



Growing Together

Ensuring healthy food, viable farms, and
a prosperous Buffalo Niagara

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About Growing Together

Growing Together is the technical report informing the sustainable food access and justice element of One Region Forward, a regional sustainability plan for Erie and Niagara Counties of western New York State. Funded by the United States Department of Housing and Urban Development (HUD), the development of the region's Sustainable Communities Regional Planning Grant is led by the Greater Buffalo Niagara Regional Transportation Council and managed by the University at Buffalo Regional Institute (UBRI) under the leadership of Professor Robert Shibley. Growing Together was made possible through this grant to Professor Robert Shibley (PI). Additional support was provided through grant #1105024-1-62098 from the National Institute of Food and Agriculture (NIFA) of the United States Department of Agriculture.

Growing Together was prepared by the University at Buffalo Food Systems Planning and Healthy Communities Lab under the guidance of Dr. Samina Raja. Jessica Hall coordinated and managed the production of the report. Its content was developed in collaboration with UBRI and was informed by deliberations of the Food Access and Justice Working Group members of One Region Forward between April 2013 and February 2014.

Recommended Citation

Raja, Samina, Jessica Hall, Travis Norton, Patrick Gooch, Subhashni Raj, Taylor Hawes, and Jennifer Whittaker. 2014. *Growing Together: Ensuring healthy food, strong farms, and a prosperous Buffalo Niagara*. Food Systems Planning and Healthy Communities Lab and University at Buffalo Regional Institute/Urban Design Project, University at Buffalo.

Acknowledgements

Numerous individuals and organizations including those listed below contributed generously to this report with their ideas and time. The authors are grateful to the members and coordinator of the Buffalo-Erie Food Policy Council for their review of this report.

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Massachusetts Avenue Project, Growing Green Youth

The United States Department of Agriculture

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EXECUTIVE SUMMARY

Food is a celebrated part of the Buffalo Niagara region's history, economy, culture, and, indeed, its identity

As early as the mid-1800s our region was a powerhouse in the US food economy. The presence of steam-powered grain elevators on Erie Canal allowed grain to be stored and transported across the Eastern Seaboard with unprecedented efficiency. By early 1900s grain passed through Buffalo at a rate that would be sufficient to bake bread to feed today's Americans for about two years. Today, food remains prominent in our city and region. From fresh fruits and vegetables grown in our region to culinary treats as diverse as Buffalo wings and Burmese food, our region offers much to its residents. However, the soil-to-soil system that enables this food to travel from farm to plate faces numerous challenges. Farmers in our region struggle to make farming an economically viable enterprise. Land development pressures and extreme weather events add additional constraints. The region's consumers, too, are faring poorly as many lack access to healthful, affordable, and culturally acceptable foods. Our region is addressing these challenges head on. Our farmers, residents, not-for-profit community, faith-based groups, cooperative extension, anti-hunger advocates, business owners, chefs, and many others are working extraordinarily hard to rebuild the region's food system. Community supported agriculture, farmers' markets, community gardens, urban agriculture, wholesale food hubs, mobile food trucks, and numerous other innovations are emerging rapidly. The region must make a collective effort to support these extraordinary efforts and chart a course that replicates and sustains these innovations in

the food system. Our region's policy makers, too, must recognize the critical role they play in supporting these community champions in their efforts through supportive policy and public investments.

Drawing on the ideas generated by participants of the Food Access and Justice Working Group in the *One Region Forward* regional planning process as well as data collected and analyzed by researchers, Growing Together charts a course for promoting agricultural viability and improving food access in the two counties of the Buffalo Niagara region. The report echoes community aspirations that residents have access to healthful, affordable and culturally acceptable foods; that sustainable farming remain viable in our region; and that there be stronger connections between the region's farmers and residents. Part of a larger regional plan to move our region toward a more sustainable future, this technical report offers a deep dive into the region's food system and highlights 38 ideas that our region's food system stakeholders – including residents, not-for-profits, businesses, and local governments – can adapt, modify, and utilize to grow their own communities' food systems.

The Growing Together technical report contains eight sections, not including the appendices. Following the introduction, Section 2 of the report describes the setting and natural environment that is the very foundation of our region's food system. Buffalo Niagara is blessed with fertile, farmable soil. However, more farmland is used for houses than for food production, and the amount of land in farming continues to decline as sprawling development continues to consume land. More than one hundred miles of Buffalo Niagara's perimeter is bordered by the Great Lakes, bodies of freshwater that enable our region to grow food. The region's farms consume only minute amounts of the region's

measured water resources: only 0.23 percent of all water withdrawn in Buffalo Niagara is used on farms. Nonetheless, our water resources face threats as well. First, the region's water delivery systems waste water: about one-third of treated water leaks from pipes before it reaches the tap. Second, although most of Buffalo Niagara's water quality is good, parts of the Great Lakes and local waterways have contaminated sediment and are so polluted that the government recommends that people limit or avoid eating fish caught in them. Influenced by the presence of the Great Lakes, our region's micro-climate is favorable for particular crops. The climate is changing, however, and has already produced higher average temperatures than experienced in previous decades. Temperatures are expected to continue to rise, and longer periods of drought, as well as infrequent but heavy rains, will become more common. These changes will ripple through the region's agricultural system, creating challenges in lucrative sectors including dairy, apples, and grapes, but may also provide opportunities for farmers to raise other foods.

Section 3 reports the demographic trends and socio-economic conditions that drive demand for food as well as constrain access to food among residents in the region. The bi-county region is home to 1.1 million people, 81 percent of whom live in Erie County. Although the population in the region has been declining, recent trends suggest that this decline is slowing down. Nonetheless, the population continues to face several constraints. A significant proportion of the region's households live in poverty. One-third of households live on \$35,000 or less per year. Poverty is concentrated among women and children. Only three percent of the population receives assistance through the federal Temporary

Assistance for Needy Families (TANF) program. In short, many in our region face significant economic constraints.

In large part due to economic constraints, many of our region's households struggle to obtain and eat food that is affordable and nutritious. Part B of Section 3 describes these food-related constraints experienced by residents. Approximately three-quarters of Buffalo Niagara adults do not consume the recommended servings of fruits and vegetables. Diet-related diseases are more common in the region than across the state: sixty-three percent of adults are overweight or obese and eleven percent of the population has diabetes. Some public assistance is available to those who struggle to meet their daily food and nutrition needs. Twelve percent of households participate in the federal Supplemental Nutrition Assistance Program (SNAP) to supplement their food budgets. Forty-one percent of the region's school children participate in the free or reduced-cost school lunch program. Many eligible low income and food-insecure households, however, do not receive any public assistance for food in part because the requirements of such programs are onerous and some people are unaware of their eligibility.

Although our region's residents face significant economic challenges in procuring food, our region's food system has the potential to improve economic conditions for residents by being a driver for regional economic development. Section 4 of the report outlines the role of the food system in the economy of Erie and Niagara Counties. The region's food system currently comprises 10.6 percent of Buffalo Niagara's total GDP and generates \$4.16 billion annually. Compared to the nation and the state, particular food industries in our metro area are economic powerhouses: Buffalo Niagara specializes in dairy manufacturing, specialty food processing, and fruit and vegetable preserving. The region also has higher rates of employment in convenience and corner stores than does New York State or the U.S as a whole. Despite its potential to be an economic powerhouse, the region's food system is fractured. Different sectors of the food system – production, processing, aggregation, distribution, wholesale, and retail – are not interlinked to maximize economic returns to the region and its residents.

Section 5 delves into the workings of key sectors of the food system to identify opportunities for strengthening and growing our region's food system. Part A of Section 5 describes the workings of the region's agriculture and food-production sector. The region's farmers produce a range of products not all of which are for human consumption. Soybeans and sweet corn top the list of vegetables produced, and apples and grapes are the most common fruits. The most abundantly harvested crop is hay for animal feed. The challenges faced by the agricultural sector are many. The agricultural workforce is aging. More than half of farmers are older than fifty-five, and few new and young farmers are joining the agricultural workforce. Nearly half of all our farmers work a second job that is off-farm suggesting that farming is not a viable occupation. Farmers report that labor costs, labor regulations, and entry into new markets are the biggest challenges they face. These and other farm business challenges have tangible consequences: more farms experience net financial loss than net financial gain.

Food processors, wholesalers, and aggregators link farms with the region's food retailers. Part B of Section 5 details the landscape of food processing, aggregation, and wholesale in Erie and Niagara Counties. The region is home to 252 food processors employing 6,010 people and earning approximately \$1.8 billion in annual sales. Compared to processors throughout the nation and the state, the region's processing sector specializes in animal slaughtering and dairy manufacturing, which comprise over fifty percent of the sector's sales. Among the region's 159 food wholesalers, large-scale wholesalers dominate the market. Small- and medium-sized wholesalers that are most likely to purchase supplies from local farms are more prevalent, yet they are able to capture only a small share of wholesale sales in the region.

Food reaches the end consumer – residents and institutional buyers – through a variety of vendors that include retail establishments (e.g., supermarkets and farmers' markets), service establishments (e.g., restaurants and cafeterias), emergency food providers (e.g., food banks and other charitable organizations), and large institutions (e.g., school lunch programs and hospital meal programs). Part C of Section 5 describes this distribution system. The region's retail sector, of

1,984 stores with over 31,000 employees and nearly \$7 billion in sales, play major roles in determining the types of foods that people can access. Supermarkets (n=67) and grocery stores (n=337), which sell more fresh fruits and vegetables and a greater variety of healthy food choices, are less prevalent than convenience stores (n=928), which tend to sell less healthy food at higher prices. Communities in other parts of the country have found that barriers hindering corner and convenience stores from selling fresh foods can be surmounted with public policy, education and marketing initiatives (as described in Section 7). Consumers also obtain food from service establishments such as restaurants and cafeterias that sell prepared foods. Buffalo Niagara is served by nearly three thousand restaurants, of which 22 percent are chain restaurants. Many of the locally-owned restaurants are doing their part to strengthen the local food system by procuring produce directly from the region's farmers.

Food also gets sold directly by growers to consumers in the region. The region is home to nine community supported agriculture (CSA) operations through which farmers sell shares of their produce directly to their members at the beginning of the growing season. The region is also served by twenty-five farmers' markets where farmers vend directly to buyers at the market. However, only five farmers' markets accept WIC and only eight accept SNAP, leaving low income people with fewer options to buy fresh, local produce. Overall, interest in such direct farm-to-consumer operations is growing and offers a tremendous opportunity for connecting local growers with underserved consumers.

Large institutions such as universities and colleges, school districts, hospitals, senior living facilities, and correctional facilities, too, play a large role in procuring and distributing food. Public schools and universities feed 163,000 public school students and 89,000 college students. Correctional facilities feed 6,000 inmates each year. Just these three institutions feed a total of 258,000 people, which is equal to nearly one-quarter of the region's population. There is a significant opportunity in harnessing the collective purchasing capacity of these large institutions to procure and provide healthy and local foods in our region. Although the data on the collective demand of large public and private institutions for food are limited, it is clear that a coordinated effort to increase the share

of locally grown and healthy foods by large institutions presents a win-win opportunity for our region's farmers and residents.

Finally, those residents who experience hunger in our region are served by a network of emergency food providers such as food banks and pantries. Alone, the Food Bank of Western New York provided food to 36,207 people in 2011. These emergency food providers are an essential safety net in our region. However, they have limited capacity to deal with chronic food insecurity. It is imperative that our region collectively address factors – such as poverty – that lead to hunger in the first place.

Each sector of our region's food system has multiple assets (described in Section 5). However, because the system as a whole has not received attention and investment, many economic opportunities are lost and challenges within each sector are exacerbated. Section 6 analyzes the three key challenges that must be addressed systemically if our region is to maximize the opportunities afforded by the food system: 1) disparities residents face in accessing healthful foods in the region, 2) the degree to which our region can feed its population healthy foods, and 3) the possibilities and constraints for identifying and protecting farmland from development in the future. The disparities in residents' access to food, described in Part A of Section 6, are a result of both economic deprivation (see Section 2) and limited physical access (see Section 5). Twelve percent of the region's households do not own vehicles and live in neighborhoods that are not served by supermarkets, making it difficult for them to physically access affordable, healthy food. Part B of Section 6 assessed the degree to which our region's farms can sustain healthy eating by residents. Results suggest that if the region's residents purchased only locally-grown food and ate the recommended servings of fruits and vegetables, just 38 percent of the population's demand for fruits and vegetable could currently be met by what local farmers grow. This suggests an opportunity for local farmers to increase production of fruit and vegetables to meet the local demand, and for educators and advocates to increase consumer education about the importance of buying healthy and local food. Finally, it is not possible to increase and sustain the region's self-reliance in healthy foods without availability of

good quality farmland. Part C of Section 6 analyzes the degree to which such land exists in our bi-county region. The analysis shows that unused land that is suitable for farming exists in the region but not in the quantities needed for the region to be self-reliant in fruits and vegetables. In fact, the 22,505 unused acres suitable for farming constitute only one-third of the acreage necessary for Buffalo Niagara to be self-reliant in produce. To ensure a sustainable future, our region must protect its prime farmlands.

Our region is not alone in experiencing the twin challenges of food inaccessibility and limited agricultural viability. Many communities in the United States share these challenges. Fortunately, many communities have also begun to address these challenges. Communities are establishing healthy corner stores, revising food-procurement ordinances, and creating food hubs, to name a few. Section 7 draws on these model practices from across the country to bring fresh ideas to our region. In working towards a more sustainable and just food system, Buffalo Niagara can learn from the successes and challenges other communities have experienced.

In the concluding Section 8, Growing Together provides 38 ideas for strengthening the region's food system. The ideas have three broad themes: to improve consumer food access, to strengthen farm viability, and to connect underserved consumers with local growers. The ideas comprise of suggestions focused on policy change (e.g., instituting long-term leases for community gardens), creation of programming support (e.g., workforce development in the food system), and development of physical infrastructure (e.g., rainwater capture methods on farms) in support of the food system. Some of the ideas can be implemented by civic actors such as not-for-profit groups while others can be implemented by the private sector. Many ideas focusing on public policy reform require action by local, state and federal levels of government (Appendix C describes selected current policies at the state, county, local government level that communities may wish to review prior to considering these ideas.). Section 8 also identifies potential actors and potential timelines for implementation of these ideas. None of the ideas, however, can come to fruition without our region moving forward to monitor food system indicators to gauge our region's progress over time. Regional sustainability indicators, including those focusing on the food system, are available in the overarching regional sustainability plan for Buffalo Niagara: A New Way to Plan for Buffalo Niagara.

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1.

INTRODUCTION

The Buffalo Niagara food system is a complex network of people, places, and policies that enables the production, distribution, marketing, purchasing, consumption, and disposal of food. *Growing Together* is a plan for making this food system more sustainable and just. It seeks to ensure that all people have access to healthful, affordable, and culturally appropriate foods and that they have sovereignty over the workings of their food system. *Growing Together* also envisions a regional food system in which food production remains an economically viable pursuit with minimal harmful impacts on natural resources.

The Buffalo Niagara food system offers many opportunities for promoting a sustainable region. The region's food system has great assets, including ample fresh water,¹ strong farm cooperatives,² a unique climate for producing tree fruit,³ and a specialization in dairy production and processing.⁴ Urban growing is burgeoning in Erie and Niagara Counties, with urban farms and community gardens becoming prized assets in many neighborhoods.⁵ The Food Policy Council of Buffalo and Erie County is entering its first full year, and new board members were welcomed by a packed house during the second annual Buffalo Food Policy Summit's Public Forum in October 2013. Moreover, May 2013 saw the formation of Healthy Food Healthy People, a Niagara County coalition seeking to address challenges

in the county's food system through policy change.

To make the most of its assets, the region must address the many challenges that its food system currently faces. For example, half of the region's farmers are engaged in farming as a second job, local farm labor is hard to find,⁶ and more high-quality soil is used for housing than for farming.⁷ The most prevalent food-retail stores in neighborhoods are convenience stores, which often have fewer healthy food options and higher prices, while many farmers' markets do not accept food-assistance benefits as payment,⁸ and about three-quarters of adults do not eat enough fruits or vegetables.⁹ Moreover, one in twelve households do not own a car,¹⁰ and many people with limited car ownership live in homes that are not located within walking distance of a supermarket.¹¹

These problems represent only a small fraction of the issues that Buffalo Niagara faces in its food system. The reason for mitigating these, however, extends beyond ensuring that residents eat healthy food and that farming will continue to take place; the food system is unjust. Small- to medium-sized farmers as well as residents are faring poorly within the food system. Moreover, access to and consumption of healthy foods depend on where one lives and the amount on personal income. The environmental unsustainability

of the current food system is another cause for concern. Many agricultural practices and food choices—such as those that pollute fresh water, fail to capture methane, or magnify the demand for meat—are unsustainable and detrimental to future generations' abilities to live on this earth. Failure to respond to these challenges in a comprehensive and timely fashion will result not only in lost opportunities but in damage to the viability of the region's agricultural sector, to its public health and residents' access to healthy food, and to the region's natural resources.

Growing Together identifies the region's assets and challenges in food production, food access, and the connections between them. Around

How to read *Growing Together*

For quick insight into key findings, browse the "In brief" call-out boxes at the beginning of the sections. The page number associated with each finding is listed. In addition to the "In brief" call-out boxes, sidebars provide more detail about topics touched on in the report's core text. Lastly, find two short reports ("Farmer Interview Report" on page 66 and "Youth audit of food stores in Buffalo Niagara" on page 70) within **Growing Together** that give farmers' perspectives on challenges and opportunities in food production and youths' assessments of Buffalo Niagara food retail.

1 Chapter 2

2 Chapter 5

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9 Chapter 3

10 Chapter 3

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the nation, communities engaging in similar processes have developed and deployed new policies, practices, and programs to improve food access and justice. Growing Together contains a selection of innovations from other communities that address problems similar to those experienced by Buffalo Niagara residents.¹² Concepts presented in the *Model Policies and Practices* chapter form the basis of several innovations in the chapter *Ideas for the Future*. Many other ideas discussed for implementation in the region derive from an assessment of strengths and opportunities within the region's food system as well as from deliberations of One Region Forward's Food Access and Justice Working Group members.

Growing Together's thirty-eight proposals in the section *Ideas for the Future* recommend policies and programs that will make agriculture and food production an economically viable and sustainable occupation; that will make nutritious, affordable, and culturally acceptable food more equitably available to residents; and that will strengthen the relationships between Buffalo Niagara's food producers and the region's population.¹³ The responsibility for improving the region's food system and ensuring its viability for future generations rests with Buffalo Niagara itself—its people, its businesses, and its government.

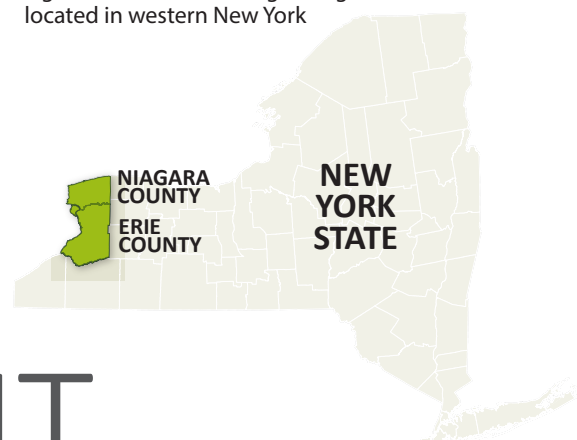
¹² Chapter 7

¹³ Chapter 8

2.

SETTING AND NATURAL ENVIRONMENT

Figure 1. The Buffalo Niagara region, located in western New York



Erie and Niagara Counties are home to historic cities, quiet suburbs, and rolling countryside, with much of the region a short distance from the shorelines of two sparkling Great Lakes, Erie and Ontario (Figure 1). This landscape encompasses 2,383 square miles (1,524,880 acres). With roughly 110 miles of shoreline along the Great Lakes and the Niagara River, much of the counties' perimeter is water.^{1,2}

A. Soil resources

The region sits atop high-quality, farmable soils. In fact, approximately 79 percent, or 786,000 acres, of the region's land area has farmable soil. Farmable and non-farmable soils, which vary in quality, are shown in Figure 2.³ Land with farmable soils is used in many ways, including for farming, homes, and commercial development. The region's most agriculturally productive soil is designated prime farmland.

Residential development comprises the largest share of the land uses on the region's 196,739 acres of prime farmland (Table 1). In fact, homes take up more prime farmland area than agriculture does: thirty-five percent of prime

farmland sits under homes, while only 28 percent is actively farmed. Around 15 percent—30,219 acres—of land with prime farmland soil sits vacant (Table 1).

Today, 214,097 acres of land of all types of farm-quality soil—not only prime farmland soil—have been developed. In red, Figure 3 displays land on all types of farmable soils that has already been developed for non-agricultural uses.

For the remaining land to be ready for farming, approximately 33 percent, or 333,000 acres, of land on farmable soils would need major modifications, such as drainage or rock removal

IN BRIEF

PG 14

Approximately 79 percent of the counties' land area has farmable soil.

PG 14

Thirty-five percent of prime farmland sits under homes, while only 28 percent is actively farmed.

Table 1. Uses on land with prime farmland soil

Land	Area (acres)	Percentage of land
Total Land in Buffalo Niagara (not under water)	992,987	100
Land with Farmable Soils	786,000	79
Developed Farmable Soils	214,097	27% of land with farmable soils
Land with Prime Farmland Soils	196,739	100
Residential	69,712	35
Agriculture	54,921	28
Vacant	30,219	15
Commercial	5,811	3
Wild, Forested, Conservation Lands and Public Parks	3,740	2

¹ "Niagara Falls Geology Facts & figures," Niagara Parks, accessed July 22, 2013, <http://www.niagaraparks.com/media/geology-facts-figures.html>.

² "History," Erie County Sheriff's Office, accessed October 29, 2013, <http://www2.erie.gov/sheriff/index.php?q=history>.

³ Staff, Soil Survey, "Web Soil Survey," Natural Resources Conservation Service, United States Department of Agriculture, 2013.

IN BRIEF

PG 15

Ninety-nine percent of the water the region uses comes from the Great Lakes.

PG 21

Generally, Buffalo Niagara's water quality is good, but eating fish from some large urban water bodies—a common practice among refugees—is dangerous to peoples' health.

(Figure 4). Preparing these lands for agriculture could enable greater local food production but may also impact ecosystems that thrive in wet soils.

B. Water resources

In a sustainable food system, water must be present for agricultural uses and must be of acceptable quality. Like the climate, water resources drive the basic ability to farm.

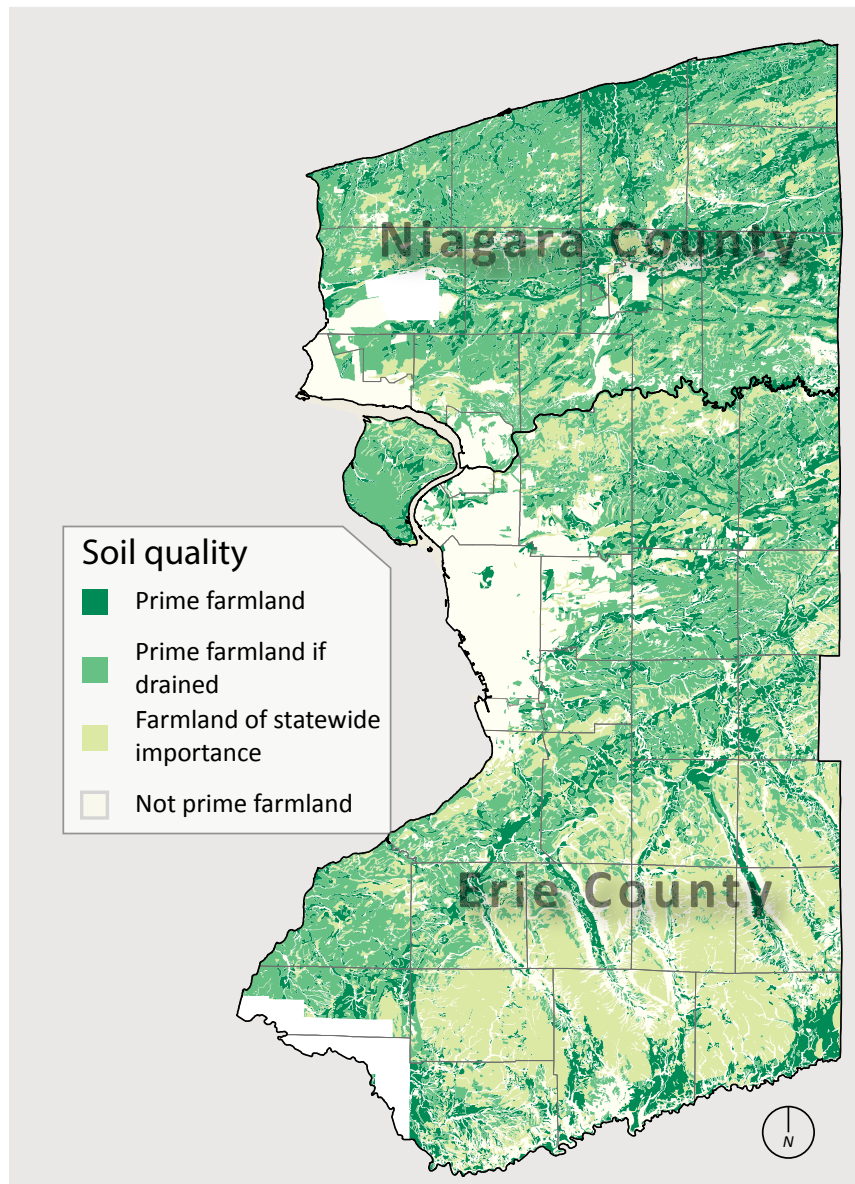
Erie and Niagara Counties—located adjacent to Lakes Erie and Ontario and home to numerous tributaries—depend on the Great Lakes for water. The Great Lakes watershed drains 94,250 square miles throughout eight U.S. states and Canada.⁴ Together, the Great Lakes make up nearly one-quarter of the earth's freshwater resources. Niagara County lies within the western Lake Ontario basin, while Erie County is located within the Lake Erie-Niagara River watershed. The two counties cover twenty major watersheds, and more than thirty-six major streams and tributaries pass through them.⁵ The headwaters of most Erie County watersheds are in the Allegheny Plateau,⁶ which stretches from central New York southwest to West Virginia.

⁴ "Great lakes fact sheet," New York State Environmental Protection Agency, 2012, accessed December 10, 2013, <http://www.epa.gov/greatlakes/factsheet.html>.

⁵ "Erie County Water Quality Strategy," Erie County Water Quality Committee, January 2011, accessed October 29, 2013, <http://www.ecswcd.org/docs/2011%20Water%20Quality%20Strategy.pdf>.

⁶ "Erie County Water Quality Strategy," Erie County Water Quality Committee.

Figure 2. Farmable soils in Erie and Niagara County



Source: NRCS, 2013. Note: White areas have no available data. For definitions of farm soil types, see Appendix A.

Nearly all Buffalo Niagara water withdrawals,⁷ which top 1.09 billion gallons per day (equal to the water in 1,529 Olympic-sized swimming pools), are sourced from the Lakes (Table 4).^{8,9}

⁷ Water withdrawal is the "water removed from the ground or diverted from surface water for use." Joan F. Kenny et al., "Estimated use of water in the United States in 2005: U.S. Geological Survey Circular 1344," USGS, 2009, accessed October 10, 2013, <http://pubs.usgs.gov/circ/1344/>

⁸ Kenny, Joan F. et al., "Estimated use of water."

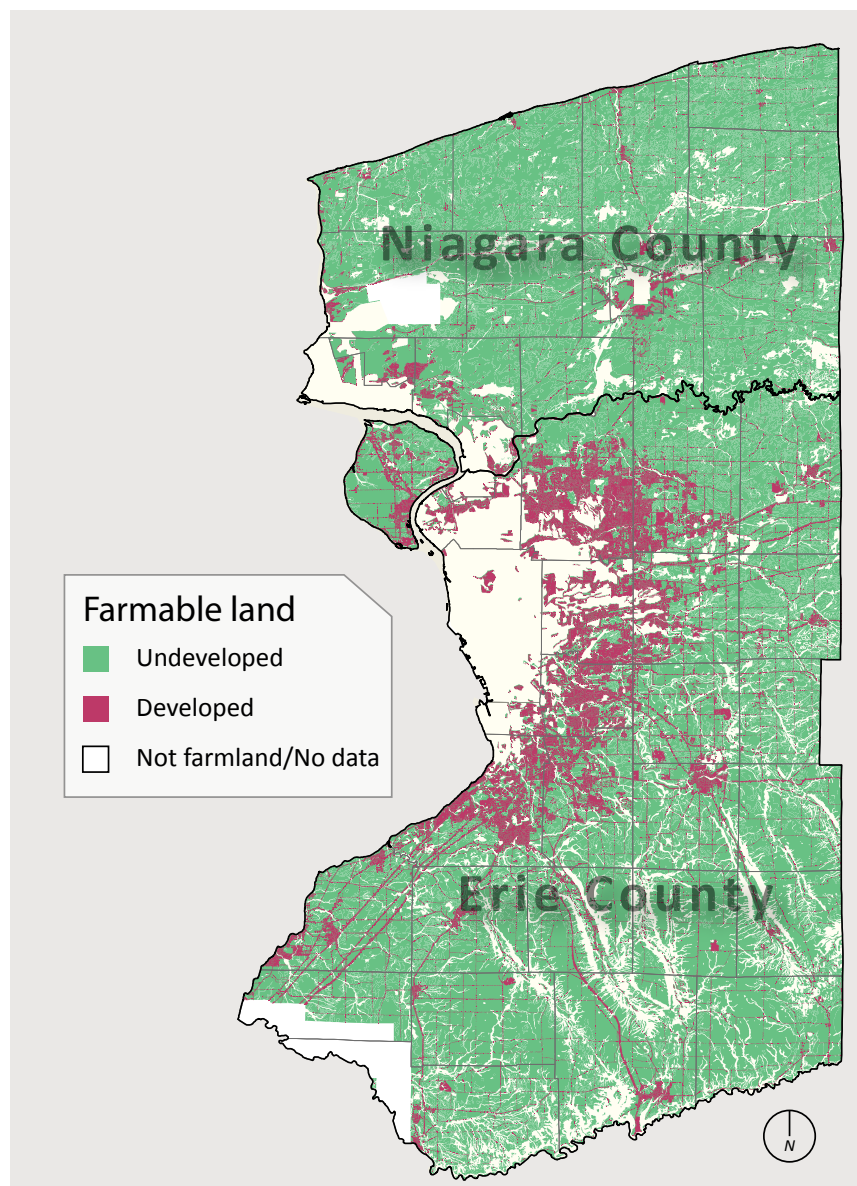
⁹ US Geological Survey data estimate water use by using the estimated water usage data provided by the states. States provide estimates for many categories of water usage, including public supply, domestic, irrigation, livestock, aqua-

As Table 4 shows, 99 percent of all water withdrawn for use in the region is surface water obtained from the Great Lakes and their tributaries. The remaining 1 percent is groundwater pumped from public and private wells.

Water is withdrawn by public agencies and by residents. Power generation constitutes the largest share (75.8

culture, industrial, mining, and thermoelectric power. States estimate both fresh and saline (no saline water is withdrawn in Buffalo Niagara) water withdrawals as well as public and self-supplied water, in an attempt to quantify all types of water usage.

Figure 3. Farmable land developed for non-farming use



Source: NRCS, 2013; "Cropland Data Layer," USDA National Agricultural Statistics Service, 2012. Note: White areas indicate no available data.

percent) of water withdrawal in the region due to the presence of the New York Power Authority, a state agency responsible for generating hydroelectric power. However, much of this water is returned to the watershed after it is used to generate electricity. Water withdrawals for domestic, commercial, and industrial uses by public providers comprise the next largest share (20.3 percent) of the region's water demand. Water used for irrigation (which includes golf courses and agriculture) by both public agencies and individuals who self-supply water accounts for less than 1 percent of all water withdrawals (Table 5).¹⁰

The Buffalo Niagara population receives water from both surface and groundwater sources. Much of rural southern Erie County uses well water, which is pumped from the ground. Residents of the central and northern parts of Erie County and the population of Niagara County, however, consume water supplied by a variety of county and municipal water authorities that obtain water from Lake Erie, the Niagara River, and the ground.

Erie County's largest water provider is the Erie County Water Authority (ECWA), which delivers approximately 67.33 million gallons of water per day to more than half a million consumers in thirty-five municipalities. An ECWA intake in Lake Erie in the Town of Evans supplies water to the southern areas of the ECWA water system, while a Niagara River intake in Tonawanda supplies water to the northern portion of the ECWA's service area and to parts of Genesee and Wyoming Counties.

The Niagara County Water Department serves most of Niagara County, but three Niagara County municipalities have their own water services: the cities of Niagara Falls, North Tonawanda, and Lockport.¹¹

¹⁰ It is possible that USGS data underestimate agricultural water usage, which includes water used for livestock, aquaculture, and irrigation. USGS estimates for agricultural water usage do not include water used by food producers that is delivered through the public water supply. Some Buffalo Niagara farmers irrigate crops using water directly from the public supply. Farmers are incentivized to use publicly supplied water because of the low water costs for customers withdrawing at high rates as well as the need to adhere to market-led growing practices that demand that drinking-quality water be used for washing produce.

¹¹ Unlike Erie County, the NCWD does not directly supply to residential or commercial users; instead, it supplies bulk water to the municipalities that fall in the counties discussed above, and the municipi-

Table 4. Daily water withdrawals, 2005

	Erie		Niagara		Region	
	(mg/d*)	% of total water withdrawals	(mg/d*)	% of total water withdrawals	(mg/d*)	% of total water withdrawals
Surface	795.02	99.08	288.64	99.00	1,083.66	9.90
Ground	7.36	0.92	2.33	0.80	9.69	0.89
Total	802.38	100.00	290.00	100.00	1,093.35	100.00

IN BRIEF

PG 18 The Great Lakes heavily shape the region's climate.

PG 18 Temperatures in the region are rising.

PG 19 The region will experience more drought and more infrequent, heavy rain.

PG 19 Changing climate and weather patterns will impact local agriculture.

The region obtains water from area lakes and rivers, but it is used inefficiently. In fact, large shares of publicly treated water never make it to customers. Approximately one-third of all water sent to Erie and Niagara County public water consumers is lost in leaks, used for fire-fighting, or used to flush the water mains. At a minimum, these losses total 42.5 million gallons of water per day, which equals the volume of sixty four Olympic-sized pools. Figure 6 shows the share of water lost before delivery to customers, by water departments in the two counties.¹² Although this water is eventually returned to the region's watershed, inefficiencies in the delivery of water represent an economic

palities then supply water to customers. In all three counties, service connections are maintained and operated by the municipality. Additionally, water usage on two Native American reservations in Niagara County is not included due to the lack of data.

12 Multiple sources: (1) "Annual Water Quality Report," Buffalo Water Authority, 2011, <http://www.buffalowaterauthority.com/Quality/WaterQualityReports/20112012WaterQualityReport>. (2) "Annual Drinking Water Quality Report," City of Lockport Department of Public Utilities—Division of Water, 2011, http://www.gigov.com/news_info/waterquality-09.pdf. (3) "Annual Drinking Water Quality Report," City of Lockport Department of Public Utilities—Division of Water, 2011. (4) "Annual Drinking Water Quality Report for 2008," Town of Grand Island, 2008, http://www.gigov.com/news_info/waterquality-09.pdf. (5) "Annual Drinking Water Quality Report for 2011," Niagara County Water District, 2011. (6) "Annual Drinking Water Quality Report for 2011," Niagara Falls Water Board, 2011, http://www.nfwb.org/pdf/CCR/2011_CCR.pdf. (7) "Annual Drinking Water Quality Report for 2011," Town of Tonawanda Water System, 2011, <http://www.tonawanda.ny.us/ArchiveCenter/ViewFile/Item/213>. (8) "2011 Water Quality Report," Erie County Water Authority, 2011, http://www.ecwa.org/pdf/AnnualWaterQualityReport/110_2011%20Annual%20Water%20Quality%20Report.pdf.

loss for the region's taxpayers. North Tonawanda and the City of Lockport lose approximately as much water as they deliver, while the City of Niagara Falls loses about two times more water than it delivers. Conversely, only 2 percent of the Niagara County Water Department's (NCWD) water is lost. Assuming that water for flushing mains and fire-fighting comprise similar shares of each district's water use, leaky water systems may be causing the differences in water delivery between the NCWD and the three municipal governments that supply water to their residents.

In the near future, multiple forces will accelerate the demand for water from Lakes Erie and Ontario and will make it costlier. Climate change will cause a greater agricultural water demand, and other U.S. communities facing water shortages with growing populations will pipe lake water away. Faced with a growing demand for the Great Lakes' freshwater, our water systems may soon become environmentally and economically unsustainable.

Water quality and safety

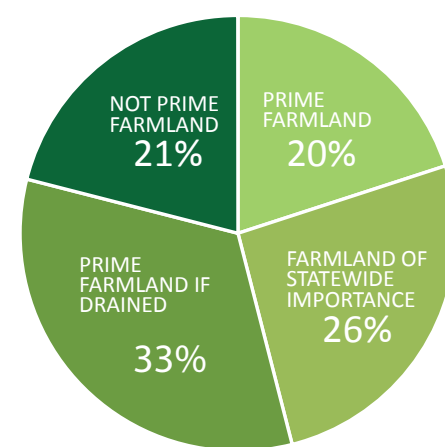
Surface and groundwater quality in the region is undermined by pollution from multiple sources. Some pollutants are generated at one location—also called a point source—while others are generated by a source that impacts

a larger area, also called a non-point source. Industry, agriculture, and sewers are point sources of pollution, while pollution in the air and in water bodies are non-point sources.

Pollutants and germs can reach the human body through water used in the food system. Consequently, water-quality monitoring and standards for water quality are critical to public health. Food contamination can occur in multiple ways. Some pesticides and industrial pollutants bioaccumulate¹³ inside

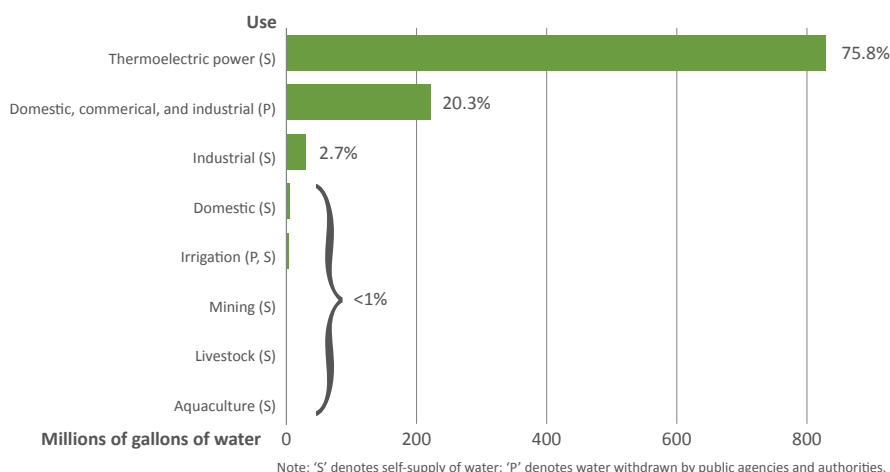
13 Bioaccumulation is the process by which plants animals absorb

Figure 4. Farmable soils, by share of land area



Source: NRCS, 2013. For definitions of farm soil types, see Appendix A.

Figure 5. Daily Buffalo Niagara water withdrawals, by use and provider



Source: Kenny, Joan F. et al., "Estimated use of water."

plants and animals, creating magnified risks for humans when those foods are consumed.¹⁴ Other pollutants and germs dry on plants after exposure to rainfall and pose a threat upon contact or consumption if they are not washed. Chemical pollutants in the waterways present a health risk to people in contact with the waters and sediments in these waterways. Some pollutants found in the region's waterways include polychlorinated biphenyls (PCBs), heavy metals, Mirex, and Dioxin.¹⁵ PCBs, Mirex, and Dioxin are particularly troubling because they accumulate in the skin, guts, head, belly fat, and lateral lines of fish.¹⁶ Chemically contaminated fish present a health danger to people who eat them, a topic discussed in more detail in "Fish consumption advisories and at-risk populations."

Microbial contamination of water is also a concern. Water can carry pathogenic organisms, including salmonella, *E. coli*, shigella, hepatitis A, and cyclospora,¹⁷ which can contaminate food during growing, harvesting, processing, packing, and holding. Produce and livestock contamination can result in produce recalls and culling of livestock. Moreover, the repercussions from selling contaminated agricultural products hurt farms' reputations and finances. Consequently, vigilance in monitoring water quality for public safety is required.

Surface water quality and safety

In the region, almost all publicly supplied water is withdrawn from surface water sources in the Great Lakes watershed. Water from this watershed is generally of acceptable drinking quality and meets public health standards. In 2011, the Erie County Water Authority (ECWA)—which provides publicly supplied water to parts of Erie County—tested water quality and found that any contaminants found were present in amounts well below public health safety thresholds established by the State of New York.¹⁸ Surface water quality is also acceptable in Niagara County, although

some contaminants have been reported. In 2011, the Niagara County Water District (NCWD) tested fifty-two sites within the water system and found contamination at two sites, where lead was present at levels that violated New York State public health standards.¹⁹

Ground water quality and safety

In both counties, about 1 percent of all water consumed is sourced from the ground (Table 4), which generally holds water of acceptable quality.²⁰ At some well locations in 2006, however, contaminants were detected in the counties' ground water samples in concentrations that exceeded recommended limits set by the United States Environmental Protection Agency and the New York State Department of Health. In addition, several types of bacteria were also detected in concentrations that exceeded federal Maximum Contaminant Levels (MCL).²¹ As shown in Table 3, the constituents that exceeded the recommended levels at some wells were: total coliform, *E. coli*,²² iron, manganese, aluminum, arsenic, lead, and radon 222.²³

C. Climate

Agriculture is vulnerable to changes in weather and climate. The Buffalo Niagara climate influences the region's agriculture in many ways, including its food production, agricultural yields, and resource usage. Hence, understanding current and projected climatic conditions is important for planning a sustainable food system.

Situated adjacent to each other, Erie and Niagara Counties share similar climates. The counties' climates are

strongly influenced by the Great Lakes.²⁴ As shown in Table 3, precipitation varies between the two counties, with less rain and snow falling in Niagara County than in Erie.²⁵ In an average year, Erie County receives 40.44 inches of rainfall, while 34.32 inches fall on Niagara County. In terms of snowfall, Erie County also sees more precipitation: 96.1 inches of snow fall on Erie County, but Niagara County shovels out from just 75.1 inches each year—about 21 inches less than Erie County. Moreover, in Erie County, the average depth of snowfall per season is 1.0 inch, while Niagara sees only 72 percent of that depth—0.8 of an inch.²⁶ Micro-regional differences are caused by lake-effect patterns from Lakes Erie and Ontario as well as by elevation. The highest point in Erie County is 1,940 feet,²⁷ which is nearly three times higher than Niagara County's highest point of 680 feet, at the crest of the Niagara escarpment.²⁸

Unlike precipitation, the temperature ranges across the two counties are similar. Historically, temperatures in Erie and Niagara Counties have ranged from an average low of 25.2°F and 25.5°F (January), respectively, to an average high of 71.3°F and 71.2°F (July), and have averaged 48.5°F and 48.3°F over thirty years (1981–2010).²⁹

Temperatures, however, are rising. In a band across the shoreline of northern Niagara County and in the north eastern quadrant of Erie County, the annual average low extreme temperature³⁰ increased between 1986 and 2005, resulting in those regions entering a warmer plant hardiness range.³¹ In the

chemicals from the environment into their tissue from exposure to a contaminated medium or consumption of contaminated food.

14 Brown, Katie, Sarah Cunningham, and Amber Goguen, "A people's guide to eating fish caught in Western New York," Buffalo Niagara Riverkeeper, 2012.

15 Brown, Katie, Sarah Cunningham, and Amber Goguen, "A people's guide."

16 Ibid.

17 "Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables," Food and Drug Administration, 1998, accessed October 30, 2013, <http://www.fda.gov/downloads/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/UCM169112.pdf>.

18 "2011 Water Quality Report," Erie County Water Authority.

19 "Annual Drinking Water Quality Report for 2012," Niagara County Water District.

20 The United States Geological Service (USGS) monitors groundwater quality. In 2006, the USGS sampled thirty-three wells in western New York to assess regional groundwater quality. The USGS tested for five physical properties and 219 constituents in wells inside Buffalo Niagara and in surrounding counties. The data described in this report are for several western New York Counties—not only Erie and Niagara.

21 "Ground-Water Quality in Western New York," U.S. Geological Survey, 2006, accessed October 30, 2013, <http://pubs.usgs.gov/of/2008/1140/pdf/OFR2008-1140.pdf>.

22 *E. coli* (E.coli) is one type of total coliform. *E. coli* differs from total coliform because *E. coli* is specifically found in fecal matter and does not grow in the environment. Total coliform includes five types of bacteria that are found in human or animal feces as well as in the soil. The presence of *E. coli* (not total coliform) in a water sample definitively connotes contamination by human or animal feces.

23 "Ground-Water Quality," U.S. Geological Survey.

24 Climate data are collected at specific points, which are used as proxies for larger geographical areas. Climate data in this report are from the Buffalo Niagara International Airport and Niagara Falls airport monitoring station, which are used as proxies for the climates of Erie and Niagara Counties, respectively. Data provided are a collection of thirty years of climate data (1981–2010).

25 National Weather Service Forecast Office: Buffalo, NY, "NOWData - NOAA Online Weather Data," accessed October 29, 2013, <http://www.nws.noaa.gov/climate/xmacis.php?wfo=buf>.

26 Ibid.

27 "National Elevation Dataset," U.S. Geological Survey, 2013, <http://ned.usgs.gov/>

28 "Profile of Agriculture in Niagara County, NY," Cornell University Cooperative Extension, accessed July 22, 2013, <http://www.cceeniagaracounty.org/program-areas/agriculture/profile-of-agriculture-in-niagara-county-ny/>.

29 Ibid.

30 An average extreme temperature is the lowest temperature measured per year, then averaged over a thirty-year period. Source: USDA ARS Plant Hardiness Zone Maps.

31 "Plant Hardiness Zone Maps: 1990 and 2012," USDA Agricultural Research Service, accessed October 29, 2013, <http://planthardiness.ars.usda.gov/PHZMWeb/Downloads.aspx>.

Fishing consumption and at-risk populations

Consuming fish with bioaccumulated pollutants in its body tissue can pose numerous health risks. Depending on the pollutant and its concentration, the effects on human health can manifest quite rapidly or over several years.¹ New York State has publicized advisories against consuming fish caught in many water bodies in Buffalo Niagara. Specifically, women under fifty and children under fifteen are advised against eating any fish caught in Lake Ontario and are advised to eat no more than a few meals per month of fish caught in Lake Erie. Men over fifteen and women over fifty can safely eat fish caught in a greater share of Western New York water bodies, but are still advised to limit meals containing locally caught fish to a few per month or none at all.² Many people, however, regularly catch fish to eat from the region's polluted waterways, unaware of their industrial legacy. Members of Buffalo's refugee population commonly eat from the Buffalo and Niagara Rivers, unknowingly exposing themselves and their families to illness-causing pollutants. With limited English-language skills, some refugees do not benefit from the English-language consumption advisories advertised by New York State. Filling this void, community organizations are reaching out to refugees with an info-graphic and multi-language campaign to educate them about safely consuming fish caught in the waterways. Buffalo Niagara Riverkeeper spearheads the initiative, visiting popular fishing spots daily to educate anglers and publishing pocket-sized handbooks in five languages that detail safety information on all potential catches.³

1 Brown, Katie, Sarah Cunningham, and Amber Goguen, "A people's guide."

2 "Western Region Fish Advisories: Advice by Waterbody," New York State Department of Health, revised May 2013, accessed October 30, 2013, http://www.health.ny.gov/environmental/outdoors/fish/health_advisories/regional/western.htm.

3 Kwiatkowski, Jane. "Buffalo Riverkeeper educates immigrant anglers of WNY fish," The Buffalo News, August 4, 2013, <http://www.buffalonews.com/city-region/buffalo-riverkeeper-educates-immigrant-anglers-about-dangers-of-wny-fish-20130804>

Table 2. Contaminants in water wells, 2006

Contaminant	# with contaminant	% with contaminant	# in which maximum contaminant threshold was exceeded	% of wells in which maximum contaminant threshold was exceeded
Radon-222	33	100	24	73
Manganese	29	88	15	45
Iron	29	88	14	42
Total coliform	12	36	12	36
Arsenic	32	97	2	6
E. coliform	2	6	2	6
Aluminum	21	64	1	3
Pesticides	14	42	0	0

Table 3. Precipitation and average temperatures

	Erie	Niagara
Rainfall (in.)	40.4	34.3
Snowfall (in.)	96.1	75.2
Average high temperature (F)	71.2	71.2
Average low temperature (F)	25.2	25.5
Average temperature (F)	48.5	48.3

future, New York State temperatures are projected to rise an additional 1.5°F to 3°F by the 2020s and 3° F to 5.5°F by the 2050s.^{32,33} In the year 2100, the average annual temperature across the state is projected to be at least 58°F (10 degrees warmer than Erie and Niagara's average temperatures between 1980 and today) but could reach 67°F under certain projections. Precipitation patterns will also change. Climate models predict large volume increases in precipitation in winter and spring but predict both more drought and heavy rain in summer and fall. Heavy downpours will become more commonplace when rain falls, while the frequency of rainfall events will decline.³⁴

These changes in temperature and precipitation will force adaptations to current farming practices, including the use of pesticides, water, energy, and the plants grown in the region. Moreover, these changes might drastically alter the economy because several of the foods that the region's farmers produce are among the most sensitive to the changing climate. For example, small dairy farms are at risk because of the high cost of cooling barns that will be necessary; grapes are endangered because premature springs engender buds that are vulnerable to frost; and fall apple yields may be reduced due to summer heat stress.³⁵ Consumers will also bear the brunt of the changing regional climate because it will cause national and international ripple effects on food availability and price.

32 Rosenzweig, Cynthia et. al. "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation (Technical Report)," December 28, 2011, <http://pubs.giss.nasa.gov/abs/ro02210k.html>.

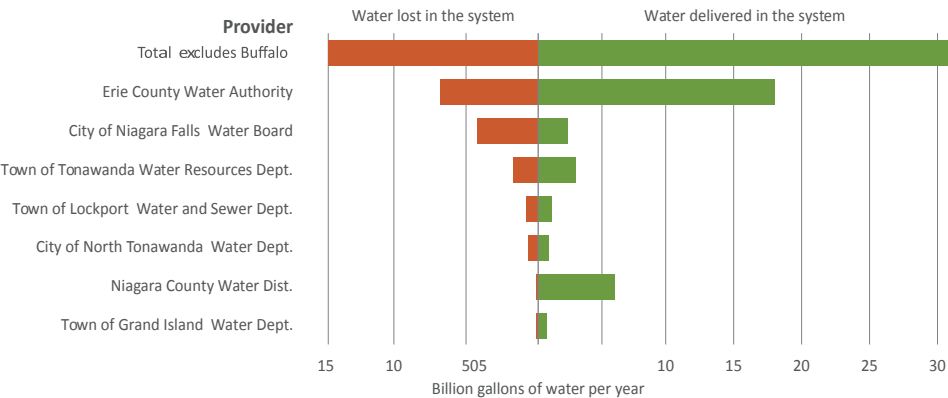
33 The upper estimate reflects estimated temperatures if atmospheric carbon dioxide does not decline from current levels.

34 Rosenzweig, Cynthia et al. "Responding to Climate Change,"

35 Ibid.

Although the food and farming practices with which the region is familiar will change, new weather patterns could bring beneficial opportunities for farms and consumers. While longer growing seasons may pair with uncertain water availability, they could also enable higher yields, the cultivation of different foods requiring a longer period to reach maturity, and the production of multiple types of crops in one season on the same piece of land.

