individuals—and one in six children—in NYS were experiencing food insecurity.<sup>3</sup> These numbers worsened during the pandemic. By 2020, 14% of adult New Yorkers reported household food scarcity, including 32% of Hispanic New Yorkers and 21% of Black New Yorkers which reflected increasing racial and ethnic disparities.<sup>4</sup> Supply-chain disruptions, inflation, and weather volatility associated with climate change have exacerbated food insecurity by impacting pricing and availability of food to food-stressed populations.<sup>5</sup>

An extensive body of research on the nature of food insecurity provides explicit and implicit indications of the role that private sector engagement and investment could play in addressing the interconnected challenges of strengthening the food system and alleviating food insecurity in underserved communities across the state. More specifically, a review of over 18 recent government, academic, and organizational reports produced by a wide range of stakeholders since 2015 point to several important themes for investors interested in improving the efficiency of production, processing, distribution, and sales of food within the state to benefit food insecure people. These areas include: 1) infrastructure; 2) farmland protection and conservation; 3) local and regional foodways; 4) workforce recruitment and training; 5) consumer education; and 6) technological innovation.

## 1. Infrastructure

Aging and obsolete infrastructure is widespread within NYS. In some cases, regional marketplace infrastructure has not been updated since the early 1900s and is in desperate need of repair. Outdated infrastructure cannot support the needs of modern food systems—including cold storage, streamlined loading docks, and efficient transportation routes—which results in increased food waste and product shortages. Despite being one of the largest food-producing regions in the state, Central New York has lost much of its processing infrastructure.<sup>6</sup> Private investment could help update aging infrastructure, implement more efficient processes, and streamline production and transportation.

On the production side, flat and diminishing capacity impedes the broader availability of local food across the state.<sup>7</sup> To make NYS food production more competitive with food sourced from California to Mexico, private sector engagement and investment could help to improve farm-management practices, streamline processes (e.g., antibiotic use, sowing, crop rotation, packaging), pilot or expand brokerage business models that aggregate products from multiple small farms under one branding umbrella to enhance cost efficiency, and increase the resiliency of supply chains by improving and updating infrastructure needs.

The lack of transportation for consumers exacerbates food insecurity. Although travel times to grocery stores across suburban, rural, and urban settings in NYS consistently averages about 20 minutes, urban residents' lack of effective transportation presents a considerable barrier to their ability to purchase food.<sup>8</sup> Additionally, the diminished presence of local stores in rural and suburban areas poses challenges to safe and efficient food access. Private engagement and investment have the potential to impact the cost, frequency, and efficiency of transportation to and from stores for consumers, as well as delivery services that could support the needs of communities where transportation remains a barrier.

## 2. Farmland Conservation

NYS is home to more than 33,000 farms and about 60,000 producers, but available farmland has been in steady decline over the last decade.<sup>9</sup> Nearly half of the state's farmers make less than \$10,000 annually in agricultural market sales, and for every consumer dollar spent on food, farmers receive less than 8% of the total revenue.<sup>10</sup> In addition to climate change, which threatens farm productivity, the extraction of resources from existing farmland and increased utilization of land for non-farm purposes (e.g., housing, solar development projects, urbanization) erode the state's capacity to increase the production and availability of local food over time.

The application of innovative financial instruments to support farmland trusts or conservation easements could help strengthen the state's agricultural foundation. Additionally, there may be opportunities to diversify farmer incomes (e.g., food waste to energy, regenerative agricultural practices) in ways that would facilitate farmland restoration and conservation.

### **3. Regional Foodways**

There are persistent issues that often prevent locally grown food from being available in those communities that are closest to farms in NYS. The structure of modern food supply chains poses one challenge, as small farms can struggle to meet the production volume, quality, and consistency demanded by wholesalers and their big-box retail customers. Required certifications can mean costly upgrades that smaller farms cannot afford. Additionally, the variation in the location of food demand versus food supply within the state (e.g., 40% of food processing/manufacturing is centered downstate near New York City (NYC), while significant production occurs upstate) results in additional costs and complexity.<sup>11</sup>

Existing programs (e.g., Nourish New York, Farm-to-School) are meant to facilitate the availability of local food and shrink the distance between producers and consumers, but they are limited in scope.<sup>12</sup> Private industry may be able to help state and local governments increase the efficiency and effectiveness of these programs. Additionally, the private sector could help facilitate the availability and diversification of local crops to meet the specialized needs of local populations, provide products better aligned with the food-culture needs of those who are food insecure, and/or encourage the development of new or specialized products that could support artisanal, custom, and other lower-volume, high-value markets.

### **4. Farm Workforce Support**

New York's agricultural workforce is aging rapidly. Fewer than 2% of farmers identify as racial or ethnic minorities, which does not adequately reflect the true diversity of the state.<sup>13</sup>

Private industry engagement and investment could support training and the development of a new farming workforce that is younger, more diverse, creative, and willing to incorporate technological innovation into its work while diminishing the practice of relying on undocumented, immigrant, and/or unpaid labor.<sup>14</sup>

### **5. Consumer Education**

The presence of diet-related health conditions and diseases places a significant strain on the healthcare system. A 2019 survey estimated that annual healthcare costs associated with food insecurity in NYS topped \$3.4 billion.<sup>15</sup> Studies suggest that consumer education related to improving food-system literacy would encourage more direct engagement with and desire for local food products, which are often cheaper and more environmentally sustainable to produce and transport.<sup>16</sup> Additionally, improved awareness of aid programs can help those who qualify for federal or state assistance to enroll and claim their benefits.<sup>17</sup>

Private sector engagement and investment could help improve consumer education and demand for healthier nutrition options and/or consumption of fruits and vegetables. Direct-marketing platforms and improved operation-management systems could support outreach and customer management.

### **6. Technological Innovation**

The tools used to manage the state's food system need to be modernized and streamlined. Additional investment could improve customer management, project management, supply chain management, and operational efficiency, through the application of food science, agricultural technology, AI, and other technologies being developed, commercialized, financed, and applied by the private sector.

In short, research indicates that there are clear opportunities for private-sector engagement and investment to address the needs of food systems, by streamlining production and distribution, easing operational obstacles in the farming process, creating new markets to bolster local foodways, developing avenues for diverting food waste, and addressing community food needs. Banking and lending could assist with the preservation and distribution of farmland. New technologies could drive efficiency and support sustainable practices. But it appears that few of these approaches are being applied directly to the question of food insecurity.