Figure 6. Water production, delivery, and loss in Buffalo Niagara’s public supply



Source: Includes only water authorities with publicly available data.
(1) “Annual Water Quality Report,” Buffalo Water Authority, 2011. (2) “Annual Drinking Water Quality Report,” City of Lockport Department of Public Utilities—Division of Water, 2011. (3) “Annual Drinking Water Quality Report,” City of North Tonawanda Public Water System, 2010. (4) “Annual Drinking Water Quality Report for 2008,” Town of Grand Island, 2008. (5) “Annual Drinking Water Quality Report for 2011,” Niagara County Water District, 2011. (6) “Annual Drinking Water Quality Report for 2011,” Niagara Falls Water Board, 2011. (7) “Annual Drinking Water Quality Report for 2011,” Town of Tonawanda Water System, 2011. (8) “2011 Water Quality Report,” Erie County Water Authority, 2011.

The impact of climate change on local agriculture

Climate change will impact the region's agriculture, as documented by a 2011 New York State Energy Research and Development Authority Report. The report's findings related to agriculture are presented below.

Dairy Industry

Increased temperatures and longer duration of higher temperatures will affect New York's dairy industry substantially. Dairy cows are sensitive to increases in temperature, humidity, and sunlight.¹ Dairy cows suffering from heat stress eat less, produce less milk, have fewer offspring, and are at a greater risk of illness.² Currently, the dairy industry is New York's largest agricultural sector, with a revenue of \$2.2 billion annually.³ Since 1950, milk production per cow has increased by 300 percent.⁴ However, milk production per cow will decline as temperatures and the frequency of summer heat stress increase, unless farmers adapt to the increasing temperatures and stress on their cows. Farmers can make capital investments that increase the cooling capacity of dairy barns in order to reduce heat stress on cows and maintain production levels.⁵ Without these changes, dairy farms may produce less milk even as their herds remain the same size.

Crops

Higher temperatures and fewer freezing days may allow for a longer growing season for crops. However, increased temperatures, heat wave days, and drought will stress crops, especially perennial fruit crops such as apples.⁶ Perennial fruit crops are exposed to and affected by the climate year round; thus they are affected by changes in both summer and winter. This added stress may reduce yield and quality, canceling out much of the benefit of a longer growing season.

New York State produces the second greatest apple yield of any state in the United States,

and apples are the number one fruit crop in the state, bringing in \$233.1 million dollars in revenue.⁷ However, apples that have traditionally thrived in New York State's cool-season, such as Empire and McIntosh, may struggle due to climate change.⁸ Research shows that apple trees will bloom less and produce less fruit when stressed by heat, lack of water, and inadequate winter chill.^{9,10} At the same time, climate change may allow opportunities to grow varieties such as Fuji and Granny Smith, which require a longer growing season. If farmers can adapt to the changing climate and invest in new apple varieties, New York State's apple industry will not disappear. Temperature and precipitation changes will not be the only aspects of climate change that affect apples. They will also be affected—like all crops—by insects, pests, and weeds that once could not survive in New York's climate but may thrive as the region's climate changes.

In general, farmers will need to adapt to new conditions and try new crop varieties to remain economically viable. Adaptation may mean capital investment in equipment and facilities, such as cooling technology for dairy barns, to ensure the economic viability of farming traditional New York State varieties of crops and livestock. Adaptation could also occur through investments in new crops or technology in order to change with the climate, such as growing Fuji or Granny Smith apples rather than Empire or McIntosh apples. In either case, New York farmers and the larger community will need to invest time and money in order to remain economically viable.

1 Rosenzweig, Cynthia et. al. "Responding to Climate Change,"

2 Ibid.

3 "Agriculture by the Numbers: New York Farming is Big Business," New York State Office of the State Comptroller, August 2012, <http://www.osc.state.ny.us/osdc/rpt7-2013.pdf>.

4 Rosenzweig, Cynthia et. al. "Responding to Climate Change,"

5 Ibid.

6 Ibid.

7 Ibid.

8 Ibid.

9 Ibid.

10 Winter chill refers to periods of time in which winter temperatures are below 45°F but above freezing. Apples and many stone fruits require a certain number of hours of winter chill in order to set blossoms and produce fruit.

3.

RESIDENTS' EXPERIENCES: CONDITIONS AND CONSTRAINTS

IN BRIEF

PG 22 The region is home to 1,135,509 people, with 81 percent living in Erie and 19 percent in Niagara.

PG 22 The population declined by 3 percent between 2000 and 2010.

PG 25 The region is aging—the median age increased from thirty-seven to forty between 2000 and 2010.

PG 23 Ethnic diversity is growing: thirteen percent of the population is black, nearly 3 percent is Asian, and nearly 3 percent is American Indian, Hawaiian and Pacific Islander, or an unspecified race.

PG 25 Single-mother households are increasingly common.

PG 27 Thirteen percent of households do not own a vehicle.

Buffalo Niagara is home to a diverse group of people facing an array of challenges in accessing food. In different ways, age, sex, race, ethnicity, and educational background impact people's nutrition and ability to access food. Household income and access to transportation also make a difference. Moreover, the demands for food and food-related services in Buffalo Niagara are changing due to regional demographic shifts, presenting challenges for those working to improve the region's food system.

A. Population

Erie and Niagara Counties are home to approximately 1,135,509 people. Nearly 81 percent (919,040 people) of the population lives in Erie County, and 19 percent (216,469) lives in Niagara County. From 2000 to 2010, the region's population declined by 3 percent—a loss of 34,602 people.¹

Age and sex

Currently, the region's population is relatively equally divided in age groups, although the retirement-age population is the smallest. Children under eighteen comprise approximately 22 percent (245,434 people) of the region's population. Additionally, about a quarter million (249,032, or 22 percent) individuals are between the ages of eighteen and thirty-four; twenty percent (225,504) of people are thirty-five to forty-nine; and 21 percent (236,817) of the population are fifty to sixty-four. Men and women aged sixty five and over (numbering 178,752) constitute roughly 16 percent of the total Buffalo Niagara population.²

¹ SF1, United States Census, 2000 and 2010.

² SF1, United States Census, 2010.

Table 5. Median age in Buffalo Niagara, 2000-2010

Year	Median age
2000	37
2010	40

Source: SF1, United States Census, 2000 and 2010

More women than men live in the region. Collectively, the two counties are home to 547,979 males and 587,530 females, meaning that 7 percent fewer men than women live here. The chasm between the sizes of the male and female population decreases in the sixty-five and over populations, in which the women's population is only 3 percent larger than the men's.³

The region's population is aging. In 2000, the average median age was thirty-seven, but in 2010, the average median age rose to forty (Table 5). Although the number of people sixty-five and over decreased 3 percent since 2010, from 185,142 to 178,752, the share of the overall population that is sixty five and older has not changed in that time.⁴ As older people stop driving, they must find other ways to reach healthy food retailers such as supermarkets, which are not within walking distance of many of the region's homes (Chapter 6). Without family to provide rides to the store or to deliver groceries to their homes, and with few corner and convenience stores offering fresh foods, many elderly residents may face reduced access to healthy food as they age.

³ Ibid.

⁴ Ibid.

Diversity: race, ethnicity, and immigration

People of color, many ethnic groups, and immigrants often live in food environments that chronically ignore their needs. Communities of color in regional cities often live in neighborhoods underserved by healthy food retail, a disturbing disparity that has far-reaching impacts. Recent immigrants and people of many different ethnicities may not be accustomed to cooking and eating the foods that are commonly sold in Buffalo Niagara's stores. Finding culturally acceptable foods can be a difficult task.

While the two counties are both home to an array of ethnic and racial groups, Erie County is more racially diverse than Niagara County. The majority of the population of Erie and Niagara Counties is White (82 percent, or 926,917 people), while the second most populous racial group is Black, totaling 13 percent (150,681 people) of the population (Table 6). Erie County, however, is home to a greater share of Black people (133,049, or 14 percent of its 2010 population) than Niagara County (17,632, or 8 percent of its 2010 population). Following national trends, the entire region has become racially diverse since 2000, when 84 percent of the counties' population was

White and 12 percent was Black.⁵

Diversity is increasing partly because of a large influx of Asian refugees. While in 2000 the Asian population of the Erie and Niagara County region was 15,000, (1 percent of the total population), by 2010 the Asian population had increased to 30,000 (3 percent of the total population). Asian people constitute a greater share of the Erie County population than the Niagara County population; Erie is home to 27,624 Asian people, who comprise 3 percent of the total population, whereas 1 percent (2,407 people) of the Niagara County population is Asian.⁶

Smaller numbers of other ethnic and racial groups also live in the two counties, as shown in Table 6. There are 872 Hawaiian or Pacific Islanders and 17,670 people of unspecified races. Additionally, in 2010, the population of American Indians and Alaskan Natives totaled 13,969, making up just over 1 percent of the population. Native Americans comprise a slightly larger percentage of the population in Niagara County than in Erie County, where they may reside on Native American reservations. The Tuscarora and Tonawanda reservations of Niagara County house 1,635 people,

5 DP-1, United States Census, 2010.

6 Ibid.

which is 0.75 percent of the county's population. While more Native Americans live on the Cattaraugus and Chautauqua reservations (2,484 people) in Erie County, they account for a smaller share of Erie's entire population, or 0.27 percent.

Although minority groups experience food-related challenges, many are taking action to improve food access in their communities (page 24).

Education

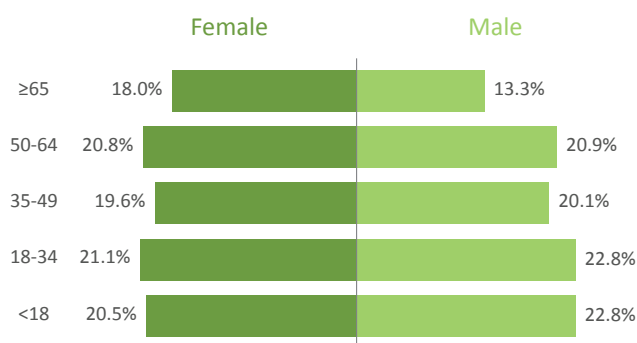
Educational attainment is an important factor in people's food decisions. People with low educational attainment are reported to eat fewer healthy foods, compared to people with higher educational attainment.^{7,8}

As low educational attainment can be accompanied by low income, people with limited education may experience more difficulty affording groceries. Moreover, people with low educational attainment may have less knowledge about nutri-

7 Barker, M. et al., "Women of lower educational attainment have lower food involvement and eat less fruit and vegetables," *Appetite*, 50(2-3) 2008, 464-468. 10.1016/j.appet.2007.10.004.

8 Bingham, C. et al., "Quality of diet and food choices of Finnish young men: a sociodemographic and health behavior approach," *Public Health Nutrition*, 13(6A), 2010. 980-986. doi: 10.1017/S1368898010001187.

Figure 7. Population by sex and age, 2010



Source: SF1, United States Census, 2010.

Table 6. The region's racial and ethnic composition, 2010

Race	Erie	Niagara	Region	% of region's population
White	735,244	191,673	926,917	81.63
Black	133,049	17,632	150,681	13.27
Asian	27,624	2,407	30,031	2.64
Hawaiian and Pacific Islander	714	158	872	0.08
American Indian and Alaskan Native	10,110	3,859	13,969	1.23
Unspecified races	16,158	1,512	17,670	1.56
Total*	919,040	216,469	1,135,509	100.00

Source: DP-1, United States Census, 2010.

Note: *Columns do not sum to correct total population figures, likely due to double counting of multiracial individuals.

tion, leading them to make less healthy-food choices.

Overall, the populations of Erie and Niagara Counties have low educational attainment. Over 88 percent of people twenty-five and older have a high school degree or an equivalent, but only 29 percent of Erie's population and 19 percent of Niagara's population has a higher degree. As detailed in Table 7, higher degrees are more common in Erie than in Niagara County.

Household structure

The region is home to 473,720 households. The majority of households, or 81 percent (383,164), are in Erie County, while 90,556 (19 percent) are in Niagara County. The average household size in

Table 7. Educational attainment, 2010

	Population older than 25					
	Erie		Niagara		Region	
	N	%	N	%	N	%
Less than high school	72,285	11.61	17,236	11.63	89,521	11.61
High school graduate	187,336	30.09	55,430	37.41	242,766	31.50
Some college	115,020	18.47	28,115	18.97	143,135	18.57
Associated degree	66,496	10.68	18,317	12.36	84,813	11.00
Bachelor's degree or higher	181,451	29.14	29,075	19.62	210,526	27.31
Total	622,588	100.00	148,173	100.00	770,761	100.00

Source: American Community Survey – 5-year estimates, United States Census, 2010.

*Denotes population over 25 years old.

Ethnic Foods: An opportunity

Immigrants often experience a different food environment in Buffalo Niagara than they were accustomed to prior to resettling in the region. Many of the tens of thousands of foreign-born people, especially refugees, living in Buffalo Niagara face cultural, spatial, and financial barriers to food access. Local farmers, food retailers, and community organizations can improve food access for immigrants by producing, selling, and helping residents grow foods they know how to prepare, can reach using public transit, and can afford.

In 2010, approximately 67,750 people born outside the United States lived in Erie and Niagara Counties.¹ Thousands of foreign-born people who make their homes in Buffalo are recently arrived refugees, growing numbers of whom settle here every year. In 2013, Buffalo expects approximately 2,000 refugees to resettle in the city, while 1,600 settled in the city in 2012.² Refugees come from numerous countries—mostly from Africa, western Asia, and Southeast Asia.

Immigrants are accustomed to preparing foods with ingredients commonly found in their home countries, but these ingredients are rarer in the Buffalo Niagara region. International food stores, however, are increasingly found in urban refugee neighborhoods, where people rely on public transit and have difficulty getting to suburban ethnic food retailers. Immigrants themselves are actively involved in transforming the food environment.

Vineeta International Foods, opened by an immigrant couple in December 2012 in the refugee-dense Grant-Ferry community on Buffalo's West Side, is an 11,000 square-foot store selling international foods, including fresh produce, meats, lentils, bread and flour, herbs and spices, and teas and beverages. The store's owners, Raj and Sujata Chauhan, operate an international food store in Amherst—a first-ring Buffalo suburb—and opened Vineeta International Foods to serve the city's inner-city refugee population, which had trouble getting to the couple's suburban location.³

Few foods traditionally eaten by immigrants are produced locally. However, long-time local farmers and newly arrived refugees are increasingly seeking to produce foods that have traditionally been part of immigrants' cultures and diets. Local farmers express interest in producing international foods and would like to communicate with the immigrant community to learn how to better meet its needs and preferences.⁴ Against that backdrop, in September 2013, Journey's End (one of Buffalo's refugee resettlement agencies), Cornell Cooperative Extension, and Wilson Street Urban Farms received a \$240,000 grant to educate forty refugee gardeners and farmers about growing food and to develop food-producing gardens on two city plots. The food produced on these plots will boost low-income city-dwellers' access to healthy, culturally acceptable, and affordable food.⁵

1 DP-1, United States Census, 2010.

2 "Refugees & Resettlement Services: What are refugees and refugee settlement?" Journey's End Refugee Services, Inc., accessed October 28, 2013, http://www.jersbuffalo.org/index.php/services/category/refugees_resettlement_services.

3 Franke, Robert, "Vineeta International Foods to Strengthen Grant-Ferry's Status as Buffalo's Place for Ethnic Foods and Wares," Buffalo Rising, December 14, 2012, accessed October 28, 2013, <http://buffalorising.com/2012/12/vineeta-international-foods-to-strengthen-grant-ferrys-status-as-buffalos-place-for-ethnic-foods-and/>.

4 Farmer interviews, University at Buffalo Food Systems Planning and Healthy Communities Lab, June-August 2013.

5 "Journey's End receives \$855,000 to Fund New Programs," Journey's End, October 1, 2013, accessed October 28, 2013, http://www.jersbuffalo.org/index.php/news/entries/journeys_end_receives_855000_to_fund_new_programs.

Table 8. Labor force participation by sex in Buffalo Niagara, 2010

	In labor force	% of total labor force	% of total population*
Men	294,684	51	68% of men
Women	281,841	49	59% of women
Total	576,525	100	63%

Source: American Community Survey – 5-year estimates, United States Census, 2010.

* Denotes population 16 and over

Table 9. Family structure in Buffalo Niagara, 2010

Household type	N	% of family households
Family households with children under 18	131,324	46
Family households with children living with non-parent relative	9,337	3
Single-mother households with own children	35,886	13

Source: SF1, United States Census, 2010.

both counties is 2.3 people. The majority (286,822, or 61 percent) of the region's households are comprised of families, with a slightly higher percentage of family households (63 percent) in Niagara County than in Erie County (60 percent). Forty-six percent (131,324) of family households in the region are home to children under eighteen years, and 7 percent of family households with children (9,337) are home to children living with relatives other than their parents (Table 9).⁹

Households can comprise either unrelated people or families, of which there are many kinds. Family households tend to share financial resources more than non-family households do. As a result, those living in non-family households may experience more difficulties affording food. This is not always the case, however: single-parent, multi-generational, or extended family households may experience unique financial hardships that make food difficult to afford.

Family households run by a single mother with her own children comprise 12.5 percent (35,886) of the region's total family households (Table 9).¹⁰ In

9 SF1, United States Census, 2000 and 2010.

10 This figure includes only single-mother house-

holds in which a mother is caring for her own children. It does not include single-mother households in which a mother is caring for other related children, which occurred in 4,587 more of the region's family households in 2010, meaning that a greater number of single women and the children under their care are at risk of nutritional insecurity than is shown above. Data on only single-mother households with a mother's own children are provided because year 2000 U.S. Census data on single-mother households with related children are unavailable.

Unemployment, poverty, and income

People's financial status impacts their food security. People with low incomes

holds in which a mother is caring for her own children. It does not include single-mother households in which a mother is caring for other related children, which occurred in 4,587 more of the region's family households in 2010, meaning that a greater number of single women and the children under their care are at risk of nutritional insecurity than is shown above. Data on only single-mother households with a mother's own children are provided because year 2000 U.S. Census data on single-mother households with related children are unavailable.

11 SF1, United States Census, 2000 and 2010.

Table 10. Household composition in Buffalo Niagara, 2010

	N	% of households
Average household size (people)	2.3	...
Households	473,720	100
Family households	286,822	60.55

Source: SF1, United States Census, 2010.

Table 11. Poverty by sex in Buffalo Niagara, 2010

	Number	% population
Men	69,599	13% of men
Women	87,808	15% of women
Total	157,407	14%

Source: American Community Survey – 1-year estimates, United States Census, 2012.

Table 12. Single-mother households in Buffalo Niagara

Year	Single-mother households	% of family households
2000	36,871	12.2
2010	35,886	12.5

Source: SF1, United States Census, 2010.

have less money to spend buying groceries. Many also face job constraints—such as long or irregular working hours—which limit their available time to purchase, grow, or prepare healthy food.

In 2010, the average unemployment rate in Erie and Niagara Counties was just over 8 percent. Of those aged sixteen years and over, 63 percent—roughly 576,525 people—are working or seeking work. The labor force is composed of nearly the same share of women as men (49 and 51 percent, respectively) but a much larger share of the male population (Table 8).¹² Interestingly, slightly more women than men in the region are below the poverty level; an estimat-

12 American Community Survey – 5-year estimates, United States Census, 2010.

ed 15 percent of women and 13 percent of men are in poverty (Table 11).¹³ This sex differential is more likely related to women's persistently lower pay than to their lower workforce participation, although both likely impact poverty. In fact, the average median incomes of women and men who worked full-time jobs throughout 2010 are starkly different: in 2010, the average median income of men was \$45,779, while the average median income of women was \$34,448 (Table 13).¹⁴

Many individuals and families in the region are coping with tight finances. People earn less money in the Buffalo Niagara region than is average for the nation. The average per capita income in Erie and Niagara Counties—\$24,118—is over \$2,500 lower than that of the nation (\$26,708). Additionally, approximately 14 percent of the Erie and Niagara County population is below the poverty line (estimated 157,407 people, see Table 11), and more than one-third (38 percent, 177,547) of the region's households live on income and benefits totaling less than \$35,000 per year.¹⁵ Unsurprisingly, family households are more financially secure than non-family households because family households pool resources more often. In fact, the counties' average median family income is \$57,132, which is nearly \$12,000 more than the counties' average median household income of \$45,731.¹⁶ The difference may also occur because family households are more likely than non-family households to be composed of older—and thus, usually higher-paid—members of the workforce.

Moreover, comparing household income against household expenditures shows that many households struggle to make ends meet. Average annual household expenditures in the region are approximately \$47,192.¹⁷ This means that many households make approximately as much as they spend, and at least 38 percent of households (all households making \$35,000 or less per year) fall about \$12,000 short of reaching equilibrium between annual income and average expenditures.

Not having enough money makes buying

¹³ Ibid.

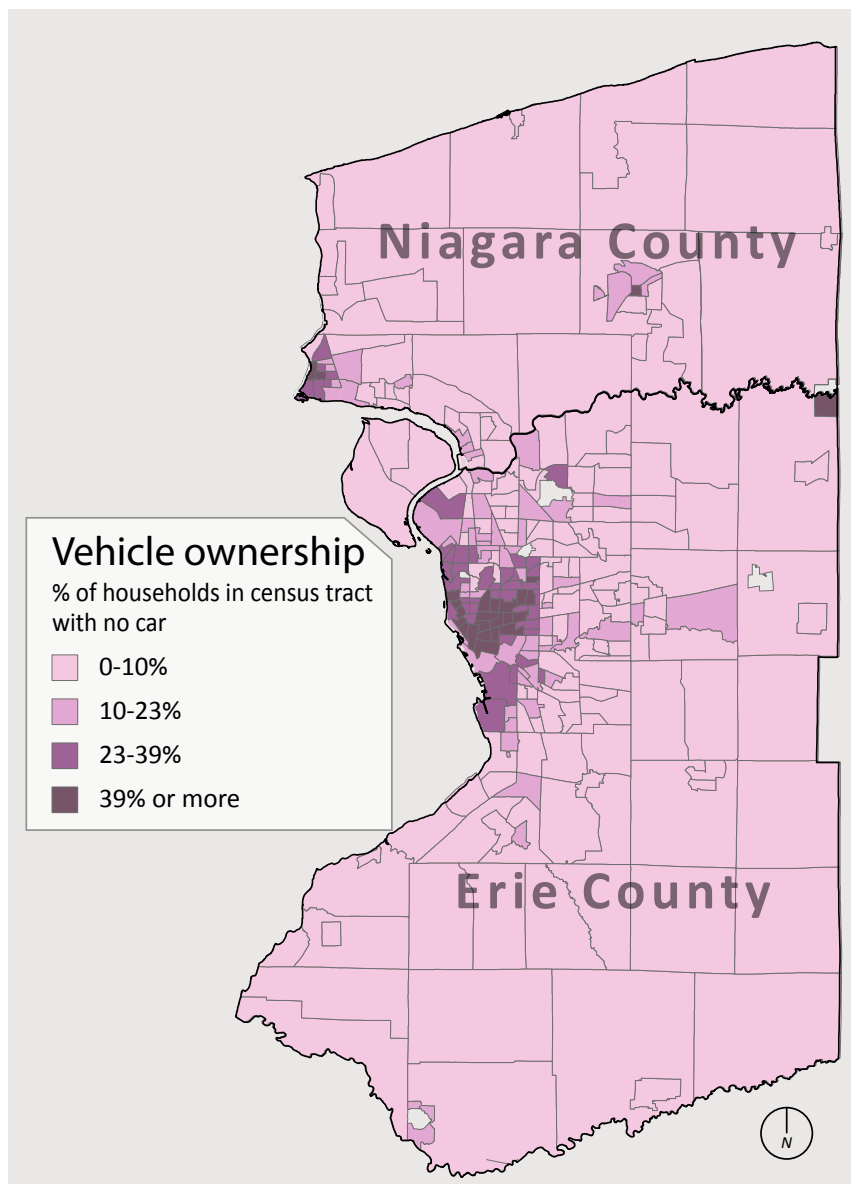
¹⁴ Ibid.

¹⁵ American Community Survey – 5-year estimates, United States Census, 2010.

¹⁶ Ibid.

¹⁷ "Region of residence: Average annual expenditures and characteristics," United States Department of Labor Bureau of Labor Statistics, 2011, accessed December 12, 2013, <http://www.bls.gov/cex/2011/Standard/region.pdf>.

Figure 8. Vehicle ownership in Buffalo Niagara



Source: American Community Survey – 5-year estimates, United States Census, 2011. Note: White areas indicate no available data.

food a problem. In fact, in a random survey of 1,000 Niagara County residents, 23 percent stated that they worried that their food would run out before they had money to buy more. Moreover, 20 percent described how they relied on a few low-cost foods to feed their children because they were running out of money to purchase food, and 19 percent said that they could not afford to eat balanced meals.¹⁸

¹⁸ "Niagara County Food Security Survey Report," Cornell Cooperative Extension, October 20, 2011.

Vehicle access

Food-retail establishments in the region are often located far from residences, making it difficult for people without cars to physically access food. Thus, access to a vehicle impacts people's nutrition. The Cornell Cooperative Extension reports that only 67 percent of people in Niagara County who have very low-food security¹⁹ drive their own car

¹⁹ The Cornell Cooperative Extension study measured

Table 13. Yearly income by sex in Buffalo Niagara, 2010

	Yearly income (\$)
Men	45,779
Women	34,448

Source: American Community Survey – 5-year estimates, United States Census, 2010.

to obtain food.²⁰ Conversely, 92 percent of food-secure people drive their own cars to obtain food. Across both counties, 13 percent (an estimated 60,284 households) of households lack access to a vehicle, and vehicle-less households are concentrated most in urban areas (Figure 8). Household vehicle ownership is greater in Niagara County than in Erie County, with approximately 90 percent of Niagara County households owning a vehicle (approximately 8,354 households do not own a vehicle) and 86 percent of Erie County households owning a vehicle (roughly 51,930 households do not own a vehicle).

It is important to ensure that the 60,284 households without cars can reach a food retailer that sells healthy foods. Car ownership is expensive and can be cost-prohibitive for low-income individuals. According to the Bureau of Labor Statistics, the cost of owning a car was \$4,459 in 2011.²¹ AAA reports that the cost of owning a car increased 2 percent from 2011 to 2012 and that the cost of vehicle ownership continues to rise because of increasing fuel and tire prices. Moreover, the annual cost of owning a car, \$4,459, is greater than the average household's expenditures on clothing and entertainment together, which total \$4,129 per year. Vehicle ownership, and thus greater food access, is simply unaffordable for many low-income people and families.

food security in Niagara County by randomly calling 1,000 households. Heads of households responded in agreement or disagreement with eighteen food security statements. The "agree" responses were summed and participants were scored as "food secure," having "low food security," or "very low food security" based on thresholds of the number of statements with which participants agreed and the presence of children in the household.

²⁰ "Niagara County Food Security Survey Report," Cornell Cooperative Extension, October 20, 2011.

²¹ "Region of residence," Labor Bureau.

General public assistance

Very few Buffalo Niagara residents receive non-food-specific public assistance that would help to lower the burden of overall household expenses. Although poverty rates are high in the region, just 3 percent (14,901 households) of households are enrolled in the Temporary Assistance for Needy Families program (TANF, formerly known as Welfare), which provides monetary assistance to low-income families who are working or actively seeking work. TANF allowances are used to cover basic necessities, energy costs, and housing costs.

Five percent of the counties' households (approximately 23,280 households) receive Supplemental Security Income (SSI). Elderly, blind, or disabled people with low income are eligible to receive SSI to pay for necessities, such as food, clothing, and shelter. On average, each household participating in the SSI program receives \$8,662 per year.²²

B. Food assistance

Food assistance for people of all ages

Several programs offer nutrition assistance to people of all ages. They include the Supplemental Nutrition Assistance Program (SNAP), the Emergency Food Assistance Program (TEFAP), the Food Distribution Program on Indian Reservations (FDPPIR), and the Child and Adult Care Food Program.

One of the most widely known sources of nutrition assistance is the Supplemental Nutrition Assistance Program (SNAP), a federal, income-based monetary assistance program that helps people obtain a nutritionally adequate diet. Approximately 12 percent (54,359) of Buffalo Niagara households are enrolled in SNAP.²³ In Erie County, 44,792 households, or 12 percent of households, receive SNAP assistance, while 11 percent (9,567 households) of Niagara County households receive SNAP. SNAP participation is greater in the region's cities than in its suburban or rural areas. However, in many non-urban areas between eight and eighteen percent—and in some places up to 34 percent—of households receive SNAP benefits.

²² American Community Survey – 5-year estimates, United States Census, 2010

²³ American Community Survey – 5-year estimates, United States Census, 2010.

Two other programs offer assistance to a broad range of age groups. The Emergency Food Assistance Program (TEFAP), administered by the USDA, purchases food to be distributed by local organizations that serve food-insecure populations.²⁴ Local organizations, such as the Food Bank of Western New York, receive food from this program for distribution.²⁵ The Food Distribution Program on Indian Reservations (FDPPIR) makes USDA foods available to low-income people living on Indian reservations and to Native Americans in designated areas near reservations.²⁶ Lastly, the Child and Adult Care Food Program provides meal-cost reimbursements to day care facilities that tend to children who are eligible for free or reduced lunch, as well as to eligible nonresidential, functionally impaired adults.

Food assistance for children and pregnant women

Many nutrition programs specifically assist children. The National School Lunch Program (NSLP) provides free or reduced-price meals to students from low-income families. In the region's public schools, 41 percent of students receive free and reduced lunches.²⁷ The Summer Food Service Program provides free meals to people under eighteen years old during the summer months. The program aims to ensure that children from families with low incomes have enough healthy food to eat when school is not in session.

Women, Infants, and Children (WIC) is a federally funded nutrition assistance and education program for pregnant women, infants, and children. Administered in Erie and Niagara Counties by Catholic Charities, WIC provides food and nutrition education benefits to approximately 20,000 people in the region each month.²⁸ On average, New York State WIC recipients receive monthly

²⁴ "The Emergency Food Assistance Program (TEFAP)," USDA Food and Nutrition Service, accessed December 12, 2013, <http://www.fns.usda.gov/tefap/emergency-food-assistance-program-tefap>.

²⁵ "The Food Bank of Western New York," Feeding America, accessed December 12, 2013, <http://feedingamerica.org/foodbank-results.aspx?state=NY>

²⁶ "Food Distribution Program on Indian Reservations (FDPPIR)," USDA Food and Nutrition Service, accessed December 12, 2013, <http://www.fns.usda.gov/fdd/programs/fdpiir>.

²⁷ "Search for Public School Districts," National Center for Education Statistics, 2010-2011, accessed December 12, 2013, <http://nces.ed.gov/ccd/districtsearch>.

²⁸ "What is WIC?" Catholic Charities, accessed December 12, 2013, <http://ccwny.org/Services/tabid/59/cid/15/cat/WIC%20Program/Default.aspx>.

benefits of \$55.02,²⁹ which total about \$660 per year.

Food assistance for senior citizens

Two programs focus specifically on nutrition assistance for low-income elderly people. First, the Elderly Nutrition Program (ENP), funded by federal and state governments, provides free meals³⁰ to people aged sixty and older and to people with disabilities under age sixty. In Erie and Niagara Counties, ENP meals are provided by senior centers, senior living facilities, and community centers at sixty-eight specific locations, and they are also home-delivered.³¹ Each meal provides at least one-third of the USDA's daily recommended nutritional intake.³²

New York State administers the federal Senior Farmer's Market Nutrition Program (SFMNP), which provides cash assistance to senior citizens with incomes below 185 percent of the poverty level to purchase food directly from farms, farm stands, and CSAs. In 2010, 107,720 of the state's seniors received coupons to participate in SFMNP.³³ The value of the coupons redeemed at New York State farms, farm stands, and CSAs was \$1.7 million. This benefits both farms and seniors, but the benefit to seniors is small: the value of the coupons is only \$15.88 per receiving senior.³⁴

While there are many programs to assist the region's population in getting enough healthy food to eat, many people who do not qualify for these benefits still struggle. Qualification for most nutrition-assistance benefits is based on one's income, yet many people make

just enough money to be disqualified from food-assistance programs, even if they still struggle with food insecurity. In fact, according to the Niagara County Food Security Survey, very few food-insecure households actually receive public food assistance. Seventeen percent of households that responded to the survey were determined to be food insecure, but less than half (47 percent) of those households received public food assistance.³⁵ In fact, among low food security households in Niagara County, 37 percent received SNAP and 17 percent were in the NSLP.³⁶ Among very low food-security households, only 56 percent received SNAP, and 32 percent were enrolled in NSLP. Consequently, many more people contend with inadequate nutrition than are allowed to receive public food assistance.

C. Food and health

Few Erie and Niagara County adults consume the recommended amounts of fruit and vegetables per day. The USDA recommends that half of each meal consist of vegetables and fruits.³⁷ According to the Erie and Niagara County health assessments, however, only 25 percent

35 "Senior FMNP," Cornell University Division of Nutritional Sciences, accessed December 16, 2013, http://www.fnec.cornell.edu/Our_Programs/FMNP/Seniors.cfm.

36 "Niagara County Food Security," Cornell Cooperative Extension.

37 "ChooseMyPlate.gov," USDA, accessed December 16, 2012, <http://www.choosemyplate.gov>.

IN BRIEF

PG 22 Although 12 percent of households receive SNAP benefits, many more low-income and food-insecure households do not receive any public assistance.

PG 27 Forty-one percent of Buffalo Niagara students receive free or reduced-price lunches.

PG 28 Approximately one-quarter of the region's adults eats the recommended servings of fruits and vegetables.

PG 29 Sixty-three percent of adults are overweight or obese, and 11 percent are diabetic.

Community engagement in Growing Together

Community engagement played an important role in the creation of **Growing Together**. In addition to input given from the community at large-scale events for One Region Forward, **Growing Together** received guidance from three key groups: the region's farmers, youth from the Massachusetts Avenue Project's (MAP) Growing Green Program, and the One Region Forward Food Access and Justice Working Group.

Farmers provided information on the challenges they face in farming and the opportunities they see ahead. A report based on Growing Together's conversations with farmers is located on page 66 in the *Food Production* section.

Youth from MAP's Growing Green Program assessed the availability and price of healthy food as well as the quality of the store environment in sixteen food retailers in Erie and Niagara Counties. Their work contributed greatly to Growing Together's research and conclusions about the region's food environment. The report can be found on page 70 in the *Distribution and Retail* section of this report.

Lastly, the thirty-six members of the Food Access and Justice Working Group, representing a range of stakeholders, from farmers and county planners to public health officials and urban growing organizations, provided expertise on issues taking place throughout the food system. A final review was conducted by members of the Buffalo-Erie Food Policy Council, many of whom also served on the Food Access and Justice Working Group.

29 "WIC Program: Average Monthly Benefit Per Person," USDA Food and Nutrition Service, December 6, 2013, accessed December 12, 2013, [http://www.fns.usda.gov/pd/25wifavgfd\\$.htm](http://www.fns.usda.gov/pd/25wifavgfd$.htm).

30 Meals are free, but the suggested contribution for people over 60 in Erie County is \$3.50 and is \$4 in Niagara County.

31 "Nutrition & Dining – Stay Fit Dining Program," Erie County Department of Senior Services, accessed December 12, 2013, <http://www2.erie.gov/seniorservices/index.php?q=nutrition-amp-dining-stay-fit-dining-program>. Meals on Wheels programs in the region are discussed in the food distribution section below.

32 "Elderly Nutrition Program," United States Department of Health and Human Services, accessed January 6, 2014, <http://www.nutrition.gov/food-assistance-programs/elderly-nutrition-program>.

33 "Senior Farmer's Market Nutrition Program," USDA Food and Nutrition Service, accessed December 2012, <http://www.fns.usda.gov/wic/seniorfmnp/SFMNPFY-2011Profile.htm>.

34 "Senior FMNP," Cornell University Division of Nutritional Sciences, accessed December 16, 2013, http://www.fnec.cornell.edu/Our_Programs/FMNP/Seniors.cfm.

and 26 percent of Erie and Niagara County adults, respectively, consume the recommended amount of fruits and vegetables.^{38,39} Consequently, most residents do not have a healthy diet. Some people have low food security because they are low income, but many others face non-economic obstacles to eating healthfully, such as long distances required to obtain food, lack of knowledge about food-preparation methods, lack of time to prepare food, or lack of social support for a healthy lifestyle.

Fruit and vegetable intake is important because poor diets negatively impact health. Diets that are low in nutrients or that lack nutritional diversity and diets that are high in fat and cholesterol can lead to negative health outcomes.^{40,41}

38 "Erie County, New York 2010-2013 Community Health Assessment," Erie County Department of Health, accessed December 16, 2013, <http://www2.erie.gov/health/sites/www2.erie.gov/health/files/uploads/pdfs/CHA.pdf>.

39 "2010-2013 Community Health Assessment," Niagara County Department of Health, September 2009, accessed December 16, 2013, <http://www.niagaracounty.com/Portals/4/Docs/CHA%20document.pdf>.

40 "Adequate Nutrients Within Calorie Needs," from Dietary Guidelines for Americans 2005, USDA, accessed December 16, 2013, <http://www.health.gov/dietaryguidelines/dga2005/document/html/chapter2.htm>.

41 L. Bellows and R. Moore, "Fact Sheet No. 9.319: Dietary Fat and Cholesterol," Colorado State University Extension, accessed December 16, 2013, <http://www.ext.colostate.edu/pubs/foodnut/09319>.

Along with diabetes, obesity and overweight—which are associated with heart disease and some cancers—are three of the most prevalent diet-related negative health outcomes in New York State.⁴² Moreover, Erie and Niagara County adults suffer from obesity, overweight, and diabetes at a higher rate, compared with adults across New York State. Specifically, 65 percent of Erie County adults, 62 percent of Niagara County adults, and 60 percent of New York State adults are overweight or obese. People suffering from diabetes total 11 percent of Erie County adults, 12 percent of Niagara County adults, and 10 percent of New York State adults.⁴³

Poor health of residents is costly to the region in many ways: in years and quality of life lost; in absences from work; in direct medical expenses to people; and in tax dollars, some of which pay for the region's medical facilities. Consequently, dietary improvements are necessary to stem the region's epidemic of nutrition-related diseases, improve people's quality and length of life, and to reduce preventable medical treatment costs spent at doctors' offices and

pdf.

42 "Erie County, New York 2010-2013 Community Health Assessment," Erie County Department of Health; "2010-2013 Community Health Assessment," Niagara County Department of Health.

43 "Erie County, New York 2010-2013 Community Health Assessment," Erie County Department of Health; "2010-2013 Community Health Assessment," Niagara County Department of Health.

paid through taxes.⁴⁴

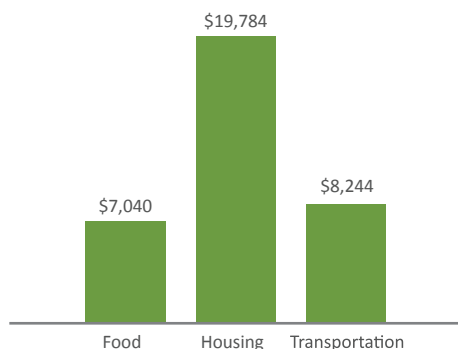
D. Food spending

Among households in the Northeast, approximately 12 percent of expenses go to food (Table 15). When compared to all household expenditures, food ranks the third highest behind transportation and housing.

The average household in the Northeast spends \$6,799 on food each year; sixty percent of this is spent on food consumed at home, while around 41 percent is spent on eating out (Table 15). The greatest share of the money that people spend on food at home (20 percent) goes toward fats, oils, sugars, and nonalcoholic drinks, while much smaller shares are expended on meat (13 percent), fruits and vegetables (12 percent), cereals and bakery items (9 percent), and dairy products (7 percent). This illustrates the centrality of processed and unhealthy food in homes and can be tied to the low consumption of fruits and vegetables and the prevalence of food-related negative health outcomes. It is harder to determine the healthfulness of food purchased outside the home at restaurants. Different restaurants offer different food choices, but in general the foods they offer tend to have more calories and be of poorer nutritional qual-

44 For more information about the costs of obesity, see <http://www.healthycommunitieshealthyfuture.org/learn-the-facts/economic-costs-of-obesity/>

Table 14. Household spending as share of total income, Northeast region, 2010



Source: "Consumer Expenditure Survey, 3rd Quarter 2011 through 2nd Quarter 2012." U.S. Bureau of Labor Statistics, 2013, accessed December 16, 2013, <http://www.bls.gov/cex/22012/midyear/quintile.pdf>.

Food Policy Council of Buffalo and Erie County

On May 21, 2013, the Erie County Board of Health created the Food Policy Council of Buffalo and Erie County (FPC). The FPC is an advisory body that serves as a resource to local governments on all policy issues concerning food. The Board voted unanimously to create the FPC—the first of its kind in New York State—as a sub-commission of the Board.¹ The first members of the FPC were seated on October 23, 2013.² The Erie County government and the county's municipalities will be able to use the expertise of the FPC to make decisions on a wide range of issues impacting the county, such as obesity and peoples' limited access to healthy food. The FPC can also help develop solutions to such issues; for instance, it could assist in the development of local food-procurement opportunities.

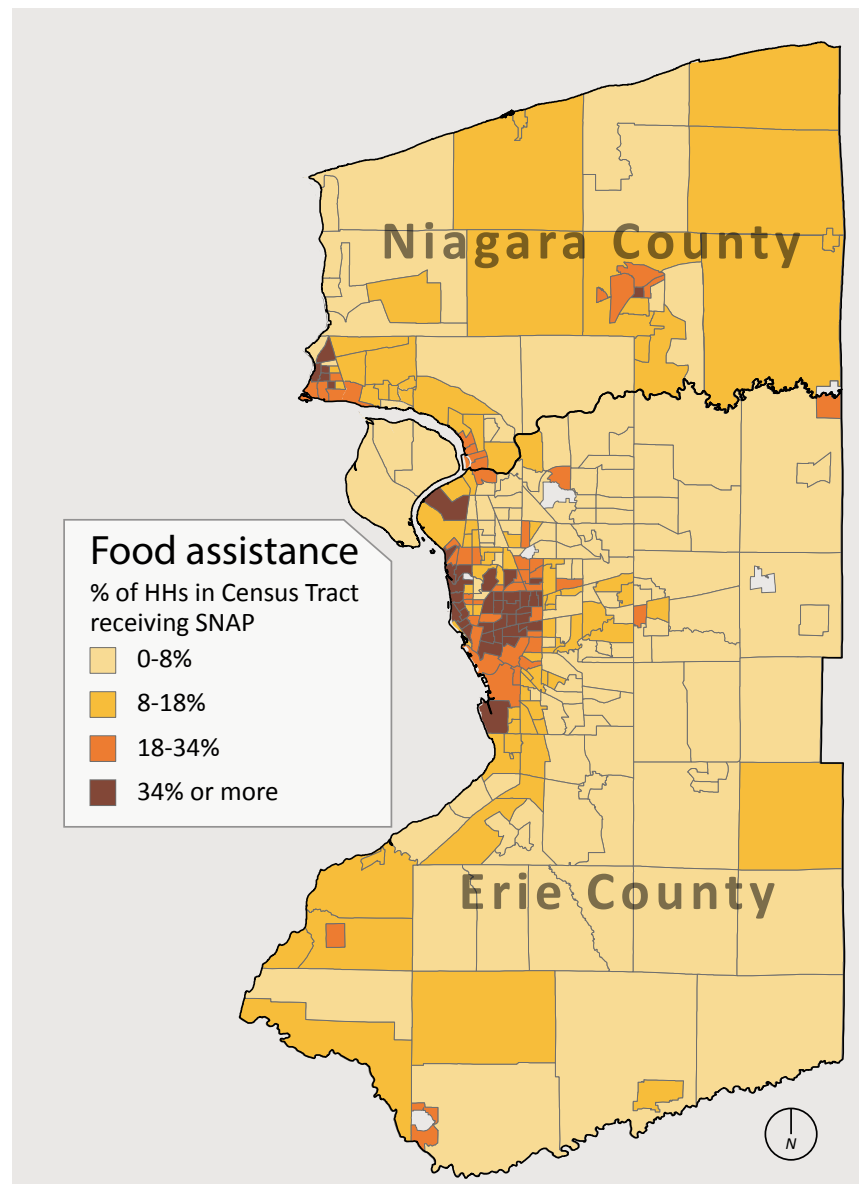
1 "History of the FPC," Healthy Kids, Healthy Communities – Buffalo accessed January 28, 2014, <http://hkbc-buffalo.org/about-the-fpc-of-buffalo-and-erie-county>.

2 Sommer, Mark. "New Food Policy Council takes on problems in the local food system," *Buffalo News*, October 23, 2013.

ity—features that have been tied to increases in body weight— than foods that are prepared at home.⁴⁵

45 "Food Away from Home." U.S. Department of Agriculture Economic Research Service, 2013, accessed December 16, 2013, <http://www.ers.usda.gov/data-products/food-expenditures.aspx#Uq9UseKOciQ>.

Figure 9. Participation in Supplemental Nutrition Assistance Program



Source: American Community Survey – 5-year estimates, United States Census, 2011. Note: White areas indicate no available data.

Table 15. Yearly household expenditures on food, Northeast region, 2012

Types of food expenditures, per household	\$	% of food expenditures	% of all expenditures
Food at home	4,206	59.74	7.60
Cereals and bakery products	611	8.68	1.10
Cereals and cereal products	200	2.84	0.36
Bakery products	412	5.85	0.74
Meats, poultry, fish, and eggs	900	12.78	1.63
Beef	228	3.24	0.41
Pork	155	2.2	0.28
Other meats	156	2.22	0.28
Poultry	166	2.36	0.30
Fish and seafood	141	2.00	0.25
Eggs	54	0.77	0.10
Dairy products	455	6.46	0.82
Fresh milk and cream	155	2.20	0.28
Other dairy products	300	4.26	0.54
Fruits and vegetables	856	12.16	1.55
Fresh fruits	302	4.29	0.55
Fresh vegetables	265	3.76	0.48
Processed fruits	138	1.96	0.25
Processed vegetables	152	2.16	0.27
Other food at home	1,382	19.63	2.50
Sugar and other sweets	149	2.12	0.27
Fats and oils	119	1.69	0.22
Miscellaneous foods	684	9.72	1.24
Nonalcoholic beverages	386	5.48	0.70
Food prepared by consumers on out of town trips	43	0.61	0.08
Food away from home	2,628	37.30	4.70
Food, total	7,040	100.00	12.72
Annual expenditures, total	55,334	...	100.00

Source: "Consumer Expenditure Survey," U.S. Bureau of Labor Statistics.

THE FOOD ECONOMY

IN BRIEF

PG 32 GDP from food businesses is \$4.16 billion annually and comprises 10.6 percent of the region's total GDP.

PG 32 GDP from crop and animal production is growing, but employment in those sectors is declining.

PG 32 Compared to the nation and state, the region specializes in specialty food manufacturing, dairy manufacturing, and fruit and vegetable preserving. The region also has a higher concentration of convenience stores, compared to other communities in the nation and state.

The region's food economy is a multi-faceted system with links to other economies within the region and throughout the state, the country, and the globe. Buffalo Niagara's food economy is large, and it is subject to local forces such as the climate, the region's education system, and municipal taxation and licensing. Additionally, it is impacted by distant issues such as federal subsidies, national food-industry trends, and the price of fuel. This chapter gives a general overview of the Buffalo Niagara food-system economy, while the chapter that follows gives more details about farming and food production, processing and wholesale, and food distribution.¹

A. The food system's market value

The Buffalo Niagara metro area's gross domestic product (GDP)² was \$39.2 billion in 2010, 2 percent, or \$756 million, larger than in 2005 (Table 16). Food-related GDP³ is big business in the region, comprising 10.6 percent (\$4.16 billion) of total GDP (Table 16). Total food-related GDP grew by less than 1 percent between 2005 and 2010, but larger GDP growth occurred in two food industries: crop and animal production, which grew by 26 percent, and food

services, which grew by 15 percent.⁴ Conversely, GDP of food processors fell by 9 percent; GDP of wholesalers dropped by 2 percent; and GDP of wholesale trade (which includes food wholesale) declined by 2 percent (Table 16).

Food-related GDP grew overall, but, as shown in Figure 10, food-related employment declined in the region from 2005 to 2010. Some of the region's largest declines in employment occurred in the processing and wholesale sectors, where GDP also fell. The opposing trends in GDP and employment may indicate increases in efficiency due to mechanization, which increases output while lowering the demand for labor.

B. The food system's contribution to the economy⁵

Compared to New York State, Buffalo Niagara's food economy is strong. The region specializes more, however, in some food subsectors than in others. Specialization can be measured in location quotients: the relative dependence of a local economy on a certain kind of employment when compared to the state or national economy. A local economy is specialized in a sector when the sector's location quotient is above one, and is considered weak when the sector's location quotient falls below one.⁶ As shown in Table 17,

¹ Disposal of food waste is a key piece of the food system, however, it is not within this report's scope.

² GDP refers to real GDP, the inflation adjusted value of economic output. For the U.S. economy as a whole, GDP is measured as the sum of all private consumption, gross investment, government spending, and exports net imports. Industry-specific GDP is a measure of the value of the goods and services produced in that industry minus expenses.

³ Food-related GDP refers to the total value of goods and services produced in the following sectors: crop and animal production, food and beverage and tobacco product manufacturing, wholesale trade, and food services and drinking places.

⁴ "Real GDP by Metropolitan Area," U.S. Bureau of Economic Analysis, 2013.

⁵ "Quarterly Census of Employment and Wages," U.S. Bureau of Labor Statistics.

⁶ Location quotients are indicators of regional economic specialization that allow us to identify strengths and weaknesses in the nation's economy.

Buffalo Niagara specializes in food service, which shows location quotients of 1.06 and 1.08 for New York State and the U.S., respectively. The region specializes in many types of food processing, such as sugar, confectionary, and dairy processing, which have location quotients of around 2.

In some food subsectors, the region's location quotient shows disparities in employment specialization between the state and the nation. Buffalo Niagara specializes in bakeries and tortilla manufacturing, when compared to the nation, but when compared to the state, the region is less specialized. Animal slaughtering and processing is a highly specialized subsector in Buffalo Niagara compared to the state, but, when looked at in the context of the U.S. economy, the region is less specialized (Table 17). The same is true for crop production and fruit and vegetable preserving. Other food subsectors, such as animal production and vegetable and melon farming, employ proportionally fewer people locally, compared with the state and nation.

Buffalo Niagara specializes in employment in some food production subsectors. Although little data are available about employment in specific crop sectors, employment in apple orchards is concentrated in the region, when compared to the nation. Focusing on specific niche crops the region specializes in, instead of on a large sector, could boost local production and make the region more competitive.

In general, food processing is highly concentrated in Buffalo Niagara compared to the state and the nation.

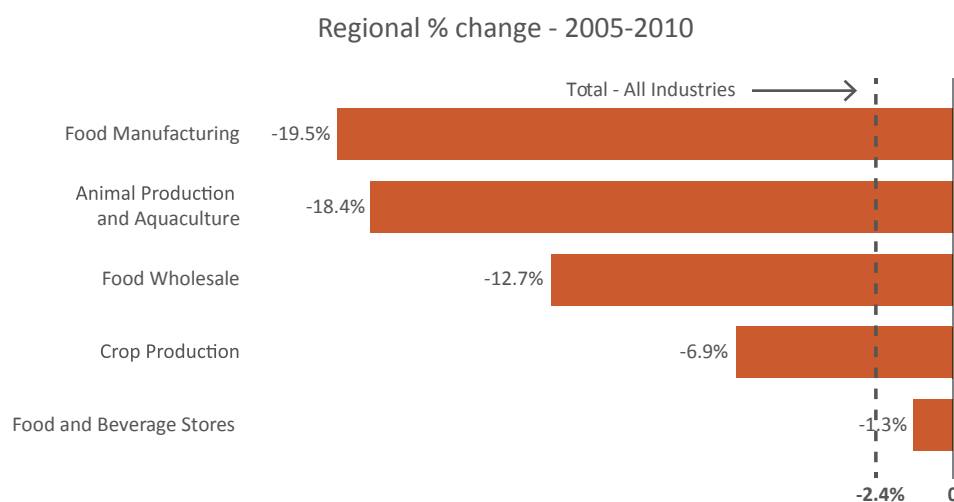
They capture the relative dependence of a local economy on a certain kind of employment when compared to the larger state or national economy. A location quotient can tell us, for instance, what proportion of overall employment in Buffalo Niagara is agricultural compared to the proportion of statewide employment that is agricultural. A local economy is seen as specialized in a sector when the sector's location quotient is above 1, and is considered weak when the sector's location quotient falls below 1. Another common interpretation of location quotients claims that an economy exports in a sector that has a location quotient above 1 and it imports in a sector with a location quotient below 1. High location quotients are likely the result of a comparative advantage that the region experiences in a specific sector. Because a local economy's location quotient is relative to the larger economy to which it belongs, two comparisons are provided here. The first is to the economy of New York State and the second is to the U.S. economy as a whole. When studying the food system's economic sectors and links, location quotients tell us the sectors in which the region is particularly strong and self-sufficient and in which sectors the region is likely dependent on other places. A range of food-system sector location quotients are summarized in Appendix E.

Table 16. Gross Domestic Product in the food industry (millions of chained 2005 dollars)

Sector	Buffalo Niagara Metro Area			All U.S. Metro Areas		
	2005	2010	Change (%)	2005	2010	Change (%)
Crop and animal production	87	110	26	47,389	51,596	9
Food and beverage and tobacco product manufacturing	818	743	-9	132,426	139,055	5
Wholesale trade	2,342	2,285	-2	676,112	649,292	-4
Food services and drinking places	889	1,025	15	230,193	224,399	-3
Total, food industries	4,136	4,163	1	1,086,120	1,064,342	-2
Total, all industries	38,463	39,219	2	11,263,078	11,623,332	3

Source: "Real GDP by Metropolitan Area," U.S. Bureau of Economic Analysis.

Figure 10. Percent change in regional employment, 2005-2010



Source: Quarterly Census of Employment and Wages," U.S. Bureau of Labor Statistics, 2013, accessed December 16, 2013, <http://www.bls.gov/cew/>.

This is the case especially for dairy product manufacturing, fruit and vegetable preserving, and specialty food manufacturing. The region's specialization in dairy product manufacturing, however, points to possible lost opportunities in the local food system. The region has over two times the proportion of dairy processing jobs, compared with New York State and the U.S. as a whole. However, dairy wholesale is less concentrated here than throughout the state and nation. Although recent data on employment in dairy production are unavailable, the region and its surrounding counties are well known as areas with high dairy production. This means that, although Buffalo Niagara exports much of the dairy it processes, the region has not internalized connections in the market between producers, processors, and wholesalers. This presents an opportunity for a regional wholesaler, possibly in the form of a food hub.

The region has concentrations of food-retail jobs similar to those in the state and throughout the U.S. Overall, the region has proportionally more employment in food retail establishments, compared with the U.S. as a whole, but less compared with other places in New York State.

Food jobs make up a greater share of Buffalo Niagara's economy than in the rest of the state and about the same share as in the rest of the country. Across all food-system sectors,⁷ the region has over 73,000 jobs, 17% percent of all jobs in the region (Table 17).

⁷ See Appendix E for all sectors.

Table 17. Region's specialization in the food sector, 2010

Industry	Regional employment	Location quotient	
		NY base	U.S. Base
Crop Production	813	1.22	0.38
Animal Production and Aquaculture	394	0.74	0.44
Vegetable and Melon Farming	211	0.98	0.56
Fruit and Tree Nut Farming	226	0.76	0.30
Apple Orchards	190	0.78	1.28
Food Services and Drinking Places	40,912	1.06	1.08
Support Activities for Animal Production**	43	0.38	0.39
Sugar and Confectionery Product Manufacturing	510	2.52	1.90
Fruit and Vegetable Preserving and Specialty Food Manufacturing	666	1.33	0.95
Dairy Product Manufacturing**	1,597	2.73	3.04
Animal Slaughtering and Processing	743	2.72	0.38
Bakeries and Tortilla Manufacturing	735	0.50	0.66
Other Food Manufacturing**	171	0.38	0.26
Beverage Manufacturing*	54	0.12	0.08
Grocery and Related Product Merchant Wholesalers	1,904	0.55	0.67
Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	559	0.66	0.85
Dairy Product (except Dried or Canned) Merchant Wholesalers	25	0.13	0.15
Farm Supplies Merchant Wholesalers	36	0.32	0.08
Grocery Stores	13,350	1.06	1.34
Supermarkets and Other Grocery (except Convenience) Stores	12,192	1.03	1.30
Convenience Stores	1,159	1.70	2.05
Specialty Food Stores	1,203	0.66	1.40
Beer, Wine, and Liquor Stores	784	0.96	1.42
Total Food***	73,386	1.25	0.99
Total-All Industries	426,600	1.00	1.00

Source: "Quarterly Census of Employment and Wages," U.S. Bureau of Labor Statistics.

* Data unavailable for Erie County,

** Data unavailable for Niagara County.

***Total food jobs are taken as the total jobs from the following sectors:

Crop Production, Animal Production and Aquaculture, Support Activities for Animal Production, Food Manufacturing, Beverage Manufacturing, Agricultural Implement Manufacturing, Farm and Garden Machinery and Equipment Merchant Wholesalers, Grocery and Related Product Merchant Wholesalers, Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers, Farm Supplies Merchant Wholesalers, Other Miscellaneous Nondurable Goods Merchant Wholesalers, Nursery, Garden Center, and Farm Supply Stores, Food and Beverage Stores, Food (Health) Supplement Stores, Gasoline Stations with Convenience Stores, General Freight Trucking, Freight Transportation Arrangement, General Warehousing and Storage, Solid Waste Collection, Solid Waste Landfill, Community Food Services, Food Services and Drinking Places.

5.

FOOD PRODUCTION, PROCESSING, WHOLESALE, AND DISTRIBUTION

IN BRIEF

PG 36

A greater portion (43 percent) of Niagara County's land is used for agriculture than in Erie (22 percent), and acres of farmland in both counties have declined since 1978.

PG 36

Most farmers are white males, and more than half are older than fifty-five.

PG 36

Nearly half of farmers farm as a secondary occupation.

PG 36

Most of the region's 2,080 farms are small.

PG 66

Farmers find labor costs, labor regulations, and entering new markets challenging. They see the most opportunities in food hubs, local marketing, and agricultural tourism.

Generally, the food that people purchase passes through a complex chain of intermediaries, from its origin on a farm to one's plate. In fact, for every dollar the U.S. population spent on food in 2008, only about 16 cents were paid to the farmers who grew the food. The remaining 84 cents of each dollar went to intermediaries, including packers, processors, wholesalers, marketing agencies, distributors, retailers, and restaurants.¹ The following chapter details the current state of the region's field-to-fork food chain.

A. A profile of farming

The following section offers a profile of the region's 2,080 farms, including its farmers, operations, agricultural inputs, and products. A greater portion of Niagara County land than Erie County land is used as farmland. Similar to national trends, farmland has declined in both counties from more than 350,000 acres in 1978² to 291,992 acres in 2007.³ Figure 11 shows the location of farmland in use and Figure 12 gives an historical view of the acreage of farmland in use.

¹ Canning, Patric, "A Revised and Expanded Food Dollar Series: A Better Understanding of Our Food Costs," Economic Research Report 114, USDA Economic Research Service, 2011.

² "Census of Agriculture Historical Archive," USDA NASS, 1978, accessed December 16, 2013, <http://agcensus.mannlib.cornell.edu/AgCensus/homepage.do?session-id=C897C316AE2E08C3C0A3E773E6D49C3E>.

³ "Census of Agriculture," USDA NASS, 2007, accessed December 16, 2013, http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/New_York/.

Farmer characteristics

Erie and Niagara Counties are home to over 3,000 farmers. Farmers are aging, and the majority are white males. As shown in Table 20 and Figure 13, there are approximately two times more male farmers than female farmers, and most farmers are over fifty-five years old. In fact, 56 percent of farmers are over fifty-five, 17 percent of farmers are younger than forty-five, and only 3 percent are younger than thirty-five, meaning that few young people have decided to become farmers. Nearly all Buffalo Niagara farmers are white.⁴

On average, net revenue per farm is \$25,815, although revenue is more than \$6,000 higher for Niagara County farms than for Erie County farms (Table 21).⁵ This may be because fruits and vegetables are grown in greater abundance in Niagara County and are sold at higher prices than many other crops, or because wineries, which bring in tourist income, are more abundant in Niagara than Erie County. Interestingly, 48 percent of principal farmers in Buffalo Niagara work primarily outside the farm, which could indicate that farmers need to work off the farm to make ends meet.⁶

Types and size

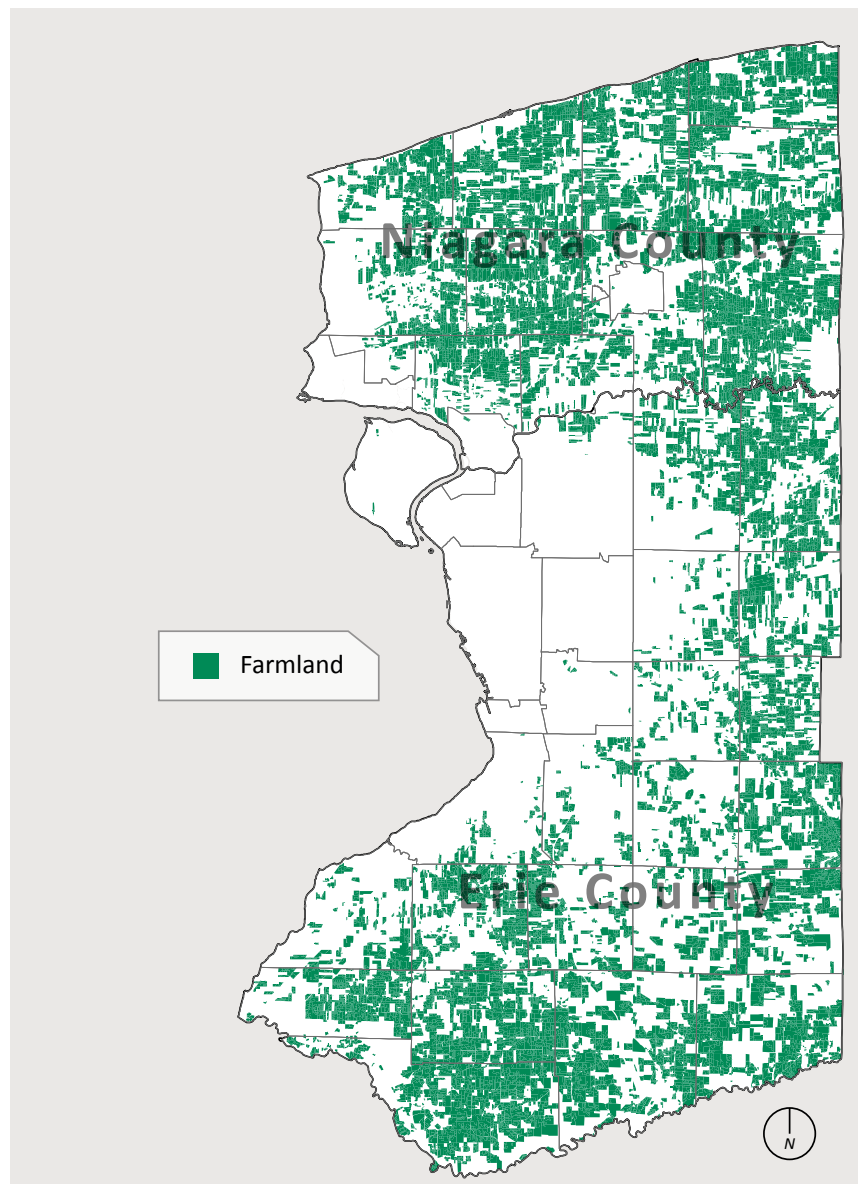
Farms come in many sizes and types,

⁴ "Census of Agriculture," USDA NASS, 2007.

⁵ "Census of Agriculture," USDA NASS, 2007. Some information is suppressed by the USDA.

⁶ "Census of Agriculture," USDA NASS, 2007. Some information is suppressed by the USDA.

Figure 11. The location of farmland in Buffalo Niagara, 2010



Source: "2012 Parcel Data," edited by Tax Mapping Division County of Niagara Real Property Services, New York State GIS Clearinghouse, 2012; "Erie County Parcels 2012," edited by Erie County, 2012; US Department of Agriculture, Natural Resource Conservation Service. Common Land Unit and Farm Service Areas for Erie and Niagara County, NY, 2013.

but the majority of the region's farms are small, family-owned, and exist on land that the farmer partially owns. Forty-seven percent of farms operate on less than fifty acres, 70 percent operate on less than one-hundred acres, and 90 percent operate on less than 1,000 acres (Figure 18).

Approximately 85 percent of the region's 2,080 farms are owned by families or individuals. Most farmland is jointly owned. In fact, nearly two-thirds of farmland is worked by co-owners,

while just over one-third of farmland is operated by a single owner. Only 2 percent of farmland is operated by tenant farmers (Table 19).⁷

As the region's farmers age and seek to continue their income while reducing their need to work, more farmland may be rented out to tenant farmers.

How farms grow food

⁷ "Census of Agriculture," USDA NASS, 2007. Some information is suppressed by the USDA.

Land

Farms operate on approximately 30 percent (291,992 acres) of the region's million acres of land (Table 18). Farmland comprises a much larger share of Niagara County's land than Erie County's, with farmland comprising 43 percent of all land in Niagara and 22 percent of land in Erie County.

As shown in Table 24, cropland comprises the largest share of all land on farms, at 73 percent. The majority (59 percent) of cropland is harvested, while 11 percent remains idle, is undergoing soil improvements, is fallow, or has failed (Table 24). Woodland and pastureland comprise 13 and 9 percent of all farmland, respectively.⁸

Chemicals

Much of Buffalo Niagara's food and agricultural products are grown conventionally, using pesticides and industrially manufactured fertilizers. As shown in Table 22, at least 25 percent of the region's farmland is treated with chemicals to prevent crop loss.⁹ Additionally, about 40 percent of farmland is treated with synthetic and non-synthetic fertilizers (119,036 acres). Only 17 percent of fertilized land is fertilized with animal manure.¹⁰ Rather, a large portion of fertilized land is fertilized with industrially manufactured fertilizers and non-manure organic matter.¹¹

Farmers use chemicals and fertilizers to protect their crops from pests and to provide soil enrichment that improves crop yield. Often, crops are treated with pesticides when an imminent pest danger looms, to ensure the farm doesn't lose the crop.¹² Industrially manufactured fertilizers are compounds composed of at least 5 percent (each) of nitrogen, potassium, and phosphorus. They are used when manure and

⁸ A small share (5 percent) of all farmland is not used as cropland, woodland, or pastureland; rather, it is likely used for other farm operations, including animal housing and feed storage, irrigation ponds, or farm-equipment storage.

⁹ A much larger share of farmland may be treated because it is likely that some farmers, for example, use only fungicides, while others use only herbicides or insecticides.

¹⁰ "Census of Agriculture," USDA NASS, 2007.

¹¹ Non-manure fertilizers could include food compost. The Agricultural Census does not separate types of non-manure fertilizers.

¹² Farmer interviews, University at Buffalo Food Systems Planning and Healthy Communities Lab.

Table 18. Agricultural acreage, 2007

	Erie	Niagara	Region
Total land area (acres)	667,315	334,628	1,001,943
Area used by farm operations (acres)	149,356	142,636	291,992
% of total land in agriculture	22	43	29

Source: "Census of Agriculture," USDA NASS, 2007.

Table 19. Land tenure of farmland in Buffalo Niagara, 2007

Land tenure	Acres	%
Part owner	181,039	62
Full owner	104,497	36
Tenant	6,456	2
Total	291,992	100

Source: "Census of Agriculture," USDA NASS, 2007.

organic compost do not provide enough nutrients to the soil.

Some people are concerned about the use of pesticides and industrial fertilizers because of the negative impacts they may have on human and ecosystem health. There are concerns that residue from pesticides, which are sprayed to poison pests, can cause diseases in humans.¹³ Additionally, there is consensus that the overuse of industrially manufactured fertilizers pollutes the region's waterways.¹⁴ In Ohio, the overuse of industrially manufactured fertilizers has partly caused the algal blooms that plague western Lake Erie in the summer, because fertilizers can wash off land after heavy rains and pollute nearby

13 "Pesticide Illness & Injury Surveillance," Centers for Disease Control and Prevention, September 11, 2013, accessed October 31, 2013, <http://www.cdc.gov/niosh/topics/pesticides/overview.html>

14 Wines, M., "Spring Rain, Then Foul Algae in Ailing Lake Erie," The New York Times, March 14, 2013, accessed October 31, 2013, http://www.nytimes.com/2013/03/15/science/earth/algae-blooms-threaten-lake-erie.html?pagewanted=2&_r=0

Table 20. Farmer characteristics in Buffalo Niagara, 2007

	N	%
Farmers	3,252	100
Male	2,116	65.1
Female	1,136	34.9
Race, all farmers	*3,252	
White	3,147	95.9
Non-white	**68	2.1
Primary occupation, principal farmers	2,080	100
Farming	1,075	51.7
Other	1,005	48.3

Source: "Census of Agriculture," USDA NASS, 2007. Some information is suppressed by the USDA.

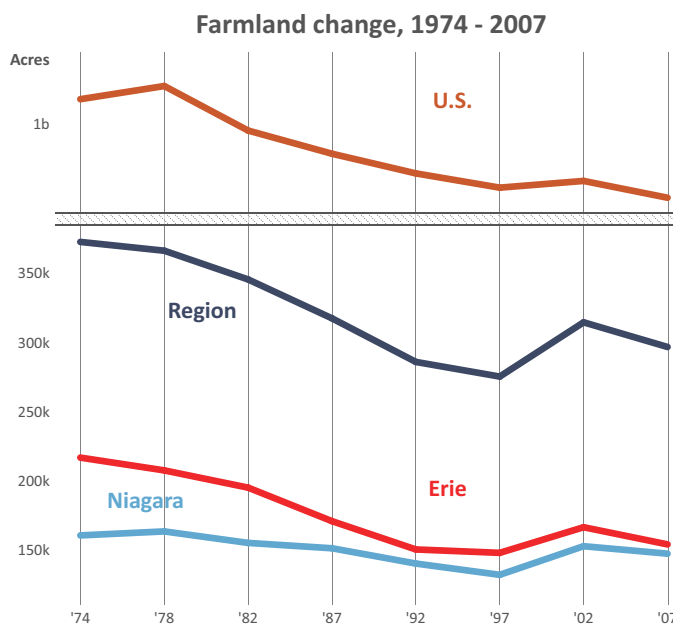
* Figures provided by the Census of Agriculture for farmer races do not sum to 3,252, **Conversations with farmers about their labor supply suggest that the numbers provided by farmers to the Census of Agriculture likely underreport the presence of Black, Hispanic, and Latino farmers because of immigration issues.

Table 21. Net revenue per farm, 2007

	Erie	Niagara	Region
Average farm revenue (\$)	23,081	29,657	25,815

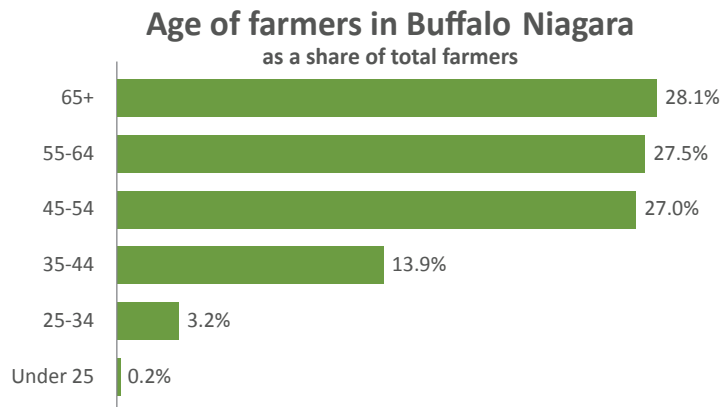
Source: "Census of Agriculture," USDA NASS, 2007.

Figure 12. Farmland acreage, 1978-2007



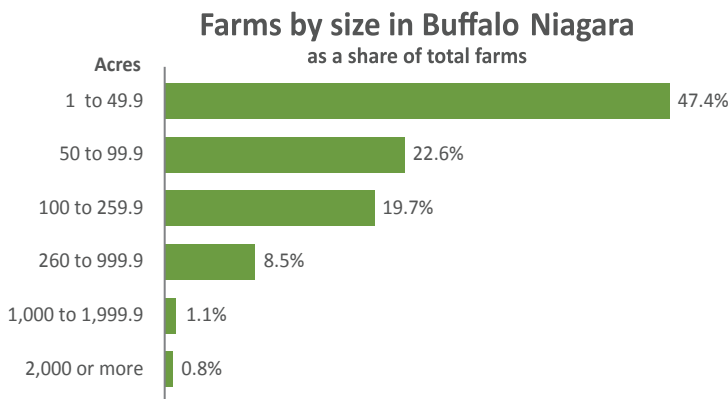
Source: "Census of Agriculture Historical Archive," USDA NASS, 1978-1987; "Census of Agriculture," USDA NASS, 1992-2007.

Figure 13. The share of farmers by age in Buffalo Niagara, 2007



Source: "Census of Agriculture," USDA NASS, 2007. Some information is suppressed by the USDA.

Figure 14. Farm size, 2007



Source: "Census of Agriculture," USDA NASS, 2007. Some information is suppressed by the USDA.

waterways.¹⁵

Concerns about the environmental impacts of food production have, in part, catalyzed the demand for organic food. Organic farming, which currently takes place on less than 2 percent of the region's farmland, is rapidly becoming more popular (Table 23).¹⁶ While twenty-two farms are already USDA Certified Organic, thirteen farms are currently transitioning to USDA Certified Organic methods (Table 23). The acreage per farm of farms transitioning to USDA Certified Organic methods is, however, small: while farms that are currently organic average 223 acres per farm, farms transitioning to organic methods average forty-four acres per farm.¹⁷ Some produce farms grow both USDA Certified Organic and conventionally produced foods to

15 Wines, "Spring Rain, Then Foul Algae."

16 "Census of Agriculture," USDA NASS, 2007.

17 Ibid.

meet the growing demand for certain organic products.¹⁸ More local farms may be using organic methods, but they are not counted among organic growers by the Agricultural Census because they are not USDA Certified Organic producers.¹⁹

Energy

The food system consumes energy. In the food system, multiple energy sources are harnessed and utilized for countless purposes. For example, in farms, gasoline and diesel fuel power tractors, trucks, and water pumps. Electricity,

18 Farmer Interviews, University at Buffalo Food Systems Planning and Healthy Communities Lab.

19 Additionally, farms selling less than \$5,000 per year and using USDA Certified Organic methods do not need to have USDA Certified Organic accreditation to use the USDA Certified Organic label on their products.

solar power, and natural gas illuminate, heat and cool barns, refrigerate milk in storage tanks, and power ice machines used to cool freshly-picked produce. Among energy users within the food system, agriculture ranks third in energy consumption, behind processors and household consumers.²⁰

New York State farms have begun using more energy, while across the nation farm energy use has declined. Specifically, New York State farms used two percent more energy in 2004 than they used in 2000, while U.S. farms used one percent less energy in 2004 than in 2000.²¹

While farms consume energy, there is an opportunity for on-farm clean energy generation. This energy is generated from wind turbines, methane digesters, and solar panels—and allows farmers to cut utility costs and increase and diversify their revenue. In New York State, 202 farms report generating energy. Fifty-eight farms have small wind turbines that generate, on average, 5 kilowatts and cost over \$22,000 to install. Most of this cost—64 percent—was covered by outside sources such as the USDA. Sixteen New York State farms have methane digesters, which collect manure and convert it to energy. These machines produce, on average, over 30 million cubic feet of methane (equivalent to 5.54 kilowatts) and cost \$1.6 million to install. Photovoltaic and thermal solar panels generate energy on 156 farms in the state—by far the most common form of on-farm energy generation. These generate, on average, 2.5 kilowatts of energy and cost just under \$22,000 to install—59 percent of which is covered by outside sources. In 2009, New York State farms that generated energy saved, on average, \$5,067 on their utility bills.²²

What the region produces

Crops

Nearly three-quarters of the region's agricultural land is used to grow crops. More than 50 percent (58 percent or 100,236 acres) of cropland grows food

20 Canning, Patrick, Ainsley Charles, Sonya Huang, Karen R. Polenske, and Arnold Waters. "Energy Use in the U.S. Food System." USDA Economic Research Service. Report Number 94 2010.

21 "Table 16—Energy input" in "Agricultural Productivity in the U.S.," USDA ERS, 2010. Accessed January 29, 2014, <http://www.ers.usda.gov/data-products/agricultural-productivity-in-the-us.aspx#.UulRhPldV8E>.

22 "On-farm Renewable Energy Production Survey," USDA NASS, 2009.

Table 22. Treated farmland in region, 2007

Treatment method	Acres	% of farmland
Fungicide	9,716	3.3
Herbicide	73,553	25.2
Insecticide	40,899	14.0
Other chemicals	4,123	1.3
Fertilizer	119,036	40.8
Manure	48,509	16.6
Non-manure fertilizer	70,527	24.2

Source: "Census of Agriculture," USDA NASS, 2007.

only for animals that are later consumed by humans (Figure 16). As displayed in Figure 16, the remaining 42 percent of agricultural land grows food for people (10 percent of all harvested cropland), food that both animals and people eat (or for industrial needs) (31 percent), and crops that are not for consumption (1 percent).²³

About 370.49 million pounds of fruits and vegetables were grown in the region in 2007 (Table 27). Of the 18,502 acres of harvested cropland that yields crops solely for people to eat, approximately 55 percent (9,872 acres) yield vegetables. About twenty-nine varieties of vegetables are grown in the region. The five vegetable crops grown in the greatest acreage in the region are soybeans,²⁴ sweet corn, head cabbage, pumpkins, and potatoes (Table 25).²⁵ More acres are dedicated to soybeans (13,165 acres) than to all other vegetables grown in Buffalo Niagara (9,872 acres), yet few people eat soybeans in unprocessed, vegetable form.²⁶

In the region, 45 percent (7,987 acres) of cropland dedicated solely to human consumption is used to grow fruit, and less than 1 percent (twenty-nine acres) is used to grow nuts. The five fruit crops grown in the greatest acreage are apples, grapes, tart cherries, peaches, and pears ("Table 28. Five vegetables and five fruits harvested in the

²³ "Census of Agriculture," USDA NASS, 2007.²⁴ Soybean acreage is not included in vegetable acreage total.²⁵ Soybeans are not grouped within the class of foods that are harvested solely for people to eat and are rarely eaten as a vegetable in the United States; however, they are added here because of their nutritional classification as a vegetable.²⁶ "Census of Agriculture," USDA NASS, 2007.

Table 23. Organic farming in Buffalo Niagara, 2007

	Acres	% of farmland	Operations	% of farm operations
Organic farming	4,909	1.7	22	1.1
In transition to organic farming	584	0.2	13	0.6
Total organic or transitioning	5,493	1.9	35	1.7

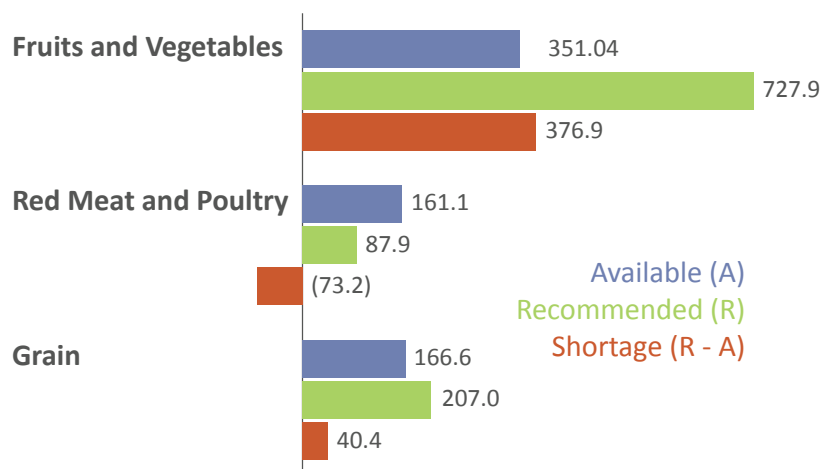
Source: "Census of Agriculture," USDA NASS, 2007.

Table 24. Uses of farmland, 2007

	Erie (acres)	Niagara (acres)	Region (acres)	% of regional farmland
Cropland	98,588	113,623	212,211	73
Harvested	81,444	90,129	171,573	59
Pasture, grazing	4,067	3,790	7,857	3
Other	13,077	19,704	32,781	11
Pastureland	17,703	9,949	27,652	9
Woodland	23,975	13,666	37,641	13
Other farmland (not used as crop, pasture, or woodland)	9,090	5,398	14,488	5
Total farmland	149,356	142,636	291,992	100

Source: "Census of Agriculture," USDA NASS, 2007.

Figure 15. Food availability versus recommended consumption



Source: "Food Availability Data System," USDA Economic Research Service.

Organic farming

Organic farming has been on the rise over the past twenty years in the United States. For many farmers, growing produce and raising animals organically offer a way to promote sustainable agricultural practices while selling products at a premium. The value of organic goods has been consistently higher than their conventional counterparts, but the cost of organic production can be higher as well. Organic farmers cannot rely on pesticides, fertilizers, or antibiotics that work to increase output and protect livestock and crops against diseases and pests. Among New York State dairy farmers, for instance, organic milk sells for 1.6 times more than conventional milk. However, when all costs, including those of paid and unpaid family labor, are considered, profit margins for New York's organic dairy farmers are actually lower than those for conventional farmers.¹

All farmers must be certified by a licensed certifier in order to market their products as organic. In New York State, one of the biggest certifying agencies is the Northeast Organic Farmers Association of New York (NOFA-NY). NOFA-NY is a statewide organization that has been advocating for local, sustainable, and organic farming in the state since 1983. Their certification wing, NOFA-NY Certified Organic, LLC, has been accredited by the USDA since the implementation of the National Organic Program in 2002. This program mandates that all farms with annual sales of over \$5,000 that wish to use organic labeling must become certified.

NOFA-NY's certification process involves the creation of an organic system plan (OSP) with the following components:²

Method: Farmers must provide a detailed description of the management and tracking of land, crops, and animals. For crop farmers, this must include information on all crops, including seed and transplant sources, land-production history, and soil and plans for soil development and crop rotation. Animal farms must also include an animal inventory, health-management plan, pasture plan, and feed-rotation information. The farm must also produce maps identifying all fields, greenhouses, and other production areas, as well

as storage, processing, and handling facilities. Farms must guarantee that there is no use of and no risk of contamination from prohibited materials such as pesticides and genetically engineered materials. This means that all fields, including those not used to grow organic goods, must be documented, and buffers between fields may be required.

Audit trail: Each farm must create and keep a record of all production, processing, and marketing activities that demonstrate that organic practices are being employed at all levels. Such records include farm and facility diagrams; records of seed origins; records for each field and the practices used in it, including maps, history, and soil, water, and crop tests; harvest records; and sales receipts.

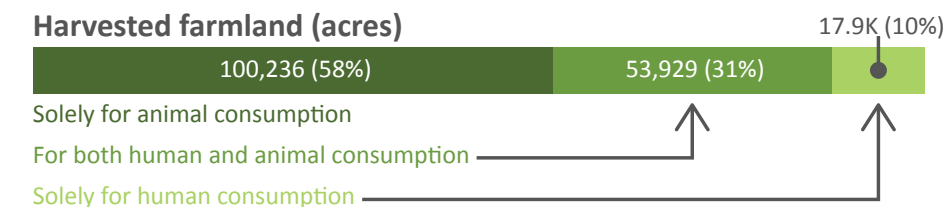
History: When first becoming certified, farms must have a detailed audit trail for at least three years prior to certification, demonstrating that the farm has followed organic practices. In order to become certified, a farm must undergo a documented conversion process that includes following all organic methods. The conversion time is three years for crop farmers and one year for animal farms. Farms can apply to have their methods and audit trail reviewed and revised before and during conversion to ensure streamlined certification at the end of the conversion period.

The costs of conversion to organic production can be considerable for farmers, although programs are in place to reduce the burden. Certification fees vary by farm size, but USDA cost-sharing grants can reduce first-time certification fees. For example, farms making \$15,000 per year can see their yearly fee reduced from \$625 to \$175, while farms making \$500,000 per year can see a reduction from \$2,275 to \$1,600. Although the USDA's Agricultural Management Assistance program provides funds of up to \$50,000 and technical assistance for conversion to organic, the conversion period—during which farmers are, for all intents and purposes, organic but cannot sell their products as such—is likely difficult for farmers to bear.

¹ "Milk Production Costs and Returns, Arms Farm Financial and Crop Production Practices," edited by U.S. Department of Agriculture Economic Research Service, 2010, accessed December 16, 2013, <http://www.ers.usda.gov/data-products/commodity-costs-and-returns/organic-costs-and-returns.aspx#.Uq9hy-KOciR>.

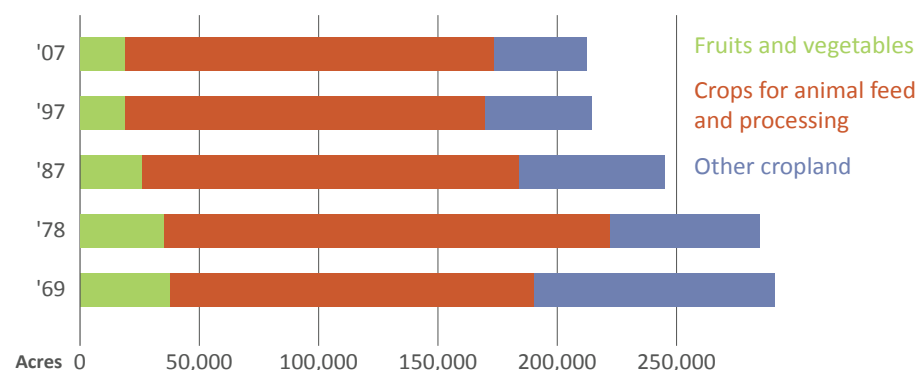
² "USDA National Organic Program Regulations & NOFA-NY Certified Organic, LLC Guidance and Policy Manuals," NOFA-NY Certified Organic, LLC, 2014, accessed February 7, 2014, <http://www.nofany.org/sites/default/files/certforms/2014%20Regulations%20Guidance%20Policy%20Manual.pdf>.

Figure 16. Acres of harvested cropland by consumption status, 2007



Source: "Census of Agriculture," USDA NASS, 2007.

Figure 17. Crop types grown in Buffalo Niagara, 1969-2007 (acres of cropland)



Source: "Census of Agriculture Historical Archive," USDA NASS; "Census of Agriculture," USDA NASS, 2007; "Census of Agriculture," USDA NASS, 2002. Crops for fodder and processing denote crops for animal consumption and crops that are generally processed, such as soybeans.

Table 25. Ten regional crops harvested in the greatest acreage, 2007

Crop	Acres
Hay	*58,627
Corn grain	31,233
Haylage	*24,378
Corn silage	23,338
Soybeans	13,165
Oats	4,744
Wheat	3,579
Apples	3,187
Grapes	2,945
Sweet corn	2,408

Source: "Census of Agriculture," USDA NASS, 2007.

* Note that the Census of Agriculture reports acres of hay and haylage harvests for land that may have been harvested more than once per season. Therefore, the acreage reported may represent one, two, or more harvests in a single year (2007).

greatest acreage" on page 46). Niagara County is home to three times the fruit-producing acreage of Erie County (6,002 acres versus 1,985 acres), likely because of its niche micro-climate created by the Niagara Escarpment.²⁷

Animal Products

Many species of animals are raised, hunted, and sold for food in the region. Approximately 760 farms with animals operate in the two counties.²⁸ Farms with cattle are the most prevalent type of animal husbandry farm in the region, with 526 farms raising cattle. More farms have beef cows than dairy cows, but dairy cows are the most prevalent cattle type in the region. In fact, 53 percent of cattle farms have beef cows, but, as Table 29 shows, dairy cows (23,534) are nearly seven times more prevalent in number than beef cows (3,507).²⁹

Next to cattle, poultry species are the second most prevalent animal type on the counties' farms (Table 29). Although numbers on many species are suppressed by the Census

27 "Census of Agriculture," USDA NASS, 2007.

28 Source: U.S. Census of Agriculture, 2007. ["Data is only available for Niagara County. Niagara County's climate is more conducive to growing tree fruit, compared to the climate of Erie County. The aggregated bearing acreage of peaches and pears in Erie County likely ranges between two and 37 acres.]

29 Ibid

IN BRIEF

PG 42 Hay is harvested in the greatest acreage of all crops, and corn grain is harvested in the second greatest acreage of all crops.

PG 39 More than 50 percent of cropland grows food only for animal consumption.

PG 43 In 2012, 11,106 wild deer were tagged in 2012—nine times greater than the number of cattle sold for slaughter in 2007.

PG 50 Farms make more revenue per acre on fruits and vegetables than on commodity crops.

PG 47 One of every three mouthfuls of food is dependent on pollination by honeybees, but the bee population is dwindling.

PG 45 Each year between 1970 and 2007, the region lost an average of nearly 500 acres of land growing fruits and vegetables. Land dedicated to growing hay, corn, grain, and other commodity crops, however, increased by 2,083 acres in that 37 year period.

Emissions in the food system

The food system also produces gas emissions that contribute to an increasingly unstable climate. Agriculture alone accounts for 10 percent of all U.S. emissions (Figure 18).¹ Moreover, global meat production contributes 14 to 22 percent of the world's total greenhouse gas emissions.² Methane, which has an impact on global warming that is twenty five times higher than that of carbon dioxide, is released most densely by ruminant animals such as cows. In western New York, dairy farming is an important piece of the economy and of local culture. Dairy farming will likely grow because of the heightened demand for yogurt and the new yogurt manufacturing plants nearby. Increases in dairy production will create more methane emissions and lead the region faster toward climate change—a concern the community must balance with its current economic well-being. It may be easier for the community to reduce its contribution to methane emissions another way: by reducing the amount of meat that each person consumes.

1 USDA, Economic Research Service using data from U.S. Environmental Protection Agency. 2014. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012, Table 2-14.

2 Fiala, Nathan, "How Meat Contributes to Global Warming," *The Scientific American*, February 4, 2009, accessed December 16, 2013, <http://www.scientificamerican.com/article.cfm?id=the-greenhouse-hamburger>.

of Agriculture, poultry farms likely raise over 10,000 birds.³⁰

Sheep, goats, and hogs are also raised, as well as deer, elk, llamas, and rabbits. The regions' farms raise nearly seven thousand head of sheep, goats, and hogs (Table 29).

Deer hunting is a western New York tradition, and for many rural families venison is a winter staple. In 2010-2011, the NYS Department of Environmental Conservation sold 163,227 sporting licenses, which include licenses for fishing, hunting, and trapping.³¹ In the region, 11,106 deer were tagged in 2012—nine times more than the number of cattle sold for slaughter in 2007.³²

Additionally, fishing is both a hobby and a source of food. Some communities, like the burgeoning refugee populations in Buffalo, commonly eat fish that they catch from the Niagara River. More about fishing in the Great Lakes can be found on page 49.

Natural sweeteners

The region produces natural sweeteners in the

30 Data on pullets and layers is suppressed by the USDA, creating the possibility that chickens—not turkeys—are raised in the greatest number.

31 License sales by county," New York State Department of Environmental Conservation, accessed December 16, 2013, <ftp://ftp.dec.state.ny.us/dfwmr/licsales>.

32 "New York State White-tailed Deer Harvest Summary, 2012," New York State Department of Environment and Conservation, Division of Fish, Wildlife & Marine Resources, accessed January 23, 2014,

forms of maple syrup and honey. Nearly 25,000 gallons of maple syrup and 28,000 pounds of honey are made in the region each year, but production is much more prevalent in Erie than in Niagara County. Twenty-five Erie operations have 21,580 maple tree taps and produce 3,005 gallons of maple syrup. In contrast, Niagara County produces much less; four operations have 1,250 taps and produce 318 gallons of syrup. Similarly, Erie produces more honey than Niagara produces. Erie is home to eighteen operators producing 27,966 pounds of honey, while Niagara has one operation producing an unreported amount of honey.

Water use in agriculture

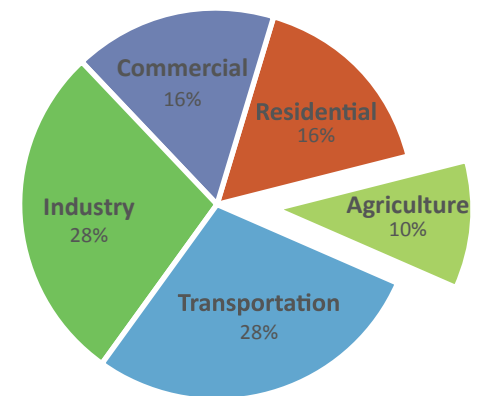
The region's farms use approximately 2.9 million gallons of water per day for irrigating crops, raising livestock, and operating aquaculture. Agricultural water use—estimated from all public and private surface and groundwater withdrawals—accounts for 0.23 percent of all water withdrawals in the region.³³

IN BRIEF

PG 43 Water used for agriculture totals only 0.23 percent of the region's total measured water use.

33 Kenny, Joan F., et al., "Estimated use of water."

Figure 18. Greenhouse gas emissions by industry



Source: "Agriculture's role in climate change: greenhouse gas emissions and carbon sequestration," USDA Economic Research Service, 2012. Accessed January 29, 2014, <http://ers.usda.gov/data-products/chart-gallery/detail.aspx?chartId=35632&ref=collection#UulQTvIdV8E>.

Water for crop production

A small share of the region's farms and cropland are irrigated (i.e., they use more water than what falls on their land as rain). Of the 2,080 farms, only 281, or 13 percent, are irrigated.³⁴ Additionally, only 6,220 acres of cropland are irrigated, which constitutes just 2 percent of farmland.^{35,36,37} This may be because much of Buffalo Niagara has a high

34 The Census of Agriculture determines irrigation use by asking producers: "Were any of the acres on this operation irrigated by sprinklers, flooding, ditches or furrows, drip or trickle irrigation, etc. in 2007?"

35 Census of Agriculture," USDA NASS, 2007.

36 It is possible that irrigated land is under-quantified. Irrigated acreage is low compared to the 17,859 acres that are currently used to grow fruits and vegetables, which can require irrigation. Consequently, it is possible that irrigation figures are under-reported to Census of Agriculture and underestimated by the USGS. The USGS methods and data are, however, relatively thorough. The USGS calculates irrigation water using the following data and methods: "Irrigation water use includes self-supplied withdrawals and deliveries from irrigation companies, irrigation districts, cooperatives, or governmental entities.... Sources of data for irrigation withdrawals and irrigated acres included State and Federal crop reporting programs.... Withdrawals also were estimated using information on irrigated crop acreages along with specific crop water-consumption coefficients or irrigation-system application rates.... Estimation methods ideally included adjustments for climatic variables, system efficiencies, conveyance losses, and other irrigation practices such as pre-irrigation. Other methods of estimating irrigation withdrawals included extrapolation of sample data on crop water-application rates or power-consumption coefficients." Source: Joan F. Kenny et al., "Estimated use of water."

37 These farms and farmlands do not include livestock farms, which use water that is not considered crop irrigation water in the Census of Agriculture.

water table.

Farms use 1.47 million gallons of water per day to irrigate 2,820 acres of cropland in Erie and 3,400 acres in Niagara (Table 26).³⁸ Most of the water used is surface water, but some comes from underground; ground water totaling 390,000 gallons per day is used to irrigate 27 percent of cropland, while 1.08 million gallons of surface water irrigates 73 percent of irrigated cropland each day.³⁹

The region's farmers generally irrigate using one of two methods: sprinklers or micro-irrigation systems. The majority of the region's irrigated cropland is watered using sprinklers (Table 26) Overhead sprinklers spray water through the air to the ground, while micro-irrigation systems apply water directly to the ground's surface or are buried beneath the ground. Micro-irrigation systems are growing in popularity for some farm types—especially orchards and vineyards—because they waste less water than overhead sprinkler systems do, uniformly distribute water, and can even reduce labor time and the amount of fertilizers used.⁴⁰ Micro-irrigation systems can be quite sophisticated, allowing the farmer to collect data about crops' water needs and to appropriately adjust watering.⁴¹

The projected changes in precipitation over the next several decades will impact agricultural water usage, possibly forcing more farmers to invest in irrigation infrastructure and to begin irrigating during dry spells.

According to local farmers farms often pay less per unit of water, for agricultural water use than residential customers pay.⁴² This is due to cheaper pricing rates for higher volumes of water consumption. Across water districts, public water usage is billed at different rates for residential and commercial parcels, and the cost for both is calculated in two general manners. In one method, a fixed price charged for a specific quantity of water declines as the quantity used increases. In the second method, water is metered—meaning one pays per quantity—or unmetered, in which users are charged at rates based on their building's size; for example, a two-bedroom house is charged

38 Farmers are incentivized to use publicly-supplied water because of the low water costs for customers withdrawing at high rates, as well as the need to adhere to market-led growing practices that demand that drinking-quality water be used for washing produce.

39 Kenny et al., "Estimated use of water."

40 Reich, D., Goodin, and I. Broner, "Micro-Sprinkler Irrigation for Orchards. Fact Sheet 4.703," Colorado State University Extension, 2013, accessed July 25, 2013, <http://www.ext.colostate.edu/pubs/crops/04703.html>.

41 Farmer Interviews, University at Buffalo Food Systems Planning and Healthy Communities Lab.

42 Ibid.

Table 26. Crop irrigation, 2005

	Erie	Niagara	Region	% of total (Region)
Withdrawals per day (thousands of gallons)	670	800	1,470	100
Ground Water	180	210	390	27
Surface Water	490	590	1,080	73
Irrigated cropland (acres)	2,820	3,400	6,220	100
Sprinkler	1,920	2,320	4,240	68
Surface irrigation	900	1,080	1,980	32

Source: Kenny, Joan F., et al., "Estimated use of water in the United States in 2005: U.S. Geological Survey Circular 1344," USGS, 2009, accessed October 10, 2013, <http://pubs.usgs.gov/circ/1344/>.

less than a four-bedroom house.⁴³

Water billing methods that provide cheap water in large quantities are likely in place to attract commercial industries that need large volumes of water to operate. The region has access to immense amounts of freshwater, which causes people to forget that water is a resource that must be conserved. While the low price of water may make business and farming cheaper here than elsewhere, it might also encourage the exhaustion of the region's water resources.

Water use for raising livestock

Water used for livestock accounts for 0.1 percent of the region's total water use (Table 30). The region's livestock farmers use almost as much water as is used by crop farms to irrigate cropland. Daily, livestock farms use 1.04 million gallons of water. Two times more water is used for livestock in Erie County than in Niagara County: Erie County livestock operations used 700,000 gallons per day and Niagara County used 340,000 gallons per day. As shown in Table 30, 65 percent (680,000 gallons per day) of water for livestock was sourced from groundwater and thirty-six percent (360 thousand gallons per day) was sourced from surface water.

Water for aquaculture

Water is also used to raise fish and shellfish for food, restoration, conservation, and

43 Two examples of different water billing methods occur in the Erie County Water District (ECWD) and in the Town of Tonawanda. In the ECWD, water is priced solely on the amount used: the more one uses, the lower the rate paid. The Town of Tonawanda applies different graduated rates to residential and commercial uses.

Table 27. Weight of Buffalo Niagara's fruit and vegetable yields, 2007

Fruit/vegetable	Lbs.
Green vegetables	466,300
Red and orange vegetables	28,032,724
Other vegetables	150,033,410
Beans and peas	30,984,156
Starchy vegetables	39,461,692
Fruit	121,518,338
Total	370,496,620

Source: "Census of Agriculture," USDA NASS, 2007 and "Annual Statistical Bulletin," USDA NASS, 2007, accessed January 24, 2013, http://www.nass.usda.gov/Statistics_by_State/New_York/Publications/Annual_Statistical_Bulletin/index.asp.

sport.⁴⁴ Water used for aquaculture, which is performed by six Erie County businesses and by an unknown number of businesses in Niagara County (Table 32), accounted for 0.005 percent of total water use in Erie County. Only Erie County used water for aquaculture, withdrawing 40 thousand gallons of water per day. As shown in Table 32, ground water supplied 50 percent (20 thousand gallons per day) of this water and the other half (20,000 gallons per day) came from surface water (Table 32).

44 Ibid.

National food availability, production trends, and nutrition

Eating fruits and vegetables is vital to health, but most people in the region don't eat enough of them. As a result, the region's population suffers from poor health at high rates. Data from the Erie and Niagara County Departments of Health indicate that only 26 percent of Erie County residents and 27 percent of Niagara County residents consume at least five servings of fruits and vegetables daily, as recommended by the USDA.^{1,2} Most of the population's diet lacks nutritional diversity, is low in nutrients, and is high in fat and cholesterol, which can lead to poor health outcomes.^{3,4} Unsurprisingly, approximately six in ten Erie and Niagara County adults are overweight or obese. Moreover, 11 percent of Erie County adults and 12 percent of Niagara County adults live with diabetes.^{5,6}

The region could fix these health problems if every person went to the store and bought fruits and vegetables to eat, right? This might put a dent in the problem, but there actually aren't enough fruits and vegetables available in the region's food supply to feed its population the recommended amounts. Across the United States, there is a mismatch between the types of food available to consumers and the types of foods necessary for a healthy diet. Only one-half of the recommended daily servings of fruits and vegetables is available in the U.S. food supply, whereas red meat and poultry are available at about twice the rate recommended for healthy eating (Figure 15).⁷ The limited availability of fruits and vegetables is tied to numerous factors, including food-industry practices, consumer preferences, market trends, and government incentives that make growing fruits and vegetables less viable for farmers than growing other products.

One reason the country currently faces limited fruit and vegetable availability is because major changes have occurred in the types of food it

produces. Throughout the twentieth century, the region's farms dramatically shifted away from growing fruits and vegetables and towards producing commodity crops, which are primarily used in processed foods and for animal feed. In 1940, fruit and vegetable farming comprised the majority of the region's crop production, with about four times more acreage dedicated to them than to other crops.⁸ Since then, however, the situation has reversed. While farmland in the region dropped by 26 percent between 1970 and 2007, land dedicated to growing fruits and vegetables fell even faster. On average, the region lost nearly 500 acres of land growing fruits and vegetables every year. Land dedicated to growing hay, corn, grain, and other commodity crops, on the other hand, actually increased by 2,083 acres in that same time period (Table 25). Land dedicated to soybean production, for example, has grown from 194 acres in 1970 to over 13,000 acres today, eclipsing fruits and vegetables in land area in that time. Hay is now the most widely grown crop in the region, covering over 36 percent of cropland.

The rise of commodity crops in the region is likely due to their stable price, relatively low labor demands, and the governmental and industrial support networks that make them more economically reliable. Fruits and vegetables, on the other hand, are increasingly imported from elsewhere due to the limited growing season coupled with year-round demand and high domestic labor costs.

1 "Erie County, New York 2010-2013 Community Health Assessment," Erie County Department of Health.

2 "2010-2013 Community Health Assessment," Niagara County Department of Health

3 "Dietary Guidelines for Americans," USDA, 2005, Accessed July 2008, <http://www.health.gov/dietaryguidelines/dga2005/document/html/chapter2.htm>

4 "Fact Sheet No. 9.319," Bellows and Moore.