Typically, these opportunities are framed as aspirational and offered as ideas or suggestions, with little consideration for how these solutions might actually be put into practice. To truly meet the needs of NYS residents, it is important to move forward in a way that takes these ideas from concept to application. More specifically, there is a need to figure out whether and how private sector engagement and investment can target the key drivers of NYS food access in a way that would result in a meaningful impact on food insecurity in NYS.



# Key Drivers of NYS Food Access

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Research indicates the presence of several industry and market trends that impact the accessibility of food within the state. These trends can significantly impede or catalyze the ability of private-sector engagement and investment to address the needs of the food system, and have to be clearly understood if different approaches to addressing food insecurity are to have success in the market.

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## Industry Wholesale and Retail Trends

Food wholesalers assemble, store, and transport food to customers, including food retailers. The food wholesale sector is experiencing ongoing consolidation and vertical integration.<sup>18</sup> In response, manufacturers and large retailers have moved to create their own distribution operations to improve profit margins by shortening the supply chain.<sup>19</sup> The resulting decrease in wholesalers has left smaller, independent grocers (i.e., one to 10 stores) with fewer options to obtain food items.<sup>20</sup>

The location, size, business models, and ownership structure of food retailers (businesses where consumers purchase prepared or raw food) are a major driver of food access. Two seemingly conflicting trends have shaped the food retail market: an expansion of where food is sold and a concentration of the market. Today, retailers include a variety of businesses, from small independent retailers to larger supermarkets, supercenters, convenience stores, dollar stores, drug stores, and food cooperatives.

The concentration of the sector has made it more difficult to access food variety. As large, nontraditional food retailers (e.g., warehouse clubs, superstores, supercenters) entered the food retail sector and expanded rapidly, their enormous purchasing power, industry-leading logistical capabilities, and success in securing regulatory immunity for anti-competitive supply terms made it difficult for smaller retailers to compete.<sup>21</sup> That, together with growing consumer demand for one-stop shopping, moved retailers to expand product assortment and store footprints on cheaper land outside of urban centers.<sup>22</sup> Larger stores led to fewer store locations.<sup>23</sup> Supercenters (and other large nontraditional retailers) are able to engage in volume purchases and offer food products at lower prices than other food retailers (e.g., Walmart supercenter food items are priced 15-25% lower than those in traditional supermarkets).<sup>24</sup> While research indicates staple foods are typically priced higher in small versus large food retail environments, price differentiation varies.<sup>25</sup> In some cases, larger outlets (e.g., supermarkets) offer lower prices through economies of scale.<sup>26</sup> In other cases, smaller stores have been found to offer lower prices for fresh foods than their larger competitors.<sup>27</sup> Nevertheless, the food retail sector continues to evolve as it consolidates and integrates. From 1990–2019, food retail spending at traditional supermarkets decreased from 80% to 62%, while spending at supercenters increased from 3% to 18%.<sup>28</sup>

The COVID-19 pandemic accelerated the way in which consumers shopped for food, as online retail sales grew from an estimated 2.7–3.4% of total grocery sales to 8.1% (\$1137 billion) in 2020, 9.5% in 2021, and a projection of over 20% in the next decade.<sup>29</sup> Online purchases tend to be dominated by bulk and canned goods, dairy, and eggs; while shoppers continue to prefer buying fresh fruit and meat in-store.<sup>30</sup> Additionally, online shoppers tend to prefer the product assortment, convenience, and ease of delivery providers (e.g., Instacart) over online-only grocers (e.g., Amazon Fresh).<sup>31</sup>

Changes in food wholesaling and distribution have led to four types of discrimination in the grocery sector: price, payment, product supply, and packaging.<sup>32</sup>

- **Price discrimination:** Charging one purchaser a more favorable price than another for the same or similar products. Most commonly, this takes the form of failing to provide price promotions and/or providing less favorable payment terms.
- **Payment-terms discrimination:** Offering larger retailers more favorable terms of payment. Certain large retailers can receive “scan-based payment” terms from suppliers, meaning that they pay for a final product only when it is scanned for sale to a consumer. Independent retailers, on the other hand, pay for products upon receipt. This increases their need for working capital and their inventory risk, while also reducing their profit margins.



- **Product-supply discrimination:** Refusing to supply independent retailers with products that are made available to larger retailers, and/or favoring larger retailers on allocation or delivery terms. For example, suppliers often enforce minimums on products for smaller buyers that effectively bar them from stocking certain products.
- **Packaging discrimination:** Refusing to provide certain package sizes or promotional packaging to smaller retailers, while providing them to larger competing retailers. Some manufacturers, for example, no longer provide larger-sized versions of products to independent grocers, while still providing them to larger retailers, including big-box and club stores.

These practices benefit larger, more powerful buyers by allowing them to: 1) secure more advantageous terms than smaller buyers; and 2) impose higher purchasing costs or other disadvantages on their rivals. In many cases, the wholesale price offered to independent grocers is higher than the *retail* price at wholesale clubs. As a result, independent grocers often resort to buying entire pallets of must-have products from their competitors, enabling larger retailers with great buying power to undercut smaller retailers and gain market share, which in turn further undercuts small retailers and allows larger retailers to capture greater market share.<sup>33</sup>

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## Trends in Consumer Food Retail Preferences

Community food environments (i.e., people's proximity to food retail locations, the cost of food items, and the variety and density of food retail within a specific geographic area) influence individuals' decisions about where to shop, dietary quality, and associated health outcomes.<sup>34</sup> An increasing body of research has begun to explore *where* people shop for food, particularly among low-income and/or minority populations.

Food environments differ markedly across different socio-demographic factors.<sup>35</sup> Studies indicate that supermarkets are more common in predominantly white areas, while grocery stores (typically smaller, with less variety) are common in areas with a predominantly minority population.<sup>36</sup> Research has also shown that supermarkets are more likely to be located in wealthier neighborhoods, while convenience stores are more prevalent in less-wealthy neighborhoods and in areas with food insecurity.<sup>37</sup> Rural areas typically have convenience stores and, more recently, discount retailers (e.g., dollar stores) which tend to stock highly processed, shelf-stable products that are inadequate for a healthy diet, thereby impacting the health outcomes of consumers who frequent those outlets.<sup>38</sup>

Small retailers often fail to sell enough volumes of produce and other perishables to meet distributors' minimum order requirements and avoid losses from inventory spoilage. The availability of food items varies across different types of food retailers. Convenience stores tend to offer a limited range of food products, as well as less healthy versions of foods (e.g., whole milk vs. reduced- or low-fat milk).<sup>39</sup> Smaller neighborhood stores have been found to offer less produce, which can vary between store locations.<sup>40</sup> Within urban areas, larger supermarkets offer the greatest variety of healthy food (e.g., fruits and vegetables).<sup>41</sup>

Over the past two decades, there has been a focus on creating structural interventions (i.e., constructing new food retail spaces) that increase physical access to food within community food environments, to combat obesity and food insecurity in low-income and minority neighborhoods.<sup>42</sup> The efficacy of such interventions is unclear. Some studies have shown an association between increased access to nutritious foods and improved dietary quality,<sup>43</sup> but others have not.<sup>44</sup>

Research has indicated that physical proximity is not the determining factor in a consumer's food purchasing decisions.<sup>45</sup> Rather, individuals tend to bypass their nearest food retail location and travel to their primary store, a trend consistent across characteristics such as food program participation (e.g., SNAP, WIC), income level, and food insecurity.<sup>46</sup> Individuals who use alternative forms of transportation (e.g., walk, bike, mass transit) tend to shop closer to home than other individuals but still do not, on average, utilize the closest supermarket as their primary food retail location; other factors—including selection, quality, and price—may also influence where consumers purchase food.<sup>47</sup>

In the U.S., households across all income levels tend to patronize multiple stores on a regular basis and shop at 11 different food retail locations over the course of a year.<sup>48</sup> Low- and middle-income households shop at supercenters at a higher rate than high-income households, while the latter are more likely to shop at club stores than other income groups.<sup>49</sup> Households using SNAP benefits shop at similar outlets, but vary their purchasing patterns when their SNAP benefits are depleted, at which point they shop more frequently at drug and convenience stores.<sup>50</sup>

A study on food purchasing patterns in the northeastern U.S., which included four locations in NYS, found that 88% of respondents used grocery stores as their primary food retail location, while only 7% used supercenters.<sup>51</sup> Food purchasing patterns differed, however, according to participation in federal nutrition programs: 59.8% of respondents who participated in those federal programs identified supermarkets as their primary food retail location and 30.3% chose limited assortment stores as their primary food retail location, compared to 69% and 18.3%, respectively, of respondents that did not participate in those programs.<sup>52</sup>

Urban and rural shoppers have been found to utilize traditional supermarkets as their primary food retail outlet at indistinguishable rates (about 65%), even as supermarkets were the preferred food shopping location for rural residents and ranked highest in rural residential expenditures vis-à-vis food shopping.<sup>53</sup> More rural residents (18%) shop at supercenters as their primary food retail location compared to urban residents (4%).<sup>54</sup> But rural residents are not more likely than urban residents to shop at discount retailers (i.e., dollar stores), while nearly 25% of urban residents rely on convenience stores as their primary place to shop for food, compared to only 6% of rural residents.<sup>55</sup>

Food purchasing patterns differ by income, with low-income individuals in both rural and urban geographies buying fewer fruits and vegetables, less meat and non-meat proteins, and fewer snacks and sweets.<sup>56</sup> While more than one-third of NYS adults consume fruit and 21.5% consume vegetables less than once per day, the consumption of produce is lower among males, low-income residents (those who earn less than \$50,000 per year), adults living with a disability, and those who've reached lower levels of formal education.<sup>57</sup>

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## Food Financing Trends

The type and amount of funding available to farmers and food businesses impacts food access in NYS. Various public and private funding sources are available to small and midsize farms and food-related businesses in NYS.<sup>58</sup>

Private funding sources—typically provided by foundations with food system-relevant missions—consist primarily of loan and grant programs that are not specific to NYS but instead cover a specific geographic area of the U.S.<sup>59</sup>

At the federal level, the U.S. Department of Agriculture (USDA) is the public sector source of grants, loans, and other support for farms and food-related businesses, such as educational resources on land management and conservation practices, risk management, and ways of finding local markets.<sup>60</sup> The USDA offers various resources and programs that are specifically aimed at small and midsize producers in the U.S., including: the Farm Storage Facility Loan Program (FSFL), which provides low-interest financing to producers for building or upgrading certain facilities to store eligible commodities<sup>61</sup>; its Microloan Programs, which provide limited funding to new small and midsize farms<sup>62</sup>; the Organic Certification Cost Share Program (OCCSP), to assist with the organic certification small and midsize farms<sup>63</sup>; and the Gus Schumacher Nutrition Incentive Program (GusNIP), which provides funding for three types of nutrition incentive programs for income-eligible individuals: 1) the Nutrition Incentive Program, which seeks to increase the consumption of fruits and vegetables by providing SNAP participants with incentives at the point of sale (POS); 2) the Produce Prescription Program, which provides funding for projects that promote or evaluate fruit and vegetable prescriptions for household consumption, food security, and healthcare costs; and 3) the Training, Technical Assistance, Evaluation, and Information Centers Program, which provides support services.<sup>64</sup>

At the state level, the NYS Department of Agriculture and Markets (NYSDAM) is focused on facilitating new market access for farmers; supporting marketing efforts for producers and retailers; ensuring local, healthy food is available in schools; improving infrastructure that's related to fairgrounds and animal shelters; and promoting climate-resilient farming practices.<sup>65</sup> Programs include those focused on new farmers,<sup>66</sup> as well as socially and economically disadvantaged farmers.<sup>67</sup> NYSDAM provides funding through partnerships with other governing authorities, such as New York's Regional Economic Development Councils (REDCs), which are coalitions of public and private sector experts and stakeholders tasked with developing long-term strategic plans for economic growth in their regions, including innovative practices and/or research to meet consumer demand for locally grown produce, and programs that provide financial support to rural communities across the state.<sup>68</sup>

Despite public investment in the food system, research has indicated a significant gap between what farm and food-business entrepreneurs say they need, and the funds that are available to them, regardless of funding sources (e.g., grant-makers, investors, lenders).<sup>69</sup> Entrepreneurs have noted the need to obtain capital to purchase equipment; build, renovate, or purchase

structures; achieve marketing or wholesale readiness (via short-term working capital); acquire supplies (via multi-year working capital); purchase or repair distribution vehicles; make land improvements or purchase land; hire service providers; and access flexible loan refinancing.