5 "Erie County, New York 2010-2013 Community Health Assessment," Erie County Department of Health

6 "2010-2013 Community Health Assessment," Niagara County Department of Health

7 "Food Availability Data System," USDA Economic Research Service, 2012, accessed July 2013, [http://www.ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system.aspx](http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system.aspx)

8 "Food Availability Data System," USDA Economic Research Service, 2012, accessed July 2013, [http://www.ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system.aspx](http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system.aspx)

Farm economics

Revenue

Sale of agricultural products comprises a majority (92 percent) of farm revenue. Farms also make a small amount of money from several other sources (Table 31). Government payments total just over \$4 million and Commodity Credit Corporation loans bring over \$2 million to the region's farmers. Revenues from patronage and participation in co-ops comprise \$1.8 million of the \$239 million in total revenue.⁴⁵

Farm sales vary by type of farm product. In 2007, Buffalo Niagara farmers sold nearly \$221 million in agricultural products. Sales from livestock and poultry in the region comprise almost 54 percent of farm sales, but the majority of that revenue comes from milk and dairy products, which comprise 74 percent of livestock and poultry revenue, or 40 percent of all farm sales.

Interestingly, Erie County farmers garner the most revenue from livestock sales, about \$88 million, while Niagara County farmers reap the most from crop sales: sales of livestock and poultry comprise a much greater share of Erie's sales (64 percent) than Niagara's sales (41 percent), while crop sales (including grains, oilseeds, dry beans, and dry peas) bring in a greater share of Niagara's sales (59 percent) than Erie's (36 percent) (Table 33).

Fruit and vegetable sales comprise 12 and 13 percent, respectively, of all farm sales. Fruits sold for \$27 million, while vegetables sold for \$28 million. Field crops, such as grains, oilseeds, and dry beans, and dry peas, bring less revenue per acre, compared with fruits and vegetables. Grains, oilseeds, dry bean, dry peas make up only 9 percent (\$18.7 million) of all farm product sale revenues, even though crops in this group are grown in large acreage in the region. They are popular to grow and have a low value per acre partly because they require much less labor and farm worker skill—which farmers have identified as challenges to their businesses—than fruits and vegetables require.⁴⁶

Nearly all farm sales are made to intermediaries rather than directly to individual consumers, meaning that farms share revenue from food sales with myriad other businesses. Less than

⁴⁵ "Census of Agriculture," USDA NASS, 2007.

⁴⁶ Farmer Interviews, University at Buffalo Food Systems Planning and Healthy Communities Lab.

Table 28. Five vegetables and five fruits harvested in the greatest acreage, 2007

Crop	Acreage harvested or bearing
Vegetables	18,927
Soybeans	13,165
Sweet corn	2,408
Head cabbage	2,398
Pumpkin	536
Potato	420
Fruit	7,391
Apple	3,187
Grape	2,945
Tart cherry	508
Peach	*488
Pear	*263

Source: "Census of Agriculture," USDA NASS, 2007

*Data are only available for Niagara County. Niagara County's climate is more conducive to growing tree fruit than is the climate of Erie County. The aggregated bearing acreage of peaches and pears in Erie County likely ranges between two and thirty-seven acres

Table 29. Farms with animals and head of animals sold, 2007

	Number of farms with inventory	Inventory
Cattle and calves	526	51,735
Beef	280	3,507
Milk	162	23,534
Sheep and goats	320	3,654
Sheep, including lambs	83	2,210
Goats	147	1,444
Meat goats	110	917
Milk goats	54	312
Angora goats	7	43
Hogs and pigs	93	2,434
Deer	8	166
Elk	4	32
Alpacas	35	468
Llamas	19	161
Mules, burros, and donkeys	86	177
Rabbits	74	699
Poultry	197	NA
Turkeys	26	*57
Broilers	43	9,271
Layers	163	NA
Ducks, geese, and other poultry species	82	NA

Source: "Census of Agriculture," USDA NASS, 2007

*Numbers suppressed for Erie or Niagara County

Greenhouse growing

Greenhouses and nurseries are a notable part of local food production. While data on greenhouse production are limited for the region, there are sixty-seven nurseries in the region, with nearly \$6.5 billion in annual sales. Six tomato operations and one herb operation exist. In addition, sixteen farms grow transplant strawberry and vegetable crops. Nearly 63,000 square feet are dedicated to growing transplant crops under cover, with sales of nearly \$165,000 annually.¹

¹ "Census of Agriculture," USDA NASS, 2007.

The importance of bees and farm crop diversity to sustaining food production.

One of every three mouthfuls of food is dependent on pollination by honeybees. Although honeybees are not the only pollinators that are important to agriculture, their role in commercial agriculture is critical to the success of America's fruit and vegetable growers. In North America, honey bees alone pollinate nearly ninety-five kinds of fruits.¹ In New York, crops such as blueberries, cranberries, pumpkins, tomatoes, potatoes, apples, and pears depend on honeybees for pollination or produce higher yields when pollinated by bees.² Of the one-hundred crop varieties that provide 90 percent of the world's food, seventy-one are pollinated by bees of both wild and honey varieties.

Honeybees are employed across the country on large scales to pollinate commercial crops. Honeybee colonies, however, have dropped from a peak of five million in 1940 to 2.5 million today.³ Colony Collapse Disorder (CCD) has nearly put commercial beekeepers out of business. CCD is the term used to describe hives that adult bees have abandoned, with food and young (brood) still intact.⁴ The causes of CCD are not entirely clear, but evidence points to pesticides called neonicotinoids and pests such as the ectoparasitic mite, which bring viruses harmful to honeybees.⁵

Bees are healthiest when they take in nutrients from a variety of sources. Pollen from a variety of flowering plants is essential to maintain a diet that is nutritionally adequate. Without a diverse and nutritional diet, bees become susceptible to pathogens, parasites, and other stressors including pesticides.⁶ Poor bee nutrition can result from changes in the ways farms use land. For example, converting land on which a diverse array of crops is grown to land on which only corn is grown can be detrimental to bee nutrition. Additionally, the loss of open foraging areas with wild or maintained flowers may be killing bees.

CCD has affected commercial beekeeping businesses, services that are vital to producing the food that we purchase and consume every day. Commercial beekeepers rent out their hives to farmers across the country. Hives are loaded on semi-trucks and driven across the country, where bees are released into the fields to pollinate crops. According to Cornell University, Jim Doan, a commercial beekeeper of Hamlin, NY, at one point had 6,000 colonies that pollinated 10 percent of apples grown in New York State.⁷ However, after the 2013 winter pollinating season in Florida, Mr. Doan brought 1,100 hives back to New York State, of which only 300 remain. Cornell University reports that Mr. Doan has suffered setbacks like this before, but this loss marks the end of the commercial beekeeping business his family has run since the 1930s. Losses like Mr. Doan's are not unique to New York or even to North America; CCD is occurring around the globe. Without honeybees, crop production and quality will suffer and so will access to healthy, fresh fruits and vegetables.

The honeybee is just one of 3,000 bee species in North America, with 450 species living in the eastern United States alone.⁸ Research on the role of wild pollinators is increasing as CCD becomes more widespread. This research, although in its early stages, indicates that wild bees contribute significantly to crop pollination.⁹ As part of this research, a long-term study is underway to understand the role of wild pollinators and the elements of the landscape and of crop management that attract wild bees and keep them pollinating. Greater knowledge about the relationship between wild pollinators and crop production is essential to keeping crop production and yields high enough to feed the world.

1 Pollinators & Pesticides, Center for Food Safety, 2013, <http://www.centerforfoodsafety.org/issues/304/pollinators-and-pesticides#>.

2 "Wild Pollinators," Cornell University College of Agriculture and Life Sciences, accessed August 22, 2013, <http://entomology.cals.cornell.edu/extension/wild-pollinators>

3 Pollinators & Pesticides, Center for Food Safety.

4 Ratniek, F.L., and N. L. Carreck, "Clarity on Honey Bee Collapse?" *Science*, 2010, 327(5962): 152-153.

5 Ibid. and C. Woteki, "The Road to Pollinator Health," *Science*, 2013, 341(6147): 695.

6 "Report on the National Stakeholders Conference on Honey Bee Health," United States Department of Agriculture, 2012, accessed January 23, 2014, <http://www.usda.gov/documents/ReportHoneyBeeHealth.pdf>.

7 Walsh, B. "Plight of the Honeybee: Mass deaths in bee colonies may mean disaster for farmers--and your favorite foods," *Time Magazine*, August 9, 2013, accessed January 24, 2014,

8 "Wild Pollinators," Cornell University College of Agriculture and Life Sciences.

9 Ibid.

2 percent of all agricultural product sale revenues result from direct sales at places such as farmers' markets, farm stands, CSAs, or U-picks (Table 31).⁴⁷

Farm expenditures

Farm expenses total about \$176 million per year (Table 34). This is approximately 80 percent of yearly farm revenues and averages to about \$84,615 per farm. More farms, however, experience net financial loss than net financial gain, with 59 percent of farms showing net loss and 41 percent of farms showing net gain in 2007.

The largest expense for farmers is hired labor (see Farm Labor sidebar, pg. 52),⁴⁸ which totals nearly \$34 million per year—19 percent of all farm expenses (Table 34). As shown in Table 35, nearly one-quarter of farms employ hired workers. Thirteen percent of hired workers are seasonal, while another 18 percent work more than four months per year. On average, each farm employing hired labor spends nearly \$70,000 per year to pay hired laborers, which factors to approximately \$8,788 per hired worker. Conversely, contract and migrant laborers are employed by fewer farms and comprise a very small share of farm expenditures: five percent of farms employ contract laborers and 4 percent employ migrant laborers. It is likely that many migrant workers toil at fruit and vegetable farms, which struggle to find qualified local laborers.⁴⁹

Other major expenses are purchase of animal feed and supplies. Many of these expense categories—animal feed, fuel, fertilizers, and chemicals—are tied to the industrialization of farming. Animal feed is the second greatest expense faced by farmers and comprises 14 percent of all farm expenditures (\$25 million). In Niagara County, a larger share of farm expenditures is spent on chemicals than in Erie County, likely because crops are a larger focus than livestock in Niagara County. Lastly, depreciation and supplies and repairs both consume over 10 percent of farm expenditures.⁵⁰

B. A profile of food processing and wholesale

Food processing

⁴⁷ "Census of Agriculture," USDA NASS, 2007

⁴⁸ Hired labor includes all farm workers hired by a farm. Contract labor expenses, on the other hand, include payments made to any organization that supplies a crew of laborers to work on the farm.

⁴⁹ Farmer Interviews, University at Buffalo Food Systems Planning and Healthy Communities Lab.

⁵⁰ "Census of Agriculture," USDA NASS, 2007

Table 30. Livestock water withdrawals, 2005

	Erie	Niagara	Region	% of total (Region)
Withdrawals per day (thousands of gallons)	700	340	1040	100
Ground Water	460	220	680	65
Surface Water	240	120	360	35

Source: Kenny, Joan F., et al., "Estimated use of water in the United States in 2005: U.S. Geological Survey Circular 1344," USGS, 2009, accessed October 10, 2013, <http://pubs.usgs.gov/circ/1344/>.

Table 31. Farm revenue by source, 2007

Source	Erie		Niagara		Region	
	\$	% of total	\$	% of total	\$	% of total
Animal sales	75,404	59.7	42,893	37.8	118,297	49.3
Crop sales	41,627	32.9	60,752	53.5	102,379	42.7
Farm sources	5,132	4.1	4,842	4.3	9,974	4.2
Government payments	2,222	1.8	1,895	1.7	4,117	1.7
Insurance	185	0.1	477	0.4	662	0.3
Patronage and co-ops	1,137	0.9	672	0.6	1,809	0.8
CCC loans	501	0.4	1,770	1.6	2,271	0.9
Rent	305	0.2	154	0.1	459	0.2
Total	126,401	100.0	113,455	100.0	239,856	100.0

Source: "Census of Agriculture," USDA NASS, 2007

Table 32. Aquaculture water withdrawals, 2005

	Erie	Niagara	Region	% of total (Region)
Withdrawals per day (thousands of gallons)	40	0	40	100
Ground Water	20	0	20	50
Surface Water	20	0	20	50

Source: Kenny, Joan et al., "Estimated use of water in the United States in 2005: U.S. Geological Survey Circular 1344," USGS, 2009, accessed October 10, 2013, <http://pubs.usgs.gov/circ/1344/>.

Food processors use agricultural inputs to manufacture new goods for consumption, such as bread, wine, and dairy products. In Erie and Niagara Counties, food processors are prevalent (Figure 19) and comprise seven major industries, each of which encompasses a specific link in the food system between farmers and distributors/aggregators/consumers. These food industries are animal slaughtering and processing; bakeries and tortilla manufacturing; beverage

manufacturing; dairy product manufacturing; fruit and vegetable preserving and specialty food manufacturing; grain and oilseed milling; sugar and confectionary product manufacturing; and other processing, which includes seafood and animal feed processors. Tables 36, 37, and 38 detail the region's food-processing employment and sales.

The region is home to 252 food processors employing 6,010 people and

Great Lakes fishing¹

Buffalo Niagara borders two Great Lakes filled with freshwater fish, but only a handful of commercial fisheries from New York State still fish in Lakes Erie and Ontario. Human intrusions in the ecosystem, invasive species, competing lake uses, and lake geography all play a role in the decline of commercial fishing.

More than one hundred years of overfishing—and the poor regulation that enabled it—has depleted the Great Lakes' native fish populations.² Moreover, pollution has poisoned lake food chains and invasive species, such as rainbow smelt, have entered the ecosystem.

In the latter part of the twentieth century, competition from recreational anglers further squeezed commercial fishing. Sport fishers were concerned about the effects of a century of overfishing and feared that the continued use of gill nets—which kill more than the intended catch and were the net used most commonly by commercial anglers—would further exhaust the lakes' fish populations. In 1986, New York State settled the contest by prohibiting the sale and purchase of walleye, one of the most commonly caught fish.³ Additionally, the state prohibited fisheries from using gill-nets in Lake Erie and limited the future of commercial fishing in Lake Ontario by allowing only fisheries that held gill net permits before January 1, 1986, to use gill nets.⁴ These laws dealt a blow to the state's commercial fisheries because they prohibited the sale and purchase of one kind of regularly caught fish and drastically limited the most common method that commercial fisheries used to catch fish.

With the 1986 laws, the remaining Lake Erie gill-net fisheries were bought out by the state. Today, two Buffalo Niagara fisheries are still in business, using trap nets to catch an estimated 15,000 to 17,000 pounds of Lake Erie's yellow perch annually.⁵ Other New York State-based fisheries work in Lake Ontario, but they operate outside of Erie and Niagara Counties.⁶ Canadian commercial fisheries, however, which have catch limits,

continue to use gill nets as the primary method of harvesting fish in Lake Erie. Most of Lake Erie's Canadian fisheries' catch comes from the western basin, around Wheatley and Kingsville.⁷ A large share of walleye caught in those waters by Canadian fisheries is sold for consumption in the United States.⁸

The geography of Lakes Erie and Ontario also influences the viability of commercial fishing. Historically, the commercial fishing industry was small on the eastern side of Lake Erie because the most productive fishing areas are in the center and on the western side, where the lake is nutrient-rich and shallow. The eastern basin, nestled in New York State waters, is not very productive. Today, the eastern basin could sustainably support a larger fishery than it currently hosts, but its economic impact would be small in comparison to fisheries in other parts of the lake.⁹

The likelihood of gill-net licenses and walleye sales becoming legal once again is small. First, recreational angling groups around Lake Erie are powerful because of the economic boost that their sport brings to the state in fishing license sales, taxes on gear sales, and food sales in waterfront communities. Second, commercial anglers have little voice because participation in their trade has dwindled over the decades. Lake Ontario may not face the same barriers because the lake's U.S. region is less densely inhabited than Erie's, and pressures from recreational anglers are not as strong.

Still, the return of limited commercial fishing may not be the only way local residents can eat locally caught fish. Many sport fishers sell their catch. Although selling some species of fish is illegal and the state cannot regulate it, this provides local residents with fresh fish and gives local fishers extra income. There may be opportunities for policy changes that manage the fishery to ensure its sustainability and bring recreational fishers into the conventional food system without causing conflict with sport fishermen.

1 "License sales by county," New York State Department of Environmental Conservation.

2 "Ontario's Commercial Fisheries Policies," BiodiversityOntario.com, November 29, 2011, accessed June 25, 2013, <http://biodiversityontario.com/ontarios-commercial-fisheries-policies/>.

3 New York State Environmental Conservation Law, §§ 11-1319.2a.

4 New York State Environmental Conservation Law, §§ 11-1503.

5 Donald Einhouse (Department of Environmental Conservation) in discussion with Jessica Hall, June 25, 2013.

6 Steven LaPan (Department of Environmental Conservation) in discussion with Jessica Hall, June 28, 2013.

7 "Great Lakes Fisheries: Commercial Fisheries," Ontario Ministry of Natural Resources, June 8, 2012, accessed February 10, 2014, http://www.mnr.gov.on.ca/en/Business/GreatLakes/2ColumnSubPage/STEL02_173913.html#Commercial_Fisheries; "Lake Erie Fishermen Suing Government Over Quotas," *The Windsor Star*, September 18, 2007.

8 Donald Einhouse (Department of Environmental Conservation) in discussion with Jessica Hall.

9 Ibid.

IN BRIEF

PG 49

Buffalo Niagara farmers sell nearly \$221 million in agricultural products per year.

PG 48

In 2007, 59 percent of farms experienced net loss, and 41 percent of farms showed net gain.

PG 48

The largest expense most farms incur is paying farm laborers.

making approximately \$1.8 billion in annual sales. In terms of the number of businesses and employees, the largest processing sector in both counties is bakeries and tortilla manufacturing. Throughout the region, however, sales are highest among animal slaughtering and processing (22 percent of sales) and dairy product businesses (30 percent of sales).⁵¹

Erie County has a larger share of sales and employees in dairy and animal processing (Tables 37 and 38) compared with Niagara County. Dairy cow operations are numerous in the region, and Erie County processors extend the economic viability of local producers in the region's economy. Conversely, Niagara's beverage and bakery and tortilla manufacturers comprise a much higher share of all food-processing sales and employees than in Erie County. In Niagara County, beverage manufacturing is the strongest sector among food processors, accounting for nearly 53 percent of all processing sales, or 54.8 million dollars. Bakeries and tortilla manufacturers are numerous and account for the third highest sales among processors in the county.⁵²

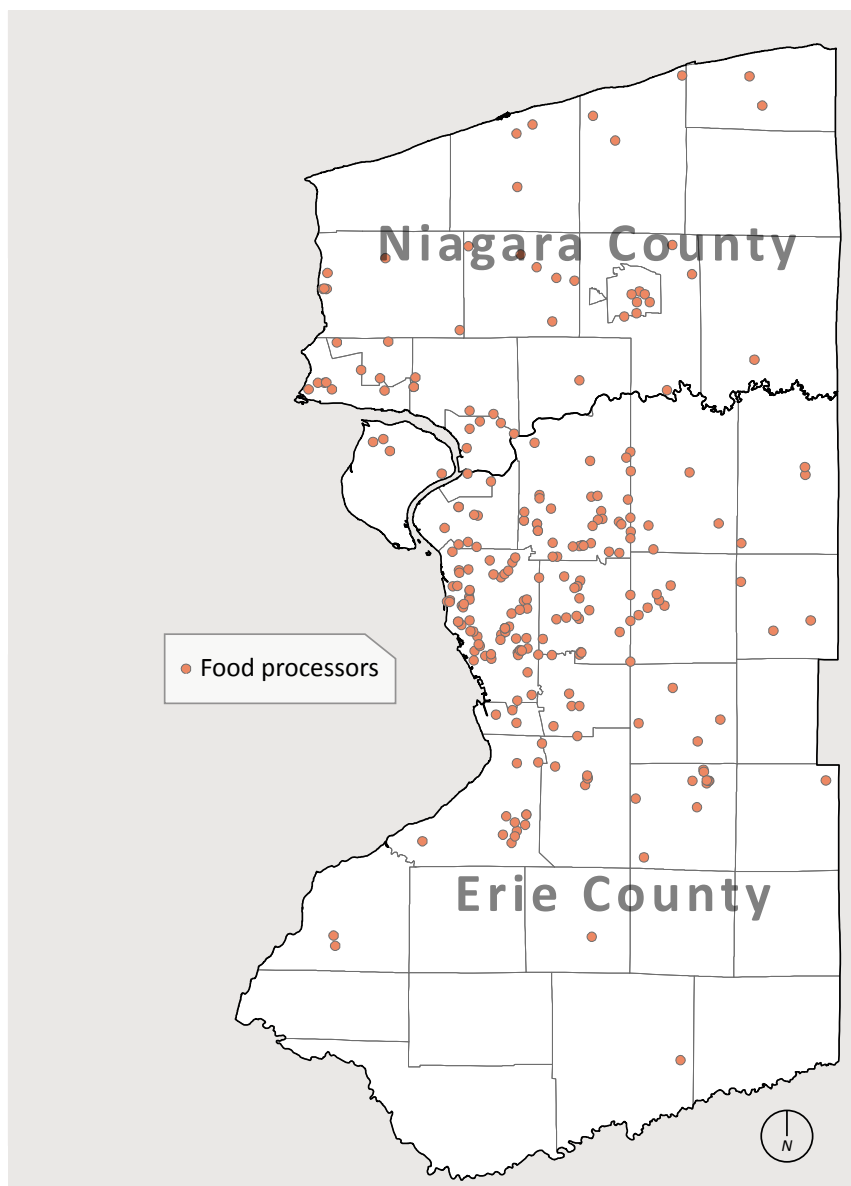
Wholesale of food

The Buffalo Niagara region is an ideal for food wholesalers because of its location on the U.S.-Canada border and its access to prominent interstate and international freight and shipping

⁵¹ ReferenceUSA, 2013.

⁵² ReferenceUSA, 2013.

Figure 19. Buffalo Niagara food processors, 2012



Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

routes, including the Great Lakes. While wholesalers are positioned to compete beyond the region, they can strengthen connections in the local food system by making markets more accessible to local farms and by reducing the price of healthy, local food.

Wholesale operations receive food from producers and processors and sell it to consumers and distributors, such as supermarkets, grocery stores, or fruit and vegetable markets. Wholesalers often specialize in a range of products—such as frozen food, meat, fish and seafood, dairy, and fresh fruit—which

they aggregate and distribute. The region is home to 159 wholesale operations with 4,800 employees and \$3.5 billion in sales in 2012 (Table 40). The majority of these businesses are located along major transportation routes in Erie County, where most of the employment and sales are concentrated (Figure 20).⁵³

The region's wholesalers vary in size, employment, and sales, as shown in Table 39. Most wholesale businesses (nearly 70 percent) are between 10,000 and 39,999 square feet in size, but

⁵³ Ibid.

Table 33. Farm sales (thousands of dollars), 2007

Product	Erie		Niagara		Region	
	\$	% of total	\$	% of total	\$	% of total
Livestock and poultry	75,404	64.4	42,893	41.4	118,297	53.6
Milk and dairy	51,451	44.0	37,118	35.8	88,569	40.1
Cattle and calves	6,302	5.4	4,806	4.6	11,108	5.0
Hogs and pigs	210	0.2	97	0.1	307	0.1
Sheep, goats, and products	84	0.1	96	0.1	180	0.1
Equine	NA	NA	160	0.2	160	0.1
Aquaculture	23	0	0	0	23	0
Other animals and products	968	0.8	130	0.1	1,098	0.5
Crops	36,652	31.3	47,026	45.4	83,678	37.9
Nursery, greenhouse, floriculture, and sod	17,690	15.1	1,603	1.5	19,293	8.7
Vegetables (including soybeans)	10,589	9.0	16,673	16.1	27,262	12.4
Fruits, tree nuts, and berries	6,317	5.4	22,459	21.7	28,776	13.0
Grains, oilseeds, dry bean, dry peas	4,975	4.3	13,726	13.2	18,701	8.5
Direct sales	1,703	1.5	2,585	2.5	4,288	1.9
Total	117,031	100.0	103,644	100.0	220,675	100.0

Source: "Census of Agriculture," USDA NASS, 2007.

Table 34. Farm expenditures in Erie Niagara, 2007

Product	Region	
	\$	% of total
Hired labor	33,615	19.1
Animal feed	25,211	14.3
Supplies and repairs	19,207	10.9
Depreciation	17,676	10.2
Seeds and plants	10,358	5.9
Fuels	10,498	6.0
Real estate and property taxes	9,310	5.3
Utilities	8,097	4.6
Interest	7,305	4.1
Fertilizers	12,811	7.3
Rent, cash, buildings, etc.	5,158	2.9
Chemicals	6,638	3.8
Animal expenditures (including breeding)	4,905	2.8
Contract labor	1,909	1.1
Total	176,366	100.0

Source: "Census of Agriculture," USDA NASS, 2007.

these account for just 23 percent of food wholesale employment and 33 percent of sales. The largest wholesalers (40,000 square feet and above) are the fewest in number but generate most of the employment (75 percent) and sales (63 percent). The region's smallest wholesalers also had the smallest share of wholesale employees and sales, with total sales in 2012 of \$140 million and 138 employees.⁵⁴

C. A Profound of food distribution

The final step in the transfer of food from producers and processors to consumers in Erie and Niagara Counties is its distribution through retailers, restaurants, farmers' markets, schools,

and other sources. Food distribution in its many forms is the primary way that the public acquires food. As such, major considerations in understanding food distribution include the location and accessibility of food sources for consumers; the price, healthfulness, and diversity of food options provided; and the connections to the local food economy that are fostered through distribution, including the sourcing and purchasing of food. This section describes the region's food system as food passes to consumers through retail, food service, institutional, emergency, and direct marketing food providers.⁵⁵

⁵⁵ Information on food retailers and food service businesses was identified by NAICS codes using the ReferenceUSA database. Data on other distributors were gathered from a variety of sources.

Food retail

Food retail in Erie and Niagara Counties is varied, as people access foods at multiple types of vendors—from supermarkets and farm stands to general merchandise and corner stores (Tables 42, 43 and 44). Retail locations, which most commonly sell fruits and vegetables, are scarce, while the most abundant stores primarily sell food low in nutrients and high in calories.

In the region in 2012, 1,984 food retailers employed 31,334 people and sold \$6.78 billion in food products (Table 42). Erie County, with 81 percent of the region's population, hosts most food-retail businesses and employees. Erie County food retailers sold about \$515 billion worth of goods in 2012. In fact,

⁵⁴ Ibid.

Farm Labor

Farmers often bemoan the low supply of experienced farm workers in the region. Labor costs comprise the largest share of farms' total expenses, so guaranteeing consistent and skilled workers is important to the overall viability of an operation. On fruit and vegetable farms, especially, the quality of the produce is tied to the way it is harvested.

A large share of farm workers in the country—over 50 percent between 2002 and 2012 according to one survey¹—are undocumented immigrants. The temporary guest worker program, through the H-2A visa, was created to reduce undocumented farm labor and make up for a shortage of domestic workers by giving those in other countries an avenue to legally work on farms for a short period of time. The program allows farms to contract foreign workers for up to one year to fill demonstrated shortages of American workers. Employers must demonstrate that there are not sufficient able, willing, and qualified U.S. workers available and that employment of H-2A workers will not adversely affect the wages and working conditions of American workers. This means that wages for H-2A workers are set at an “Adverse Effects Wage Rate” which at \$10.91 per hour in New York State is 50 percent higher than the current minimum wage for farm work of \$7.25. Employers must provide workers either three meals per day or free and convenient cooking and kitchen facilities, and housing must be provided to employees who cannot reasonably return to a permanent residence at the end of the work day. Transportation expenses must be paid by the employer, and all costs of entering the country, including travel costs, visa fees, border crossing, and application fees, are the responsibility of the employer. At the end of the work contract, employees must either return to their country or find employment elsewhere. This means that guest workers cannot form a consistent employee base for farmers. For workers, the H-2A program

presents an opportunity to work in the U.S. on a strictly temporary basis and does not offer a path to a consistent job or to permanent residency. They can remain in the U.S. for no longer than three years continuously. After that time, the employee must return to his or her own home country for at least three months.

Guest workers make up the smallest portion of U.S. farm workers. In 2009, fewer than 2 percent of farm workers were on H-2A visas, while 20 percent had Green Cards, and 27 percent were citizens. While Green Cards are more common than guest worker visas for farm workers, the program is not set up to promote stable immigrant farm labor. Its purpose is to provide legal residency for people with family members who are U.S. citizens, people who work in permanent (i.e., non-seasonal) jobs and whose employers act as a sponsor, and refugees and asylum seekers. A small number of Green Cards are issued in a lottery to those coming from countries where immigration to the U.S. is low. There are no provisions for temporary farm workers under the Green Card program, and currently, those with H-2A visas cannot gain permanent residency as part of their work.

Legal avenues for immigrant farm work in the U.S. are restricted and incentivize a reliance on undocumented labor. Undocumented farm workers earn on average around \$10,000 less per year than documented or U.S. citizen farm workers earn. They are not guaranteed the salary, living standards, or fair treatment that documented and domestic workers can expect. While the H-2A program offers non-citizens who cannot get a Green Card an opportunity to earn a salary in the U.S. and offers farms access to skilled workers, the program is clearly not working to reduce undocumented labor. The costs to farmers who want to employ guest workers are considerable. The program is designed as a last resort, and while it encourages the hiring of domestic workers, it is not creating opportunities for farmers and workers who need them.

¹ National Agricultural Workers Survey, U.S. Department of Labor, 1989-2012.

Table 35. Farm labor in Buffalo Niagara, 2007

Hired labor	
Operations employing hired laborers	488
Share of total operations at which hired laborers are employed (%)	23
Number of hired laborers	3,825
Average number of hired laborers/operation	8
Expenditures on hired labor (\$)	33,615,000
Expenditures on hired labor/operation (\$)	68,883.
Expenditures per hired laborer	8,788
Contract labor	
Number of operations employing contract laborers	101
Share of total operations at which contract laborers are employed (%)	5
Expenditures on contract labor (\$)	1,909,000
Contract labor expenses/operation (\$)	18,901
Seasonality of hired labor	
Number of hired laborers working more than 150 days/year	1418
Share of operations at which hired laborers work more than 150 days/year (%)	13
Number of hired laborers working less than 150 days/year	2407
Share of operations at which hired laborers work less than 150 days/year (%)	18

Source: "Census of Agriculture," USDA NASS, 2007

Table 36. Buffalo-Niagara Food Processing, 2012

Processor	N	%	Employees	% of Employees	Sales (\$1000)	% of Sales
Bakeries and Tortilla Manufacturing	148	58.7	1,870	31.1	173,586	9.5
Beverage Manufacturing	28	11.1	413	6.9	217,073	11.9
Other Processing	27	10.7	240	4.0	78,259	4.3
Sugar and Confectionary Product Manufacturing	16	6.4	612	10.2	135,656	7.4
Animal Slaughtering and Processing	14	5.6	600	10.0	401,886	22.0
Fruit and Vegetable Preserving and Specialty Food Manufacturing	9	3.6	1,516	25.2	161,682	8.9
Dairy Product Manufacturing	5	2.0	639	10.6	550,913	30.2
Grain and Oilseed Milling	5	2.0	120	2.0	107,469	5.9
Total	252	100	6010	100.0	1,826,524	100.0

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

IN BRIEF

PG 48 Two-hundred-fifty-two food processors make \$1.8 billion per year.

PG 50 Animal slaughtering and dairy-manufacturing sales comprise over 50 percent of all processors' sales.

PG 50 Bakery and tortilla manufacturing, as well as fruit and vegetable preserving, employ the largest portion of food-processing employees.

PG 50 One-hundred-fifty-nine food wholesalers report 3.5 billion in sales.

PG 51 Large wholesalers dominate food wholesaling sales and employment.

83 percent of the region's food-retail employees and 82 percent of food-retail businesses, or 81 percent, in total sales in 2012 are in Erie County.⁵⁶

The most numerous food retailers in the region are convenience stores. Convenience stores account for over 46.8 percent of food-retail businesses throughout the region. Convenience stores make up a larger share of food retail in Niagara than in Erie County; over 45 percent of food retail outlets in Erie County and nearly 53 percent of food retail outlets in Niagara County are convenience stores. Sales and employment in convenience stores are second only to those of supermarkets in both counties. In Erie County, convenience stores have 32.1 percent of the total employees and 35.7 percent of the total sales in food retail, with sales totaling \$1.98 billion in 2012 (Table 43). In Niagara County, they make up 33.2 percent of the total employees and 39.4 percent of total sales, with sales of \$489

⁵⁶ ReferenceUSA, 2013.

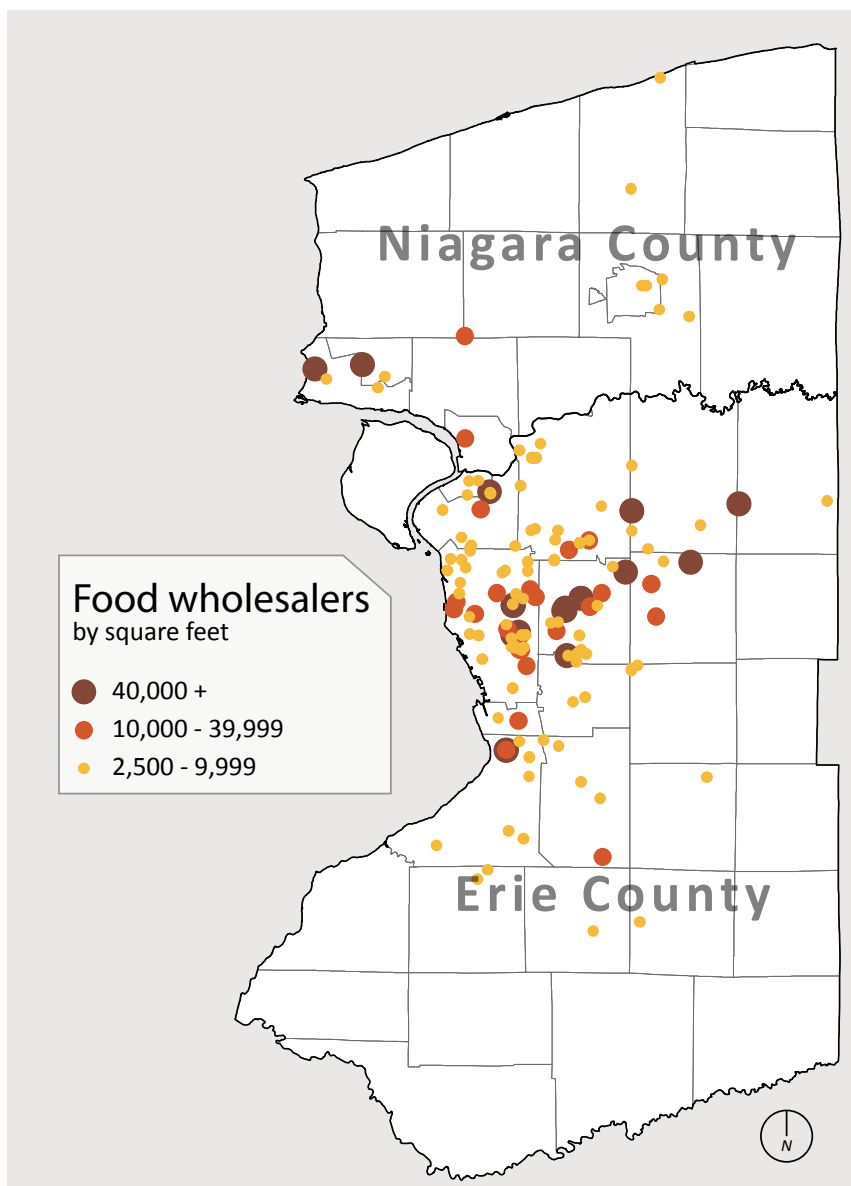
million.

General merchandise stores are also prevalent in the region. These include big-box retailers such as Target and smaller dollar stores that sell food in addition to a range of other products. In the region, these businesses account for a large share of all food retailers—nearly 14.6 percent in Erie County and 16.7 percent in Niagara County (Table 43 & Table 44). Sales and employment are also high, behind only those of supermarkets and convenience stores in both counties. In Niagara County, general merchandise stores comprise over 20 percent of all food-retail employment and over 12 percent of sales; in Erie County, these stores account for 17.3 percent of food retail employment and 11.5 percent of sales.⁵⁷ Although general merchandise stores do not usually provide the range of food choices available at supermarkets and grocery stores, they are often the most convenient food providers for communities in underserved areas.

Grocery stores are more prevalent than general merchandise stores across the two counties but earn a smaller revenue than other store types and are less common in Niagara County than in Erie County. Throughout the region, grocery stores comprise over 5 percent of employees and over 6 percent of sales in regional food retail (Table 42). Grocery stores are slightly more prominent in Erie than in Niagara County, comprising 18 percent of retail stores in Erie (Table 43), but only 12 percent of retail stores in Niagara County (Table 44).⁵⁸

Specialty stores include a wide range of businesses, from bakeries to candy stores to health food stores. These businesses encompass a large segment of the food-retail market in Erie and Niagara Counties and often blur lines between food processing, retail, and service. Specialty stores make up 11.8 percent of food retail businesses in Buffalo Niagara, 12.5 percent in Erie County, and 8.8 percent in Niagara County. Like grocery stores, employment and sales at specialty stores is small relative to their number throughout the region. In the region, 4.1 percent of food retail employment is in these stores (Table 42). In Erie and Niagara Counties, specialty stores account for 4.4 percent and 2.7 percent of employment, respectively (Table 43 & Table 44). Sales volumes in specialty stores in the

Figure 20. Buffalo Niagara food wholesalers, 2012



Source: ReferenceUSA, 2013.

region were \$158 million in 2012, with \$140 million occurring at stores in Erie County and \$17 million occurring at stores in Niagara County.⁵⁹

Regionally and in both counties individually, supermarkets account for only a small share of all food retailers but dominate the retail food sector in employees and sales.⁶⁰ Supermarkets

total about 3.4 percent of food businesses, yet they make up nearly 39 percent of food-retail employment and over 41 percent of sales. The counties differ in that supermarkets comprise a slightly larger share of all food retail employees in Erie County than in Niagara County. In the latter, convenience stores have only slightly fewer employees and nearly the same level of sales that supermarkets have.⁶¹

Fruit and vegetable markets (46) and meat and fish markets (77) comprise 2 and 4 percent of all food retailers,

⁵⁷ ReferenceUSA, 2013.

⁵⁸ ReferenceUSA, 2013.

⁵⁹ Reference USA, 2013.

⁶⁰ Supermarkets are distinguished from grocery stores in this section as those having more than fifty employees. This is used to separate large retailers such as Wegman's and Tops from smaller grocers

such as Aldi and Dash's.

⁶¹ ReferenceUSA, 2013.

IN BRIEF

PG 56 Food retail stores that most commonly sell fruits and vegetables are scarce, while the most abundant food stores primarily sell food low in nutrients and high in calories.

PG 59 Procurement knowledge, understanding how to lengthen shelf-life, marketing, and nutrition education are the biggest barriers to corner store owners selling more fresh fruits and vegetables.

PG 62 In 2012, 1,984 food retailers employed 31,334 people and sold \$6.78 billion in food products.

PG 62 The Food Bank of WNY fed 36,207 people in 2011.

PG 55 Buffalo Niagara has 2,918 restaurants, of which 22 percent are chain restaurants.

PG 59 The region is home to nine CSAs and twenty-five farmers' markets. Only five farmers' markets accept WIC, and only eight accept SNAP.

PG 57 Public institutions feed 163,000 public school students, 89,000 college students, and 6,000 correctional facility inmates each year—a total of 258,000 people.

respectively (Table 42, Table 43, Table 44, and Figure 22). Across the counties, these 123 markets—making up 2.3 percent of all food retailers—are usually locally owned businesses employing a small number of people. Total sales in 2012 equaled \$56.9 million at fruit and vegetable markets and \$99.7 million at meat and fish markets (Table 42).

Food-service establishments

Sit-down and fast-food restaurants are an important source of food for communities and a central part of the region's food economy.⁶² The location of food service businesses in the region can be seen in Figure 23.

Overall, Erie County is home to four times more restaurants than Niagara County. In Buffalo Niagara, single-location restaurants predominate in number, employment, and sales over limited-service restaurants. There are 1,803 single-location restaurants in Erie County, employing 21,489 people and totaling over \$953 million in sales in 2012. In Niagara County, 4,809 employees work at 473 single-location restaurants with sales in 2012 of \$212 million (Table 45).⁶³

Chain restaurants, although more limited in number than single-location restaurants throughout the region, provided over 22 percent of food-related jobs and over 6 percent of food sales in 2012. A larger share of Erie's restaurants than Niagara's are chains (Figure 23). In Erie County, there are 539 chain restaurants—23 percent of food-service establishments—with over 15,000 employees and \$656 million in sales in 2012. In Niagara County, there are 103 chain restaurants—approximately 18 percent of food-service establishments—with 2,920 employees and \$133 million in sales in 2012.⁶⁴

Direct Marketing of Food

Farmers' markets, farm stands, and community supported agriculture (CSA) are the means by

Table 37. Erie County food processing, 2012

Processor	N	%	Employees	% of Employees	Sales (\$1000)	% of Sales
Bakeries and Tortilla Manufacturing	119	59.8	1,668	30.1	160,756	9.3
Beverage Manufacturing	22	11.1	207	3.7	65,369	3.8
Other Processing	16	8.0	325	5.9	162,209	9.4
Sugar and Confectionary Product Manufacturing	13	6.5	597	10.8	127,979	7.4
Animal Slaughtering and Processing	11	5.5	585	10.6	390,710	22.7
Fruit and Vegetable Preserving and Specialty Food Manufacturing	8	4.0	1,401	25.3	157,537	9.1
Dairy Product Manufacturing	5	2.5	639	11.5	550,913	32.0
Grain and Oilseed Milling	5	2.5	120	2.2	107,469	6.2
Total	199	100.0	5542	100.0	1,722,942	100.0

62 Food-service establishments include (but are not limited to) locally owned restaurants, chain restaurants, fast-food restaurants, and bars and nightclubs serving food. For the purposes of this section, the region's food-service economy has been divided into two categories, locally owned, single-location establishments and chains. Other important differences between food-service businesses, such as food price, sourcing, and quality, are not captured in this section, but are important when considering the impact these businesses have on the region's population.

63 ReferenceUSA, 2013.

64 Ibid.

which farmers directly market their products to consumers. Each of these distribution methods offers promising opportunities to reconnect producers and consumers and to grow the prominence of local food in the region.

Community supported agriculture (CSA) is a way for people to connect directly with farmers and their farms. In a typical CSA, farmers sell shares, or memberships, at the beginning of a growing season to cover the cost of producing food. In return, shareholders receive weekly supplies of fresh food throughout the growing season. Shares of food are delivered to shareholders at prearranged drop-off sites, like farmers markets, or directly at members' homes. CSAs eliminate "the middlemen"—retailers, processors, and distributors—and establish a more direct connection between the food people eat and the land on which it is raised.⁶⁵ According to LocalHarvest.org, an online directory of CSAs, there are nine CSAs in Buffalo Niagara, with seven in Erie County and two in Niagara County.⁶⁶

Farmers' markets provide farmers and consumers direct access to each other on a periodic basis at a fixed location, such as in a public park or municipal parking lot. Markets are usually operated by a non-profit organization and run during the growing season. Buffalo Niagara's markets carry a range of agricultural products, including fruits and vegetables; meat and poultry; eggs; seafood; and prepared products such as baked goods, cheeses, and jams. As of March 2013, there were twenty-five farmers' markets in the two counties, with nineteen in Erie County and six in Niagara County. At some farmers' markets, low-income families and older adults can purchase produce using vouchers/EBT cards made available through public assistance programs. Some farmers' markets, however, do not accept these voucher cards. In the region, only five farmers' markets accept payment from the Women, Infants, and Children (WIC) supplemental nutrition program, including WIC cash; eight accept payment through the Senior Farmers' Market Nutrition Program, which provides coupons to purchase fresh fruits and vegetables; and three

Table 38. Niagara County food processing, 2012

Processor	N	%	Employees	% of Employees	Sales (\$1000)	% of Sales
Bakeries and Tortilla Manufacturing	29	54.7	202	43.2	12,830	12.4
Beverage Manufacturing	12	22.6	88	18.8	54,864	53.0
Other Processing	5	9.4	33	7.1	12,890	12.4
Animal Slaughtering and Processing	3	5.7	15	3.2	11,176	10.8
Sugar and Confectionary Product Manufacturing	3	5.7	15	3.2	7,677	7.4
Fruit and Vegetable Preserving and Specialty Food Manufacturing	1	1.9	115	24.6	4,145	4.0
Total	53	100.0	468	100.0	103,582	100.0

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

Table 39. Food wholesalers: number, employment, and sales, 2012

Wholesale Operations	N	%	Employees	% of Employees	Sales (\$1000)	% of Sales
Erie County	143	90	4,287	89	3,286,008	94
Niagara County	16	10	513	11	202,788	6
Region	159	100	4,800	100	3,488,796	100

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

Table 40. Buffalo Niagara food wholesalers, by size of facility, 2012

Size (sq. ft.)	N	%	Employees	% of Employees	Sales (\$1000)	% of Sales
2,500 - 9,999	26	16.35	138	2.88	140,617	4.03
10,000 - 39,999	111	69.81	1,084	22.58	1,142,331	32.74
40,000 +	22	13.84	3,578	74.54	2,205,848	63.23
Total	159	100.0	4,800	100.0	3,488,796	100.0

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

⁶⁵ Wilkinson, James. "ODC Technote 20 - Community Supported Agriculture," Office of Community Development, U.S. Department of Agriculture, 2001.

⁶⁶ "Localharvest.org Community Supported Agriculture," LocalHarvest, Inc., <http://www.localharvest.org/csa/>. An earlier report from the 2007 U.S. Census of Agriculture reports ten CSAs in Erie County and 6 in Niagara County.

Healthy Corner Stores

Historically, corner stores supplied fresh, healthy food in many neighborhoods. Today, however, many corner stores sell processed, high-calorie foods in place of nutritious ones. The lack of proximate grocery stores and supermarkets, which usually vend a broader selection of nutritious and fresh foods, compounds nutritional insecurity in many neighborhoods.

The differences between the foods sold in corner stores versus supermarkets or grocery stores, however, are not mandated by law and can be overcome to ensure that people can access healthy foods at corner stores in their neighborhoods. There are several barriers that make selling fresh produce a challenge for corner store owners. These barriers are procurement, shelf-life, marketing, and nutrition knowledge.

Procurement

Corner store owners have little experience procuring fresh and nutritious foods. They may not know what kinds of food to purchase or where to purchase them.

Corner store owners purchase foods in smaller quantities than do the owners of larger food stores, meaning that the price for those foods is higher. Transporting small quantities is also less cost-effective for store owners.

Shelf-life

Many corner store owners are not familiar with stocking highly perishable products and may need education on shelf-life and refrigeration techniques.

Marketing

Corner stores owners may not have experience marketing special products—rather, they rely on common knowledge of products that corner stores carry. The lack of proper marketing may prevent residents from purchasing fresh products.

Nutrition knowledge

Consumers may need education in and out of the store to know what types of food are healthy and how to prepare raw foods.

accept public assistance funds.^{67,68} The locations of the region's farmers markets are shown in Figure 24.

Food provision by institutions

Public and private institutions such as schools, hospitals, and prisons are important actors in the region's food system. As major purchasers and distributors of food, institutions can drive demand for more healthful and sustainable food choices and can stimulate local food economies.⁶⁹ The following is a summary of publicly available data that provides a snapshot of institutional food providers in the region.

Elementary and secondary schools

Food purchasing and distribution in elementary and secondary schools is the responsibility of individual districts. Contracts for purchasing food products are subject to a formal public bidding process.

In 2010-2011, 163,270 students were enrolled in public schools, with 81 percent of students (131,714) in Erie County school districts and 19 percent (31,556) in Niagara County districts (Table 41).⁷⁰ Many of these students are eligible to receive public nutrition assistance in their school cafeterias. In fact, 41.7 percent and 39.7 percent, respectively, of Erie and Niagara Counties' public school students were eligible to receive free and reduced-price lunches. The federally subsidized lunch program provides meals to school children whose families would otherwise struggle to provide them with lunch.

For the 2009-2010 school year, the counties' districts spent \$56.8 million on student food, with Erie County school

67 USDA Agricultural Marketing Service. "Farmers Market Search." USDA Agricultural Marketing Service, 2013.

68 It is difficult to establish actual rates of acceptance of these payment options. Compared to the USDA Agricultural Marketing Service, the New York State Department of Agriculture lists different numbers: twenty farmers markets in Erie and Niagara Counties, nineteen of which accept WIC and SFMNP. The source does not report whether the farmers' market accept SNAP.

69 "The main benefits offered by regional food procurement are support of the local economy and increased access to fresh and nutritious food." R.A. Vogt and L.L. Kaiser, "Still a Time to Act: A Review of Institutional Marketing of Regionally-Grown Food," [In English], Agriculture and Human Values 25, no. 2 (Sum 2008): 241-55.

70 U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. 2011.

Table 41. Public school districts and primary, secondary, and high school enrollment

	Erie	Niagara	Region
Number of School Districts	28	10	38
Number of Schools	223	56	279
Student Enrollment	131,714	31,556	163,270
Pre-K and Kindergarten	12,325	2,957	15,282
Grades 1 - 8	78,167	18,355	96,522
Grades 9 - 12	40,618	10,107	50,725

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. 2011.

districts spending nearly \$46.5 million (\$368.67 per student) and Niagara County school districts spending \$10.2 million on food services (\$322.55 per student). Per student, Erie County spent \$46.12 per year more than Niagara County.⁷¹

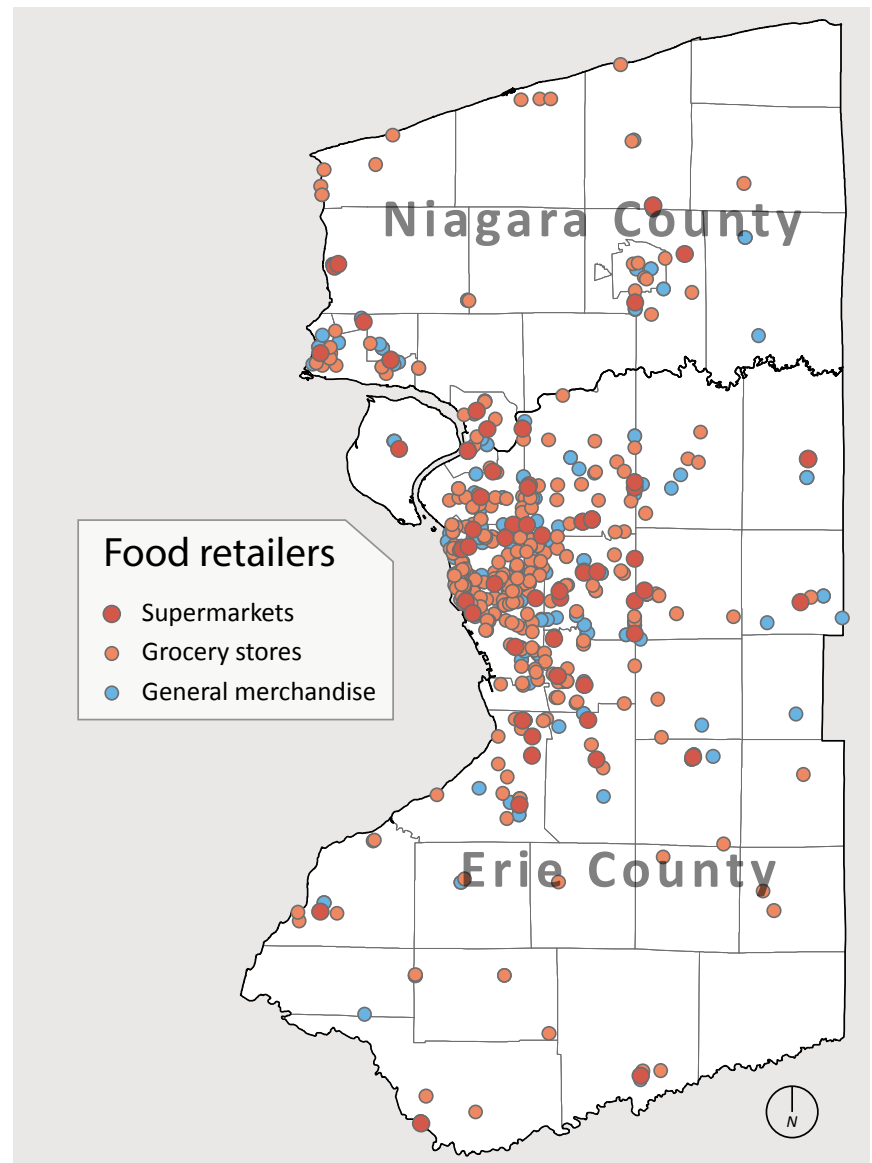
Postsecondary schools

Postsecondary schools, including colleges, universities, and vocational schools, often provide an extensive range of food services to students, faculty, and staff. These include traditional cafeteria food services and rented spaces for food providers. The region is home to twenty-nine postsecondary educational institutions with a total enrollment of 88,809 students. Eighty-three percent of institutions and 87 percent of students (twenty-four institutions, 77,390 students) are in Erie County. In 2011, auxiliary spending,⁷² which includes food-service spending (in addition to spending on other services) at postsecondary schools, averaged \$1,969.77 and \$1,076.65 per student, respectively, in Erie and Niagara Counties. The University at Buffalo, the region's largest university, had auxiliary spending totaling \$101 million, or roughly \$3,500 per student.