Those seeking capital investment tend to turn to public funding sources first, followed by bank loans, private investors, and individual donors (e.g., crowdsource funding). Private sector investors tend to have high return on investment (ROI) expectations and can be difficult to access.<sup>70</sup>

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## Food Policy Trends

Food policy is typically focused on how food is produced, processed, transported, consumed, and discarded.<sup>71</sup> Laws and regulations shape the food environment; determine how different actors and stakeholders (e.g., producers, distributors, retailers, consumers) make decisions; and influence the ways in which the food system achieves social, environmental, and economic objectives.<sup>72</sup> Policies are used to address inequalities and market failures.<sup>73</sup>

### Federal Programs

At the federal level, there is no single government authority that regulates the U.S. food system. The Farm Bill, most recently revised in 2018, mandates national food policy.<sup>74</sup> It authorizes 20 different departments and agencies—including the USDA, the Food and Drug Administration (FDA), the Federal Trade Commission (FTC), and the Environmental Protection Agency (EPA)—to play some role in creating the legal and regulatory framework under which food systems operate.<sup>75</sup> Some federal programs (e.g., crop insurance) do not require periodic reauthorization, while others (e.g., commodity support programs, nutrition assistance) expire.<sup>76</sup>

Over 75% of Farm Bill funding is allocated to SNAP, which provided nutritional support to a monthly average of 41 million Americans across 21 million households in 2021.<sup>77</sup> The remaining funds are mostly allocated to farmers—through grants, subsidies, and insurance plans. SNAP eligibility guidelines are set at the federal level, but states have some authority to tailor specific aspects of these guidelines.<sup>78</sup>

Under federal regulations, households are eligible for SNAP if they meet criteria relating to their gross monthly income, net monthly income, and the value of their assets.<sup>79</sup> Unemployed, non-disabled adults between the ages of 18–49 who do not live with children are eligible for three months of benefits.<sup>80</sup>

Food retail locations—including brick-and-mortar stores, farmers markets and farm stands, and online food retailers—must meet certain requirements to be eligible to accept SNAP benefits, such as the ability to stock units of different varieties of staple food categories on a continuous basis, maintain a percentage of gross retail sales from staple food items, allow consumers to choose the amount of benefits they wish to use on each purchase, and ensure that only eligible foods can be purchased with SNAP benefits.<sup>81</sup> Approximately 80% of all SNAP benefits are redeemed in supermarkets or superstores, though more than four million SNAP households shopped online in 2022, up from 35,000 in 2020.<sup>82</sup>

SNAP participation has been shown to improve health outcomes and quality of life, as well as bring revenue to local economies.<sup>83</sup> It is estimated that every \$5 in new SNAP benefits results in up to \$9 in local economic activity.<sup>84</sup> Moreover, SNAP may reduce food insecurity by as much as 30%, with an even greater effect on children and households that face more severe forms of food insecurity.<sup>85</sup>

### State Programs

In NYS, individuals apply for SNAP benefits online or in-person through their local department of social services. Eligible households receive benefits via an Electronic Benefits Transfer (EBT) card, which is loaded with a monthly benefit (as determined by household income and size) and can be used at any of the more than 254,000 retailers authorized by the federal program.<sup>86</sup>

NYSDAM is the primary regulatory body for state-level food policy within NYS and is responsible for overseeing the state's food system.<sup>87</sup> Its programs include Taste NY, New York State Grown & Certified, FreshConnect Checks Program, 30% New

York State Initiative (Farm-to-School), and the Farmers' Market Nutrition Program.<sup>88</sup> The agency also administers federal agriculture and nutrition funding, such as the Specialty Crop Block Grant Program and the USDA's Specialty Crop Multi-State Program, as well as providing direct aid to localities.

Other offices administer and/or oversee additional programs, including the Office of Temporary and Disability Assistance (OTDA) which oversees the local administration of SNAP; the Office of General Services (OGS); USDA's Food Distribution, which serves as the state distributing agency for The Emergency Food Assistance Program (TEFAP);<sup>89</sup> and the Department of Health, which oversees the NYS Hunger Prevention and Nutrition Assistance Program (HPNAP) to improve the quality of food provided by emergency food assistance organizations (e.g., food banks).<sup>90</sup>

Over the past decade, local and regional governments have also become more engaged in food systems as they have been particularly well-positioned to assess needs and work directly with local communities to contextualize decision-making within a given geographic context, and they can also act more swiftly to implement policies than can be done at the state level.<sup>91</sup> For example, the Good Food Purchasing bill—which would update the state's food procurement law to encourage purchasing from suppliers that demonstrate a commitment to environmental stewardship, fair labor practices and pricing, animal welfare, and nutritious foods—remains under debate in the state legislature while an executive order by NYC Mayor Eric Adams implemented the program at the municipal level.

Policies are critical to the governance of food systems. As noted previously, food and agriculture policies go beyond single sectors and require the input of different actors across a food system. Therefore, the efficacy of policies relies on an understanding of the stakeholders that are involved in the policymaking process, from their inclusion in a program and a policy's initial conceptualization, through to its implementation.

Over the past decade, food policy councils (FPCs)—formalized groups of stakeholders, representing various food-system sectors, that seek to identify and address different vulnerabilities within their respective geographic (state, city, city-county, regional) locations—have emerged as a unique form of food-system governance.<sup>92</sup> NYS' statewide FPC, the Council on Hunger and Food Policy, consists of five working groups that include representatives of various state agencies, nonprofits, and industry; they are tasked with advising the state on various food-system challenges and developing policies to reduce hunger and expand access to locally grown foods, particularly in food-insecure communities across the state.<sup>93</sup> The council supported the introduction of the NYS Farm to Food Bank Tax Credit to allow farmers to receive up to a \$5,000 annual tax credit for costs related to providing local products to food pantries, food banks, and other emergency food programs across the state. It also supported incorporating healthy eating and food insecurity into NYS's 2019–2024 Prevention Agenda, to increase the availability of fruit and vegetable incentive programs through the development of public-private partnerships.<sup>94</sup> In addition, there are 10 municipal and regional councils throughout the state.<sup>95</sup>

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## Food and Nutrition Insecurity Trends

Food insecurity, defined as “a household-level economic and social condition of limited or uncertain access to adequate food.”<sup>96</sup> has decreased nationally since 2008 and remained stable in 2020 at 10.5% of households nationally experiencing low and very low food security.<sup>97</sup> There was, however, an increase in households with children that experienced food insecurity, from 6.5% in 2019 to 7.6% in 2020.<sup>98</sup> The COVID-19 pandemic exacerbated food insecurity, particularly among Black, Indigenous, and People of Color (BIPOC) communities; households with children; and people who experienced negative job impacts.<sup>99</sup> In NYS, differentiating by rate or population will yield different views of the food-insecurity landscape. The NYS county with the highest rate of food insecurity (Montgomery, at 14.4%) differs from the county with the most food-insecure people (Erie, with over 100,000).<sup>100</sup>

Food insecure families with children are more likely to experience more severe impacts of food insecurity.<sup>101</sup> Child food insecurity is concerning for many reasons. Not only are children's health and development compromised by inconsistent access to balanced meals, but adults with children tend to put the health of their children before their own. Households with children are at higher risk of food insecurity and the detrimental health impacts that may result.



Racial and ethnic minorities experience food insecurity at higher rates than white households. Discriminatory policies have led to higher rates of food insecurity within Black populations compared to national averages. For instance, in 2019, 19.1% of Black households were food insecure, a significantly higher rate than white households at 7.9%.<sup>102</sup> Between 15 to 22% of Black households in NYS experienced food insecurity in 2020, a stark difference from the state average of 10.3%.<sup>103</sup> Increasing food security will require a multifaceted approach led by Black residents and community organizations.

Nationally, Indigenous populations face additional barriers that contribute to food insecurity, such as reduced access to food suppliers and higher costs of fresh food, due to lower economic status and geography, characterized by living apart from middle- and high-income communities that attract private suppliers and retailers.<sup>104</sup> Indigenous peoples in NYS (who may identify as members of the Cayuga Nation, Oneida Nation of New York, Onondaga Nation, Poospatuck or Unkechaug Nation, Saint Regis Mohawk Tribe, Seneca Nation of Indians, Shinnecock Indian Nation, Tonawanda Band of Seneca, or Tuscarora Nation)<sup>105</sup> experience higher rates of food insecurity resulting from disrupted traditional foodways and cultural assimilation policies that integrated their food access into colonial food systems.<sup>106</sup> Many of the food security initiatives designed by and for NYS' Indigenous tribal communities emphasize food sovereignty by focusing on building these communities' capacity to grow their own food, protecting native and heirloom crop varieties through seed-saving and sharing programs, and preserving the ability to garden and distribute food throughout their communities without interference.

Disabilities can prevent working-age adults from maintaining their employment, putting them at higher risk of experiencing food insecurity. Seniors, defined as people over 60, are another population that is vulnerable to food insecurity. A recent study by Feeding America found that 71% of seniors—1 in 14—experienced food insecurity in 2021.<sup>107</sup>

Barriers to food and nutrition security are overlapping and dynamic. For individuals and households, food security can change because of a shift in their economic circumstances, shifts in their personal life (e.g., marriage, divorce), aging, a change in nutritional needs, or a change in ability. In most cases, problems with food security are due primarily to household purchasing power. The location and distribution of affordable, healthy food can also contribute to food insecurity: there may not be enough stores in a given area (food desert), the stores that exist may be too expensive (food mirage), or they may only offer cheap, unhealthy food options (food swamp).



# Opportunities for Private Sector Engagement and Investment

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Research points to six focal areas where private sector support could catalyze collaborative partnerships to create a more sustainable, equitable, and resilient food system in NYS. These include Supply Chain & Infrastructure, Healthy Food in Retail Environments, Food as Medicine, Food Finance, Controlled Environment Agriculture (CEA), and Food and Nutrition Assistance Programs.

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## Controlled Environment Agriculture (CEA)

Controlled environment agriculture (CEA) refers to the practice of growing plants in a closed or partially closed environment, where environmental factors such as light, temperature, humidity, and CO<sub>2</sub> levels are carefully controlled and optimized for plant growth. CEA encompasses a range of growing systems, including soilless substrates, hydroponics, aeroponics, and aquaponics (combining fish and plants). A common theme of these systems is the ability to grow plants without soil but with precise control of the root-zone and capture/re-use of water and nutrients. There are also different types of CEA structures such as greenhouses and vertical farming systems (some of which are fully sunless, relying only on electrical light). Whether sunless or not, all high-tech CEA farms use supplemental lighting, temperature- and humidity-control systems (HVAC), and nutrient-delivery systems, to maintain optimal growing conditions for crops.



CEA has several benefits over field agriculture, including reduced water usage, increased yields, and the ability to grow crops in urban areas, closer to consumers. But CEA systems can be expensive to set up and maintain, and they require significant technical expertise to operate effectively. Additionally, the high energy consumption associated with lighting and climate-control systems can be a barrier to widespread adoption of CEA.

## Investment Opportunities

CEA operations often require large upfront costs, particularly production supplies, packaging, labor, structures, equipment, energy, and land. Energy costs often account for more than one-third of a CEA operation's total expenses. Another central cost element is land, which consists of both production and non-production space (e.g., packing house and walk-in coolers, restrooms, administrative offices, parking). Labor and management, energy, and structures account for more than 80% of CEA costs, while transportation costs are minimal.

The breakeven cost to grow and deliver greens for vertical farms is significantly higher than conventional outdoor farms.<sup>108</sup> CEA cash flow is impaired by high upfront investment and operational costs, consisting mainly of labor and huge energy



expenses, along with the inability to capture premium pricing. As a result, CEA companies need to become more efficient in warehouse management and distribution, instead of only increasing productivity and quality of produce.