Correctional facilities

Buffalo Niagara's jails and prisons are major purchasers and distributors of food. In 2010, the region's institutionalized population included nearly 6,000 people in adult correctional facilities and seventy people in juvenile correctional facilities.⁷³ Correctional facilities in the region include Wende Correctional Facility, the Erie County Youth Detention Center, the Erie County Jail, and the Niagara County Jail. In 2013, the counties budgeted approximately \$2.6 million for food supplies in correctional facilities, with the majority budgeted for Erie County. Specifically, Erie County budgeted \$2.1 million for food and kitchen supplies in jails per year for 2012 and

Figure 21. Supermarkets, grocery stores, and general merchandise, 2012



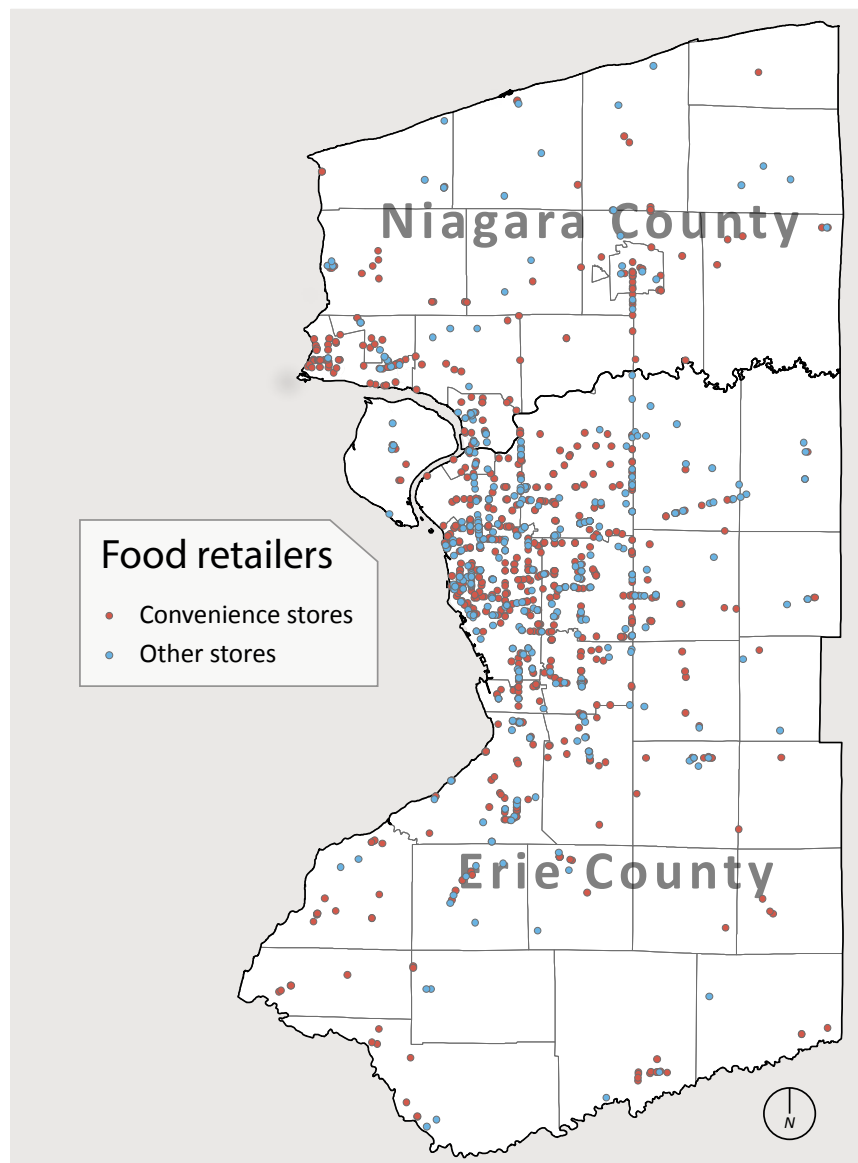
Source: ReferenceUSA, 2013.

⁷¹ U.S. Census Bureau, "Public Education Finances: 2010," 2012.

⁷² The foods provided are coffee, desserts, dried and fresh vegetables, frosting mix, margarine, packaged drink mixes, packaged food mixes (gelatin, gravy, pudding, sauce and soup bases, whipped topping), pasta, pureed food, seasonings, spices, tea, and vinegar. The available services are food warehousing, storage and distribution service; and meal preparation and delivery.

⁷³ "2010 Census Summary File 1," edited by U.S. Census Bureau, 2011.

Figure 22. Convenience stores and other stores, 2012¹



Source: ReferenceUSA, 2013.

¹ Other stores include specialty stores, fruit and vegetable markets, and meat and fish markets.

2013 but actually spent about \$200,000 more in the previous year (in 2011, \$2,303,985).⁷⁴ Niagara County budgeted only one-quarter of the amount budgeted in Erie in 2013—\$510,000—but spent less the previous year (in 2011, \$476,884).⁷⁵

Hospitals and nursing homes

Medical facilities, like hospitals and nursing homes, are major areas of interest for institutional food spending because the region—especially Buffalo—is growing its medical system. There are no publicly available data on food purchases at these institutions, but the facilities are numerous. In total, there are ten hospitals⁷⁶ and forty-nine nursing homes⁷⁷ in the region, with the majority in Erie County.

Emergency food providers

The need for emergency food is on the rise in western New York. As reported by the Food Bank of WNY, the number of households relying on food assistance in the region increased from 30,550 people in 2010 to 36,207 people in 2011. Emergency food providers include food banks, home meal delivery programs such as Meals on Wheels, faith-based organizations, and homeless shelters. Such organizations distribute food throughout the region and are a vital emergency source of food for the hungry and vulnerable.⁷⁸

The Food Bank of WNY, located in downtown Buffalo, distributes food to 340 member agencies throughout Erie, Niagara, Chautauqua, and Cattaraugus Counties. Member agencies include child care centers, food pantries, group homes, senior programs, shelters, soup kitchens, and summer camps. The Food Bank obtains perishable and non-perishable food from manufacturers, wholesalers, retailers, brokers, food distributors, and food drives. In 2011, 7.52 million pounds of food were distributed in Erie County, and 1.7 million pounds were distributed in Niagara County. The Food Bank

⁷⁴ "Erie County 2013 Budget: Adopted, Book a - Operating Funds," edited by Erie County Division of Budget and Management, 255, 2013.

⁷⁵ "2013 Niagara County Adopted Budget Book 1 of 2," edited by Niagara County Division of Budget and Management, 88-91, 2013.

⁷⁶ "Official Hospital Compare Data - General Information," Centers for Medicare & Medicaid Services, 2013.

⁷⁷ "Official Nursing Home Compare Data - General Information," Centers for Medicare & Medicaid Services, 2013.

⁷⁸ "2011 - 2012 Annual Report," Buffalo: Food Bank of WNY, 2012.

purchases the majority of the food it provides, but it also receives donations; between 2011 and 2012 the organization received 4.73 million pounds in food donations. It may become increasingly difficult for emergency food providers such as the Food Bank to feed the region's most vulnerable populations because funds from some sources are shrinking. In fact, provisions of food from federal sources such as the the USDA Emergency Food Assistance Program are declining, dropping from 3.7 million pounds in 2010-2011 to 1.7 million pounds in 2011-2012.⁷⁹

Buffalo-Niagara has a number of home meal delivery services for older adults. These include county-wide programs like Meals on Wheels of WNY and programs run by towns and cities, like Ken-Ton Meals on Wheels and Southtowns Meals on Wheels. In total, ten home meal delivery programs⁸⁰ serve Erie and Niagara Counties' elderly (over sixty and home-bound disabled populations). The largest program in the region, Meals on Wheels for Western New York, has delivered more than twenty-six million meals since opening in 1969.⁸¹ It currently serves 3,600 clients throughout Erie County. Meals are usually free with a fixed recommended donation of \$7 per day for two meals or \$35 per week, but the actual cost to prepare and deliver the food is approximately \$11 per day.⁸²

Other emergency food providers include faith-based organizations that distribute food and provide a range of social support services to vulnerable populations. These organizations include the Buffalo City Mission, the Salvation Army, and the Community Missions of Niagara Frontier. Programs such as Community Missions' Community Kitchen receive food from the Food Bank of WNY, United Way's Emergency Food & Shelter Program, and donations. This program alone served 27,842 adults and

Table 42. Buffalo Niagara food retail, 2012

Store type	N	%	Employees	% of Employees	Sales (\$1,000)	% of Sales
Convenience Stores	928	46.8	10,16	32.3	2,465,003	36.4
General Merchandise Store	297	15.0	5,585	17.8	790,582	11.7
Grocery Stores	335	16.9	1,759	5.6	434,473	6.4
Specialty Stores	234	11.8	1,286	4.1	158,013	2.3
Supermarkets	67	3.4	11,891	38.0	2,776,527	40.9
Fruit and Vegetable Markets	46	2.3	256	0.8	56,832	0.8
Meat and Fish Markets	77	3.9	451	1.4	99,709	1.5
Total	1,984	100	31,334	100.0	6,781,139	100

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

Table 43. Erie County food retail, 2012

Store type	N	%	Employees	% of Employees	Sales (\$1,000)	% of Sales
Convenience Stores	741	45.4	8,321	32.1	1,975,643	35.7
General Merchandise Store	238	14.6	4,487	17.3	637,074	11.5
Grocery Stores	293	18.0	1,490	5.7	368,030	6.6
Specialty Stores	203	12.5	1,143	4.4	140,068	2.5
Supermarkets	55	3.4	9,893	38.1	2,283,021	41.2
Fruit and Vegetable Markets	37	2.3	226	0.9	50,172	0.9
Meat and Fish Markets	64	3.9	391	1.5	85,935	1.6
Total	1,631	100	25,951	100	5,539,943	100

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

79 "Financial Statements and Additional Information for the Year Ended June 30, 2012," Food Bank of WNY, 2012; "Financial Statements and Additional Information for the Year Ended June 30, 2011," Food Bank of WNY, 2011.

80 Erie County: Meals on Wheels of WNY, Southtowns, Alden, Amherst, Ken-Ton, City of Tonawanda, East Aurora MOW; Niagara County: Long Term Home Health Care Program, Meals on Wheels of Niagara Falls, North Tonawanda Meals on Wheels.

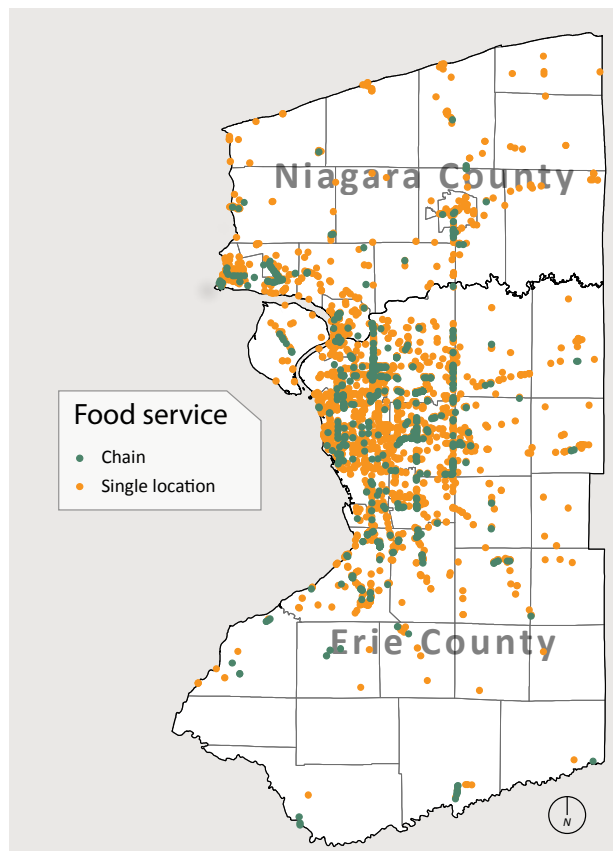
81 Meals on Wheels for Western New York, Inc. "News & Events: We're Celebrating 45 Years!," April 9, 2014. Accessed August 8, 2014, <https://mealsonwheelswny.org/news/were-celebrating-45-years>.

82 Meals on Wheels for Western New York, Inc. "Meal Services: Home-Delivered Meals." Accessed August 8, 2014, <https://mealsonwheelswny.org/home-delivered-meals>.

Niagara County's trans fat-free program

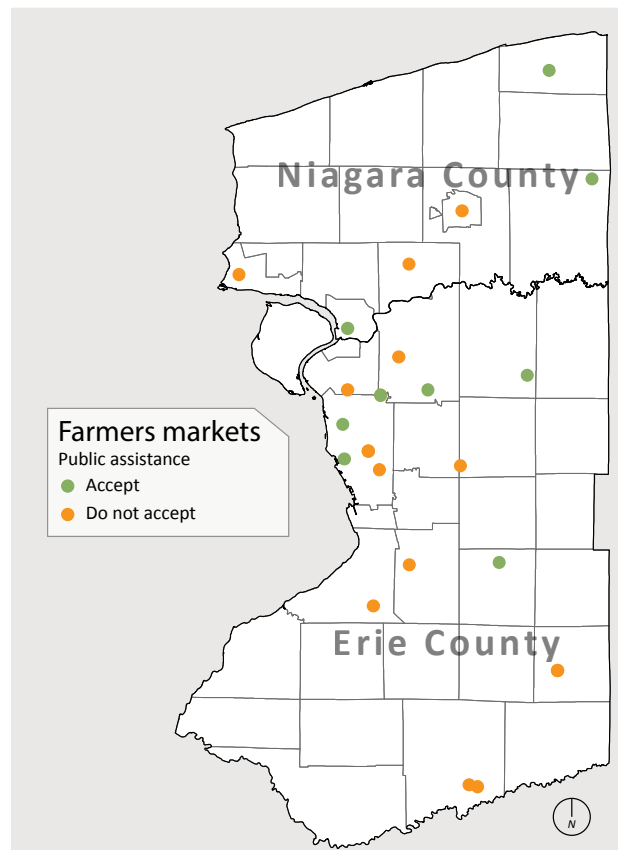
The Niagara County Department of Health recognizes the problem of coronary heart disease in the Niagara County community. Attempting to lower the rate of disease the Department of Health passed a motion in 2007 to recognize food-service establishments that have minimized the use of artificial trans fats. The county maintains and publishes a list of the restaurants that have, in whole or in part, reduced their use of trans fat and provides these restaurants with a certificate.

Figure 23. The region's food-service businesses, 2012



Source: ReferenceUSA, 2013.

Figure 24. Buffalo Niagara farmers' markets, 2013



Source: "Farmers Market Search." USDA Agricultural Marketing Service.

1,804 children in 2012.⁸³

⁸³ Community Missions of Niagara Frontier, Inc., accessed February 11, 2014, <http://www.communitymissions.org/crisisservices/kitchen.htm>.

Table 44. Niagara County food retail, 2012

Store type	N	%	Employees	% of Employees	Sales (\$1,000)	% of Sales
Convenience Stores	187	53.0	1,785	33.2	489,360	39.4
General Merchandise Store	59	16.7	1,098	20.4	153,508	12.4
Grocery Stores	42	11.9	269	5.0	66,443	5.4
Specialty Stores	31	8.8	143	2.7	17,945	1.6
Supermarkets	12	3.4	1,998	37.1	493,506	39.8
Fruit and Vegetable Markets	9	2.6	30	0.6	6,660	0.5
Meat and Fish Markets	13	3.7	60	1.1	13,774	1.1
Total	353	100	5,383	100	1,241,196	100

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

Table 45. Food-service presence, employment, and sales, 2012

	N	%	Employees	% of Employees	Sales (\$1,000)	% of Sales
Erie						
Single	1,803	77	21,489	59	953,309	59
Chain	539	23	15,007	41	655,856	41
Total	2,342	100	36,496	100	1,609,165	100
Niagara						
Single	473	82	4,809	62	212,518	62
Chain	103	18	2,920	38	132,706	38
Total	576	100	7,729	100	345,224	100
Region						
Single	2,276	78	26,298	59	1,165,827	60
Chain	642	22	17,927	41	788,562	40
Total	2,918	100	44,225	100	1,954,389	100

Source: "ReferenceUSA U.S. Businesses," Infogroup, Inc., Government Division, 2013.

Institutional purchasing

Public institutions in Erie and Niagara Counties feed over 200,000 people every day. With many mouths to feed, educational institutions are major food purchasers. About 200,000 people eat at educational institutions each year, a figure that includes only students. Over 20,000 undergraduates attend the University at Buffalo, Buffalo State College, Erie Community College, and Niagara County Community College. Moreover, approximately 185,000 children between the ages of five and seventeen live in the two counties, with a large share of those children attending public schools. Connecting farms with food servicers at local public institutions can open large new markets for local farmers while feeding the Buffalo Niagara population local food.

This case study explores institutional food-purchasing policies at the University at Buffalo. The University at Buffalo's food-service organization, Campus Dining and Shops (CDS), spent \$6.3 million in 2011-2012. CDS spent 92 percent of this budget, or \$5.8 million, solely on food, while \$0.5 million was spent on auxiliary purchases to enable food service. The CDS's food purchases are directed by procurement policies at the State, SUNY, and University at Buffalo levels.

At the highest level, CDS must abide by New York State finance laws on state purchasing, which specify that the New York State Procurement Council enacts purchasing policies. Broadly, the Procurement Council strives to improve the state's procurement policies to ensure the missions of state agencies, to guard state and taxpayer interests, and to be fair to businesses.¹ When state agencies seek to purchase items, including food, they must first establish whether a preferred source (as identified by the Procurement Council) can provide it. The Procurement Council has named preferred procurement sources that it believes advance social and state economic goals.² Preferred sources are the Correctional Industries Program, National Industries for the Blind, New York State Industries for the Disabled, Inc., and the New York State Office of Mental Health. The NYS Industries for the Disabled, Inc. is

the only preferred source providing food commodities and services, which state agencies are required to purchase if the items meet an agency's specifications.

If a product is not available as desired from a preferred source, or if the preferred source's price for it is over 15 percent above the market rate,³ the purchasing agency can purchase the product from providers with whom the state has already set up contracts (Office of General Service's Centralized Commodity Contracts (CCC)) or use a bidding process to solicit new vendors. Three types of CCCs impact UB's food purchasing: those pertaining to fluid milk, household items and sundries, and baked goods.⁴ Of the six contracts the state has with milk providers, one is located in Buffalo Niagara: Upstate Niagara Cooperative. For food, household items, and sundries, the state contracts only with Sysco Food Services in Albany (other food contracts do not apply to western New York State agencies). Bimbo Foods, Inc. of Albany has the only baked goods CCC. Agencies can purchase goods through a competitive bidding process if the bidder's price is lower than a CCC supplier's,⁵ but priority must be given to the CCC supplier if it matches the quoted price within two days.⁶ Moreover, if a state agency's purchase is less than \$50,000, the purchasing agency is not required to hold a formal bidding process (assuming the price is lower than that of a CCC supplier).⁷ The mandated use of preferred sources and CCC suppliers may limit local farms' abilities to vend to CDS, unless CCC suppliers source food from local farmers or CDS requests products that CCCs do not stock or cannot supply less expensively than farms can.

The state finance laws and Procurement Council address the possibility of state agencies having New York State-grower purchasing policies but do not address local-grower policies. A state agency may choose a

3 "New York State Procurement Guidelines," New York State Procurement Council, July 2009, accessed January 24, 2014, <http://ogs.ny.gov/BU/PC/Docs/Guidelines.pdf>.

4 "State contract award notices—commodities," New York State Office of General Services, accessed June 2014, <http://ogs.ny.gov/purchase/spg/lists/commodity.asp>.

5 New York State Finance Law, Article XI, State Purchasing, §163.3.a.v.

6 "New York State Procurement Guidelines," New York State Procurement Council.

7 New York State Finance Law, Article XI, State Purchasing, §163.6.a.

1 New York State Finance Law, Article XI §§ 161.1, 163.2.

2 "List of Preferred Source Offerings," NYS OGS, revised June 2013, accessed January 24, 2014, <http://www.ogs.state.ny.us/procurecounc/pdfdoc/pslist.pdf>

food-procurement policy requiring New York State foods, but the specifics must be approved by the State Commissioner of Agriculture and Markets, who decides whether the quantity and quality of the requested foods are available from state growers.⁸ If the foods are not available, the agency can stipulate that New York State foods be purchased when they are available in the correct quantities.⁹

Under state supervision, several agencies influence university procurement policies. SUNY procurement policies mirror state procurement policies. Other agencies within the SUNY system—for example, SUNY Research Foundation and University at Buffalo Foundation—have procurement policies, but they do not apply to Campus Dining and Shops. University at Buffalo procurement policies specify that competitive quoting and evidence of reasonable price are required for purchases over \$5,000. In non-binding language, the university stresses the importance of purchasing from women and minority-owned businesses.

The University at Buffalo does not have any requirements for local purchasing, but CDS management attempts to source some CDS food locally. Of the dollars CDS spent solely on food in 2011-2012, 28 percent (\$1.6 million) was used to purchase food from local sources. Forty-nine percent of dollars (\$785,949) spent on local food was paid to Desiderio's, a Buffalo produce packer, which provided all of UB's fresh produce.¹⁰ Seventy-two percent (\$4.2 million) of CDS's total dollars purchased food from non-local sources. Most of this non-local food is purchased through Sysco and US Foods. Meats such as poultry and fish comprise the greatest share of spending on non-local foods. In fact, CDS spent about \$1 million on non-local meat and explained that the university's demand for meat cannot be met by the region's farmers.¹¹

8 New York State Finance Law, Article XI, State Purchasing, §165.4.a-b.

9 New York State Finance Law, Article XI, State Purchasing, §165.4.c.iii-v.

10 Raj, Subhashni. "Investigating University at Buffalo's food procurement policy: a farm to institution policy analysis," University at Buffalo Department of Urban and Regional Planning, course PD592, Spring 2013.

11 Ibid.

The power of schools to improve nutrition

Many students eat the lunches—and sometimes the breakfasts and snacks—that their schools provide each day. In response to concerns over the nutritional quality of school food and children’s health, the government, schools, and community members are taking action.

The federal government recently implemented nutrition changes to school lunch programs, seeking to leverage schools’ powerful impact on child nutrition. Locally, the new lunches—requiring more fruits and vegetables and limiting meats and certain grains—have met both praise and opposition from students and school districts. Proponents say they enjoy having more healthy foods to eat,¹ while opponents counter that the new lunches cost slightly more, that some students prefer other foods,² and that participation in school lunch programs has declined in some schools because of the changes.³

Changing children’s food preferences, however, may require more than simply substituting new foods in place of the foods that children were used to eating. Simultaneous hands-on educational components can be the key to making healthy foods more palatable to children. A local program, Seeds of Living Education (S.O.L.E.), at Hamburg, NY’s Union Pleasant Elementary School,

uses this approach. Through its garden, S.O.L.E. seeks “to encourage lifelong, nutritious eating habits by offering school children a hands-on, educational experience in a living classroom in the natural environment.”⁴ S.O.L.E.’s Giving Garden is used in a multidisciplinary classroom curriculums and is a tool to teach children about growing food and its impact on health. It provides fresh, healthy food for children to eat during the day, which the garden’s organizers hope will spur interest in procuring additional fresh, local food for the school’s meal program.⁵

S.O.L.E.’s programs are working, as evidenced by the changes in children’s food preferences that the school’s food workers see in the cafeteria. In 2012, the school’s food-service director said, “At first I never thought the kids would embrace [eating raw vegetables], and now we serve them in our lines...S.O.L.E. proved to me that it does work.”⁶

S.O.L.E. can be an example to other local school districts—such as the Buffalo Public Schools, where a program like S.O.L.E. could be scaled up—of incorporating necessary nutrition changes and hands-on learning to improve children’s health.

1 Tober, Olivia. “Reactions to New School Lunch Guidelines,” *The Buffalo News*, January 10, 2013, accessed December 12, 2013, <http://www.buffalonews.com/apps/pbcs.dll/article?aid=/20130110/life04/130119990/1306>.

2 Tober, “Reactions to New School Lunch.”

3 Werbitsky, Eileen. “Springville-Griffith School Lunches Feel Pinch of Legislation,” *The Buffalo News*, February 6, 2012, accessed December 12, 2013, <http://www.buffalonews.com/apps/pbcs.dll/article?AID=/20130206/CITYANDRE-GION/130209381/1010>.

4 “Seeds of Living Education’s Mission Statement.” Accessed January 22, 2014. Seeds of Living Education. <http://www.seedsoflivingeducation.org/mission-goals.html>

5 “Goals,” <http://www.seedsoflivingeducation.org/mission-goals.html> Accessed January 22, 2014. Seeds of Living Education.

6 Colmerauer, Catherine. “Healthier choices for Hamburg Schools: District introduces new chicken wrap to menu,” *The Sun*, March 8, 2012, accessed January 22, 2014, http://www.thesunnews.net/news/900-Healthier_choices_for_Hamburg_Schools_District_introduces_new_chicken_wrap_to_menu_.html.

Farmer Interview Report

Farmers' perspectives

To ensure a stronger food system our region must address farmers' concerns. Buffalo Niagara farmers' report that their primary concerns are access to dependable and affordable labor, availability of local processing and consumer markets, and formation and maintenance of a supportive regulator environment.¹

Who are the farmers?

Most of the farmers interviewed were men; in fact, only two of the seven farmers were women. Five farmers had been involved in farming since childhood, as they had been raised on farms and had chosen to continue farming as a livelihood in adulthood. Two other farmers started farming later in life—one married into a farm family, and another followed career interests in agriculture.

Where do they farm?

Farmers at four Erie County farms and at two Niagara County farms were interviewed. Four farms were in agricultural districts, and one farmer was applying for an agricultural district designation for their new farm when the interviews took place.

What do they farm?

Half of the farmers farmed on a combination of rented and owned land. Two others farmed only on land they owned, and one farmed on land owned by the farmer's family. The farmers obtained land in a variety of ways; sometimes, parcels were cobbled together using several procurement methods. Two farmers had inherited their land from family, and three farmers had purchased their land from family. One had obtained parcels from friends or neighbors, and another had purchased a house with some acreage. The area upon which farming took place ranged from between approximately eight to 530 acres, although the median was fifty-one acres. One farm dedicated its operation solely to dairy cows, another farmed tree fruits, and a third grew only blueberries. The three remaining farms grew a mix of fruits and vegetables, and in addition, one grew field corn, another grew flowers, and another raised chickens, goats, pigs, and sheep.

Why do they farm?

All farmers farmed as a full-time business, but many listed other reasons for farming, too. All but one farmer expressed

the desire to continue family farming traditions, and four of six farmed to keep land in agriculture. Two farmers also began farming in order to provide people with healthy foods. Lastly, one farmer described his interest in farming as a hobby as well as a full-time occupation.

A. What farmers say about labor...

Key issues:

- Labor is the biggest expense on most farms.
- Finding local, skilled farm workers is challenging because hours are irregular, and work is demanding.
- Farm labor regulations can be onerous for farm owners.

Labor is the biggest expenditure for the majority of the farmers interviewed. On average, approximately 46 percent of produce farms' expenditures were on hired and contract labor, and for all farms, spending on labor ranged from 10 percent to 60 percent of all expenditures. Farmers have difficulty finding local, skilled farm workers. Picking fruits and vegetables and tending animals requires manual labor and specific knowledge. Farm workers are also few because people avoid farm work for several reasons, including long or unpredictable hours, odors from animal manure, and, often, the lack of health insurance. In addition, farm-labor regulations can be onerous for farm owners. In the following paragraphs, each of these reasons is explored in further detail.

Farmers cite farm odors as an impediment to recruiting workers. Unsurprisingly, farm work can be smelly. Farming can involve handling dirty animals, manure, fuel, and grease—scents that can cling to peoples' skin and clothing.

Health is another labor-related concern for farmers and farm workers. Farm work is physically demanding and may involve the use of dangerous machines and tools. Injuries, along with common illnesses, can require medical care, which is expensive for those without health insurance. The current health insurance system, however, makes providing health insurance to all farm workers cost-prohibitive for most farmers. On some farms, only the management team is provided with health insurance. Other farmers opt for health insurance through the Farm Bureau, avoiding privately purchased and managed health insurance plans. The Affordable Care Act (ACA), which aims to make health insurance less costly and mandates coverage for certain types of entities, may solve some of these problems, but farm owners know little about it and they fear the ACA will be extremely

¹ Interviews were conducted by researchers at the University of Buffalo's Food Systems Planning and Healthy Communities Lab.

costly for them.

Much farm work is an all-day affair, and farmers and farm workers often labor from before dawn to after dark during the growing season. One farmer noted that, by the time the interview had taken place at 8 a.m., a farm worker had already completed a thirty-mile round trip journey to the Clinton-Bailey Market to deliver a truckload of produce. During another 8 a.m. interview, a farm worker was already mowing hay fields. On rainy days, however, farm work can reach a standstill. This means that farm workers, who are generally paid hourly, unexpectedly take home less pay during bad-weather weeks. There is no guarantee that this will be balanced out by other weeks of good weather. Some farmers, such as dairy farm operators, see an opportunity to shorten long work days and avoid the management and liability issues associated with hiring farm laborers through the use of mechanized tools such as robotic milking systems. Fruit and vegetable farmers, however, see manual labor as vital to the success of their harvest and expect labor challenges to persist.

Farmers often spoke about the cost of labor regulations. One major concern for farmers is potential farm-worker overtime legislation. Acknowledging the hard labor that farm workers perform in the growing season, legislators are trying to ensure that farm workers receive overtime pay and adequate time off. Farm owners, however, contend that farm work is inherently different from other types of work because it depends on weather, time of day, and season. Farmers worry that workers' days off could coincide with the only workable day in a week of bad weather; that new labor practices could leave food un-harvested in the field; and that greater labor costs could drive food prices up, lowering the competitiveness of local farmers with farms in other states that do not have farm-worker overtime requirements.

To fill the labor gap, many farmers employ migrant workers, whose jobs are accompanied by heavy regulation. Farmers recall a time when workers were numerous—when the bikes of local children would be piled under the trees of a farm as neighboring children picked produce there. Today, only small farmers who operate in suburban and urban areas might hire young people to work. Mostly, however, farmers hire foreign workers. On three of the six farms interviewed, the majority of the staff was comprised of migrant foreign workers. Many workers come from rural areas in their home countries, where they developed skills on family or neighboring farms. Some farmers hire laborers on H-2A agricultural worker visas, which allow for temporary laborers to be hired at a high cost. Farmers can hire H-2A visa holders only by demonstrating to the government that they are unable to find qualified American workers. Wages for H-2A workers are set at an “Adverse Effects Wage Rate” that, at \$10.91 per hour in New York State is 50 percent higher than the current minimum wage for farm work (\$7.25). Farmers complain about the H-2A visa because of its inflexibility, its high cost, and the government inspections that accompany it. The length of time that foreign farm workers remain in the U.S. depends on their immigration statuses: while some can stay for years and move from farm to farm as needed, H-2A visa-holders can work for no more than one year on a single farm and can stay in the U.S. for

no more than three years continuously.

B. What farmers say about markets...

Key issues:

- Competition from the global market
- Building a customer base
- Local food branding
- Organic farming
- The Clinton-Bailey Market and a regional food hub
- Affordable and accessible processing

Local farms vend their products near and far, operating in the context of the national and global markets. Many issues impact local farms' ability to compete with farms across the nation and the world. Specifically, farmers mentioned the cost and shortage of labor in the region; the commodification of processed produce; the value of the dollar; the cost of processing; high taxes; onerous environmental safety restrictions; and the location, quality, and efficiency of freight systems.

Building a market is a necessary and time-consuming task that the region's farmers undertake. New farmers have the most difficulty building a consistent customer base because they lack connections to purchasers and the consumer trust that long-time farmers spend years to build. Additionally, new farmers may lack the capital required to achieve Good Agricultural Practices (GAP) certification. GAP certifications demonstrate that a grower has minimized the risk of food contamination at the farm, and they are often required to access larger markets, such as supermarkets. Long-time farmers can also face challenges finding markets. One long-time farmer described his work as a “desk job” because of the time he spends on the web researching new venues for selling his products and trying to anticipate what types of products will be in demand in the future.

Among the farms interviewed, the dairy farm was the only one not struggling to find markets. It was part of The Upstate Niagara Cooperative—a group of over 360 western New York dairy farms that have contracts to provide milk to the Cooperative. The Cooperative is owned collectively by the farmers, some of whom have been under contract for decades. Although the dairy farm interviewed had a dependable market, the farmers described how most dairy producers lament the low prices their milk fetches and the difficulty involved in making a living from dairy farming.

Some local farmers have been venturing into organic farming to improve the population's health, but for many farmers, organic farming is simply a financial choice. Some farmers expressed the desire to grow organic food because they want people to eat food free of pesticides and other chemical additives. Others found that selling organic food was a money-maker for their farms. Half of the farmers interviewed said that they care less about the products they produce than about their ability to ensure the livelihood of their families and workers. There are niche markets for certain types of organic foods—like apples and dairy—which farmers cater to because those niches are more profitable than highly competitive non-organic markets. One small dairy farmer recently switched his farm to organic

production because, had it remained a non-organic dairy producer, it would have been forced out of business. Despite the costs of organic production, the farmer felt that using organic production methods would be more profitable than using conventional methods because organic milk fetches higher prices. Organic regulations include storing manure from organic and non-organic cattle separately and quarantining and quickly selling cows requiring antibiotics to recover from illness.

Finding markets is difficult for some farmers, but being dependably connected with a supermarket, farm cooperative, CSA, food aggregator, or food processor lets farmers worry less about finding markets to sell their goods.

Supermarket sales comprised between 3 and 80 percent of four farms' revenues, with the median share around 60 percent. Being connected with a supermarket buyer is good for farmers because it enables them to sell a large share of their goods to a single buyer. This lowers farmers' marketing and transportation costs. However, these connections are considered uncommon and can be fraught with difficulties. Two farmers discussed how picky supermarket produce-buyers can be, with one reporting that buyers inspect the shape, taste, and texture of produce before taking a shipment. One farmer's fresh produce was denied by a chain supermarket upon delivery because of surface imperfections deemed low quality by the buyer. However, another supermarket chain was quickly willing to purchase the same produce. Some farmers are distrustful of supermarkets because of the bidding war that supermarkets can induce between farmers. For example, one farmer recounted delivering specifically ordered produce to a supermarket, only to have his shipment denied in favor of cheaper produce offered by another farmer. Several farmers discussed how supermarkets display artificial interest in local farmers' produce for the purpose of negotiating lower buying prices from larger, more distant farms.

Farmers use and see opportunity in food aggregators such as the Clinton-Bailey Market and farm cooperatives such as the Eden Valley Growers. Large-scale produce farmers regularly deliver food to an atrophied Clinton-Bailey Market, which is populated by more brokers than farmers and consumers. Farmers, however, recall days when the market was the primary hub of fresh produce for the region. One farmer said that his ancestors travelled by horse and wagon from northern Niagara County to sell their farm's fresh produce at the market. The trip was long, but the market was so profitable that instead of returning home after selling their produce, the farmers would travel only halfway back to meet another wagon sent from the farm, full of another load of produce to sell.

Farmer cooperatives are also helpful for farmers, as evidenced by the benefits that the Upstate Niagara Cooperative offers to the dairy farmer interviewed. Farm cooperatives aggregate food from many farms and allow smaller producers to access large-scale markets. Moreover, farm cooperatives have a limited exemption from antitrust laws, which allows the participating farmers to set their prices so that they do not underbid one another. One farmer interviewed found being part of the Eden Valley Growers cooperative extremely positive for the farm—80

percent of farm revenues was made through the cooperative—while another farmer expressed hope that farmers would create more cooperatives. The Eden Valley Growers cooperative began in 1956 and is a partnership of ten Erie County growers. The cooperative owns coolers that give produce a longer shelf life, and it manages the marketing and distribution of the growers' products.

Some farmer cooperatives are food hubs, facilities that aggregate, store, process, market, and distribute local or regional food. The processing aspect of food hubs is attractive to farmers because processing can minimize the amount of good-quality food that is wasted due to discoloration or misshapenness. Farmers are ambivalent about the benefits of food processing to their farms. On one hand, many farmers see processing as uneconomical because of the low payout they receive for processed food and the global competition that farms enter when they turn their fresh produce into a canned product. On the other hand, farmers cite the need for food processing to fetch reasonable prices and the need to find a specific niche in processing so that local farms are competitive in the global commodity economy. One farmer suggested Individual Quick Freezing as a processing method that could be economical for local farmers because it produces a higher-quality product, compared with many conventional freezing methods.

Creating a local food-marketing strategy may be another way for farmers to gain a competitive edge in the global food economy. Many farmers cited local food marketing as a major opportunity for them. Few, however, had time to advertise their own products or to think about a local branding strategy. Some farmers discussed the power of "New York State Apples" and "Upstate Farms" branding and suggested that farms need two parallel branding strategies—one to identify them for local consumers as western New York farmers and another to label them for national consumers as New York State farmers.

Most farmers interviewed also participate in markets that enable closer interaction between farmers and local residents, such as community supported agriculture (CSA), farmers' markets, farm stands, and farm-to-school programs. Two farmers were involved in CSAs. One farm's CSA sales comprised 50 percent of its income, while the other farm's involvement consisted of supplying needed fruits to an external CSA. A few farmers also found that farmers' markets, farm stands, and relationships with restaurants provided them with money-making markets. At the same time, many reported that farmers' markets and farm stands were not worth their time because sales were inconsistent, and the cost of transporting food was high. Some farmers also described the competitiveness of farmers markets, where long-time farm vendors often fear losing market share to new farm vendors.

Many farmers are interested in selling food to schools but are hampered by the issue of scale. Farmers want the opportunity to provide healthy food to students, and they see opportunities in selling large scale to school-food distributors, but not in selling to individual schools. Farmers say that selling to individual schools is not cost effective for them. One farmer said that

his farm considered its own farm-to-school participation as charity. Farmers contend that if children, families, and school districts decide that they want local food in schools, they should persuade their school food provider to purchase en masse from distributors sourcing food from local farms.

C. What farmers say about regulations...

Key issues:

- Food safety regulations
- Environmental regulations
- Tax regulations

Farmers are concerned about several types of regulations. These include labor regulations—which are discussed above—as well as food-safety regulations and environmental regulations. Some regulations, however, are seen as beneficial, such as regulations that lower the tax burden for farms.

Food safety regulations are onerous for some farmers and form a barrier to their entrance into large markets. As mentioned above, Good Agricultural Practices certification—commonly known as GAP certification—and differing food-safety regulations for foreign markets are a challenge for farmers. Large supermarket chains such as Tops and Wegman's require GAP certification, which ensures that growers have tools in place to minimize potential food contamination and to track contamination if it occurs. The grower must create a food safety plan that identifies and addresses all pathways of possible contamination and enables the traceability of food back to the farm. Additionally, the grower must ensure that the water used to wash produce meets EPA standards for drinking water, which can be a challenge for the well and surface that water farmers commonly use. Lastly, large-scale farmers selling produce outside the United States must comply with food-safety and pesticide regulations of the countries in which they sell; in Europe, these regulations are often more stringent than those in the U.S.

Environmental regulations can be onerous for some types of farms, specifically dairy farms. Cows produce manure, which dairy farms aggregate—sometimes in pits—for later use on their fields. Drainage from the pits is regulated to ensure that nearby waterways are not polluted with excess manure. The dairy farmer interviewed operates near a waterway, and his farm is inspected several times each year.

While farmers struggle with labor, food safety, and environmental regulations, they enjoy the benefits of certain tax exemptions, including agricultural assessments, farm-building exemptions, and the farmers' school tax credit. Several farmers cited the importance of these tax-reducing measures to the viability of their businesses.

D. What farmers say about education...

Key issues:

- Cornell Cooperative Extension provides a host of useful services.
- Government officials should know more about farming and farms.
- Agricultural tourism can promote public awareness about

farming issues.

Throughout the interviews, the farmers often discussed the importance of education to the viability of local food production. They stressed that both the public and other farmers should be aware of current issues in farming. Through Cornell Cooperative Extension, many farmers take part in education and training programs, use published agricultural reports to better understand regulations, and manage and improve their land through soil testing and improvement services. A few farmers stated that extension services are of lower quality than services provided by for-profit agriculture companies and that the extension publications offer advice using confusing language, to avoid legal culpability. Still, extension services are widely used.

Farmers believe that educating the public about farms will help keep them in business. Farmers lament the government's, food stores' and general population's lack of farming knowledge. Many farmers complained that government officials make farming harder. They would like officials to spend a day on the farm to experience the issues that farmers deal with on a daily basis. As mentioned previously, farmers also indicated that grocery stores and the general public have unrealistic standards for produce. Several farmers felt that agricultural tourism could be an opportunity for people to learn more about farms and farm products.

In conclusion

Erie and Niagara County farmers run complex businesses that provide the human necessity of food. To remain viable, farmers need a knowledgeable, reliable workforce and labor costs they can afford; access to an array of economical processing and consumer markets; food and environmental safety regulations that are feasible for small-scale farms; and continuing, high-quality agricultural and food-system education for themselves, food intermediaries, and the public.

Youth audit of food stores in Buffalo-Niagara

Our region's youth are impacted by the food choices available in their communities, yet young people have limited opportunities to voice an opinion about their food system. Massachusetts Avenue Project (MAP) works to build capacity of youths to study, engage in, and transform the local food system. In 2013, 32 youths audited and surveyed sixteen retail food stores in Erie and Niagara Counties.¹

This group audited a range of food store types in both urban and rural areas in the two counties, including convenience stores, grocery stores such as Aldi's, supermarkets such as Tops, and big-box stores such as Walmart, Target, and Dollar General. The audit focused on two components of the stores. First, youths surveyed the availability, price, and quality of a variety of foods in each store and scored stores using the Nutrition Environment Measures Survey (NEMS). Second, the young people conducted an audit of the store environments, focusing on physical features such as interior and exterior lighting, cleanliness, safety, the presence of a security guard, acceptance of EBT and WIC, and advertisement of products. After all stores were audited, the young people shared their perception of different food store types. The results from this survey are summarized below.

Store survey results

In each food store, youths conducted a survey of the availability, price, and quality of a variety of foods. These included fruits, vegetables, milk, ground meat, hotdogs, frozen dinners, canned beans, baked goods and bread, and beverages. Scores were assigned to the audited stores based on the survey. Figure 25 details the average scores that each store received.

Availability

Youth researchers documented the availability of healthy foods. Healthy foods included fruits, vegetables, lean meats, reduced-fat frozen dinners, and low-fat baked goods. The presence of healthy food options was used to score stores on a 25-point scale, with a higher score indicating availability of

healthier food.

Notable differences in the availability of healthy foods exist among the sixteen audited stores. Supermarkets scored relatively well on the scale, averaging 20.8 points out of a possible 25 points. Big-box stores and grocery stores had only about half of the possible healthy foods available, with average scores of 12.8 and 14.3, respectively. Convenience stores, which are the most prevalent in the region, had the lowest availability of healthy foods, averaging just 10.5 points (Figure 25).

Table 46 shows the share of food stores by type that sold fruits and vegetables. The youths looked for the presence of fruits such as bananas, apples, oranges, grapes, cantaloupes, peaches, strawberries, honeydew melons, watermelons, and pears. They also looked for vegetables such as carrots, tomatoes, peppers, broccoli, lettuce, corn, celery, cauliflower, cucumbers, and cabbages. Convenience stores had a meager 35 percent of these fruit types and 45 percent of these vegetable types. Big-box stores and grocery stores had more options, but neither had more than three-quarters of the items surveyed. Supermarkets had the most options for fruits and vegetables, carrying on average of 98 percent of both fruit and vegetable types surveyed.

Price

Although healthy food may be available in stores, its price compared to unhealthy food can influence shopping behavior. The price of healthy food compared to unhealthy alternatives in the stores surveyed was scored out of a possible 17 points.²

Across all stores, scores based on the price of healthy food were consistently low. Big-box stores scored the highest, averaging 3.5 points. Grocery stores only received 2 points on average, while supermarkets and convenience stores received fewer than 2 points. This audit suggests that, for most foods, healthier options are either the same price or more expensive than unhealthy

¹ MAP's Growing Green summer youth were trained by Research Assistants from the University of Buffalo Food Systems Planning and Health Communities Lab.

² When healthy food was more expensive than unhealthy food, a store received point deductions, meaning stores could receive a negative overall score for price. Stores were given points when they had a lower price for healthy options. When healthy and unhealthy options had the same price, no points were given.

Table 46. Percentage of stores carrying fruits and vegetables

	Fruit	Vegetables
Convenience	35.0%	45.0%
Big box	52.5%	57.5%
Grocery	70.0%	56.7%
Supermarket	98.0%	98.0%
All stores	65.6%	66.9%

Source: UB Food Systems Planning and Healthy Communities Lab.

Note: Ten fruits and ten vegetables were surveyed in each store.

Table 47. Comparing the price of healthy and unhealthy food

	Percentage of stores where price of healthy food compared to less healthy food is...		
	Cheaper	More Expensive	Same
Convenience	9.4%	18.8%	71.9%
Big Box	27.3%	21.2%	51.5%
Grocery	19.2%	19.2%	61.5%
Supermarket	26.8%	46.3%	26.8%
All Stores	21.2%	28.0%	50.8%

Table 48. Average store-environment quality rating

	Average quality (1 lowest, 3 highest)	
	Outside	Inside
Convenience	2.17	2.56
Big Box	2.02	2.38
Grocery store	1.95	2.58
Supermarket	2.64	2.80

Source: UB Food Systems Planning and Healthy Communities Lab.

options. Throughout the audited stores, whole-grain bread was consistently more expensive than white bread, lean meat was more expensive than regular meat, and 100% juice drinks were more expensive than regular juice drinks containing sugar and artificial ingredients. On the other hand, most stores priced low-fat milk the same or lower than whole milk. Low- or reduced-fat frozen dinners were also often the same price as regular frozen dinners, and baked chips were the same price as regular chips in many cases. Table 47 shows how the prices of healthy food stack up against the prices of unhealthy alternatives across all stores.

Quality

The youth rated the quality of a store's fruits and vegetables as acceptable or unacceptable. These ratings were aggregated for each store on a scale of 0 to 6. If available in stores, most fruits and vegetables were seen to have acceptable quality. Supermarkets, convenience stores, and big-box stores each had an average quality score of 6. In grocery stores, on the other hand, fruits and vegetables were in slightly worse condition. The average quality score for these stores was 5.33.

Aggregate score

Scores for availability, price, and quality were added together to form an aggregate score. Out of all possible healthy food points (48 total), no audited store averaged 60 percent or above. Supermarkets had the best scores, with most around 60 percent (28.2 out of 48 possible points). By contrast, most convenience stores were around 36 percent—averaging only 18 out of 48 possible points. Big-box stores and grocery stores had scores at around 46 percent, or around 22 out of 48 possible points—still a solid F on the healthfulness scale.

Conclusion

The store surveys by the MAP youths reveal that there are real differences in the price and availability of healthy food among different types of stores in our region. While supermarkets offer the most food options, healthy foods are usually priced at levels equal to or higher than their less healthy counterparts. Convenience stores fared the worst in the survey. They have a limited availability of healthy food options, and when those

options are present, they are priced in a way that encourages choosing less healthy alternatives. Big-box stores and grocery stores are somewhere in the middle. They have moderate availability of healthy food without the range of supermarkets, while price disparities between healthy and less healthy foods persist.

Store environment audit results

The quality of a store's environment—its cleanliness, the friendliness of its staff, how easy it is to navigate—is often as important as the food it sells. The youths also audited the environment inside and outside the stores. They documented the stores' lighting, cleanliness, and safety, among other things. They also gathered data on the services available in the stores, such as the acceptance of public assistance like EBT for SNAP or WIC and the presence of a deli or kitchen. Below, we present a summary of their findings.

Average indoor/outdoor rating

The quality of the stores' interiors—its entrance, lighting, shelving, and cleanliness—and exteriors—its awning, sidewalk, parking lot, trash bins, cleanliness, safety, and windows—were rated on a 3-point scale, where 1 is poor, 2 is fair, and 3 is good. The average quality scores for each store type are shown in Table 48.

Most stores scored around 2, or fair, for outside quality. Supermarkets were rated higher than other stores, while grocery stores had the lowest rating, with most scores between fair and poor. The environment inside stores was consistent across store types, with most stores between fair and good. Once again, supermarkets had the highest average rating at 2.8, while big-box stores scored nearer to the fair rating.

Advertising

The youths counted the number of signs posted on the outside of the stores. These included store logos and ads for food, lottery, or other goods. Table 49 shows the average number of signs on the outside of each store type. Supermarkets had by far the most signs in front, while big-box stores had only one sign—

the store sign—in front. Grocery stores had nearly as many signs as supermarkets had, while convenience stores had an average of nine signs on the outside.

Acceptance of public assistance

The youths reported whether each store accepted EBT and WIC. Table 50 shows the percentage of stores of each type that accepted EBT and/or WIC. Four-fifths of supermarkets accepted both EBT and WIC, while one-fifth accepted only WIC. Grocery stores were evenly divided between those that accepted EBT, WIC, and both EBT and WIC. Most big-box stores accepted both EBT and WIC, but one-quarter did not accept any form of public assistance. None of the audited convenience stores accepted both EBT and WIC. Most accepted EBT only, while one-quarter accepted WIC only.

Youth reflections on food stores

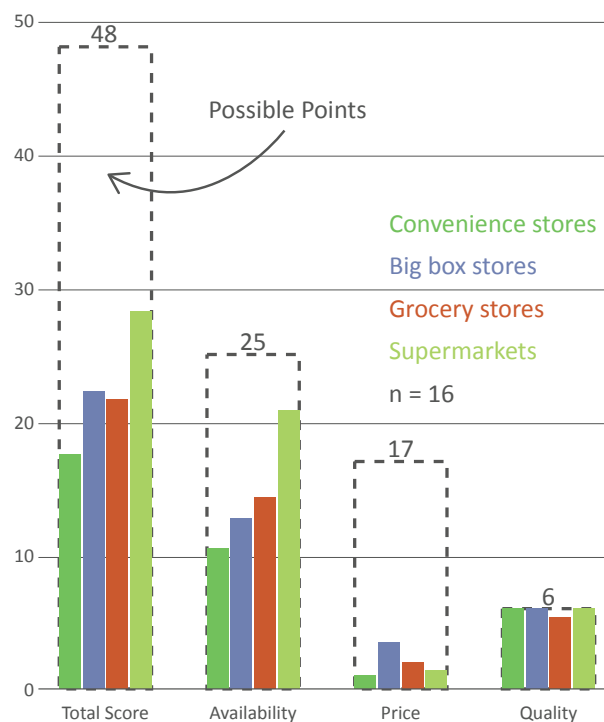
After completing the survey and audit, the MAP youths shared their thoughts on the different food stores they had visited. They also shared what they thought would be an ideal version of each food-store type.