Despite billions of dollars invested in indoor vertical farming in recent years, weak returns have been a significant impediment in attracting traditional types of financing, thus forcing these farms to rely on venture and private capital funding. Alternative funding mechanisms such as community benefit agreements (CBAs) can guarantee certain benefits for a community (e.g., local jobs, living wages) in exchange for community support of a project that could drive a more efficient and expedited development process, institutional purchase of hyperlocal produce, and sales to local schools, hospitals, or government offices. Additionally, investments in alternative energy sources (e.g., solar, waste heat) could benefit CEA operations and community outcomes.

## Suggestions for Action

Private sector investment in CEA could help catalyze expansion and growth, improve efficiencies, fuel product development, and automate and scale operations to effectively deliver fresh goods in a short amount of time, limit spoilage, and save on transportation costs to increase access to healthy food options. These improvements could impact food insecurity by facilitating hyper-local, sustainable food production. Additionally, investment in CEA could positively impact the intake of vitamins and minerals, which are important for long-term health.

A good starting point may be mid-tech greenhouses with a lower capital investment cost than vertical farms. Ventures that produce cash crops (such as culinary herbs) as well as a greater portfolio of nutritious vegetables may be able to become both profitable and supportive of community food efforts.

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## Supply Chain & Infrastructure

Access to funding is a clear challenge for food hubs, regardless of their size. At times, their complex structures as nominal state authorities and public benefit corporations make them ineligible to receive much public funding or partake in philanthropic funding opportunities. In the wake of the COVID-19 pandemic, some had to suspend programs that were explicitly designed to help combat food insecurity. Hubs that are organized as nonprofit organizations can seek grant funds, but those operating as for-profit entities are ineligible for such funding and rely heavily on the vitality of local markets, which are limited in scale.



While NYC and other downstate markets provide opportunities for farmers to sell their produce within larger, more demanding markets, they divert resources away from central and northern regions of the state. As a result, it is challenging for consumers in those areas to access regional produce, driving up food insecurity and putting immense pressure on farmers to transport their wares hundreds of miles away rather than sell them closer to home.

Central New York is one of the largest food producing regions in the state, but connections between the region's agricultural producers and consumers (a so-called "last mile" issue) have broken down over the last several decades. Significant demand and revenue generation for produce downstate, coupled with the loss of local processing capacity upstate, have created an environment where food is shifted from communities in need. A lack of coordination and partnership between food hubs create gaps in service and lead to food waste, which ultimately harms both producers and consumers.

## Investment Opportunities

Food hubs and distributors would like to modernize and build stronger marketplaces to simultaneously improve producers' ability to sell, distribute, and market their goods and consumers' access to food.

Many food hubs have limited refrigerated and frozen food storage spaces, making it even more difficult to store produce effectively. Effective storage-allocation systems are vital components that significantly impact the success of efforts to mitigate food waste. The lack of modern and efficient cold storage facilities remains a challenge that contributes to food waste and greenhouse gas emissions, and exacerbates food availability.<sup>109</sup>

The pressure on producers (especially small farms) to get food to buyers as quickly and profitably as possible contributes partially to driving business away from aging local food hubs and towards hubs with more resources and better infrastructure, such as those located downstate and in NYC. Additional pressure to distribute exclusively within NYC also draws regional food away from where it's grown, making it more challenging for local communities upstate to access local products.

Existing food-hub infrastructure, as well as established transportation routes and a limited ability to store food regionally, make it uneconomical for farmers to keep food local. Without effective storage or transportation infrastructure, farmers risk their products going bad or not getting sold in time.

Existing food hubs are scattered unevenly across the state. Most food hubs in NYS are in the eastern half of the state, where there are comparatively fewer agricultural producers but a higher preponderance of smaller farms.

Investment in cold chain and cold storage technologies has emerged as a key priority for markets, food hubs, farmers, wholesale coalitions, and depot centers. Market hubs need support updating their buildings and infrastructure, to address new safety regulations and accommodate vans and trucks in spaces previously intended for trains, horses, or carriages. When building infrastructure breaks down, funds that might otherwise be allocated to expand programs that address food insecurity, provide market space for new farmers, or offer community resources get shifted to focus on immediate repairs.

Managing distribution also requires investment in the systems that allow market managers to oversee what is getting sold, when, and where. Farmers and food hubs alike are sending products to cities without a clear understanding of costs associated with these sales because of the volatile pricing of fuel and labor. As a result, slim margins are further eroded by the inability to forecast standardized pricing for overhead. Investment in cold storage and other infrastructure would support local foodways while also reducing food waste and ensuring that community members have a dignified and accessible opportunity to purchase local food that has been grown in their regions.

Pressure from retailers and producers to sell their food makes it nearly impossible for distributors to focus on distributing excess and/or locally grown food to those who are suffering from food insecurity. Greater networking capabilities could help overcome communication obstacles within the supply chain, between and across local producers and food hubs that contribute to supply chain bottlenecks.<sup>110</sup> Insufficient networking capabilities in rural environments have also made it difficult for organizations to obtain labor or provide essential services to smaller vendors/farmers. At the same time, food hubs and rural workers in Upstate New York need better broadband access to connect to farms and regional food hubs/distribution.

When new and emerging food hubs lack long-term operating plans, the absence of financial planning affects infrastructure investments. A key factor behind the closure of food hubs is the lack of a solid financial foundation and the amount and types of capital needed to support growth as well as provide a buffer for challenges.<sup>111</sup> While grant funding and in-kind contributions of free warehouse space and labor can help support emerging food hubs, their long-term viability requires them to support costs through the business itself.<sup>112</sup>

## Suggestions for Action

Food hubs represent a unique opportunity for private industry that is interested in streamlining foodways and getting products to consumers more efficiently. The most obvious opportunities lie in untapped markets that food hubs and distribution centers have indicated could address gaps in their ability to function efficiently. Investment in cold storage and improved infrastructure is a potential avenue that private sector manufacturing, transportation, and refrigeration firms might consider exploring. Investment in updating equipment is a basic intervention that could lead to significant reductions in lost or wasted food.



Private industry could also help identify ways to make products available to smaller hubs with unique pricing options, low-cost or no-cost loans, or rental fees that could allow these facilities to gain access to produce-saving cold chain technology while still enabling their revenue to grow. Cold storage and other types of infrastructure investments could simultaneously benefit local farmers and underserved communities by expanding capacity and reach.

Investment in new technologies (e.g., supercooling) could result in more effective food preservation. Automation could improve deliveries and payment processes, standardize quality control, streamline end-user experiences, and enhance oversight.