They felt that convenience stores have limited choices and lack access to buses and other transit, helpful staff, and fresh fruits and vegetables. They felt positive about these stores' lower numbers of ads, despite the fact that the ads promote cigarettes, lottery, and unhealthy foods. Overall, they thought that convenience stores were positive because they were convenient for shoppers and were easily accessible in most neighborhoods. The youths felt that the ideal convenience store would have more food options.

Supermarkets were seen as clean, neat, nice, and full of options. However, the young people felt supermarkets were too isolated and had some policies that discriminated against youth, such as those requiring backpacks to be removed and stored at the door. Although security guards can make supermarkets safer, the youths felt threatened and judged by the guards. In fact, although the students felt that supermarkets had the best selection of food, they felt that the ideal supermarket would be judgment-free and less prejudiced towards youth.

While big-box stores are not usually seen as major food providers, students saw Target and Walmart as well organized and clean. In regard to food, students thought they had a lot of variety and a good amount of fresh produce. Pricing, however, was hard to follow and different than in other food stores. Stores like Dollar General, on the other hand, had food but no fresh produce, and some shelves were cluttered. The students felt that their ideal big box would be like Target or Walmart and that they would rather shop at those stores than at Dollar General.

Figure 26. Average healthy food score for surveyed stores



Source: UB Food Systems Planning and Healthy Communities Lab.

Table 49. Signs outside stores

	Average # of signs outside
Convenience	9.0
Big Box	1.0
Grocery store	12.5
Supermarket	15.5

Source: UB Food Systems Planning and Healthy Communities Lab.

Table 50. Public assistance acceptance

	Percentage of stores that accept EBT or WIC			
	EBT + WIC	EBT only	WIC only	No public assistance accepted
Convenience	0%	75%	25%	0%
Big Box	50%	25%	0%	25%
Grocery	33.3%	33.3%	33.3%	0%
Supermarket	80%	0%	20%	0%

Source: UB Food Systems Planning and Healthy Communities Lab.

HOW WELL DOES THE BUFFALO NIAGARA FOOD SYSTEM WORK?

The prior section painted a descriptive picture of the region's vast and complex food system. In this section, the workings of the food system are analyzed to understand how well it serves the region. Results from three specific analyses are included. The first documents the extensive disparities in access to food retail within the region. The second assesses the degree to which Buffalo Niagara is self-reliant in the production of healthy food for its residents. Finally, the section concludes with an assessment of the region's land capacity potential to support agricultural expansion and thus improve the region's self-reliance in the production of healthy food.

A. Disparities in access to food retail

Buffalo-Niagara residents experience disparities in geographic access to healthy food-retail stores, specifically supermarkets. This analysis identifies areas that may benefit from concerted policy and programmatic efforts to promote access to healthy foods.

Most trips made by residents in the region—especially those for food and shopping—are made by car.¹ In particular, nearly all shopping trips occur by car. Recent National Household Travel Survey data for Buffalo Niagara show that 95 percent of those surveyed travel by car, while around 4 percent travel on foot. Trips using public transit and bicycles comprise less than 1 percent of all shopping travel. Walking, the second

most common means of traveling to purchase food, presents a number of challenges for those without a vehicle. It is hard to carry groceries for a family when traveling by foot, and food-retail options within a reasonable walking distance are more limited than those within a reasonable driving distance.

Spatial disparities in access to supermarkets exist throughout the region. A large number of residents lack physical access to stores that stock healthy, affordable foods. The location of food stores and the availability of transportation options to reach them both affect food-retail access. People who own cars have better access to food, compared to people without cars.

A 2008 study of food retail access in Erie County found that an average of 0.01 supermarkets are located within a five minute walk of Erie County neighborhoods.² This limited access impacts some residents more than others. People with limited incomes and limited access to automobiles are often worse off, as they have few options to purchase food within their immediate environments. Households without access to supermarkets are likely to choose more proximate options such as convenience stores, which generally have fewer healthy food options and higher prices. The region has sixty-seven supermarkets, which often have the healthiest and most affordable food, and over 900 convenience stores, where healthy food is either absent or more expensive (see Special

2 Raja, Samina, Changxing Ma, and Pavan Yadav, "Beyond Food Deserts: Measuring and Mapping Racial Disparities in Neighborhood Food Environments," *Journal of Planning Education and Research*, 2008, 27(4), 469-482.

Report on pg. 70).³

Extremely limited access to supermarkets within walking distance

In the Buffalo Niagara region, nearly 56,000 households, or 12 percent of all households, lack access to a supermarket because they live beyond the average walking distance for shopping, which is 0.4 miles⁴ and lack a vehicle⁵ (Figure 26 and Table 51). These households are concentrated in urban areas, especially Buffalo and Niagara Falls. In the neighborhoods identified, lack of access to supermarkets may contribute to negative diet-related health outcomes, such as diabetes and heart disease. Choosing to eat healthfully in these environments costs more—for transportation to supermarkets or for healthy food at grocery and convenience stores—than eating easily accessible foods that are less healthy.

Limited access to supermarkets among households with vehicles

Households located farther than the average driving distance from supermarkets (4.6 miles)⁶ are more likely to

3 ReferenceUSA, 2013.

4 Based on responses from the region in the 2009 National Household Travel Survey.

5 Throughout the region, 60,284 households—13 percent of all households—have no vehicle available and must therefore rely on other means, such as walking, taking a cab, or using public transit, to shop for food.

6 According to 2009 National Household Travel Survey results for Erie and Niagara Counties.

1 Based on responses from the region in the 2009 National Household Travel Survey.

choose more proximate stores, which commonly have fewer healthy food options or higher prices. Throughout the region, over 53,000 households (11 percent of the population) live farther than the region's average driving distance to a supermarket. Figure 27 shows the spatial disparities in driving access throughout the region.

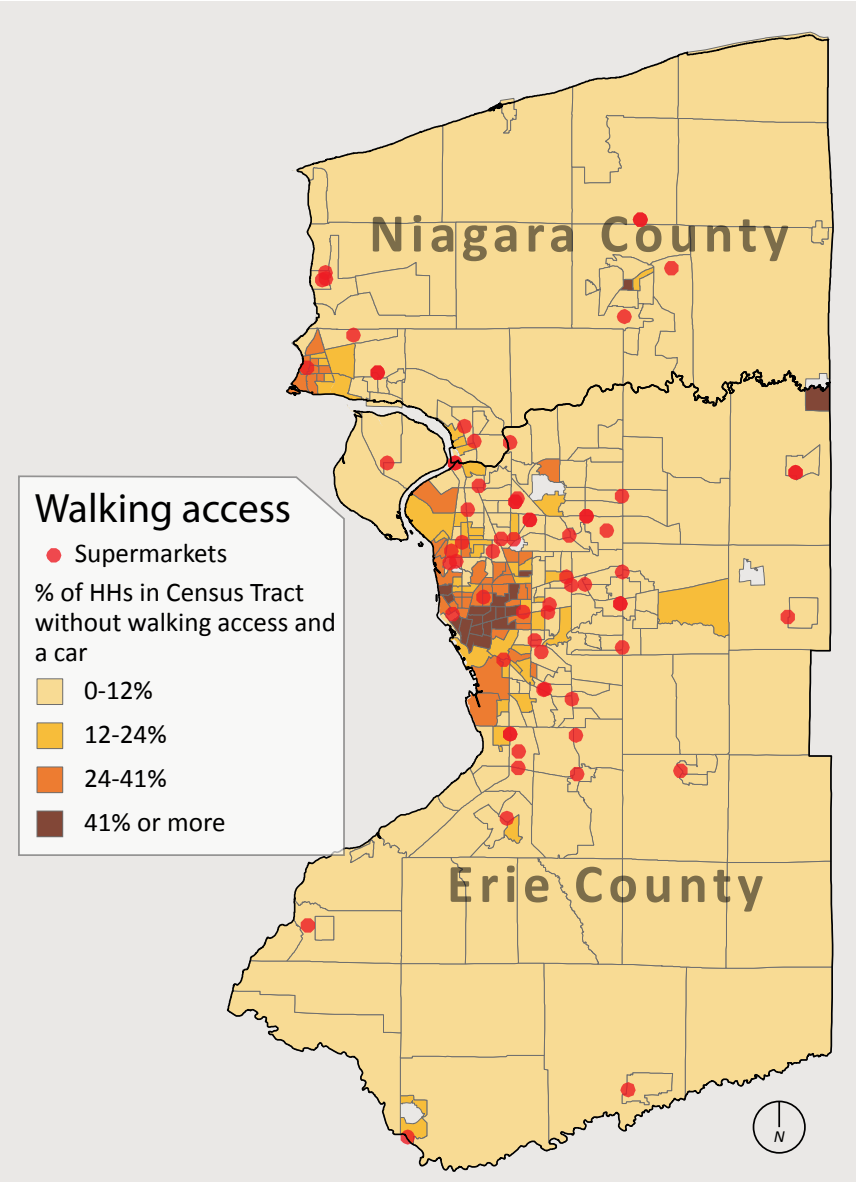
Those living in rural areas, especially rural Niagara County, have lower driving access to supermarkets than do those living in urban areas. Although urban areas face the highest rates of food insecurity, rural areas in the region face their own problems with low food access. A lack of access may result in the consumption of less healthy foods and subsequent negative health outcomes. These results also underline the risks associated with limited vehicle access in rural areas. Rural households that do not own a car or do not have the money to use one may face even lower food security than do similar households in urban areas, where there are numerous smaller neighborhood food stores.

Although supermarket access is often equated with access to healthy food, it is important to consider access to all sources of healthy food, including smaller grocery stores and fruit and vegetable markets. Erie and Niagara Counties have sixty-eight supermarkets, but there are nearly 400 neighborhood grocery stores and fruit and vegetable markets that provide food to communities. These stores may have higher prices, but they are more geographically accessible than supermarkets. Policies to improve the availability and affordability of healthy food in smaller neighborhood stores—such as corner stores and small-footprint grocery stores—will have an important impact on access to healthy food in Buffalo Niagara.

B. Self-reliance in availability of locally grown fruits and vegetables

The ability of a region's farms to produce the food its population eats is an important component of sustainability. This concept is called agricultural self-reliance, and it is determined by comparing the nutritional needs of the population with the types and quantity of food produced by farms in the population's community. The idea of agricultural self-reliance is growing in importance because of global climate change and

Figure 27. Limited access to supermarkets for households without a vehicle



Source: ReferenceUSA, 2013, American Community Survey – 5-year estimates, United States Census, 2011.

Table 51. Households with limited access to supermarkets, 2012

	Households without....				Total HHs
	Driving access		Walking access and a car		N
	N	% of total HHs	N	% of total HHs	
Erie	35,417	9	48,005	13	378,080
Niagara	17,645	20	7,949	9	88,152
Region	53,062	11	55,954	12	466,232

Source: ReferenceUSA U.S. Businesses,” Infogroup, Inc., Government Division, 2013, American Community Survey – 5-year estimates, United States Census, 2011, Food Systems Planning and Healthy Communities Lab, University at Buffalo.

IN BRIEF

PG 73

Twelve percent of households live farther than average walking distance from a supermarket and don't have access to a car.

PG 78

If residents purchased only locally grown food and ate the recommended servings of fruits and vegetables, only 38 percent of the population's demand for fruits and vegetables could be met.

PG 78

There are 22,505 acres suitable for conversion to farmland. If this land were converted to grow fruits and vegetables, the region would only meet 33 percent of its additional land needs (on top of its current self-reliance of 38 percent) for fruit and vegetable self-reliance.

nutritional problems that may be alleviated by sourcing food more closely to where it is consumed.

An agriculturally self-reliant region is more food secure than others in the face of climate change. Many of the agricultural areas across the globe that produce the food eaten in Buffalo Niagara will face water shortages as the climate continues to change—a problem the water-rich Buffalo Niagara region will avoid. By producing a greater share of the region's food locally, the Buffalo Niagara population will be less dependent on food from regions where food production has an uncertain future—and therefore less at risk of food insecurity.

Diversifying the foods farms produce can slow climate change and improve human health. Livestock farming, through enteric fermentation and ma-

Table 52. Self-reliance of Buffalo Niagara fruit and vegetable production, assuming consumption patterns meet the USDA nutrition guidelines

Food sub-group	Self-reliance (%)	Additional crop acres needed for self-reliance
Dark green vegetables	1	2,604
Red and orange vegetables	10	5,060
Beans and peas	51	11,323
Starchy vegetables	9	8,441
Other vegetables	134	-485
Fruit	34	8,630
All fruit and vegetables	38	35,574

Source: U.S. Census of Agriculture; National Agricultural Statistical Service; USDA, Food Systems Planning and Healthy Communities Lab, University at Buffalo.

Table 53. Fruit and vegetable self-reliance acreage in Buffalo Niagara, 2007

	Acres
Fruit and vegetable land in production	31,024
Additional land needed to reach self-reliance	35,574
Total acres for self-reliance in fruit and vegetable production	66,598

Source: U.S. Census of Agriculture; National Agricultural Statistical Service; USDA, Food Systems Planning and Healthy Communities Lab, University at Buffalo.

Table 54. Cropland use in Buffalo Niagara, 2007

Type of cropland	Acres
Total cropland	212,211
Harvested cropland	173,217
Unharvested cropland	38,994

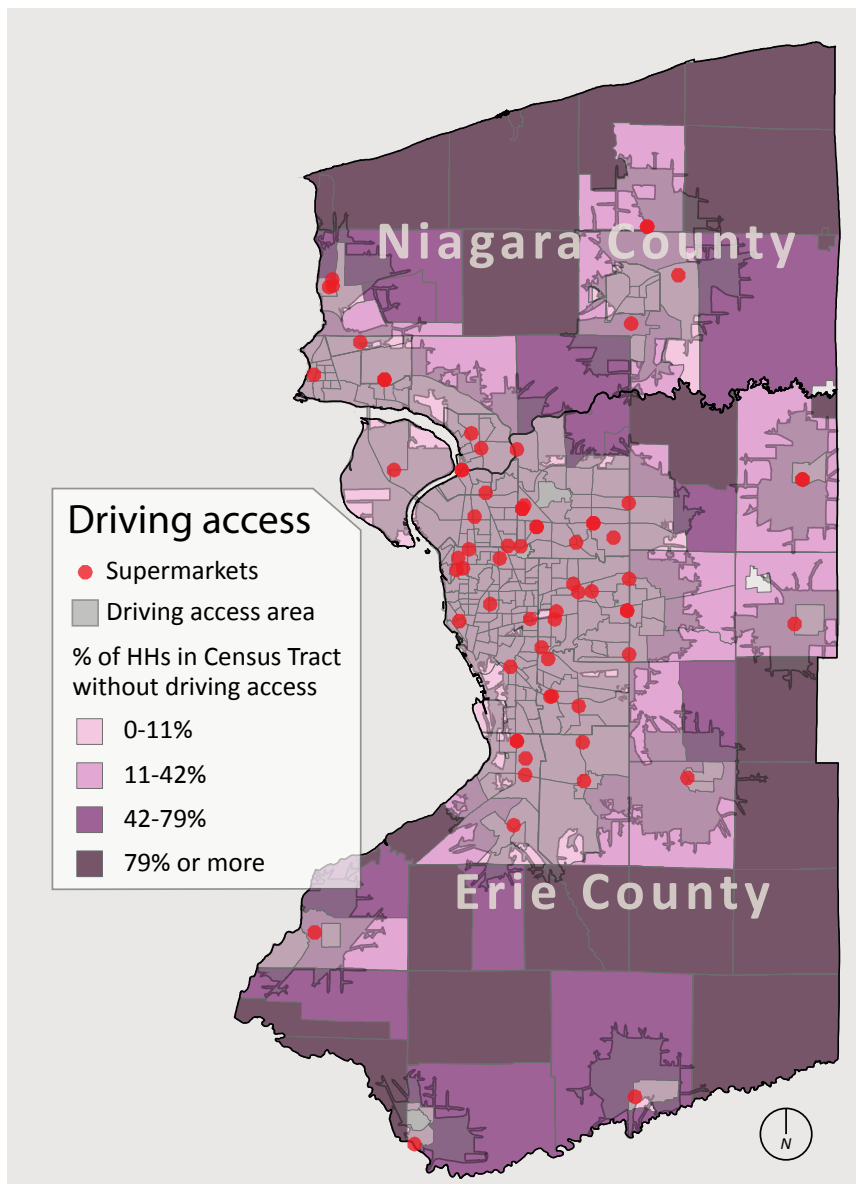
Source: "Census of Agriculture," USDA NASS, 2007.

Table 55. Acres of land in Buffalo Niagara suitable for conversion to farmland, based on soil and slope, 2013

Suitability	Acres	%
High	49,643.3	34.3
Medium	23,507.2	16.3
Low	71,328.7	49.4
Total	144,479.3	100.0

Source: National Resources Conservation Service (NRCS), 2013, Food Systems Planning and Healthy Communities Lab, University at Buffalo.

Figure 28. Limited access to supermarkets for households with vehicles



Source: ReferenceUSA, 2013; American Community Survey – 5-year estimates, United States Census, 2011.

nure management, emits 32 percent of the methane—a greenhouse gas involved in climate change—released into the atmosphere from the United States.⁷ Simultaneously, more meat is available for consumption across the nation than is recommended for good health. Thus, in the process of producing more meat than people should healthfully consume, people are driving more methane into the atmosphere. Moreover, if people were to consistently consume the recommended daily servings of fruits and vegetables, there would be a national shortage of both food groups. Peoples' nutrition plays a role in causing diseases such as obesity, type-2 diabetes, and cardiovascular disease, which are common in Buffalo Niagara. Transforming agricultural practices can help address these nutritional gaps and nutrition-related diseases. Diversifying the food that farms grow to include a greater quantity and variety of fruits and vegetables can help ensure a more sustainable community, improve population health, and reduce emissions that influence the climate.

An analysis of local agricultural trends corroborates national data showing that too few fruits and vegetables are available for consumption by Buffalo Niagara residents. The region's self-reliance—the population's current demand for food compared to what the region's farmers grow—in fruits and vegetables is 67 percent. In other words, if Erie and Niagara County residents purchased and consumed only locally grown food, just two-thirds of the population's current demand for fruits and vegetables could be met.⁸

More significant, though, is that if residents purchased only locally grown food and ate the recommended servings of fruits and vegetables, the region's self-reliance in fruits and vegetables would be just 38 percent (Table 52) (Appendix B).^{9,10} The region's self-reliance

⁷ "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011.: Agriculture," Environmental Protection Agency, April 2013, <http://epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Chapter-6-Agriculture.pdf>

⁸ This assumes that 74 percent of Erie County residents and 73 percent of Niagara County residents continue to consume less produce that is recommended for health.

⁹ Recommendations are based on the U.S. Department of Agriculture and the U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2010, 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010.

¹⁰ Slightly less than one-half of the region's self-reliance is the result of soybean production. Soybeans are nutritious but are not commonly eaten in vege-

Table 56. Acreage multiplier for reaching fruit and vegetable self-reliance in Buffalo Niagara, 2007

Multiplier by which fruit and vegetable acreage must increase to reach self-reliance

2.15

Source: U.S. Census of Agriculture; National Agricultural Statistical Service; USDA, Food Systems Planning and Healthy Communities Lab, University at Buffalo.

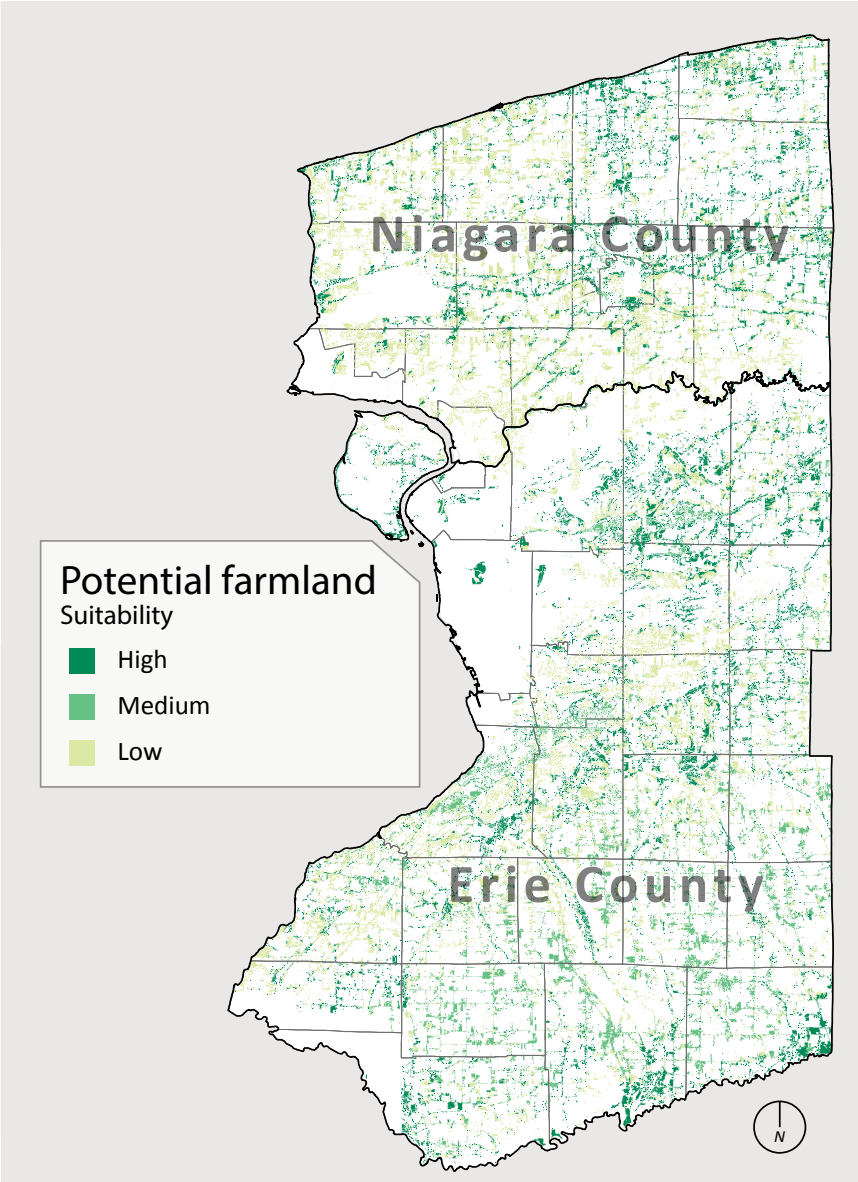
in particular types of fruits and vegetables that are important for public health is generally much lower than 38 percent. For example, Buffalo Niagara farmers can supply only 1 percent of the nutritionally recommended servings of dark green vegetables and can meet only 10 percent of the recommended servings of red and orange vegetables. Due mainly to Niagara County farmers’ prolific fruit harvests (which are three times larger than Erie County’s), the Buffalo Niagara population is 34 percent self-reliant in fruit.

In the availability of several other categories of produce, however, the region is more self-reliant. The region is 50 percent self-reliant in beans and peas due to the large volume of soybeans grown in the region. Additionally, Buffalo Niagara is overly self-reliant (134 percent) in its production of vegetables in the USDA’s sub-category “other vegetables,”¹¹ mainly because head cabbage and snap-bean production in the region is prolific.

In order to become more self-reliant and to cater to healthy eating habits, Erie and Niagara Counties need to dedicate more land to growing fruits and vegetables. Currently, 31,024 acres of fruits and vegetables are harvested in the region. In order to become self-reliant and to meet nutritional recommendations, farms in the two counties would need to grow and harvest 35,574 more acres of fruit and vegetables (Table 53).¹² This would bring the total acreage dedicated to fruit and vegetable farming to 66,598, increasing the current acreage by a factor of 2.15 (Table 56).¹³

Hypothetically, cropland is available for this increase (Table 57). The region’s farmers currently harvest only 173,217 acres of the 212,211 acres classified as cropland, meaning that 38,994 acres are not harvested. There may be barriers, however, to farming this land. For

Figure 29. Land with soil and slope suitable for farming



Source: National Resources Conservation Service (NRCS), 2013; UB Food Systems Planning and Healthy Communities Lab.

table form by Americans.

11 The USDA classifies “other vegetables” as: artichokes, asparagus, avocado, bean sprouts, beets, brussel sprouts, cabbage, cauliflower, celery, cucumbers, eggplant, green beans, green peppers, iceberg (head) lettuce, mushrooms, okra, onions, turnips, wax beans, zucchini.

12 Assuming that agricultural practices impacting weight-yields do not change.

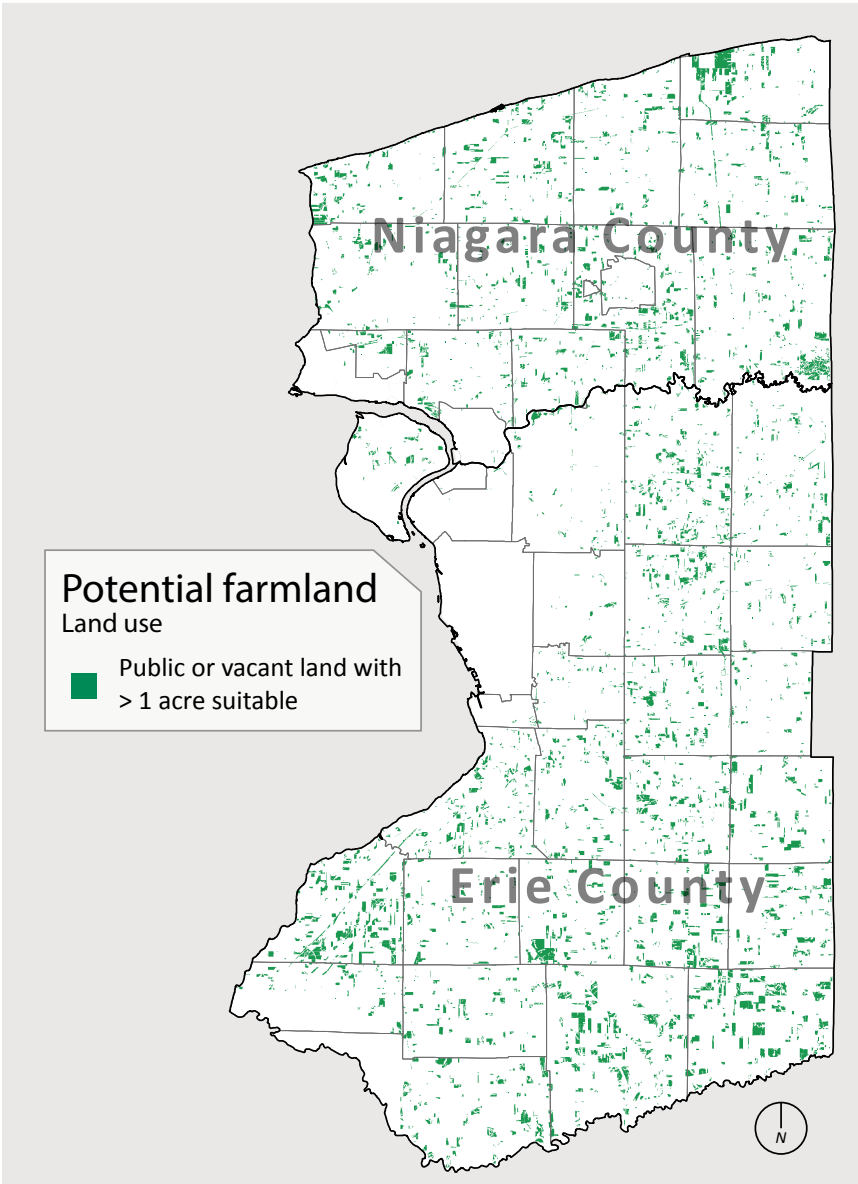
13 This analysis assumes self-reliance in fruits and vegetables year-round. The authors recognize that reaching year-round agricultural self-reliance using traditional growing methods may not be possible. Different acreage requirements and infrastructure would be necessary if production occurred year-round. Additionally, the counties around Buffalo-Niagara are less densely populated than Buffalo-Niagara and are heavily agricultural, meaning that the food grown in surrounding counties could—and likely already does—contribute to feeding the Buffalo Niagara population.

Table 57. Acres of available land in Buffalo Niagara suitable for conversion to farmland based on soil and slope, 2013

Land use	Suitability			Total
	Low	Medium	High	
Vacant	11,297.5	3,913.7	7,189.4	22,400
Publicly owned, undeveloped	32.3	33.2	39.7	105
Total	11,329.7	3,946.9	7,229.2	22,505

Source: National Resources Conservation Service (NRCS), 2013, Food Systems Planning and Healthy Communities Lab, University at Buffalo.

Figure 30. Land parcels suitable for conversion to farmland



Source: National Resources Conservation Service (NRCS), 2013; “2012 Parcel Data,” edited by Tax Mapping Division County of Niagara Real Property Services, New York State GIS Clearinghouse, 2012; “Erie County Parcels 2012,” edited by Erie County, 2012.

example, these lands may be fallow due to crop rotation, or non-farmers may own them. Farmers could switch from growing crops such as hay and field corn to growing fruits and vegetables. The next section considers the prospect of expanding farming in the region by identifying land that is suitable for conversion to farmland. This land may play a role in improving the region’s self-reliance.

C. Identifying land suitable for conversion to farmland

Farmland in the region has declined in recent decades. Despite the region’s declining population, development has continued to take place on prime agricultural land. This is problematic because farming needs to be able to shift and expand to meet not only current fruit and vegetable demand but that of the future—which will be higher—as well. This section documents the possibilities for expanding farming in the Buffalo Niagara region. Securing land for future farming expansion will require a mix of private incentives and public action to protect farmland; these actions and incentives are described in the concluding section of the report.

To identify lands that are not currently farmed but may be suitable for conversion to farmland, three key factors are considered first, soil quality and slope; second, land use; and third, development pressure.

Soil quality and slope

Not all land is suitable for growing food. A key element of land’s suitability for food production is soil quality. The quality of soil—including its composition and drainage—can be the difference between time consuming, costly remediation efforts and relatively quick, economically efficient conversion of land to farmland. Therefore, this analysis assesses current soil and slope conditions on land that is not currently being farmed. Based on its soil quality, drainage, and slope, land not currently being farmed in Buffalo Niagara but suitable for conversion to farmland has been classified as high suitability, medium suitability, or low suitability.

In total, over 144,000 acres of land not currently being farmed in the Buffalo Niagara region are suitable for conversion to farmland (Table 55) based on their soil quality and slope. Of this land,

Table 58. Farmland in areas of population change and residential development change, 2013

	Rising home construction	Falling home construction
	Acres of farmland (% of total farmland)	
Population growth areas	2,366.03 (0.93%)	119,724.98 (47.18%)
Population loss areas	90.72 (0.04%)	131,605.16 (51.86%)
Total farmland = 253786.9 acres		

over 49,000 acres have been rated “high quality,” indicating that they possess both prime farmland and level slopes. This land is the most suitable to convert to farmland and should be prioritized for farmland protection. Lands that have been rated “medium quality” constitute the smallest portion (23,507 acres) of suitable farmland. This land may have drainage issues or be steeper than is ideal, but it is still potentially viable as farmland. Finally, nearly half of suitable land falls into the “low quality” class. This land will likely be more costly to convert to farming and produce lower crop yields than will land in the other classes. However, it is still valuable to consider protecting this land for future conversion into farms. A map of lands that could potentially be used for farming—based on soil and slope—in the region is available in Figure 28.

Feasible land use

Even when soil is of good quality, the current land use, ownership, and parcel size restrict whether land can be used for farming. For example, Buffalo’s Delaware Park and parts of Forest Lawn Cemetery may be suitable for conversion to farmland because they are prime farmland with low slopes, but they are already important for other reasons. Therefore, the assessment of land available for farming further narrows the selection of lands only to those that are in public ownership, larger than one acre, and not already in use (e.g., vacant lands).

Of the over 144,000 acres of land suitable for conversion to farmland in the region based on slope and soil quality, only 22,505 acres are on vacant or public land (Table 57). All but 105 acres of this suitable land is vacant, and most of this land is of either high quality or low quality. The largest portion (39.7 acres) of suitable public land is of high quality. A map of lands that are suitable for conversion to farmland and are also vacant or publically owned appears in Figure 33.

Development pressures on current and potential farmland

Although the region has lost population, farmland still faces significant development pressure. Sprawling development that outpaces population growth at the edge of urban areas is one of the biggest threats to expanding farming and protecting existing farm-

Clarence Greenprint Program

The Town of Clarence, NY has implemented a successful farmland and open-space protection program known as Clarence Greenprint. In recent decades, Clarence has witnessed a boom in development at the expense of open space and farmlands. Town planners and residents desired to preserve the open space and farmland in their community, and in 2002, voters approved a \$12.5 million bond to fund the Greenprint Program. The program, like similar programs throughout the U.S., is designed to purchase property or development rights through conservation easements on farms and open space in the community. Clarence partnered with the Western New York Land Conservancy (WNYLC) to help design and implement the program and hold title to the easements.¹

Greenprint programs protect farmland and open space through the purchase of private property rights from private individuals, which entails complete and total ownership of the parcel or purchase of only the development rights through conservation easements. Private property transactions are more permanent than land-use regulations or zoning, which are easily amended. Conservation easements are private contracts that extinguish development rights on land in order to preserve the land as open space or agricultural land. Landowners interested in protecting their land through a conservation easement voluntarily enter into an agreement with a government agency or land trust. Once a conservation easement is created, it is difficult to terminate, which allows municipalities to entrench farmland protection into their communities’ land-use policies.² Conservation easements are flexible and the conditions of the contracts can be tailored to the specific goals of the landowner and the entity acquiring the development rights. The purchase of land outright, rather than the purchase of conservation easements, is another option and allows communities to sell farmland to aspiring farmers and recoup on investments.

Clarence developed a ranking system for agricultural land to determine which parcels warrant preservation and offer the most benefit to the town. The system rates agricultural parcels based on their: value to the local agricultural economy, soil type and quality, size, proximity to adjacent farms, and cost to acquire. If the land is worth pursuing for preservation and if the landowner is interested, an assessment for fair market value occurs. The Greenprint Program determines whether to offer an easement or to outright purchase the land and prepares a dollar offer for the agreement. Once a price is agreed upon, the Clarence Town Board makes the final decision of whether to pursue the agreement.

Since 2002, \$6.8 million has been spent to purchase 1,236 acres of farmland and open space. The cost to taxpayers is \$14.10 annually per property assessed at \$100,000. The preservation of open space resulted in a 15 percent increase in property values next to conserved land.³ Due to the program’s success, in 2012 the town approved a ten-year extension on the bond that funds the Clarence Greenprint Program, ensuring that more open space and agricultural land will be preserved.

¹ “Clarence, New York Agriculture and Farmland Protection Plan,” Town of Clarence with assistance from American Farmland Trust, 2012.

² Serkin, Christopher. “Entrenching Environmentalism: Private Conservation Easements over Public Land,” 77 U. CHI. L. REV. 341, 342 (2010).

³ “Clarence, New York Agriculture and Farmland Protection Plan,” 2012.

Table 59. Average distance traveled by Buffalo Niagara region residents (miles)

Mode	For all trips			Shopping			Eating out			Coffee, ice cream, or snack			All other eating trips		
	U	S	R	U	S	R	U	S	R	U	S	R	U	S	R
Drive	6.6	7.1	12.2	4.1	4.2	6.5	5.1	8.8	8.3	2.6	8.5	4.3	2.2	3.5	2.0
Transit	4.1	11.3	NA	3.0	NA	NA	2.0	NA	NA	NA	NA	NA	NA	NA	NA
Walk	0.7	0.7	0.6	0.4	0.3	NA	0.4	0.5	0.1	0.4	0.3	NA	NA	NA	NA
Bike	1.8	1.2	9.0	0.2	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: National Household Travel Survey, 2009.

Note: U, S, and R represent distances travelled in urban, suburban, and rural areas, respectively.

Table 60. Maximum travel distance traveled by Buffalo Niagara residents (miles)

Mode	For all trips			Shopping			Eating out			Coffee, ice cream, or snack			All other eating trips		
	U	S	R	U	S	R	U	S	R	U	S	R	U	S	R
Drive	320	500	152	40	30	28	52	147	22	8	52	6	6	5	2
Transit	15	18	NA	3	NA	NA	3	NA	NA	NA	NA	NA	NA	NA	NA
Walk	3	6	4	1	0.5	NA	1	0.5	0.1	0.6	0.5	NA	NA	NA	NA
Bike	20	6	10	0.2	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: National Household Travel Survey, 2009.

Note: U, S, and R represent distances travelled in urban, suburban, and rural areas, respectively.

land. Between 1970 and 2010, Buffalo Niagara lost 14 percent of its population, while its developed land area grew by 78 percent.¹⁴ These development patterns are threatening the region's agriculture and food system. This section examines development pressure that may impact both current and future farmland in the region's municipalities.

In New York State, municipalities have the greatest power to protect farmland. They are responsible for land-use decisions, including designating areas to preserve as farmland and open space and selecting areas in which future population growth will occur. This analysis assesses the pace of development pressures vis-à-vis population growth within municipalities, to determine where in Buffalo Niagara farmland is at greatest risk. It compares the rates of change, year by year, of population growth and the issuance of building permits for new residential development from 2005 to 2010.

14 Population and Land Area of Urbanized Areas, For the United States," U.S. Census Bureau, 1970 and 1960, <http://www2.census.gov/prod2/decennial/documents/31679801no108ch1.pdf>; "Population and Land Area of Urbanized Areas, For the United States," U.S. Census Bureau, 2010, www.apta.com/resources/statistics/Documents/2010-UZA-List.xls.

Municipalities in the Buffalo Niagara region are categorized in the following four groups (Figure 30):

1. Rising rates of home construction and population growth

Municipalities in this category are experiencing growth both in the number of new housing units being built and in their populations. Consequently, these are areas where current farms and farmland are likely under threat and where future farmland growth will be challenging.

2. Falling rates of home construction and population growth

In municipalities in this category, fewer new housing units are being built, but the population is growing. These are areas where future development is possible and even likely and where farmable land and current farmland will face pressure from development.

3. Falling rates of home construction and population loss

In municipalities in this group, fewer new housing units are being erected, and the population is declining. In these areas, current farms may be able to expand, and the possibility of converting

land to farmland is higher.

4. Rising rates of home construction and population loss

In these areas, population growth is expected—but is not yet taking place—by developers who are acquiring more permits for new buildings each year. These areas should prioritize protecting current farmland from unnecessary and speculative development and should ensure that farmable land can be farmed in the future.

Currently, farmland exists in all four municipality types, but it is highly concentrated in places with declining residential development (Table 58). The majority (51.86 percent) of current farmland exists in municipalities experiencing both residential decline and population loss. Approximately 47 percent of farmland, however, is located in municipalities with population growth but declining residential development. In these areas, the pressure to consume land for development is likely to increase. Around 1 percent—2,366.03 acres—of farmland is in municipalities with growing residential development and population. This land is likely to be under threat and would benefit from policies aimed at protecting it from development, such as

purchase of development rights.

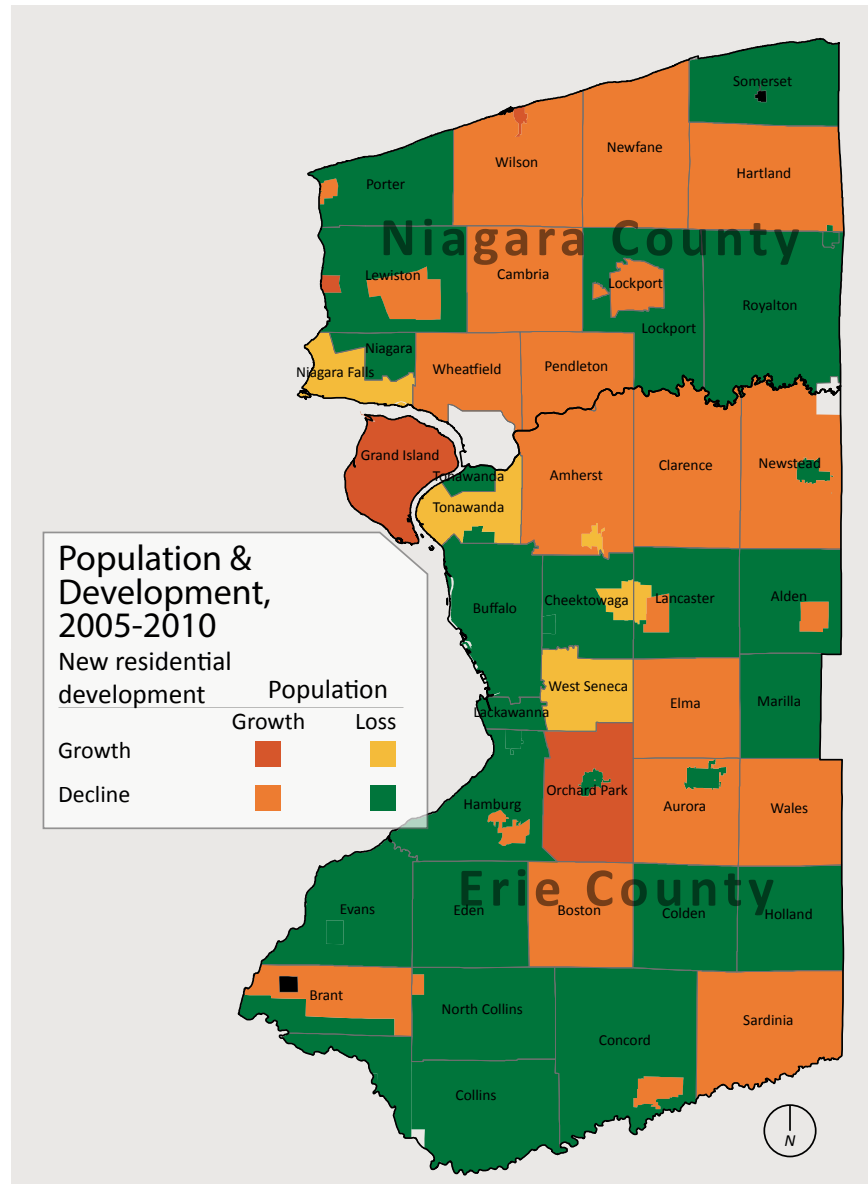
Conclusion: Self reliance through increasing farmland

Much remains to be done for the region to reach self-reliance in fruits and vegetables. For the region to meet its population's demand for the recommended levels of fruit and vegetable intake, 35,574 more acres of farmland must grow these crops. Non-farmland with soil quality and slopes suitable for farming total approximately 144,000 acres, which is more than enough to produce the fruits and vegetables the region needs to eat to have a healthy diet. Given constraints on land use and ownership, however, the amount of available land is reduced to approximately 22,000 acres—just 33 percent of the land the region needs for self-reliance.

Moreover, as some of this land will also be in demand for residential development, not all of it will be available for the expansion of local food production. The biggest opportunities for expanding farmland are in municipalities experiencing population loss and a decline in the number of new residential housing units being built. Expanding farming will require dedication from numerous actors, including policymakers and planners regulating land use, entrepreneurial farmers looking to take advantage of the wealth of productive land in the region, and the consumers who are driving demand for local food.

The majority of non-farmland that has the soil quality, slope, and land uses desirable for conversion to farmland exists in municipalities with declining residential development. While the highest share of this land is located in places that are also experiencing population decline, nearly 10,000 acres of this land is located in municipalities with a growing population (Figure 30).

Figure 31. Change in population and residential development in municipalities



Source: National Resources Conservation Service (NRCS), 2013; "2012 Parcel Data," edited by Tax Mapping Division County of Niagara Real Property Services, New York State GIS Clearinghouse, 2012; "Erie County Parcels 2012," edited by Erie County, 2012; "Building Permit Estimates," U.S. Census Bureau, 2005-2010; American Community Survey, U.S. Census Bureau, 2005-2010.

7.

MODEL POLICIES AND PRACTICES

Communities around the country are implementing practices designed to improve food access and justice. These practices range from the adoption of new policies and laws, to the investment of finances, to the establishment of training and programs to strengthen food systems. This section reports selected policies and practices from around the country that may offer lessons for the Buffalo Niagara region. Where possible, the actors and funders responsible are identified.

1. Increasing institutional purchasing of local farm products

City ordinance to increase local institutional purchasing (Cleveland, OH)

Local purchasing ordinances are one method of growing markets for local farmers in institutions. Cleveland's local purchasing ordinance intends to grow the share of local food purchased by city agencies. The passage of the ordinance was primed by a local purchasing resolution that passed in the City Council in 2008. The resolution pledged that 10 percent of food purchased through city contracts would be sourced from within 150 miles of the city.¹ The subsequent ordinance (No. 1660-A-09, passed 4/7/10) provides 2 percent bid discounts on all applicable city contracts to businesses that are sustainable, locally based, and/or purchase 20 percent of their food locally—these can be combined for a maximum discount of 4 percent.² If a local bidder with a bid discount is awarded the contract, the payment from

the city to the vendor is the pre-discount amount (not the bid discount amount).³ Contracting departments must “develop lists of local producers, local food purchasers, and local sustainable businesses for whose goods, materials, supplies, or services the city typically contracts.” Also, the agencies must work to maximize local purchasing in contracts of \$10,000 or less.⁴

Actors: Local Purchasing Working Group, Cleveland City Council, Cleveland-Cuyahoga Food Policy Coalition

Funding, capital, and staffing: No new staff or funds were supplied to support the new purchasing guidelines.

Improving school nutrition standards and increasing local food purchasing (Washington, DC)

The Healthy Schools Act was implemented in 2010 in Washington, D.C. The act requires D.C. schools to match USDA Healthier U.S. Gold Standards for school meal nutrition and to serve minimally processed foods from sustainable, local growers when possible. The act also requires schools to “promote local and sustainable foods, educate staff and students about eating them, and participate in at least one Farm to School educational event each year.”⁵ Moreover, the program establishes a school garden program. Lastly, a 5-cent reimbursement is provided for locally sourced meals,

and the source of produce is tracked to provide data on farm-to-school efforts.⁶ In the process of passing the act, the community stakeholders formed partnerships that included parents, teachers, farmers, food servicers, environmental organizations, farmers' market directors, and health advocates. The partnerships backed a 5 cent tax on soda to fund the program, which was supported despite criticism from the soda industry. The partnership also helped to defend the act from budget cuts.⁷

Actors: Washington D.C. legislative council, the city mayor, schools

Funding, capital, and staffing: The act reimburses schools with 5 cents per meal when the meal is locally grown and unprocessed and 10 cents when the meal meets the Gold Standard nutrition requirements. These and other elements of the act are funded by a sales tax on soda purchased in D.C. The garden program is funded by grants from the D.C. Office of the State Superintendent of Education.⁸

Measured impacts: At the end of the program's first year, 65.1 percent of schools served locally grown food from sustainable-practice growers at least once per month, 95.7 percent of public schools served a different vegetable each day of the week, and 96.6 percent of public schools served whole grains at least once per day.⁹

University food procurement contract with food servicer for local food purchasing

1 “Local Purchasing,” Cleveland-Cuyahoga County Food Policy Coalition, accessed January 24, 2014, <http://cccfoodpolicy.org/working-group/local-purchasing>

2 “The City Record, Wednesday, April 7, 2010,” Council of the City of Cleveland, page 12-13, accessed January 24, 2014, <http://cccfoodpolicy.org/sites/default/files/re-sources/The%20City%20Record%202010-04-07.pdf>.

3 “Local Purchasing,” Cleveland-Cuyahoga

4 “The City Record,” Council of the City of Cleveland.

5 “Strengthening Farm to School Programs: A Policy Brief for State & Local Legislators,” Community Food Security Coalition, http://wvhub.org/sites/default/files/CFSC_brief_FarmSchool_d3.pdf; “Report on the Health, Wellness and Nutrition of Youth and Schools in the District of Columbia,” Healthy Youth and Schools Commission, 2012, http://osse.dc.gov/sites/default/files/dc/sites/osse/service_content/attachments/HSA%20Commission%20FY12%20Report%20final.pdf

6 “Report on the Health,” Healthy Youth and Schools Commission.

7 “Strengthening Farm to School,” Community Food Security Coalition.

8 Ibid.

9 “D.C. Healthy Schools Act, Year One Snapshot,” D.C. Hunger Solutions, 2012, accessed January 24, 2014, http://www.dchunger.org/pdf/dc_healthy_schools_act_snapshot.pdf.

(University of Massachusetts)

The University of Massachusetts at Dartmouth solicited a food-service contract that privileges local purchasing. University-wide sustainability initiatives prompted the university to enter a food procurement contract with Chartwells—instead of renewing with Sodexo—because Chartwells included a local purchasing component in its bid. Chartwells innovated to reduce the logistical challenges of procuring from multiple farmers by working with FoodEx, an innovative for-profit food distributor with a focus on purchasing from New England producers. FoodEx connects farmers with purchasers through a website that lists what the procurers want and what farmers have. FoodEx then transports the food from the farms to the university. The shipments to UMass-Dartmouth can be small, so FoodEx also stocks the truck with orders made by several other regional universities for which Chartwells oversees local purchasing.

Actors: UMass-Dartmouth, Office of Campus and Community Sustainability; Chartwells; FoodEx; Southeastern Massachusetts Agricultural Partnership (SEMAP)

Funding, capital, and staffing: No funding changes were made as a result of this practice. The Office of Campus and Community Sustainability played a role in building momentum for the adoption of a contract with a servicer that procures locally. After the contract began, the major players were Chartwells' regional chef and FoodEx.

Issues: Chartwells must maintain the contract it has with its main vendor, causing some limitations to the amount of food that Chartwells can source locally.¹⁰

Measured impacts: The UMass-Dartmouth student body was surveyed before and after the first year of the Chartwells contract. The results of these surveys showed that students were much more satisfied with the dining service's sustainability efforts and use of locally grown products under the Chartwells contract than they had been previously.¹¹ SEMAP reports that the six farmers selling to Chartwells sold 70,000 lbs of produce worth \$100,000. It

10 Broad Leib, "Increasing local procurement."

11 "New UMASS Dartmouth Dining Drives Satisfaction Scores up 32%," Chartwells, accessed January 24, 2014, http://eatlearnlive.com/CaseStudies/UMass%20Dartmouth%20Case%20Study_2013.pdf.

is unclear what share of this was new to the farmers.¹²

Legislative change to increase procurement of in-state agricultural products (Massachusetts)

The State of Massachusetts requires that state agencies give preference to in-state foods when making purchasing decisions as long as the foods cost no more than 10 percent more than the lowest out-of-state bid.

Actors: Massachusetts's state government, state agencies

Issues: Massachusetts' state colleges and universities are seemingly exempt from the statutory requirement to procure from within the state. The bill¹³ originally required that the policy be applied to state colleges and universities because of the huge impact their food procurement policies could have on local farms. The language, however, was dropped during the legislative process because of complaints from university administrators and their institutions' large-scale food servicers. Food servicers believed that the change would drive up their costs, a concern that resonated with administrators, who felt that paying more ran counter to the state's mission of keeping costs down for students. The policy now requires only that colleges and universities make "reasonable" efforts to procure in-state foods. The likelihood of getting colleges and universities on board could be strengthened if high-level administrators had a clear picture of possible cost changes.¹⁴

One interpretation of the bill is that food servicers (depending on their contract statuses with the institutions) are not bound by the procurement rules. To ensure that the contracts that institutions have with food-service companies are impacted by the bill, the bill must explicitly extend the rules to businesses with which agencies contract.¹⁵

Private business food-pro-

12 Lade, Jennifer. "SEMAP program helps farmers grow sales," Southcoast Business Bulletin, April 20, 2012, <http://www.southcoasttoday.com/apps/pbcs.dll/article?AID=/20120420/SCBULLETIN/205010338/1036>.

13 Mass. Gen. Laws, ch. 7, § 23B (2010).

14 Broad Leib, Emily et al. "Increasing local procurement by Massachusetts State colleges and universities," Harvard University Food Law and Policy Clinic, October 2012.

15 Broad Leib, "Increasing local procurement."

curement policy (National)

Institutional procurers at Kaiser Permanente, a nationwide healthcare organization, use a sustainability scorecard to select food vendors. This method assigns a score to each vendor based on the products each offers and their ability to track the sources of their foods. The initiative is completely institution-led—there is no statutory requirement for Kaiser to engage in local procurement activities. One benefit of using the scorecard is that it tells vendors how they rank on Kaiser's sustainability index and indicates how vendors need to modify their practices in order to win bids or contracts with Kaiser. Another benefit is that the scorecard records local purchasing, which enables Kaiser to track the shares and types of food they purchase locally.¹⁶

Actors: Kaiser Permanente

Measured impacts: No metrics are available to assess post-implementation purchasing.

2. Connecting refugee populations to agriculture opportunities

Local governments can help make land in urban areas easier to farm by streamlining zoning for urban agriculture and by helping connect potential refugee farmers with vacant land.

New Farmer Training Program (Kansas City)

In this program, at Juniper Garden in Kansas City, which is targeted towards refugees but open to all city residents, participants are given up to five years of training, capital, and a quarter acre of land to start their own food-production enterprise. In exchange, they must agree to sell at least ten times throughout the year at one of ten KC-area farmers' markets and through the New Roots for Refugees CSA program in the city, and they must save a percentage of their income for future expenses on the farm.

Actors: Cultivate Kansas City; Catholic Charities of Northeast Kansas; Kansas City, Kansas Housing Authority. Funding, capital, and staffing: Grants from the U.S. Office of Refugee Resettlement

16 "Menu of Change: Healthy Food in Health Care," Health Care Without Harm, 2013, accessed January 24, 2014, http://www.noharm.org/lib/downloads/food/Menu_of_Change_2013.pdf.

Refugee Agriculture Partnership Program, the USDA Specialty Crop Block Grant, and the USDA Beginning Farmer and Rancher Development Program funded the land acquisition, farming equipment, training space, and marketing costs incurred by this program.

Measured impacts: The program currently supports sixteen refugee farmers, at least six of whom were expected to farm their own plots in 2013.¹⁷

3. Expanding urban farming and community gardening

Leasing city-owned land for urban gardening and farming (Richmond, VA)

Since 2011, the Richmond Grows Gardens program of Richmond, Virginia has made publicly owned land available for use to community groups that want to grow fruits and vegetables in the city and desire to transform vacant and underutilized land. The city has enacted extensive guidelines for both commercial and community farming on this land. While organizations lease the land from the city on a yearly basis, community gardens can be subdivided into smaller plots that can be leased at low cost to individuals in the community.¹⁸

Actors: The City of Richmond, Virginia

Funding, capital, and staffing: The Richmond Grows Gardens coordinator oversees the program. Funding is provided by the city and by yearly fees paid by participating individuals, which range between \$25 and \$50 per garden.

Measured impacts: There are currently six community gardens operating on city land and ten sites that are garden-ready.

Inventory city land appropriate for agriculture (Portland, OR)

In 2005, the City of Portland, Oregon, along with students and faculty in the Urban and Regional Planning Program

at Portland State University, started the Diggable City project, an assessment of city-owned vacant land for its potential for urban agriculture. The work was undertaken in response to a city council resolution. The project identified 430 parcels that are suitable for some scale of urban gardening and made recommendations for actions to prepare the land for growing.¹⁹

Actors: The Portland Bureau of Planning and Sustainability and Portland State University collaborated on this project.

Funding, capital, and staffing: City GIS staff, graduate students from the Urban and Regional Planning Program at Portland State University, and the Portland/Multnomah Food Policy Council (FPC) convened a Technical Advisory Committee to provide guidance on evaluation criteria, while the students undertook the actual evaluation. No funding was provided by the city for the students.

Measured impacts: Portland's city council unanimously accepted the report and tasked the FPC with implementing its recommendations. The FPC worked with the City of Portland to remove land-use policy and zoning barriers to urban agriculture that were identified in the report. The FPC also requested proposals for project ideas that need access to land.

Reforming zoning codes to make it easier to grow food in the city (Boston, MA)

Example 1: The City of Boston drafted a new zoning ordinance that seeks to enable urban growing at a variety of scales to improve access to locally produced and fresh food. The new ordinance will streamline legal protection for rooftop and ground-level commercial farms, farmers' markets and farm stands, hydroponics and aquaponics, and backyard hen- and bee-keeping facilities. Those wishing to grow and raise animals on land in Boston will have clear guidelines for safety, design, and scale. The zoning ordinance creates a process for reviewing operations to ensure that farms adhere to scale restrictions, meet minimum requirements for husbandry or cultivation type, and are not incongruous with the existing urban environment.²⁰

19 Balmer, Kevin et al., "The Diggable City: Making Urban Agriculture and Planning Priority," City of Portland, OR, 2005, accessed January 24, 2014, <http://www.portlandoregon.gov/bps/article/122587>.

20 "Article 89 - Urban Agriculture," City of Boston, 2013, accessed January 24, 2014, <http://www.bostonredevelop->

Actor: The City of Boston, Boston Redevelopment Authority, Mayor's Urban Agriculture Working Group

Funding, capital, and staffing: City of Boston planners primarily staff this project. Additional staffing will likely be needed for the comprehensive farm-review process.

Measured impacts: If adopted, Bostonians will be able to engage in various forms of urban agriculture at various scales. It is likely that the number of farms, farm stands, and animals will increase in the city.

4. Farm management to make farms more viable and sustainable

Policies and programs that promote and assist farmers in the adoption of more sustainable practices can have a positive impact on the food system and can help improve farm viability.

Whole farm planning (New York City Department of Environmental Conservation)

Whole Farm Plans (WFPs) seek to limit the negative environmental impacts of farming practices while ensuring the economic viability of farms. WFPs are farm-specific and are tailored to the agricultural practices taking place on the farm and its environmental, social, and cultural setting. The New York City Department of Environmental Conservation's Watershed Agricultural Council (WAC) provides technical assistance and funding for implementing WFPs in farms in the city's watershed, which extends into southwestern Connecticut and as far north as the Catskills. The WAC sends a team to participating farms to review their farming practices and identify their potential sources of pollution. Then, working with the farmer, they draft a WFP, which is then reviewed by the WAC. Finally, the farmer agrees to implement the plan with the support of the Council.²¹

Actors: The main actor is the Farmers and Watershed Agricultural Council—a public-private partnership that uses "payment for ecosystem services" to encourage stewardship of farmlands

mentauthority.org/getattachment/a573190c-9305-45a5-83b1-735c0801e73e

21 "Whole Farm Planning," Watershed Agricultural Council, 2013, accessed December 4, 2013 http://www.nycwatershed.org/ag_planning.html.

17 "About Us," New Roots for Refugees, accessed January 24, 2014, <http://newrootsforrefugees.blogspot.com/p/about-us.html>.

18 "Community Gardens," City of Richmond, VA, accessed January 24, 2014, <http://www.richmondgov.com/CommunityGarden>.

and open space.

Funding, capital, and staffing: Implementation of WFP and WMP is funded through a Conservation Innovation Grant from the Natural Resources Conservation Service's Environmental Quality Incentive Program. Additional funding to WAC is provided by the New York City Department of Environmental Protection,²² the U.S. Department of Agriculture, the U.S. Forest Service, and other federal, foundation, and private sources.²³ WAC provides a multidisciplinary planning implementation team, and may include representatives from the USDA Natural Resources Conservation Service, Cornell Cooperative Extension, and County Soil and Water Conservation Districts.

Measured impacts: In one WFP, farmers and WAC staff identified an alternative to liquid manure storage that reduced manure runoff while still allowing the manure to be added to fields as fertilizer. This allowed the farmer to use animal waste to improve growing without significantly raising costs or increasing labor.²⁴

State-mandated nutrient management program (Maryland)

As a part of the Maryland Water Quality Improvement Act of 1998, farmers with sales over \$2,500 or more than eight animal units are required to have a nutrient management plan.²⁵ This involves identifying and minimizing the transport of fertilizers and other farm nutrients to local water bodies. A manure- or fertilizer- spreading plan is created using data on soil quality, on-farm nutrient resources, and manure. The plan determines the amount of fertilizer that can be applied to fields while still ensuring that the quality of nearby water sources will be protected.

22 New York City's drinking water comes from the Delaware and Croton watersheds, which are protected by the Watershed Agricultural Council. New York City contributes financial support for WAC to implement conservation programs that maintain the purity of the city's drinking water.

23 "Whole Farm Planning," Watershed Agricultural Council.

24 Thurgood, John et al, "Bedded Pack Management System Case Study," Department of Applied Economics and Management, College of Agriculture and Life Sciences, Cornell University, Ithaca, NY, 2009, accessed January 24, 2014, http://www.nycwatershed.org/pdfs/Cornell_AEM_eb0916.pdf.

25 "About Maryland's Nutrient Management Program," Maryland Department of Agriculture, 2013, accessed January 24, 2014, http://mda.maryland.gov/resource_conservation/Pages/nutrient_management.aspx.

The manure-spreading plan takes into account the USDA nutrient management standards, and certified nutrient management planners are required for their supervision. In addition, nutrient management continuing education courses are required for farmers every three years.²⁶

Actors: Farmers and the Maryland State Department of Agriculture

Funding, capital, and staffing: Although the costs of the nutrient management plan ultimately rest with the farmer, cost-share funds up to \$3 per acre are available.

Measured Impacts: Ninety-nine percent of 5,433 regulated farmers are in compliance, reducing phosphorus loading in the Chesapeake Bay.

5. Food hubs to support small and medium-sized farms

Food hubs manage the aggregation, distribution, and marketing of food from local producers. There are countless examples of food hubs throughout the country. Food hubs work best when they can address opportunities in a local food economy in order to increase the scale, visibility, and viability of small-and medium-sized local agricultural operations.

Local governments can help by streamlining the permitting process for food hub facilities, by providing grants and tax incentives to new hubs, and by providing a forum for farmers and community members to meet and coordinate.

Wholesale and distribution food hub (Albuquerque, NM)

La Montanita began as a customer-owned cooperative in Albuquerque, Santa Fe, and Gallup, New Mexico. However, as demand for local food increased, the store's directors realized that local growers were struggling to stay in the market. To begin to reverse this trend, the La Montanita Cooperative Distribution Center was established. Its main goal is to create wholesale markets and provide food storage and transportation for New Mexico growers. While it increases sales of local food in its own stores, it also provides marketing

26 "Nutrient Management," Conservation Practice Standard, Natural Resources Conservation Service, accessed December 4, 2013, <http://efotg.sc.egov.usda.gov/references/public/WI/590.pdf>.

services so that farmers can sell their goods at restaurants and other food stores throughout New Mexico.²⁷

Actors: Retail food co-op

Funding, capital, and staffing: A USDA Rural Cooperative Development grant to La Montanita helped fund the creation of a distribution center with cold storage and vehicles.

Measured impacts: In 2010, the Cooperative Distribution Center sold \$2.7 million dollars in goods, 59 percent of which was purchased by La Montanita stores.

Non-profit food hub focused on marketing (Massachusetts)

Red Tomato is a Massachusetts-based food aggregation not-for-profit organization focused on the marketing and distribution of local fruits and vegetables. Rather than provide all the services necessary to get goods to market, they operate as a supply-chain coordinator, managing branding, pricing, and sales and forging relationships with farmers, transporters, agriculture scientists, and purchasers. They focus on providing high-quality, source-identified products sold at prices that are fair to farmers. In order to guarantee the quality of their products, they also support on-farm innovation and the adoption of sustainable growing practices.²⁸

Actors: Non-profit Red Tomato, scientists, cooperative extensions

Funding, capital, and staffing: Red Tomato has received support from a range of national, regional, and state funders such as Farm Aid, the Northeast Sustainable Agriculture Working Group, and the Massachusetts Department of Agricultural Resources.

Measured impacts: Red Tomato sells goods from more than forty farms throughout the Northeast to over 200 retail stores in New England, New York, and the mid-Atlantic. In 2008, average annual sales volume was \$116,411 per grower, up from \$54,923 in 2006.²⁹

6. Increasing the

27 Ibid.

28 "Mid-Scale Food Value Chains Case Study: Red Tomato," Oregon State University Extension Center for Integrated Agricultural Systems, Research Brief #82, 2010.

29 Diamond, Adam and James Barham, "Moving Food Along the Value Chain: Innovations in Regional Food Distribution," U.S. Department of Agriculture, Agricultural Marketing Service, 2012.

availability of healthy food in corner stores

Corner stores are often the most prevalent food providers in neighborhoods, yet they tend to offer fewer healthy food options and charge higher prices than other stores charge. Healthy food in corner store programs work to increase the availability of healthy food by helping store owners to market fresh fruits and vegetables to their consumers and by making it easier for farmers to get their goods to the store.

City-county healthy food retail (Seattle, WA)

"Healthy Foods Here," a Seattle-King County initiative, works to get fresh produce into corner stores throughout the city. Through this initiative, corner store owners receive technical assistance with bookkeeping, maintaining distributor relationships, coupon promotions, pricing, merchandising, and signage in exchange for selling fresh fruits and vegetables. Loans of up to \$7,500 are available to store owners to purchase refrigeration equipment, signage, and facade improvements. Twenty percent of the loan amount must be matched by the store. Small grants are also available. In addition, a community education component helps increase demand for fresh produce among consumers. Nutrition education events take place in the stores and at store-launch events. Charlie's Produce, a well-known Seattle distributor, delivered small orders to and held produce-handling training sessions for participating corner store owners.

Assistance was provided to store owners with purchasing, storing, and marketing produce. This addressed challenges stemming from the fact that many of the store owners are non-native speakers of English. The owners also had limited understanding of U.S. business practices, even though they were "fluent" business owners in their native countries. Materials for store owners were provided in multiple languages.

Actors: Seattle and King County Public Health, Seattle Office of Economic Development, individual stores, produce distributors (Charlie's Produce)

Funding, capital, and staffing: A grant from the American Recovery and Reinvestment Act funded this two-year pilot program. It was filtered through the Center for Disease Control and

Prevention (CDC) to the Department of Public Health and Office of Economic Development. Seattle received \$15 million in total, which was split among a number of programs, including "Healthy Foods Here." A program coordinator works with businesses and food providers to ensure that the program runs smoothly.

Philly Healthy Corner Store Initiative (Philadelphia, PA)

The Philly Healthy Corner Store Initiative works to bring healthy and fresh foods into corner stores to combat nutritional problems associated with low access to healthy foods in neighborhoods. The initiative also seeks to address the issue of poor outside-of-school child nutrition. The program defines corner stores as those with less than 2,000 square feet, four aisles or less, and one cash register. The initiative targets low-income areas and stores that accept public food assistance. It requires participating stores to stock four new healthy products within three months of enrollment (doing so results in a reward of \$100 dollars) and to market those products using materials provided by a program called "Healthy Food Identification." Stores can progress through the program by receiving training on sourcing, product display, and business management. Lastly, certain stores can receive grants to purchase new equipment for storing and displaying food if they agree to use the new capital only to sell healthy products.³⁰

Actors: Philadelphia Department of Public Health

Funding, capital, and staffing: The initiative was initially funded by the Food Trust, a nationwide healthy food non-profit organization with origins in Philadelphia. The Centers for Disease Control and Prevention (CDC) then funded \$15 million for the entire Get Healthy Philly initiative, which housed the Philly Healthy Corner Store Initiative. Staffing for the initiative was provided through the Philadelphia Department of Public Health. Outreach staff was bilingual. Additional funding for store conversions is granted by the Philadelphia Department of Community and Economic Development.

Measured impacts: In two years, 630

30 "Philadelphia's Healthy Corner Store Initiative," The Food Trust, 2012, accessed January 24, 2014, http://foodfitphilly.org/FOODFITPHILLY/assets/File/HCSI_Y2report_FINAL%202012.pdf.

stores committed to selling healthier products. Eighty-three percent introduced four or more new healthy products and marketing materials. Less than 1 percent of store owners declined training. On average, each of the 100 stores that received infrastructure conversion grants introduced forty-four new healthy products. Eighteen suppliers and distributors were linked to corner stores to provide a steady source of fresh produce and healthy products.

7. Making local food more affordable for low-income individuals

Revolving loan fund for community supported agriculture (Cairo, NY; NYC)

The Chelsea CSA in Cairo, New York, sells farm shares in New York City's Chelsea neighborhood and uses a revolving loan fund to help low-income shareholders and SNAP users participate. The revolving loan enables the CSA to accept incremental payments from low-income shareholders by paying farmers until low-income shareholders are able to repay the revolving loan fund in full. Additionally, the Chelsea CSA farmers accept EBT payments using the same mechanism. Without the revolving loan fund, farmers would not be able to accept EBT benefits because EBT benefits cannot cover the entire cost of the CSA in one installment. The loan is paid back each season, making funds available for the following year's users.³¹

Actors: Chelsea CSA, a cooperative between Stoneledge Farm and Hudson Guild; a community social service organization; and the Hunger Action Network of NYS.

Funding, capital, and staffing: Funding for the revolving loan fund came through a grant from the Hunger Action Network of New York. An AmeriCorps VISTA worker housed at Hudson Guild provided outreach and support for low-income CSA members. This person developed a core group of volunteers that took over coordinator duties when the VISTA program ended.

Measured impacts: The farm that supplies the food has grown since joining the CSA.³²

31 "Community Supported Agriculture in New York State," Hunger Action Network of New York State, accessed January 24, 2014, <http://www.hungeractionnys.org/CSAProfiles.pdf>.

32 "Our Story," Stoneledge Farm, 2014, accessed January 24, 2014, <http://www.stoneledgefarmny.org/our-farm/>

Expanding public food assistance for food purchasing at farmers' markets (Cleveland, OH)

Cleveland's Double Value Produce Perks program works to extend public assistance dollars at farmers' markets. Supported by the Wholesome Wave Foundation's Double Value Coupons program, SNAP and WIC recipients in Cleveland can double the value of their public benefits when they purchase \$10 or more of fresh, local produce at farmers' markets. This program benefits both shoppers and farmers by making healthy, local fruits and vegetables more affordable. Currently, sixteen of the thirty-one farmers' markets in the area support the Produce Perks program.³³

Actors: The Ohio State University Extension, Cleveland-Cuyahoga Food Policy Coalition, Ohio Direction Card, the statewide EBT card service, sixteen community farmers' markets, and the Wholesome Wave Foundation.

Funding, capital, and staffing: Funding is provided by the Wholesome Wave Foundation and a number of local organizations. The program is run by the OSU Extension and the Cleveland-Cuyahoga Food Policy Coalition.

Measured impacts: In 2012, total EBT sales at farmers' markets were over \$29,000, a 40 percent increase from the year before. In a survey of Produce Perks recipients by the Food Policy Council, most said that the program was their main incentive for shopping at the farmers' market.³⁴

8. Increasing mobility for communities with low-vehicle access

Physical access to healthy food is often a problem in low-income communities with low vehicle ownership. A number of communities have developed programs to increase physical access to healthy food by providing alternative transportation options. Some programs are explicitly food-focused while others increase food access in an overall effort

to increase mobility in communities with limited vehicle access.

Local governments can support this program by providing tax incentives for stores that provide shuttles in low-access areas and by helping stores cover the cost of vehicles.

Local governments can use tax incentives to support shuttle services run by healthcare providers. They can also help with the purchase of vehicles.

Neighborhood circulator shuttles operated by transit providers (Los Angeles, CA)

Los Angeles's DASH bus offers 50 cent rides on thirty-two circulator buses that travel to a variety of neighborhood destinations in Los Angeles. The main goal of DASH buses is to provide a viable transit option for those traveling to non-work destinations such as food stores. Average weekday service frequency for DASH buses is around twenty minutes, and buses run throughout the day, which means that shoppers can be flexible when planning their trips.

The City of Los Angeles worked with LADOT to ensure that city sales tax funds were available for DASH buses.

Actors: Los Angeles's public transit provider, LADOT

Funding, capital, and staffing: LADOT has funded this service through city sales tax revenue and through fares. Capital costs include the cost of vehicles, fuel, and storage and maintenance facilities.

Measured impacts: although most public transit services are heavily subsidized, DASH services have run at a significantly lower subsidy than other bus services run by LADOT, despite the reduced fare. A 1996 case study reported that DASH riders receive a \$1 subsidy for every ride compared to a \$30 subsidy for rail passengers.³⁵ Demand for the service is high and consistent throughout the day, unlike commuter services, which peak in rush hour periods.

Shuttles operated by retailers (Los Angeles, CA)

Numero Uno supermarkets in Los Angeles established a van shuttle service that offers rides home to shoppers

35 Gottlieb, Robert et al., "Homeward Bound: Food-Related Transportation Strategies in Low Income and Transit Dependent Communities," Working Paper UCTC #336, Berkeley, CA: The University of California Transportation Center, 1996.

who spend at least \$30 in the store. For store operators, such a service provides an opportunity to increase sales while improving access to healthy food in neighborhoods with low vehicle ownership. While many people in such communities rely on transit services to shop for food, Numero Uno recognized that it was a challenge for shoppers to carry bags of groceries on the bus, especially for those shoppers with children. The shuttle service operates daily between noon and 3:00 p.m.³⁶

Actors: Numero Uno supermarkets, a private grocery store chain

Funding, capital, and staffing: The funding for this service is provided by the supermarket itself. Capital expenses include the cost of vehicles, storage, and fuel, and staffing includes drivers for each store and a system-wide coordinator.

Measured impacts: Over 2,000 passengers a week took advantage of the service offered by one Numero Uno Market in 1998.

Neighborhood shuttle service by healthcare provider (Long Beach, CA)

Molina Healthcare's neighborhood shuttle services offer a smaller-scale version of LA's DASH circulator buses. Originally envisioned as healthcare vans for transporting individuals to medical appointments at Molina facilities, the healthcare provider saw an opportunity to improve health by improving access to neighborhood destinations, such as food stores serving fresh fruits and vegetables. At the moment, the shuttle services are free to use. While shuttles are located in neighborhoods with Molina healthcare facilities, the organization has worked with public housing administrations and neighborhood businesses to tailor services to local needs.³⁷

Actors: Molina Healthcare, a healthcare provider

Funding, capital, and staffing: Each shuttle costs approximately \$1,700 per

36 Crain & Associates, Inc., Ricardo Byrd, and Omniversed International, "Numero Uno Market Shopper's Shuttle Service," in Using Public Transportation to Reduce the Economic, Social and Human Costs of Immobility: Transit Cooperative Research Program, Transportation Research Board National Research Council, 1998.

37 O'Guin, Kathleen. "Access to Transportation Is Essential to Good Healthcare Outcomes," Community Transportation Association, 2011, accessed January 24, 2014, http://web1.ctaa.org/webmodules/webarticles/articlefiles/Fall_11_Transortation_and_Healthcare_Outcomes.pdf.

our-story.

33 "Double Value Produce Perks 2012 Report," The Ohio State University Extension and Cleveland-Cuyahoga Food Policy Coalition, 2012, accessed January 24, 2014, http://cccfoodpolicy.org/sites/default/files/resources/may_2012-may_2013_market_report_updated_1.pdf.

34 Ibid.

week to run. Funding is provided fully by Molina health, and capital expenses include the cost of vehicles, fuel, storage, drivers, and coordinators. Staff required includes drivers and coordinators.

Measured impacts: Daily ridership totaled between fifteen and forty-nine people. On one route, monthly ridership increased from 200 in November 2009 to 300 in December 2010, and to 629 in August of 2011.³⁸

³⁸ *bid.*

8.

IDEAS FOR THE FUTURE

Ideas for the Future recommends familiar and novel ways to strengthen Buffalo Niagara's food system and to make the most of our region's assets. The 38 ideas presented in this section are a guide for food stakeholders, community development organizations, policymakers, planners, health officials, and economic developers in Buffalo Niagara.

Ideas for the Future offers suggestions for boosting the production of and demand for locally grown food and for increasing access to healthy, affordable, and culturally acceptable foods. As prioritizing local food that is raised

using environmentally sustainable practices is particularly important, this section emphasizes suggestions that support this outcome as well. Increasing demand for sustainably grown, locally sourced foods may provide fiscal impetus for conventional farms to transition to more sustainable farming practices.

The ideas presented in this chapter are interconnected and are more likely to work best if most, if not all, are implemented. For the sake of readability, the ideas are presented in three categories: policy change, program development, and physical infrastructure. Each idea is briefly described. Then, actors

who may be most suited to take on the idea are identified, and a time frame for carrying out the idea is proposed. Selecting ideas for implementation is a decision best made by community stakeholders. Food system stakeholders and food leaders in partnership with their local governments will have to develop an implementation plan and metrics to guide the region's food system toward a more sustainable future. *A New Way to Plan for Buffalo Niagara*, the overarching regional sustainability plan which this report informs, provides many of these metrics.

Policy change

Idea	Details	Potential Actors	Implementation Time Frame
Idea 1 Prioritize projects from regional economic development council applicants that seek to improve food justice, food access, agricultural viability, and a sustainable food system.	Adjust REDC scoring criteria to maximize the potential of the food system to enhance economic development. Reactivate the Western New York Regional Economic Development Council's Agriculture Working Group.	The Regional Economic Development Council	Immediately (one to three years)
Idea 2 Educate local and state elected representatives and public officials on the challenges and opportunities of food production and access.		The Food Policy Council of Buffalo and Erie County, the Farm Bureau, Cornell Cooperative Extension Service	Immediately (one to three years)
Idea 3 Institute long-term leases for community gardens on publicly owned lands in Buffalo and Niagara Falls.		The City of Buffalo, The City of Niagara Falls, Grassroots Gardens of Buffalo, Greenprint Niagara	Immediately (one to three years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 4 Modify federal food subsidies to incentivize fruit and vegetable production.		The U.S. President and Congress, the U.S. Department of Agriculture	Long run (about ten years)
Idea 5 Establish a Niagara County Food Policy Council.	Update the Niagara County Farmland Protection Plan to increase farmer buy-in, and promote a shared vision with other plans in the region.	Niagara County food access and food production organizations, the Healthy Food Healthy People coalition, the Niagara County Department of Economic Development, local and county planning boards, the Niagara County Department of Public Health	Immediately (one to three years)
Idea 6 Establish a regional food-policy board to coordinate planning for food throughout western New York	Convene board with members of food-policy councils and other local food advocates. Develop an online food system database resource for the Buffalo Niagara region that would serve to (1) identify organizations and foundations that can be leveraged to get healthy food to households in need, (2) use feedback from food banks, block clubs, and other groups to inform farmers about the foods that are culturally appropriate in our region, (3) link local growers to local retailers to get local foods into local markets, and (4) create a resource whereby consumers can shop for a local farm stand, CSA or farmers' market.	Food Policy Council of Buffalo and Erie County, Farm Bureau, Cornell Cooperative Extension Service, and other interested coalitions	Immediately (one to three years)
Idea 7 Encourage breast-feeding for the youngest members of the region's population.	Modify building codes to mandate private areas specifically designated for breast feeding mothers to pump breast milk.	Municipalities	Immediately (one to three years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 9 Create pathways to legal residence for immigrant agricultural workers.		The U.S. President and Congress, the U.S. Department of Homeland Security, U.S. Citizenship and Immigration Services	Short run (four to seven years)
Idea 10 Encourage the use of mobile food trucks to deliver healthy, locally-produced foods to neighborhoods and local schools lacking healthy food options nearby.	Reduce licensing requirements or vary rates based on serving healthy foods. Integrate mobile food vendors into municipal zoning ordinances.	MAP, the NYS Department of Agriculture and Markets, supermarkets, farmers, social entrepreneurs, local public schools, municipal planning organizations	Short run (four to seven years)
Idea 11 Modify the constraints of the H-2A visa.	Enable immigrant farm workers to work at multiple farms in the same year and to return to the same sponsor farm for multiple years.	The U.S. President and Congress, the U.S. Department of Homeland Security, U.S. Citizenship and Immigration Services	Long run (about ten years)
Idea 12 Work locally to ensure equitable and just conditions for workers on local farms.	Ensure that farm workers are represented in food-system decision-making. Ensure that migrant farm workers have access to housing, healthcare, and other social services.	The Food Policy Council of Buffalo and Erie County, Cornell Cooperative Extension, the New York State Department of Labor	Long run (about 10 years)
Idea 13 Within the New York State Finance Law, mandate that a share of food purchased by any state agency is sourced from local producers and that agencies should prioritize New York State foods sourced from within the food shed over out-of-state foods.	Agencies should prioritize New York State foods sourced from within food shed over out-of-state foods by paying (if the price is different) a pre-specified percentage more for food produced both in-state and within the food shed than for food produced within the food-shed but out-of-state.	The NYS governor's office, NYS legislature	Short run (four to seven years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 14 Mandate that a certain share of food procured from the New York State Office of General Services (OGS) contracted suppliers be sourced from within the purchasing agency's food shed and that OGS contractors prioritize New York State foods sourced from the foodshed over out-of-state foods.		The New York State governor's office or legislative branches	Short run (four to seven years)

Program development

Idea	Details	Potential Actors	Implementation Time Frame
Idea 15 Determine the potential of surrounding counties to become fruit and vegetable self-reliant.		The Food Policy Council of Buffalo and Erie County, Cornell Cooperative Extension, the University at Buffalo	Short run (four to seven years)
Idea 16 Ensure that food access and farm advocacy organizations have seats on county and regional food policy organizations and are included at future planning events.		Municipal, county, and regional planning and public health organizations	Immediately (one to three years)
Idea 17 Identify farmable soils in the region.	Identify parcels not currently used for farming that could transition to agriculture. Determine parcel owners' interest in having the land farmed, and find farmers looking to rent land. Connect interested parcel owners with farmers interested in farming more land. Identify farmable soils currently used for farming.	Municipalities, the Erie County Department of Environment and Planning, the Niagara County Department of Economic Development, Farm Bureau, Industrial Development Agencies, Natural Resource Conservation Service's Soil and Water Conservation Districts.	Immediately (one to three years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 18 Offer low-cost retirement planning services to farmers.		Local financial service organizations, the Farm Bureau, Cornell Cooperative Extension, the UB School of Management, the UB Department of Finance	Immediately (one to three years)
Idea 19 Make CSAs more affordable and accessible.	Create and fund a revolving loan fund to help low-income people obtain CSA shares. Encourage volunteer support in which members have opportunities to buy shares through sweat equity. Establish refrigeration and freezer shares at CSA drop-off sites.	CSAs, the Food Policy Council of Buffalo and Erie County, The John R. Oishei Foundation, The Community Foundation of Greater Buffalo, United Way of Buffalo and Erie County, USDA, Independent Health, Blue Cross Blue Shield, Northeast Organic Farming Association of New York	Immediately (one to three years)
Idea 20 Expand farmers' markets to improve access to healthy, local food.	Ensure that all farmers' markets have EBT readers. Implement a Double-up Bucks program. Locate farmers' markets in places with low food access.	Regional farmers' markets, the Food Policy Council of Buffalo and Erie County, the Erie and Niagara County Health and Social Services Departments, Field and Fork Network, Cornell Cooperative Extension, Farmers' Market Federation of New York State, the Healthy Food Healthy People coalition, the Wholesome Wave Foundation	Immediately (one to three years)
Idea 21 Review and modify transit routing and timetables to improve peoples' access to food providers, especially in areas where vehicle ownership is low.		NFTA, GBNRTC, The City of Buffalo, The City of Niagara Falls, GO Buffalo	Immediately (one to three years)
Idea 22 Provide customers living in neighborhoods with low vehicle ownership free rides home from healthy-food retailers.	Provide free rides to customers who spend more than a baseline amount of money at the store Fund vouchers for free transit rides to and from healthy food stores	Grocery stores, taxi services, senior services organizations	Immediately (one to three years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 23 Support and enhance public food assistance.	Promote, create new, and increase participation in existing Double-up Bucks programs that are used to increase the value of public assistance dollars at fresh market retail options such as farmers' markets and to purchase locally grown products at any retail destination, including convenience stores. Work with public officials to educate people on and facilitate their enrollment in public assistance programs at public institutions (libraries, schools, colleges) and food-retail destinations, from corner stores to supermarkets. Sponsor taxi and transit voucher programs to subsidize transportation costs and increase access for food-assistance recipients. Advocate for consistency in requirements between different food assistance programs such as WIC and SNAP to streamline increased purchasing of fresh produce.	The Food Policy Council of Buffalo and Erie County, the Erie and Niagara County Health Department, Field and Fork Network, Cornell Cooperative Extension, local philanthropic organizations	Immediately (one to three years)
Idea 24 Research the potential for using social-impact bonds to improve food access		The Food Policy Council of Buffalo and Erie County	Immediately (one to three years)
Idea 25 Create a brand for specialty products from each county	Brand and market Niagara County fruit as a county specialty. Determine a brand for Erie County agricultural specialties.	The Regional Economic Development Council, the New York State Department of Agriculture and Markets	Short run (four to seven years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 26 Develop a database of vacant urban parcels and non-utilized buildings that could be used to expand local food production and processing.	Work with the cities of Buffalo and Niagara Falls, to identify and test the soil on the cities' vacant parcels. Prioritize parcels for remediation, and inform the public which parcels are most suitable for agricultural use.	The Buffalo Erie Niagara Land Improvement Corporation, the Erie County Department of Environment and Planning, the Niagara County Department of Economic Development, the City of Buffalo, the City of Niagara Falls, Cornell Cooperative Extension, the Erie County Department of Health, the Niagara County Department of Health, the Massachusetts Avenue Project, Grassroots Gardens, Greenprint Niagara, the Food Policy Council of Buffalo and Erie County, the Regional Economic Development Council	Short run (four to seven years)
Idea 27 Protect valuable farmland by establishing purchase and transfer-of-development-rights programs.	Integrate farmland protection and planning for smart growth in municipalities and throughout the region. Finance TDRs with revolving fund accounts used to pay farmers for development rights on their land. The municipalities' or counties' funds are later repaid by developers buying the development rights from the municipalities or counties.	Erie and Niagara Counties, municipal governments (Buffalo and Clarence for pilot program), municipal and county planning organizations, industrial development agencies	Short run (four to seven years)
Idea 28 Develop and implement a Healthy Corner Store program.	Start a pilot program with five corner stores in areas underserved by healthy food. Provide technical assistance to help store owners market fresh fruits and vegetables, and later provide capital assistance for equipment and store improvements.	The Erie County Department of Health, the Niagara County Department of Health, the Food Policy Council of Buffalo and Erie County	Short run (four to seven years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 29 Provide subsidies to current and incoming food stores that sell healthy foods and are located in areas with low vehicle ownership or low access to healthy foods.		Industrial development agencies, municipal and county governments	Short run (four to seven years)
Idea 30 Facilitate conversations between local farmers and ethnic food markets.	Develop partnerships between refugee and immigrant organizations and farm groups to ensure that farms grow food that meets the needs of Buffalo Niagara's diverse cultures.	Journey's End Refugee Services, Inc., the International Institute of Buffalo, Farm Bureau, Cornell Cooperative Extension, Massachusetts Avenue Project, the Food Policy Council of Buffalo and Erie County	Short run (four to seven years)
Idea 31 Increase individuals' and institutions' awareness of local farming and foods.	Bring together food service and sustainability directors of local universities, school districts, and correctional and health care facilities. Develop a collaborative network of colleges, universities, and their students to support, strengthen, and spur innovation in the local agriculture and food-distribution industries. Undertake a regional education campaign at existing events to increase public recognition of the benefits and opportunities in local agriculture and to improve residents' knowledge of local farmers. Launch a consumer-education campaign that enlists existing media networks—including broadcast television, radio, 211, and public service announcements—to promote the benefits of local, healthy food to the public Establish neighborhood-based Community Food Training and Resource Center.	The Food Policy Council of Buffalo and Erie County, Massachusetts Avenue Project, local media, schools	Short run (four to seven years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 32 Transform the food environment in K-12 schools.	Launch a nutrition education program for local public schools that uses the classroom and the cafeteria to increase students' understanding of healthy and local food through local food purchasing and farmer demonstrations. Reward school districts financially for each locally sourced meal they serve to students. Funders can promote procurement of regionally grown foods by paying school districts a fraction of the cost of each locally sourced meal served. Incorporate experiential nutrition education into classroom curriculums and school-provided lunches, using school gardens or community gardens shared through joint-use agreements.	School districts, local funders, the region's farmers, community gardens, the Youth Advisory Council, Buffalo Public School's Wellness Committee, Grassroots Gardens of Buffalo, Massachusetts Avenue Project	Short run (four to seven years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 33 Support aggregation and resource sharing for the region's farmers.	Support the "Ready to Grow Food Hub Planning Project" by providing input on challenges and opportunities in the food system. Implement the recommendations of the "Ready to Grow Food Hub Planning Project". Support the development of programs and policies that increase the marketability of locally grown food, including food hubs and farmer cooperatives.	The Healthy Food Healthy People coalition, the Farm Bureau, food access and food production stakeholders and organizations, farms, the American Farmland Trust, county planning and economic development departments, industrial development agencies, the Regional Economic Development Council, the Food Policy Council of Buffalo and Erie County, USDA, Cornell Cooperative Extension, Field and Fork Network	Short run (four to seven years)
Idea 34 To better guide policymakers, increase our understanding of the region's food system.	Study the economic impacts of urban agriculture on neighborhoods and cities. Support the "Ready to Grow Food Hub Planning Project", and develop other studies examining opportunities to market local food.	The Food Policy Council of Buffalo and Erie County, Cornell Cooperative Extension, the Healthy Food Healthy People coalition	Immediately (one to three years)
Idea 35 Promote workforce development in all food system sectors and create fair-wage food jobs.	Develop training programs that are built around food processing, preservation, distribution and preparation to limit food waste and reduce hunger locally. Establish a business incubator for food processing that leverages a network of food kitchens, culinary schools, and other actors interested in business development. Support food-based enterprise development.	The Regional Economic Development Council, Buffalo State College's Small Business Development Center, workforce development organizations, collage and university small business development programs, retailers, and restaurants	Short run (four to seven years)

Idea	Details	Potential Actors	Implementation Time Frame
Idea 36 Enable farmers to adopt more sustainable growing practices.	Provide farmers with information about the effects of climate change on crop production to encourage them to grow products that will remain resilient in a changing climate. Educate farmers about implementing diverse and long-term plans on their farms. Educate farmers about the environmental importance of stream buffers between agricultural land and waterways. Tie the education program to incentives for creating stream buffers in which state or private funding agencies would reward farmers for creating stream buffers. Facilitate Good Agricultural Practices (GAP) certification for local farmers through grants and funding mechanisms, especially for small-scale farms. Encourage the minimization of pesticide use on farms. Expand the use of practices to extend the growing season.	Cornell Cooperative Extension, the American Farmland Trust, the Western New York Land Conservancy, the Farm Bureau, the New York State Department of Agriculture and Markets, USDA NRCS, and soil and water conservation organizations	Long run (about ten years)

Physical infrastructure

Idea	Details	Potential Actors	Implementation Time Frame
Idea 37 Build farms' capacity to harvest rainwater.		Buffalo Niagara Riverkeeper, Cornell Cooperative Extension, American Farmland Trust, USDA, county and municipal water authorities	Short run (four to seven years)
Idea 38 Measure farms' water use.	Install water meters on unmetered water delivery systems.	County and municipal water authorities, Cornell Cooperative Extension, Buffalo Niagara Riverkeeper, the American Farmland Trust	Short run (four to seven years)

APPENDICES

APPENDIX A

GLOSSARY OF TERMS

The food system

The Buffalo Niagara food system refers to the soil-to-soil system through which food is produced, processed, distributed, and acquired and in which food waste is reduced and disposed.¹

Diet-related disparities

The term diet-related disparities refers to differences in dietary intake, dietary behaviors, and dietary patterns among different socioeconomic segments of the population, resulting in poorer dietary quality and inferior health outcomes for certain groups and an unequal burden in terms of disease incidence, morbidity, mortality, survival, and quality of life.²

Farmland soil³

Prime farmland has “the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable

farming methods.”

Farmland of statewide importance “includes land that is nearly prime farmland and that economically produces high yields of crops when treated and managed according to acceptable farming methods. Some land may produce as high a yield as prime farmlands if conditions are favorable. In some states, additional farmlands of statewide importance may include tracts of land that have been designated for agriculture by state law.”

Prime farmland if drained includes soils “considered feasible for improvement by draining, by irrigating, by removing stones, by removing salts or exchangeable sodium, or by protecting from overflow are classified according to their continuing limitations in use, or the risks of soil damage, or both, after the improvements have been installed.”

Land that is not considered prime farmland is, for a combination of environmental and land-use reasons, not suitable for farming.

Food production

Food production includes the growing, raising, catching, and harvesting of crops and animals for the purpose of human consumption.

Food justice

Food justice works towards a food system that is just, inclusive, community-led and participatory, without the exploitation of people, land, or the environment. Efforts aiming to achieve food justice identify and act to remove the significant structural inequities that exist within the food

system, to ensure healthy, resilient communities with equitable access to nourishing and culturally appropriate food.⁴

Food sovereignty

“Food sovereignty is the right of people to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who grow, raise, distribute and consume food at the heart of food systems.... Food sovereignty prioritizes local and national economies and markets and empowers...family-farmer driven agriculture, artisanal-fishing, pastoralist-led grazing, food production, distribution and consumption based on environmental, social and economic sustainability. Food sovereignty promotes transparent trade that guarantees just incomes to all peoples as well as the rights of consumers to control their food and nutrition. It ensures that the rights to use and manage lands, territories, waters, seeds, livestock and biodiversity are in the hands of those of us who produce food. Food sovereignty implies new social relations free of oppression and inequality between men and women, peoples, racial groups, social and economic classes and generations.”⁵

Regional food insecurity

4 “Defining food justice,” Food Justice Work Group, Portland/Multnomah Food Policy Council, 2012.

5 Definition of Food Sovereignty, International Planning Committee for Food Sovereignty, 2007, accessed 6/4/13, 2013, accessed <http://www.foodsovereignty.org/FOOTER/Highlights.aspx>.

1 University at Buffalo Food Systems Planning and Healthy Communities Lab (2013).

2 Satia, J. A. “Diet-Related Disparities: understanding the Problem and Accelerating Solutions,” *Journal of the American Dietetic Association*. 109, No. 4 (2009): 610-615 <http://dx.doi.org/10.1016/j.jada.2008.12.019>

3 USDA National Resources Conservation Service (2012). National Soil Survey Handbook Section Part 622 - Ecological and Interpretative Groups, accessed 6/12/2013, <http://soils.usda.gov/technical/handbook/contents/part622.html>

Food insecurity describes limited or uncertain availability of nutritionally adequate, affordable, safe, and culturally and socially acceptable foods.⁶

Healthy food

"A healthy food is a plant or animal product that provides essential nutrients and energy to sustain growth, health and life while satiating hunger. Healthy foods are usually fresh or minimally processed foods, naturally dense in nutrients, that when eaten in moderation and in combination with other foods, sustain growth, repair and maintain vital processes, promote longevity, reduce disease, and strengthen and maintain the body and its functions. Healthy foods do not contain ingredients that contribute to disease or impede recovery when consumed at normal levels."⁷

Hunger

Hunger is a physical sensation resulting from a lack of consumption of food. It results from "prolonged, involuntary lack of food [and] results in discomfort, illness, weakness, or pain that goes beyond the usual uneasy sensation."⁸

Regional self-reliance

Regional self-reliance is the proportion of food produced in the region to food consumed in the region.⁹

Sustainability

Ensuring that the actions we undertake today do not limit the resources available to future generations.

Sustainable regional food system

Ensures that residents have access to healthful, affordable, and culturally acceptable foods; that farming and other

regional food-production activities remain economically viable pursuits; and that the negative environmental impacts of the food system are minimized.¹⁰

¹⁰ University at Buffalo Food Systems Planning and Healthy Communities Lab, 2013.

⁶ Modified from the definition from the Life Sciences Research Office, S.A. Andersen, ed., "Core Indicators of Nutritional State for Difficult to Sample Populations," *The Journal of Nutrition* 120:1557S-1600S, 1990.

⁷ Partners in Action. (2013). *Defining Healthy Foods*. Washington State Nutrition and Physical Activity Plan Retrieved 6/4/13, 2013, from <http://depts.washington.edu/waaction/aboutus.html>

⁸ National Research Council of the National Academies, *Food Insecurity and Hunger in the United States: An Assessment of the Measure*, (National Academies Press, 2006).

⁹ University at Buffalo Food Systems Planning and Healthy Communities Lab, 2013.

APPENDIX B

METHOD OF ANALYSIS AND DATA SOURCES

Section 6A - Disparities in food access

Travel behaviors in the region

Average walking and driving distances to shop for food are based on the 2009 National Household Travel Survey (NHTS) data for the region. The NHTS, undertaken by the U.S. Department of Transportation and the Federal Highway Administration, is the most comprehensive snapshot of travel behavior across the nation. The data include information on trips from 1,013 Erie and Niagara County residents between April 2008 and April 2009. From their responses, one can develop a basic understanding of average and maximum travel time and distance for food shopping. Because the survey is taken from a sample of the population and is a nationwide dataset, data may not accurately represent the Buffalo Niagara region's population; it may oversample certain areas and undersample others. For this reason, NHTS results can only give a general overview of travel behavior.

The NHTS breaks down trips into categories by purpose, and four of these categories relate to food travel. Three trip types are for food only: going out to eat, going out for coffee, ice cream, or a snack, and other eating-related travel. The fourth category, shopping trips, includes grocery shopping but also includes trips to clothing and hardware stores. Because travel patterns differ based on available transportation options and based on the type of community in which a person lives, average and maximum travel distances traveled for food based on trip type, travel mode, and the respondent's home community type are computed. Travel modes include driving, taking transit, walking, and riding a bike. Community types include urban, suburban, and rural communities. Table 60 shows average and maximum travel distances for food-related shopping trips for urban, suburban, and rural areas.

Access to supermarkets

To understand disparities in access to supermarkets, data on the location of supermarkets and the distribution of households in the region were analyzed using GIS. Food-store data were gathered from the 2012 ReferenceUSA directory. The distribution of households and households with no vehicles throughout the region was gathered in the 2011 American Community Survey five year Estimates for census tracts. Network analysis in GIS was used to identify areas that are within the average travel distance to supermarkets for trips by car (4.6 miles) and on foot (0.4 miles). Areas covered can be seen in the analysis section above. To measure the households living within and outside of these areas, households in a census tract are assumed to be evenly distributed along its roads.¹ For each census tract, access was measured as the proportion of road miles covered by walking and driving access areas to all road miles in a census tract, to estimate the number of households that could access supermarkets by each mode. To consider all households, this proportion was multiplied by the total census tract population. When considering those without a vehicle, this proportion was multiplied by the number of households without a vehicle in each census tract.

Section 6B - The region's self-reliance on fruits and vegetables

To calculate the region's self-reliance on fruits and vegetables, the region's current production levels were compared with the area's current consumption patterns and then with federally recommended consumption patterns. First, current production levels were calculated from the Census of Agriculture data showing the acreage of fruit and vegetables grown in the two counties. Second, the acreages of each crop were converted to a cup yield based on weight yield and volume data. Current consumption patterns

¹ This approach provides a more accurate estimate than one that assumes that households are distributed evenly throughout all the area in a census tract because people are more likely to live close to roads. However, it is common sense that houses are not evenly distributed along roads. Especially in suburban and rural areas, where commercial areas are often separated from residential areas, the area within a 0.4 mile walk of a supermarket may not cover any households. For this reason, it is important to keep in mind that results estimate the number of households that lack access to supermarkets. In reality, these numbers may be higher or lower than indicated in this analysis.

Table 61. Criteria for assigning scores to an attribute of the land

Attribute	Score
Farmland soil classification	
Prime farmland	3
Prime farmland if drained	2
Farmland of statewide importance	1
Slope designation	
0 to 8 percent slope	2
8 to 15 percent slope	1

Source: Food Systems Planning and Healthy Communities Lab, University at Buffalo.

were determined using USDA data on fruit and vegetable availability per capita per year and population figures from the U.S. Census. Recommended consumption was determined using USDA nutrition recommendations, as well as population figures from the U.S. Census. In both instances, the cup figure of fruits and vegetables produced was subtracted from the cup figures for current or recommended consumption levels to determine the number of additional cups of fruits and vegetables that would need to be produced in order for the region to be self-reliant. The cup figures were converted to acreage figures using the same data and methods utilized to convert acreage to cups.

The method has limitations. First, it assumes that the produce currently grown meets nutritional requirements. For example, while produce was aggregated into USDA nutritional categories (such as "red and orange vegetables" or "dark green vegetables") and self-reliance was calculated in each particular category, it was not possible to account for the possibility that those vegetables might be missing recommended nutrients that other vegetables in that category (that are not grown in the region) have. Second, the figures provided for additional acreage necessary for self-reliance are based on a magnification of what is currently grown in the region; the figure does not account for reaching self-reliance by growing something that the region doesn't already produce.

Section 6C - Identifying land suitable for conversion to farmland

High soil quality and low to moderate slopes

A suitability analysis in GIS was used to rate land based on the quality of its soil. This method has three main components: identifying land not under consideration, developing a scoring and weighing formula for land attributes, and applying this formula to land in the region.

Constraints are identified that include land that cannot be used to expand farming. This includes current farmland, protected wetlands and conservation easements, currently developed land, brownfields, and woodlands with ecologically important tree growth.² Current farmland was identified at the parcel level, using a combination of USDA Common Land Unit (CLU) data and land-use classifications in the Erie and Niagara Counties' tax assessor roles. All land not included in these categories is considered in subsequent analyses.

Scoring layers were based on the 2012 USDA National Resources Conservation Service (NRCS) Soil Quality Survey. This survey assesses a number of attributes for each soil type, including chemical makeup, drainage, slope, and erosion. One of the most important features of the Soil Survey is the farmland ratings. For each soil type, its quality as farmland has been determined, and it has been placed in one of four categories. These are as follows:

Prime farmland, which has a "combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods";

Prime farmland if drained, which includes soils that, if properly drained and managed, will be as productive as prime farmland but that may require more work to keep dry;

Farmland of statewide importance,

2 U.S. Fish and Wildlife Service, Division of Habitat and Resource Conservation, "Classification of Wetlands and Deepwater Habitats in the United States," 2010; New York State Department of Environmental Conservation, "DEC Lands - New York State (NYSDEC)," 2012; National Conservation Easement Database, "NCED_Poly," 2012; U.S. Department of Agriculture, Natural Resource Conservation Service. Common Land Unit and Farm Service Areas for Erie and Niagara County, NY, 2013. N.Y. Department of State, New York State Department of Environmental Conservation. Brownfield Opportunity Area Boundaries, 2012.

which "includes land that is nearly prime farmland and that economically produces high yields of crops when treated and managed according to acceptable farming methods";

And, finally, land that is considered not prime farmland, which for a combination of environmental and land use reasons is not suitable for farming.³

A summary of farmland soils in the region can be found in the Soil Resources section above. Although slope is one of the factors considered when the NRCS determined farmland quality, there was a sense in discussions of issues with soil planners, that farmland soil ratings do not consider all aspects of soil slope that impact farmland. For this reason, soil was also divided into two classes by slope. The first included slopes that are nearly level or gently sloping (0 to 8 percent), while the second included moderate to very steep slopes (8 to 15 percent) that may have been included in prime or nearly prime farmland but that would be more difficult to convert to active farmland. Slopes greater than 15 percent were excluded from consideration.