## Projects

Two FoodMap NY projects explore investment opportunities in infrastructure.

### Dry Beans

Dry beans—a nutrient-dense, plant-based protein that is high in vitamins, fiber, and micronutrients—are a relatively inexpensive source of shelf stable protein, making them highly accessible year-round in any wholesale or retail setting. New York is the leading bean producer in the Northeast, representing 79% of all dry bean farms. The Center for Agricultural Development and Entrepreneurship (CADE), in partnership with Cornell University's Dyson School of Applied Economics and Management, and the Cornell Small Farms Program, has examined how private sector investment in supply chain infrastructure might help scale up production and processing to expand the dry bean industry to low income, food and nutrition insecure communities.

### Minimally Processed Produce

Across the Northeast, there is significant demand for stabilized (frozen or dehydrated) produce, yet limited capacity to manufacture stabilized fruits and vegetables at scale using the latest technology for individual quick-freezing (IQF) and dehydration. FoodMap NY explored the possibility of growing the industry for minimally processed, frozen, and dehydrated vegetable and fruit products for the benefit of low-income communities, as a potential strategy for addressing food and nutrition insecurity.

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## Healthy Food in Retail Environments

The average supermarket stocks 40,000 or more stock-keeping units (SKUs), and the scale of the largest supercenters and warehouse clubs keeps growing. Ever-larger food retail markets require correspondingly larger investments in real estate, infrastructure, logistics expertise, and marketing. Their scale requires that they be located in more affluent, concentrated geographies, where they can capture growing sales per store to produce an adequate return on investment. Small, rural communities lack the aggregate demand needed to produce adequate revenue for these large stores. Poor urban environments do not yield the returns needed for greater investment in real estate and logistics. As a result, the food retail landscape is marked by a growing emphasis on large supercenters and corporate-owned stores, while rural and urban communities alike are left with declining access to grocers that meet their need for healthy food.



Public policy experiments designed to incentivize the opening of supermarkets in underserved communities have produced disappointing results. Even when these experiments succeeded in establishing new supermarkets, many of these stores ended up closing, unable to find a path to profitability. Large-scale grocery stores are simply not designed to succeed in these communities. A changing food retail landscape has seen a proliferation of small retail locations and the expansion of online food retailers.

Meanwhile, wholesalers and distributors have consolidated even faster than retailers. While this enables them to serve lucrative large retailers efficiently, they become increasingly unsuited to serving small retailers' needs. The result is a system in which small retailers carry less variation than their larger competitors, often at higher costs for the same goods. Small food retail stores may be the only existing source of food in many rural and urban communities. Solutions that expand their inventory of healthy food items and/or reduce their costs are vitally needed.

## Investment Opportunities

While the financial viability of small food retailers appears challenging, the collective purchasing power of consumers in underserved areas suggests that new models that aggregate the buying power of underserved populations could result in broader and healthier food selection at more affordable prices. Successful models include grocery cooperatives and purchasing organizations for small retailers; cooperative wholesalers; online orders delivered to temperature-controlled food lockers; consignment sales of fresh produce and grab-and-go prepared foods; self-service and partially staffed retailers; the expansion of small-town retailers to incorporate groceries; and social purpose grocery stores. Investment in technology to aggregate demand and implement innovations that make operational costs more manageable could address these issues.

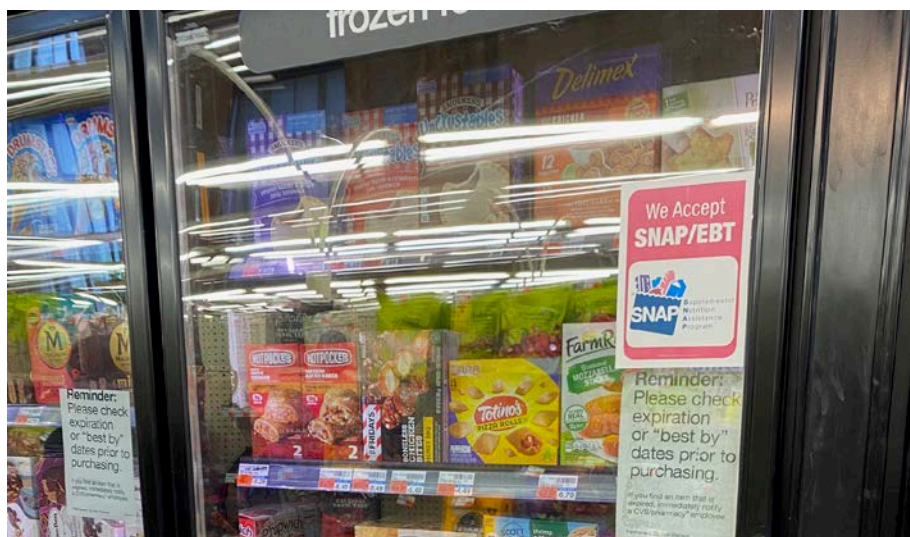
## Suggestions for Action

Private investment could help increase the adoption and diffusion of relevant, proven, financially self-sustaining business models to address healthy food in retail environments, particularly for independent grocer cooperatives, lockers, self-service grocery stores, and social purpose grocery stores. To increase cooperatives' purchasing power, they could leverage existing independent rural grocery stores that are in reasonable proximity. Lockers and self-service stores would reduce the staffing and ordering costs associated with running a store. Social purpose groceries would expand retailers that value social impact.

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## Food and Nutrition Assistance Programs

The largest federal nutrition assistance program, SNAP, is regarded as a private-public partnership that works.<sup>113</sup> Under SNAP, eligible individuals and families are provided monthly benefits through an EBT card that they can use to purchase eligible food in authorized retail stores, convenience stores, farm stands, and via online retailers.<sup>114</sup> As of 2021, one in seven NYS residents (14%) received SNAP benefits.<sup>115</sup> However, participants can experience a “SNAP gap,” in which: 1) SNAP benefits do not cover the full price of household food shopping within a given month; or 2) state residents are not enrolled in, or are otherwise ineligible, for nutrition benefits.



At the state level, the Nutrition Outreach and Education Program (NOEP) is funded by NYS and federal SNAP outreach reimbursement funds to conduct statewide outreach and education for SNAP and other nutrition programs (e.g., WIC, School Breakfast Program).<sup>116</sup> Organizations promote the benefits of SNAP to their respective communities; provide outreach to

eligible, non-participants; assist households with the application process; and mitigate barriers to SNAP participation.<sup>117</sup> Additionally, nutrition incentive programs help low-income households increase their purchasing power, particularly when combined with federal nutrition assistance.

Emergency food relief organizations (EFROs) provide food to individuals through a network that includes food banks, food pantries, soup kitchens, and emergency shelters. Increasingly, food banks receive food through food retail locations. Some food banks have direct-service programs, including through mobile markets and school food programs.

## Investment Opportunities

Private sector investment can fill the gaps in existing food assistance systems by helping to drive participation in programs, which often suffer from stigma as a barrier to enrollment. Individuals can be unaware that they have additional benefits they could spend, resulting in underutilization of benefits; others run out of resources before the next renewal period. Individuals can be less likely to enroll in and/or utilize benefits due to restrictions on which food they can purchase. There is also a need to improve the appropriateness and empathy of experiences for participating individuals.

Small, independent retailers may not be able to participate in programs because they lack the technological or staffing capacity to make necessary service upgrades or provide training. Simultaneously, there are opportunities to improve program efficiency and scale.

Other investment opportunities include deployment of better integrated digital POS payment methods, expansion of customer services, improvement of delivery services, and increased training of retail staff, to improve user experience, reduce barriers to uptake, and reduce administrative costs.

## Suggestions for Action

While food assistance networks rely heavily on public sector support for programmatic funding, infrastructure, and sustainability, opportunities exist for the private sector to play a critical role in strengthening food security for residents that utilize the services offered by food banks, food pantries, and nutrition programs. There is clearly a need to increase food assistance enrollment and overall utilization. There are opportunities to expand digital applications and/or consolidate food assistance programs, including nutrition incentive programs, into one application and on one card.

Additionally, there is also a need for the development of cost-effective and scalable POS solutions that can be fully integrated with incentive programs, through collaboration between retailers, POS system providers, and trade associations. There is also potential for improvement to delivery services and access incentive programs, to connect populations with food and nutrition assistance as a way of magnifying program impact and introducing valuable synergies across the food system.

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## Food as Medicine

Food as medicine (FAM) utilizes healthy food (e.g., fresh fruits and vegetables) to promote dietary changes that can reduce the impacts of chronic diseases.<sup>118</sup> Substantial evidence indicates that dietary factors influence the incidence of diabetes, cancer, heart disease, and other chronic illnesses, which are heightened by socioeconomic factors that limit access to nutritious food.

FAM interventions—which range from preventative to treatment-based approaches—include culinary medicine and nutrition; medically tailored meals





(MTMs), groceries, and food packages; food for health; nutritious food referrals; and prescription fruit and vegetable programs.<sup>119</sup> These interventions are some of the most promising solutions to food and nutrition insecurity because a core tenet of these approaches is to directly provide recipients with nutritious food at low- or no-cost.

Various barriers prevent more widespread adoption of FAM interventions, including state-specific caps on program enrollments and limitations on program funding.<sup>120</sup> FAM programs often lack the accurate and culturally appropriate dietary guidelines needed to provide a clear blueprint for health.<sup>121</sup>

## Investment Opportunities

While many FAM interventions are driven by nonprofit organizations, the expansion of these programs can serve the broader financial interests of the private sector and government agencies that are focused on reducing health risks and healthcare costs. Produce prescription (PRx) and MTM programs are two FAM initiatives that could benefit from private sector investment.

PRx models are a healthcare-based intervention through which doctors and other healthcare providers prescribe fruits and vegetables.<sup>122</sup> These models can drive revenue growth through local vendors, such as markets and grocery stores.<sup>123</sup> MTM programs provide nutritionally balanced meals to individuals living with advanced illness and can also be used as a preventative measure for populations that are food insecure, experience limited mobility, or are at high risk of illness. Private investment in both types of programs could improve awareness, access, participation, efficiency, effectiveness, and growth.

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## Food Finance

Many financial barriers limit food-system work and growth, but access to capital is critical for farms and food-related businesses, especially smaller ones. A diverse food system is correlated with diverse capital needs. Access to capital is critical for farms and food-related businesses, especially smaller ones. The USDA is the primary provider of grants, loans, and other support for farms and food-related businesses. State level investment focuses on more local improvements, such as connecting farmers with new markets, supporting producer and retailer marketing, and improving school nutrition.<sup>124</sup>



## Investment Opportunities

Traditional and emerging development finance tools that help businesses gain access to capital could benefit food system investment. More efficient investment is hindered by lack of transparency, institutionalized barriers, and the absence of credit histories, income and employment histories, collateral, and savings in lower-income communities.<sup>125</sup> Too often, conventional financial tools are not well-structured for food system solutions. There is a need for gap financing for farmers and food-related businesses that differs from the offerings currently provided by traditional banks and financial institutions. Investment from foundations, banks, community investment funds, crowdfunding, venture capital (VC) funds, donor-advised funds (DAFs), and community development financial institutions (CDFIs) could overcome the current risk aversion and lack of flexibility that has resulted in less capital going toward investment that could result in greater impact. Blended finance, concessionary financing, and catalytic capital could help advance more pilot projects.



## Suggestions for Action


Better identification of investors, funds, financing mechanisms, and projects that are raising capital could improve understanding of the variety of capital and investable projects available. Engagement of local community partners and leaders within specific food-system value-chain areas could help identify specific needs. Access to capital could be improved with better information about capital needs, to determine whether a project is seeking financing, what kind of capital is needed, if there's an early-stage business development gap, and if there is a need for traditional project finance or venture capital, as well as to assess lending practices, and geographic and value chain-based priorities for funding.



## Conclusion

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Research indicated numerous opportunities for private-sector investment and engagement that could strengthen the food system and alleviate food insecurity in underserved communities across NYS. Through the development of proprietary solutions, investment in the food supply chain, innovation throughout the food value chain, and new financing models, the private sector can play a unique role, in alignment with government, nonprofit, and community-based efforts—helping to address food insecurity across NYS in the areas of supply chain infrastructure, healthy food in retail environments, food as medicine, food finance, controlled environment agriculture, and food and nutrition assistance programs.

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