When developing the scoring scheme, farmland soil and soil slope were weighted evenly. Land throughout the region was divided into 10-by-10 foot squares and scored based on the sum of scores associated with its farmland rating and slope. Each attribute was given a score based on the scheme presented in Table 61. While there were five possible scores for land in the region, only three scores were actually seen throughout the region 5, 4, and 3—or high, medium, and low suitability—respectively. Results from the application of this scoring scheme to the region are shown in the analysis section above.

Feasible land use

In this section, the overlap of suitable land and current land use was investigated. Two land uses were considered possible for converting non-farmland to farmland. The first was vacant land, with a focus on rural vacant land, abandoned agricultural land, and some vacant commercial and industrial land. The second land-use category is public land that might be farmable

and that was not excluded from consideration in the suitability analysis, including forestland, conservation easements, and other undeveloped land. In addition, because conversion to farmland is costly, and because returns increase when more land can be farmed on a single parcel, parcels having less than one acre of suitable land were removed from consideration. Land use was identified using real property data for Erie and Niagara County, and an overlay analysis was performed in GIS to extract the intersection of the suitability layer and the land-use layer.

3 USDA National Resources Conservation Service (2012). National Soil Survey Handbook Section Part 622 - Ecological and Interpretative Groups. Retrieved 6/12/2013 from <http://soils.usda.gov/technical/handbook/contents/part622.htm>

APPENDIX C

ERIE NIAGARA POLICIES AND PLANS IMPACTING THE FOOD SYSTEM

Promoting agricultural economies and conserving farms

In the early 1970s, New York State established a program to prevent the conversion of farmland into different uses. Preventing farmland loss received renewed attention in 1992, when the state legislature allocated money for municipal planning to protect farmland. As an answer to nuisance lawsuits aimed at curtailing certain farm practices near developed areas, the state legislature passed right-to-farm legislation. This legislation created an explicit legal presumption that normal farm practices shall remain as-of-right in certain areas.

Protecting farmland in New York since 1973

Agriculture is a major part of New York State's identity and economy. The state, its counties, and its municipalities have many policies to promote agricultural production and bolster communities traditionally supported by agricultural economies.

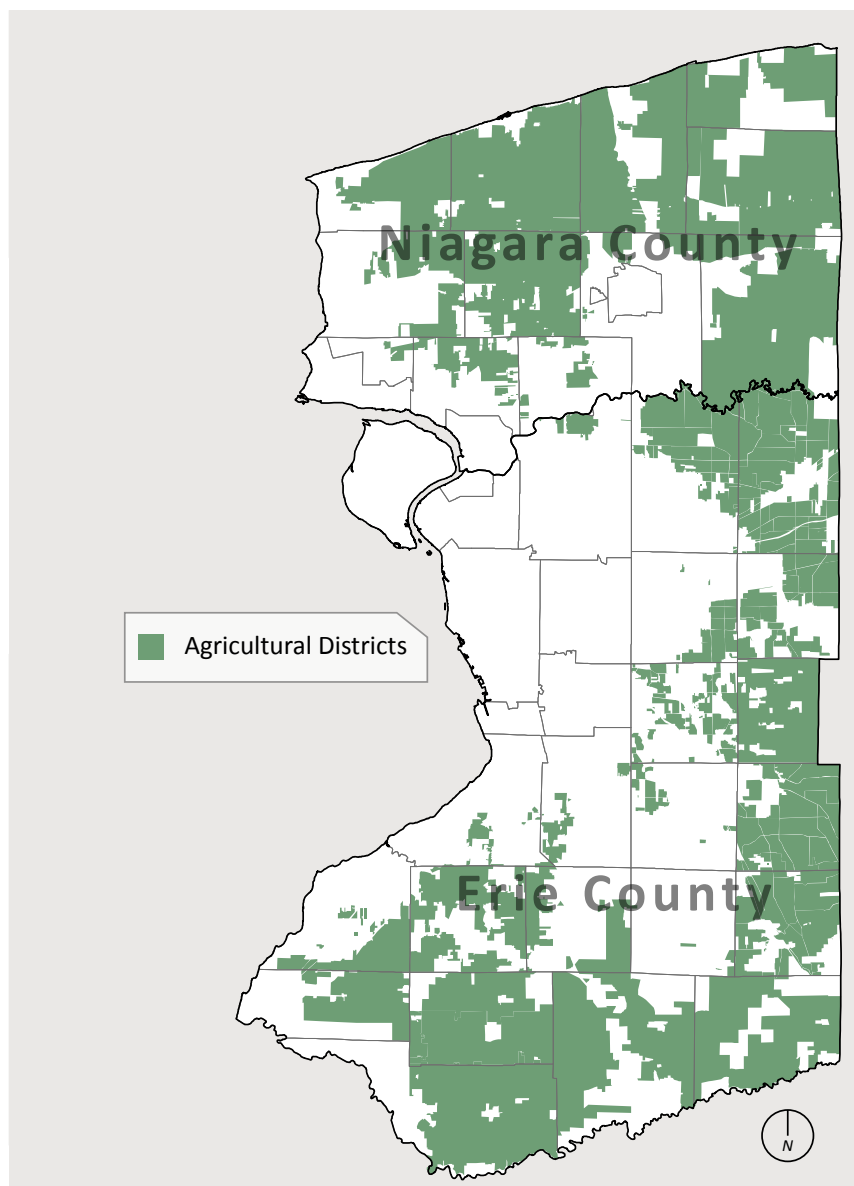
In 1973, the New York State Legislature passed the Agricultural Districts Law (ADL) to protect and preserve the state's dwindling farmland. The ADL is designed to keep farmland in operation. The ADL gives the power to landowners who own (individually or as a group) at least 500 acres to request the formation of a county agricultural district. When an agricultural district is created, the farmers within the district are protected from nuisance lawsuits and receive some tax relief for land dedicated to agriculture.¹

Section 308, the operative section of the Agricultural Districts Law, established a "right to farm" for farmers in an agricultural district.² By creating the right-to-farm law, the state legislature established a clear priority to keep farms operating and to eliminate private nuisance suits against them. Like most right-to-farm legislation, the goal is to prevent private nuisance lawsuits from adjacent property owners who are bothered by agricultural activities.

1 N.Y. Comp. Codes R. & Regs. tit. 1, § 303 (N.Y.C.R.R.).

2 N.Y. Comp. Codes R. & Regs. tit. 1, §§ 300 to 310 (N.Y.C.R.R.).

Figure 32. Agricultural Districts in Buffalo Niagara



Source: New York State Agricultural Districts Mapping Program, Cornell University Geospatial Information Repository, 2012.

Often, these activities are typical of farm operations, such as running heavy equipment early in the morning or spreading manure over fields. However, the noise and odor of these activities may be considered a nuisance by those who have moved to neighboring land to enjoy the pastoral beauty.

Right-to-farm legislation works by serving two functions. First, it serves as a publicized statement that farming is a priority in the community. Second, it requires local implementation of an agricultural disclosure statement

at the time property is transferred.³

The disclosure statement requires landowners or sub-dividers near farms or potential farms to add a caveat to the property deed stating that agricultural practices exist throughout the town; that farms may currently (or in the future) locate near the property; and that farmers have the right to undertake reasonable farm practices. The legislation and the disclosure statement work together to limit possible land-use conflicts.

3 N.Y. Comp. Codes R. & Regs. tit. 1, § 310 (N.Y.C.R.R.); 2007 Niagara County Local Law No. 7.

Right-to-farm: mediating development pressure around farms in Erie and Niagara Counties

Counties and towns have also passed right-to-farm laws across New York State. Erie and Niagara Counties as well as municipalities in the region, have right-to-farm laws (Figure 32). Erie County passed its right-to-farm law in 1999,⁴ while Niagara County passed its law in 2007.⁵ Both aim to preserve rural traditions and character, to permit the continuation of reasonable agricultural practices that are inherent to the business of farming, and to support new farms.^{6,7}

The Niagara County right-to-farm law is more magnanimous towards farmers and their practices than Erie County and New York State's right-to-farm provisions are, stating, "Should there be a conflict between the definitions employed by New York State and those contained herein, such conflict shall be resolved in favor of the agricultural producer so as to include the enterprise as an agricultural practice."⁸

Agricultural and farmland protection programs

Since 1994, New York State has funded local efforts to undertake planning and implementation of farmland protection programs.⁹ While right-to-farm laws and agricultural districts were put in place to protect farms from development pressure, in some places, more comprehensive action must be taken. The state offers two main farmland protection grants. The first is \$50,000 and is given to counties to develop comprehensive farmland protection plans, which analyze the level of development pressure on farmland, identify lands in need of protection, and outline actions for protecting farmland and promoting agriculture. The current farmland protection plans for Erie and Niagara Counties are detailed below. The second is a grant to municipalities covering 75 percent of the cost to purchase conservation easements as

4 1999 Erie County Local Law No. 1

5 2007 Niagara County Local Law No. 7.

6 2007 Niagara County Local Law No. 7.

7 2007 Niagara County Local Law No. 7.

8 2007 Niagara County Local Law No. 7.

9 N.Y. Agriculture and Markets Law § 321.

IN BRIEF

PG 105 New York State is a right-to-farm state.

PG 106 The state enacted agricultural district legislation in 1973. Later, Erie and Niagara Counties (in 1999 and 2007, respectively) and several municipalities enacted similar measures.

part of a purchase-of-development-rights (PDR) program to protect threatened farmland from conversion to other uses. Whereas right-to-farm laws protect current farmland from legal threats, PDR programs allow landowners and municipalities to ensure that the land will be protected from development in perpetuity. In order to receive state funding, municipal PDR programs must be supported by municipal and county farmland protection plans.¹⁰

Promoting New York State crops

Pride of New York

Run by the New York State Department of Agriculture and Markets, Pride of New York "is the State's promotional program for all New York food and agricultural products."¹¹ Producers who are members of the Pride program affix Pride of New York logo stickers to their products so shoppers know which foods in their grocery store are grown in their home state. Additionally, Pride of New York's website has a searchable list of food-related public events taking place across the state, as well as a database of Pride of New York's approximately 3,000 member farms and their products.¹²

10 "Farmland Protection Program," New York State Department of Agriculture and Markets, accessed January 24, 2014, <http://www.agriculture.ny.gov/AP/agsservices/farmprotect.html>.

11 "Marketing Organic Crops," NYS Department of Agriculture and Markets, accessed January 22, 2014. <http://www.agriculture.ny.gov/AP/organic/MarketingOrganicCrops.html>.

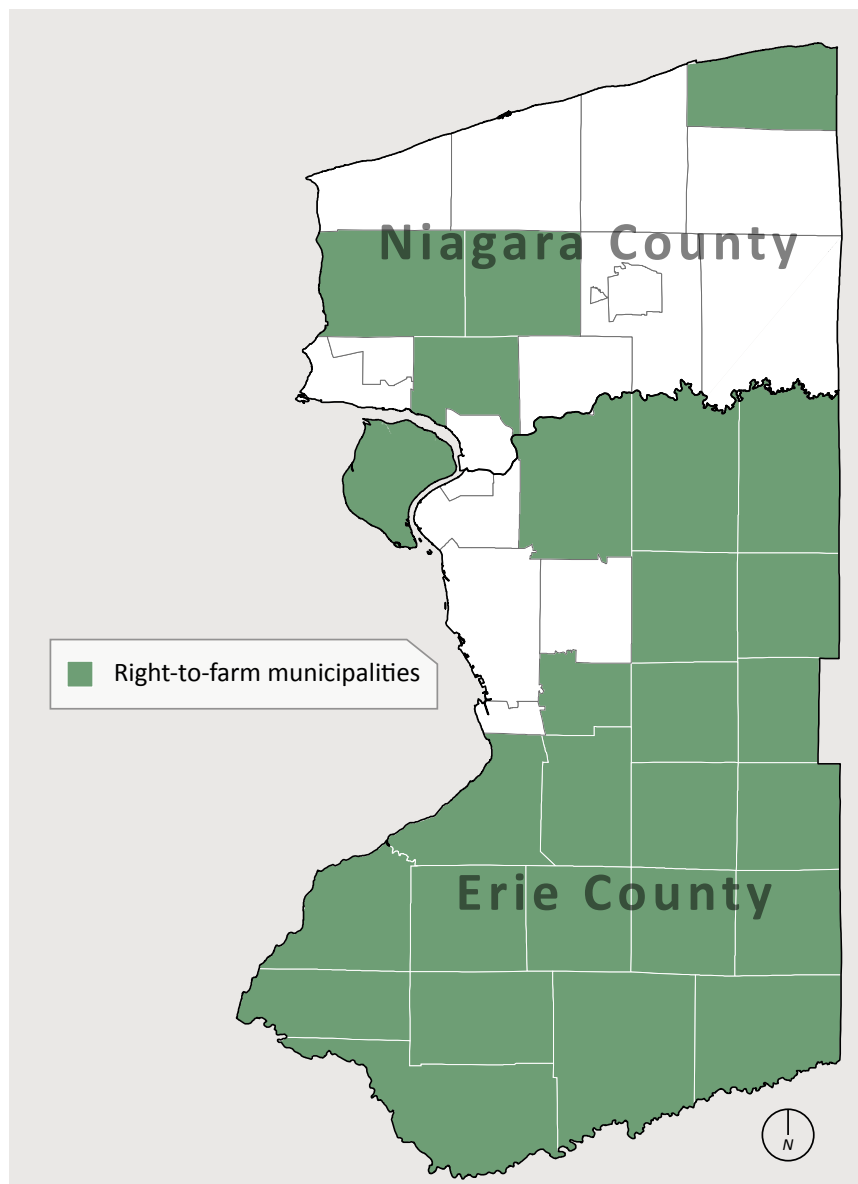
12 "Buy Local. Buy Pride of New York!" Pride of New

Table 62. Right-to-farm municipalities in Buffalo Niagara

Erie County
Alden, Town of
Amherst, Town of
Aurora, Town of
Boston, Town of
Brant, Town of
Clarence, Town of
Colden, Town of
Collins, Town of
Concord, Town of
Eden, Town of
Elma, Town of
Evans, Town of
Grand Island, Town of
Hamburg, Town of
Holland, Town of
Lancaster, Town of
Marilla, Town of
Newstead, Town of
North Collins, Town of
Orchard Park, Town of
Sardinia, Town of
Wales, Town of
West Seneca, Town of
Niagara County
Cambria, Town of
Lewiston, Town of
Royalton, Town of
Somerset, Town of
Wheatfield, Town of

Source: Food Systems Planning and Healthy Communities Lab, University at Buffalo.

Figure 33. Right-to-farm municipalities in Buffalo Niagara



Source: Food Systems Planning and Healthy Communities Lab, University at Buffalo.

Pride of New York does additional promotional and educational work using their members' information. For example, in 2011, the program supplied college and university food servicers with information and tools to assist their efforts to buy local food as part of the Farm-to-College Program piloted by the New York State Department of Agriculture and Markets.¹³

York, accessed January 22, 2014, <http://www.prideofny.com/PONY/consumer/viewHome.do>.

13 Abcarian, Lora. "Pride paints positive picture for NY branding," Produce News, June 26, 2012, accessed January 22, 2014, <http://www.producenews.com/index.php/news-dep-menu/test-featured/8182-pride-paints-positive-picture-for-ny-branding>.

Supporting farmers' markets

Although farmers' markets are not regulated at the state level, they are supported by the Department of Agriculture and Markets. The state encourages farmers' markets by providing state assistance to municipalities and public and private agencies interested in developing new markets or expanding existing markets. The state will provide technical assistance and grants of up to \$50,000,

compile and publish economic data, create cooperative relationships, and form a list of funding sources.¹⁴

Protecting and managing wild game resources

Although food produced on farms is the most common source of food in the region, hunting and fishing are traditions in many western New York families and are often overlooked in the food system.

A permit or license is required for hunters and recreational anglers in New York State.¹⁵ In order to hunt in the state, an individual must be a resident of New York State, be twelve years of age or older, and have completed a ten-hour hunter education course.¹⁶ The conditions of a resident hunting license depend on the type of game sought, the type of weapon used, the location, and the individual's age. Yearly hunting licenses range from \$0 to \$96.¹⁷ During the 2011-2012 license year, 112,839 hunting licenses were sold in Erie and Niagara Counties, which tallied gross sales of nearly 3 million dollars.¹⁸

Fishing is another source of food that is regulated by New York State. Fishing licenses are required for any individual over the age of sixteen who fishes in New York State water bodies that are not privately owned. New York State residents can purchase a license for the year (\$29.00), seven days (\$15.00), or one day (\$5.00).¹⁹ In the 2011-2012 license year, 117,809 fishing licenses were sold in Erie and Niagara Counties.

Support for urban agriculture and community gardening

14 AGM §§ 259 to 263.

15 Although there is no record of the numbers of wild game that are consumed, New York State keeps track of the licenses sold. These records show the number of people that are hunting legally in the region and can enable estimates of the number of animals that were taken.

16 "Hunting Licenses," New York State Department of Environmental Conservation, 2013, accessed September 18, 2013, <http://www.dec.ny.gov/permits/6094.html#Residency>.

17 "Resident Hunting Licenses, Permits, and Stamps," New York State Department of Environmental Conservation, 2013, accessed September 5, 2013, <http://www.dec.ny.gov/permits/6395.html>.

18 "License Sales by County for Current License Year 2011-2012," New York State Department of Environmental Conservation, 2013, accessed September 5, 2013, <http://www.dec.ny.gov/permits/26368.html>. Numbers include combined hunting and fishing licenses.

19 "License Sales," New York State Department of Environmental Conservation. Numbers include combined hunting and fishing licenses.

Food is increasingly grown in urban settings. One form of food production—community gardening—is explicitly supported in New York State law. Community gardens are “shared open spaces, where individuals garden together to grow fresh, healthful, and affordable fruits and vegetables.”²⁰ New York State law specifically declares that state-owned vacant land may be used for community gardens.²¹ The state formed the “Office of Community Gardens,” which aids organizations in creating gardens by identifying available properties, liaising with government agencies, liaising with other garden organizations and gardeners, and providing funds and grants.

Health and food safety

Laws governing the food system promote food safety for the protection of people’s health. They seek to prevent food spoilage and contamination during production and processing as well as at restaurants and retail stores. New York State sets the minimum standards that the state’s businesses and individuals must follow in order to legally produce, sell, or serve food in New York State. Several State regulations apply:

- Title 1—the Department of Agriculture and Markets—of New York Code, Rules, and Regulations (N.Y.C.R.R.) regulates food production.
- Chapter 1 of Title 10—the Department of Health—of N.Y.C.R.R. is the New York State Sanitary Code. Part 14 of the New York State Sanitary Code is devoted to food safety at food service establishments.
- Consolidated Laws of New York: The Agriculture and Markets Law (AGM), the General Business Law (GBS), and the Public Health Law (PBH).

Much of the administration and responsibility for the state’s food safety regulations are delegated to county officials. Moreover, although state regulations are the minimum that all counties must uphold, counties can write additional regulations that support or fill a void left by the state. Erie and Niagara Counties have created sanitary codes with higher standards than the state’s. Applicable rules can be found in the Niagara County Sanitary Code and

New York State’s role in reviving hop production

Hops, a bittering agent used in beer, were once an economic driver in New York State. In fact, in 1849, New York State led the nation in hop production.¹ However, a series of crop failures and the ratification of the eighteenth amendment prohibiting alcohol killed the New York State hop industry. Today, however, the revival of craft beer in North America has led to a resurgence in hop production.² In recognition of the economic buzz around craft beer and hop production, the New York State Legislature passed amendments to the Alcoholic Beverage Control Law and the Agriculture and Markets Law to promote New York hop production and to enable farmers to sell beer made from New York State hops.³

The amendments, known as the Farm Brewery Bill, reduce the regulations and cost of licenses that would normally be required of a brewery—barriers that were prohibitive for many would-be brewers. Instead of paying \$950 to \$5,000 for a license and securing a \$10,000 surety bond, farm brewers can apply for a farm-brewery license and sell beer on premise for as little as \$320 annually.⁴ The bill helps existing farmers to grow brewery businesses and helps to diversify farm crops and income, strengthening farmers’ bottom lines.

The bill also bolsters the demand for New York State malts and hops. The Farm Brewery Bill requires that, over several years, New York State-labeled beer contain an increasing percentage of New York State sourced ingredients. In 2012, 20 percent of the ingredients and hops in New York State-labeled beer must be sourced from New York State.⁵ The percentage will rise in 2019, when 60 percent of the hops and ingredients in New York State-labeled beer must be from New York State.⁶ In 2024, 90 percent of the hops and other ingredients in New York State-labeled beer will have to be sourced from within the state. Thus, growing quantities of New York State hops and malts will be used by brewers making New York State-labeled beer. This slow but steady increase in New York-sourced ingredients creates an opportunity for farmers to grow hops, malts, and other ingredients needed by New York breweries.

1 Vang, Richard, “The Past, Present, and Yes, Future of the Hops Industry,” *Upstate Alive Magazine*, no. 1 (1996): 4.

2 Fromson, Daniel, “Hops Farmers Reviving Heady Days of Brewing,” *The New York Times*, November 7, 2011, accessed January 24, 2014, http://www.nytimes.com/2011/11/09/dining/hop-farmers-reviving-brewing-in-new-york-state.html?_r=0; Josh Dawsey, “New York Farmers Give Hops a Shot: Beer Ingredient, Once Widely Grown in State, Draws New Fans,” *The Wall Street Journal*, August 21, 2013 <http://online.wsj.com/news/articles/SB10001424127887324619504579026851948897742>.

3 S. 7727/A. 10694 “Farm Brewery Bill” Passed June 15, 2012.

4 N.Y. Alcoholic Beverage Control Law § 50-57-A (ABC).

5 ABC § 3, 20-d.

6 Ibid.

20 Raja, Samina, Branden Born, and Jessica Russell. *A Planners Guide to Community and Regional Food Planning: Transforming Food Environments, Facilitating Healthy Eating*. American Planning Association, PAS Report no. 554. (2008).

21 N.Y. Agriculture and Markets Law § 31-i (AGM).

the Erie County Sanitary Code.

The following are selected highlights of state and county laws impacting food production, processing, and sales.

Food safety

Food producers must abide by numerous state- and county-regulated sanitation practices. Specific regulations exist for most crops and animals and the farmers who raise them. Below, we outline some regulations that impact dairy farms.

Rules about animals

In order to deal in or sell livestock (including cattle, swine, horses, deer, sheep, goats, or poultry), farms must purchase a \$50.00 biennial permit from New York State.²² When on the farm, all domestic and wild animals must be fed in a container that prevents food from scattering on the ground, which reduces the potential to attract rats²³ and insects. Cows and any product made from them must be kept in healthy and sanitary conditions. The cows must be fed healthy food, and barns and stables must follow sanitation regulations.²⁴

Rules about farm workers

People with communicable infectious diseases may not work with cows. If a person at a farm or dairy has a communicable infectious disease, products from that farm or dairy may not be sold or delivered except to a processing plant.²⁵ Housing for migrant farmworkers must include adequate cooking and dining facilities. These entail properly installed cooking stoves with a minimum of two burners per five occupants, an adequate amount of food, utensil storage shelves, and counter space, a refrigerator, tables and chairs, and a dishwashing sink with hot and cold running water.²⁶

Rules about products

To produce milk and milk products, a person must obtain a free permit from the state. The permit is contingent on a satisfactory sanitary inspection by the state.²⁷ All machines, utensils, and tools used in the production of milk and milk products must be sanitary and

may be inspected by agents of the State Department of Agriculture and Markets. If a person with a communicable disease has worked with dairy cows, the dairy products must be sold to a processor who pasteurizes the product, processes it into another product using a method equivalent to pasteurization, or makes the product into cheese that cures for at least sixty days.²⁸

New York State allows the sale of raw milk on farms with a permit that sets the conditions of sale²⁹ and milk-quality standards.³⁰ Generally, milk must be sold directly to consumers from a licensed farm where it was produced with a warning that the milk is not pasteurized. Additionally, farms must conduct quarterly milk pathogen testing and have milk bacteria counts below 30K/ml.³¹

Food processing

Today, a large share of food produced on farms is consumed after processing. A food-processing establishment is defined as a “place that receives food or food products for the purpose of processing or otherwise adding to the value of the product for commercial sale.”³² Processing can be as simple as cutting vegetables into easily consumed portions, canning, or jarring, and as complicated as slaughtering an animal and packaging its meat to be sold in stores. Food processing describes a range of activities, including baking, curing, cutting, mixing salad items, packaging, and smoking.³³

License and permit requirements

In New York State, most food processors must hold a \$400 Article 20-C license from the Department of Agriculture and Markets. The purpose of this license is to ensure that people selling processed foods have handled food in a sanitary manner.

A few types of processors are exempt in order to “avoid unnecessary regulation and assist in the administration of [the law] without impairing its purposes.”³⁴ Specifically, home processors making bakery products for wholesale marketing or for vending at retail

²⁸ 10 N.Y.C.R.R. § 2.52

²⁹ 1 N.Y.C.R.R. § 2.3.

³⁰ 1 N.Y.C.R.R. § 2.8.

³¹ 1 N.Y.C.R.R. § 2.3.

³² AGM § 251-Z-2 (3).

³³ “Description of Food Processing,” New York State Department of Agriculture and Markets, accessed December 3, 2013, <http://www.agriculture.ny.gov/FS/general/foodprep.html>.

³⁴ AGM § 251-Z-4.

IN BRIEF

PG 110

Commercial kitchens enable small-scale processors to process food, which is often legally impossible to do in a home kitchen because processors cannot use the same equipment or surfaces that they use to cook their own meals.

PG 112

Good-faith donors of food to a charitable or nonprofit organization are exempt from legal liability arising from food-borne illnesses.

PG 108

The New York Codes, Rules, and Regulations and the Consolidated Laws regulate multiple aspects of the food system. The counties generally administer the New York State regulations as well as the additional rules that each county establishes in its own sanitary codes.

agricultural venues, such as farms, farm stands, and farmers’ markets, do not need an Article 20-C license.³⁵ Moreover, processors making traditional food items—such as fruit jams, spices or herbs—and snacks—such as popcorn and peanut brittle—do not need a license. All home processors selling any product over the internet, however, must hold an Article 20-C license.³⁶

It is forbidden to process some products at home for public sale. For example, home processors cannot process products that need to be refrigerated. They must ensure that the finished product containers are clean, sanitary, and properly labeled; they must not be misbranded or adulterated, and if the

³⁵ If they meet certain conditions. Source: “Recipe for Success: Selling Food Products,” New York State Small Business Development Center: The State University of New York, 2010, accessed December 3, 2013, <http://www.nyssbdc.org/resources/Publications/foodproducts.pdf>.

³⁶ “Recipe for Success: Selling Food Products,” New York State Small Business Development Center.

²² N.Y. Agriculture and Markets Law (AGM) § 90-C to -F.
²³ ERIE COUNTY, N.Y., ERIE COUNTY SANITARY CODE art. XI, § 1.15d.

²⁴ AGM §§ 47 to 48.

²⁵ 10 N.Y. Comprehensive Codes, Rules, and Regulations (N.Y.C.R.R.) § 2.52.

²⁶ 10 N.Y.C.R.R. § 15.10.

²⁷ AGM § 71-L to -O.

container is made of glass, it must be sealed with a rigid metal lid.³⁷

Home processors exempt from Article 20-C must still obtain a permit from their county health department certifying that they are in compliance with the New York State Sanitary Code. Obtaining a permit to process food products in one's home is difficult, however, because food processors cannot use the same surfaces, storage areas, and cooking equipment that they use for their regular meals.

One potential solution to this problem is a shared commercial kitchen that has a 20-C license and rents it for others to use. Commercial kitchens are built or renovated to meet the sanitation requirements of the article 20-C license. Commercial kitchens exist in some churches and firehouses, and in some cases are stand-alone facilities built solely to enable food entrepreneurs to produce a processed product for sale. An entity that operates at a commercial kitchen also needs to acquire a permit stating that they are in compliance with the New York Sanitary Code. Commercial kitchens built to New York State Sanitary Code requirements offer food entrepreneurs a low-risk way to create and sell value-added products. By operating a shared facility, entrepreneurs need to pay only for their use of the facility instead of for commercial grade equipment in their own kitchens.

Food-retail

Food retail is regulated to ensure the safety of the product that a consumer purchases. Most regulations require the food retailer to apply for and maintain a license specific to the type of food-retail business they conduct. Retail food stores and food-service establishments are subject to annual inspections by county health departments and can have their licenses revoked if they fail to comply with the rules in the state's or counties' sanitary codes.

License requirements

Food-retail operations are required to obtain permission to operate, through state and county licenses and permits. These differ based on the type of food retail one intends to pursue. Fees are

paid to the county's departments of health. New York State places a duty upon anyone with knowledge about food safety to report any instance of food poisoning to the city, county, or district health officer where the food poisoning occurred.

Food-service and retail

The minimum license required to operate a retail food store, including gas stations and convenience stores, is an article 28 Retail Food Store License. This license must be renewed biennially through the State Commissioner of the Department of Agriculture and Markets.³⁸ In both Erie and Niagara Counties, an article 28 Retail Food Store License costs \$250 per food store.³⁹ Food retailers selling frozen desserts must obtain an additional \$20.00 biennial license.⁴⁰

A New York State article 28 license is not required for establishments that handle only pre-packaged, non-potentially hazardous foods (potentially hazardous foods include milk, shell eggs, and refrigerated meats); roadside markets that offer only fresh fruits and fresh vegetables for sale; food-service establishments; or food and beverage vending machines. Consequently, farmers' markets and roadside stands do not require licenses as long as they are selling fresh fruits and fresh vegetables.

38 AGM § 500.

39 Kailee Neuner, Patrick Gooch, and Samina Raja, "Buffalo's Food System: An assessment of current municipal County, and State policies that regulate Buffalo's food system," Healthy Kids, Healthy Communities-Buffalo Partnership, 2012.

40 AGM § 71-A to -K.

Food-service establishments⁴¹

In Erie County, "permanent food service establishments with a seating capacity of less than 50 people require a \$147.00 permit. This fee increases to \$282.00 if the seating capacity exceeds 50 people. Permit fees for temporary food service establishments range from \$106.00 to \$190.00 depending on the duration of the event and the date the application is received."⁴² The permit fee for a food-service establishment without on-site food preparation is \$79.00.⁴³

In Erie County, mobile food-service establishment permits cost \$147.00, and caterer permit fees cost \$282.00.⁴⁴

In Niagara County, mobile food vendors are required to pay an annual fee of \$210.00 for inspection and a permit.⁴⁵ A permit for temporary food service (less than fifteen consecutive days) costs \$50. A permit for food service at multiple temporary locations for 180 consecutive days costs \$200.⁴⁶

41 The Erie County Sanitary Code regulates some aspects of food preparation in homes, but not in schools. Dwelling units must have a room or portion of a room to prepare and/or cook food. The room must include a working kitchen sink with an adequate amount of heated water under pressure (Source: ERIE COUNTY, N.Y., ERIE COUNTY SANITARY CODE art. XI, § 1.19, a,1). Conversely, school buildings are not required to have a kitchen, even though they provide a large share of childrens' daily nutritional intake.

42 Neuner et al., "Buffalo's Food System: An assessment."

43 Neuner et al., "Buffalo's Food System: An assessment."

44 Neuner et al., "Buffalo's Food System: An assessment."

45 NIAGARA COUNTY, N.Y., NIAGARA COUNTY SANITARY CODE ch. XIV, § 2 (2010).

46 "Application for a temporary permit to operate a food service establishment," Niagara County Health

Shared commercial kitchens.

Shared Vegetarian Kitchen—a commercial kitchen in Buffalo Niagara with a 20-C license—can be rented by the hour.¹ The 1,500-square-foot kitchen has commercial ovens, freezers, refrigerators, food-processing equipment, 30-quart mixers, dry storage, shrink wrapping, nutrition labels, and strictly vegetarian food processing.² Other existing regional kitchens, such as those used by Erie and Niagara County Community Colleges' (NCCC) Culinary Arts and Bakery Programs, could be converted into commercial kitchens. In 2012, construction was completed on the 90,000 square-foot Niagara Falls Culinary Institute (NFCI). The NFCI is home to NCCC's Hospitality and Tourism Program, and features a fine-dining restaurant, a French pastry shop, a New York-style deli, a wine store, a culinary-themed bookstore, a tourism kitchen, and the Small Business Development Center. The high-quality facility could be used as a commercial

1 "New York Shared Use & Commercial Kitchens," Northeast Center for Food Entrepreneurship, Cornell University, Department of Food Science, 2013, accessed September 5, 2013, <http://necfe.foodscience.cals.cornell.edu/kitchens-supplies/small-co-packs-commercial-kitchens/new-york>.

2 Ibid.

37 Ibid.

Hygiene in food retail

Food vendors are inspected by an agent of the Department of Agriculture and Markets at least once per year and must post the results of their most recent sanitary inspection near a public entrance.⁴⁷ Any place engaged in the preparation, sale, or service of food for and to the public is subject to inspection, and all utensils and containers used in the preparation, sale, or service of food must be sanitary.⁴⁸ Due to limited washing facilities, mobile food-service establishments and pushcarts must provide single-service tableware.⁴⁹ Additionally, operations must cease if the potable water supply does not meet sanitary code requirements, there is any cross connection or other fault in the potable water system, or the sewage is disposed of in an unsanitary manner.⁵⁰

Food-vending operations and permanent and temporary food-service establishments must provide a well-maintained and sanitary toilet and hand-washing facility for employees.

In both counties, permanent food-service establishments and food-vending operations with seating capacities exceeding twenty people are required to have washing facilities for public use.⁵¹ The Erie County Sanitary Code mandates that bathrooms may not be located not within one-hundred feet of any place where food is prepared or served.⁵² Public toilets must be kept clean and well-maintained and must contain facilities for washing and drying hands, including soap.⁵³

New York State requires that temporary food-service establishments provide enough potable water from an approved source for food preparation, cleaning and sanitizing, and hand washing. Hot water must be available.⁵⁴ Mobile food-service establishments must have adequate hand-washing facilities for the operator, with potable water and soap, unless all food served is prepackaged

Department, accessed February 4, 2014, http://www.niagaraCounty.com/Portals/4/Docs/TempPermit_Food-Service.pdf.

47 AGM §§ 500.2, 500.4. Moreover, vending machines must resist tipping. Those requiring electrical power must be grounded or double-insulated. Source: 10 N.Y.C.R.R. § 14-5.96.

48 10 N.Y.C.R.R. ch.1, p.14 § 1.110.

49 10 N.Y.C.R.R. ch.1, p.14 § 4.104.

50 10 N.Y.C.R.R. ch.1, p.14 § 1.10.

51 10 N.Y.C.R.R. ch.1, p.14 § 1.142c.

52 ERIE COUNTY, N.Y., ERIE COUNTY SANITARY CODE art. IV, § 1(e)1.

53 ERIE COUNTY, N.Y., ERIE COUNTY SANITARY CODE art. IV, § 5.

54 10 N.Y.C.R.R. ch.1, p.14 § 2.9.

and pre-wrapped.⁵⁵ Mobile food service establishments must have a water system with a storage tank of at least forty gallons unless all food served is prepackaged and wrapped, or the permit-issuing official requires a lesser or greater amount. Liquid waste must be stored in a permanently installed holding tank with greater capacity than the potable water storage tank.⁵⁶

Food workers' hygiene

People with communicable diseases that can be transmitted through food may not work in a food-service operation.⁵⁷ Any food-service worker who touches uncooked food or food after it has been cooked must wear gloves and use sanitary utensils.⁵⁸ Employees should maintain a high degree of personal cleanliness, wash their hands regularly, consume food only in designated dining areas, refrain from using tobacco while engaging in food preparation or service, and wear hair nets.⁵⁹

55 10 N.Y.C.R.R. ch.1, p.14 §§ 4.140, 4.142.

56 10 N.Y.C.R.R. ch.1, p.14 §§ 4.120, 4.130.

57 10 N.Y.C.R.R. ch.1, p.14 § 1.70.

58 Public Health (PBH) § 1352.

59 10 N.Y.C.R.R. ch.1, p.14 §§ 1.71, 1.72, 2.16, 4.80, 5.71.

Food-specific safety rules

The state sanitary code places many regulations on food products. Permanent and mobile food service establishments must have an adequate amount of cold-and-hot-food storage facilities.⁶⁰ Food must be free from adulteration, spoilage, filth, or contamination and may only be obtained from approved sources.⁶¹ Approved sources are those that comply with all laws relating to food and food labeling and have prepared food in a place holding the necessary license to operate, if required. Any food that is exposed to filth, toxic substances, rodents, manual contact during service or preparation if not cooked prior to service, or held for longer than two hours between 45 degrees Fahrenheit and 140 degrees Fahrenheit is considered contaminated.⁶² Businesses may only sell meat and poultry affixed with an official inspection mark signifying that it has passed a federal inspection.⁶³ Additionally, it is illegal to sell any parts of domesticated dogs or cats for human

60 10 N.Y.C.R.R. ch.1, p.14 §§ 1.44, 1.45, 4.51, 4.52.

61 10 N.Y.C.R.R. ch.1, p.14 § 1.31.

62 10 N.Y.C.R.R. ch.1, p.14 §§ 1.31, 1.40, 2.3, 4.50, 5.40.

63 AGM § 96-m, 96-z-28.

Rules about displaying and packing food

Many regulations concern the branding, labeling, and packaging of food. These are not intended to prevent food-borne illness; rather, they are meant to ensure that consumers are not defrauded by food vendors mislabeling or hiding the contents of the product being sold. Farm products may not be sold if they have false or misleading labeling or if they are packed such that the surface is not representative of the package's contents. For example, a container labeled "Empire apples" must contain only Empire apples of similar quality throughout the container. Some products in closed packages must also include the grade of the product as defined by the State Commissioner of the Department of Agriculture and Markets. For example, a box of apples must display the variety, grade, minimum diameter or numerical count, and quantity of contents, as well as the name and address of the packer or re-packer.¹

Thus, a farmer selling a closed package of apples must label them with the variety (such as MacIntosh or Empire), with a grade (such as U.S. Extra Fancy or Fancy), the quantity of apples contained within the package, and the address of the packer. Products not in closed packages, such as bulk displays at farmers' markets or grocery stores, may be sold without a grade or classification.² Such displays eliminate the need for classification by allowing the consumer to inspect the product directly instead of relying on a grade or classification.

1 "Rules and Regulations Relating to New York State Apple Grades," Circular 859, New York State Department of Agriculture and Markets, Division of Food Safety and Inspection, November 1993.

2 AGM §§ 157 to 160.

Less common food vending rules and licenses

There are several other types of food-vending licenses and rules for less common practices. First, a food salvager must have a New York State article 17-B permit.¹ Second, honorably discharged members of the U.S. military (and their spouses, even if the veteran is deceased) who are either veterans of war or who have served overseas can obtain a free license to peddle wares on the street.^{2,3} Third, itinerant vendors may not sell food manufactured and packaged for sale by a person less than two years old.⁴

Construction and renovation of food-service establishments

In Erie County, a plan review fee of \$147.00 may be required for food-service establishments prior to new construction, a major renovation, or commencing operation.⁵ In Niagara County, prior to construction, all new and remodeled food-service establishments are required to submit plans for review and approval. The fee for plan review is \$160.00. Food-service establishments must also pay an annual fee to cover the cost of the inspection and permit required to serve food. Niagara County charges different fees for different types of inspections and permits for food-service establishments based on state classifications. The state assesses food-service establishments based on the foods and the population served. It classifies establishments from low risk to high risk based on the potential for food-borne illness. The fees charged for inspection rise with the risk. An annual fee of \$145 is charged for low-risk establishments, \$220 for medium-risk establishments, and \$315 for high-risk establishments.⁶

1 AGM §§ 216 to 222. Distressed or damaged food are cans so badly dented that the safety of the product inside can no longer be guaranteed.

2 General Business (GBS) § 32.

3 Disabled honorably discharged veterans living in New York State cities populated by more than one million people have additional rights to vend on the street. Source: GBS § 35-A

4 GBS §§ 37 to 39.

5 Neuner et al., "Buffalo's Food System: An assessment."

6 NIAGARA COUNTY, N.Y., NIAGARA COUNTY SANITARY CODE ch. XIV, § 2 (2010).

consumption.⁶⁴

Mobile food-service establishments, pushcarts, and food-vending operations must be serviced and obtain food only at a food-storage area operated under a valid permit.⁶⁵ All food must be protected from contamination during storage, preparation, display, service, and transportation. Potentially hazardous food must be kept at appropriate temperatures (below 45°F or above 140°F) "except during necessary times of preparation or during a limited period of time while being held for service which may not exceed two hours."⁶⁶ Specific requirements for reheating and thawing food must be followed.⁶⁷ Potentially hazardous foods must be cooked to specific temperatures.⁶⁸

Food cannot be prepared or served with bare-

64 AGM § 96-h.

65 10 N.Y.C.R.R. ch.1, p.14 §§ 4.95, 5.31, 5.20.

66 10 N.Y.C.R.R. ch.1, p.14 §§ 1.31, 1.40, 2.3, 4.50, 5.40.

67 10 N.Y.C.R.R. ch.1, p.14 §§ 1.83, 1.86, 4.92.

68 10 N.Y.C.R.R. ch.1, p.14 §§ 1.82, 2.3, 4.50.

hand contact, and the re-service of unused or unprotected food is prohibited.⁶⁹ Temporary and mobile food-service establishments and pushcarts may only serve food that requires limited preparation, such as seasoning and cooking.⁷⁰ Finally, vending machines must dispense potentially hazardous food in an individual, original container or wrapper. All food (except fresh fruit) dispensed from a vending machine must be stored or packaged in clean protective containers.⁷¹ Retail food stores with more than three full-time employees or annual gross sales in excess of \$3 million must employ at least one individual who has been trained and certified in the safe and proper handling, preparation, cooking, storage, serving, delivery, removal, and disposal of food.⁷²

Permanent, mobile, or vending establishments must cease operation immediately if, during inspection, a

69 10 N.Y.C.R.R. ch.1, p.14 §§ 1.80, 2.3, 1.41, 4.90.

70 10 N.Y.C.R.R. ch.1, p.14 §§ 2.3, 4.41.

71 10 N.Y.C.R.R. ch.1, p.14 §§ 5.41, 5.44.

72 AGM § 71-A to -K.

permit-issuing official finds food from an unapproved or unknown source; potentially hazardous food stored at inappropriate temperatures; re-service of potentially hazardous food; or improperly labeled, stored, or used toxic items.⁷³

Disposal or donation of excess food

New York State recognizes that excess food is often grown on farms, unsold at processing facilities, and not purchased from food retailers. The New York Agriculture and Markets Law contains a provision encouraging the donation of excess food rather than its disposal. The provision removes liability for any illness that arises from the condition of the food, if the donor believes in good-faith that the food is fit for human consumption. This waiver of liability applies to a donor of any canned or perishable food, farm product, or game that is donated to a bona fide charitable or nonprofit organization for free distribution.⁷⁴ With this waiver, any farmer, manufacturer, restaurant owner, or store owner who has excess unsalable food is able to donate that food without the worry that they or their business will be held liable for any illness arising from their donated food.

Erie and Niagara planning framework

The New York State Constitution delegates land-use and zoning decisions to the local government through Article IV, commonly known as home rule. Therefore, many municipalities within Buffalo Niagara have their own planning departments and have the final say in land-use decisions, even though municipal-level decisions commonly impact the lives of people outside of those municipalities. Counties have limited statutory power to influence municipal planning decisions, such as the right to review certain municipal land use decisions that affect county property or land within 500 feet of a municipal border.⁷⁵ County planning is important, however, because it helps municipalities work together on issues that heavily influence life in each place but over which many municipalities lack jurisdiction. County and regional plans can also be formally adopted by municipalities.

County-level planning

73 10 N.Y.C.R.R. ch.1, p.14 §§ 1.10, 4.20, 5.10.

74 AGM §§ 71-Y to -Z.

75 N.Y. General Municipal Law § 239-m to -n (GML).

Erie and Niagara County governments provide planning services for each County and aid the planning efforts of the municipalities within them. Neither governments' planning services focus directly on planning for food, but their work impacts the food system.

Erie County Environment and Planning

Planning is provided by the Erie County Department of Environment and Planning ("Erie County Planning"). The department's mission is to coordinate, support, and implement planning programs and development projects "that improve the quality of life for Erie County residents, businesses, and visitors."⁷⁶ The department's duties are broken into seven focus areas: economic development; community development; regional planning; environmental services; arts, culture, and heritage promotion; geographic information services; and sewerage management.⁷⁷ Food is not an explicit focus area of Erie County Planning, but it is addressed by the Farmland and Agriculture Protection Plan under the Regional Planning focus area. The Farmland and Agriculture Protection Plan focuses on ensuring economic viability of the county's farms and farming communities.

Niagara County Department of Economic Development

Planning for Niagara County is provided by the Niagara County Department of Economic Development. The services offered by this department include promoting "orderly growth and development through the dissemination of information; preparation of plans, projects, and programs; and provision of technical services."⁷⁸ The department also "promotes sustainable economic development, job creation and retention, tax base expansion, and improved quality of life for all Niagara County residents."⁷⁹

Food is not an explicit focus of Niagara

County's planning department. Agriculture, however, is a large part of Niagara County's economy. The Niagara County Department of Economic Development focuses on the county's agricultural sector and on maintaining economically viable farms. Accordingly, Niagara County has a farmland protection plan. The plan addresses food production as a way to ensure economic viability, but not as a way to address food access and food justice.

Food in Buffalo Niagara's regional plans

Although there are many plans for individual municipalities in Buffalo Niagara, there are fewer regional plans. Regional plans are identified in detail below.

Framework for Regional Growth—Erie County's adopted comprehensive plan

The Framework for Regional Growth ("The Framework") is both a plan for the region and the adopted comprehensive plan of Erie County. In 2006, Erie and Niagara Counties published a Framework for Regional Growth, which detailed how the two counties could work together to shape the physical development of the Buffalo Niagara region and grow the regional economy. Although Niagara County was a part of the Framework's development, the County never formally adopted the Framework for Regional Growth.

The Framework developed seven principles that would guide the policies and strategies of future development in Erie and Niagara Counties. These principles are a vital economy, sustainable neighborhoods, strong rural communities, improved access and mobility, efficient systems and services, effective regional stewardship, and conserved natural and cultural assets.

Although the Framework does not directly address food access, the preferred scenario and several of the Framework's principles may improve food access. The Framework for Regional Growth calls for reinvesting in existing residential areas and building compact, walkable communities around existing development. This form of development could lead to neighborhoods with improved access to food stores. Compact neighborhoods also reduce peoples' need

IN BRIEF

PG 112 New York is a home rule state, meaning that municipalities have local planning power.

PG 112 Several recent regional and county plans impact food access and justice.

to travel, via car or public transit, to distant food-retail stores.⁸⁰

Additionally, the Framework for Regional Growth is designed to improve the economies of all community types: rural, suburban, and urban. The Framework's preferred scenario would continue to enable farming in rural communities by reducing the conversion of farms and open space into residential and commercial properties. If the Framework's seven principals are followed, the pressure to develop farmland should decline.⁸¹

Niagara Communities Comprehensive Plan 2030

In 2009, Niagara County released its first comprehensive planning document dedicated solely to the county and its municipalities.⁸² The focus of the plan is to encourage desirable and appropriate growth and development, strengthen the local economy, improve the delivery of services, prioritize and coordinate capital improvements, and improve the quality of life for county residents.⁸³ The plan does not address food access directly, but it touches on food in sections about farmland loss, the local food-processing industry, the sport fishing industry, and agricultural tourism.⁸⁴

In Niagara County, agriculture is a significant contributor to the local economy and an industry ripe for growth. One aspect of appropriate growth and development is

⁷⁶ "About DEP," Erie County Department of Environment and Planning, accessed January 23, 2014, <http://www2.erie.gov/environment/index.php?q=about-dep>

⁷⁷ "About DEP," Erie County Department of Environment and Planning.

⁷⁸ "Niagara County Department of Economic Development," Niagara County, 2012, accessed August 8, 2012, http://www.niagaracountybusiness.com/contact_NCD-ED.asp.

⁷⁹ "Niagara County Department of Economic Development," Niagara County.

⁸⁰ "Framework for Regional Growth," Erie and Niagara Counties, New York, 2006.

⁸¹ Ibid.

⁸² "Niagara Communities Comprehensive Plan 2030: A Plan to Communicate, Collaborate & Connect," Niagara County, New York, 2009.

⁸³ Ibid.

⁸⁴ Ibid.

Municipal plans and zoning codes impacting food in Buffalo Niagara

In addition to regional plans, a few municipal and multi-municipality plans and zoning codes specifically address food. Most plans touch on food through planning for agriculture. These include *Tourism Toolkit: Strategies and Action Steps for Tourism Development in the Southtowns of Erie County*; *Sowing the Seeds for Southtowns Agribusiness*; *The Aurora Open Space Plan*; and the *Town of Clarence Agricultural and Farmland Protection Plan*.

A new land-use plan in Buffalo, however, directly addresses multiple aspects of the city's food system and is tied to a new zoning ordinance. The City of Buffalo began revamping its zoning code in late 2010. The new ordinance, known as the Buffalo Green Code, was driven by two concerns. First, the current zoning code has been in use since 1953, and although it has been amended and revised over time, its fundamental structure is outdated. Second, in 2006, the City of Buffalo adopted a new comprehensive plan—*The Queen City in the 21st Century: Buffalo's Comprehensive Plan*. Consequently, the zoning code was complicated and out of date.¹

When the work is complete, the City of Buffalo will have a land-use plan and a unified development ordinance that will replace the current zoning code. The unified development ordinance will combine the zoning code, subdivision code, and public realm standards into a single document intended to be user-friendly.

1 "Draft Land Use Plan," City of Buffalo, 2011, <http://www.buffalogreencode.com/BuffaloFutureLandUsePlan.pdf>.

In 2011, the City of Buffalo released a draft land-use plan, *Buffalo 2012-2032: Future Land Use Plan*, which addresses for the first time, food, food access, and the food system. The draft plan identifies the need to provide access to healthy food. The future land-use plan addresses this problem, although many of the strategies are paired with caveats about long-term use, potential conflicts, and subjective aesthetic requirements. The draft plan states that "where areas are predominantly vacant, the plan will allow transitional uses such as community gardening...or urban agriculture, while keeping open longer-term options for redevelopment."² The draft plan also supports "aesthetically-pleasing... municipal orchards and urban agriculture within high-vacancy blocks to reduce city maintenance expenditures."³

The draft plan also seeks to enable the production and distribution of healthy food, listing several strategies. These include "removing barriers to developing grocery stores, healthy corner stores, outdoor markets, and farmer's stands;"⁴ allowing structures like greenhouses and hoop houses where small-scale urban agriculture takes place; allowing long-term urban agriculture in high-vacancy neighborhoods; and allowing temporary-location produce sales.⁵

2 "Draft Land Use Plan," City of Buffalo.

3 "Draft Land Use Plan," City of Buffalo.

4 "Draft Land Use Plan," City of Buffalo.

5 Ibid.

limiting the conversion of agricultural lands into more developed uses.⁸⁵ The plan identifies the need to manage sprawl to protect viable agriculture soils and existing farmlands, as well as to maintain rural character and open space.⁸⁶ Such preservation is a key component of the Niagara Communities Plan and is taken up by the Niagara County Agricultural and Farmland Protection Plan.

Stakeholders from the eastern communities of Niagara County identified the need to keep production local and to encourage greater processing, packaging, shipping, and marketing of local products.⁸⁷ The plan identifies similar opportunities for growth by tying local agriculture to local food processing.⁸⁸ This may increase the viability of the local farm economy.

85 Ibid.

86 Ibid.

87 Ibid.

88 Ibid.

Agritourism is also addressed in the Niagara County Communities Plan. The plan identifies an opportunity to grow agritourism along a rural corridor from Youngstown-Lockport Road in Ransomville to Becker Farms, a 340-acre working farm in Gasport, New York. Becker Farms grows fruits and vegetables, has a winery and brewery, and invites the general public for tours and festivals on the farm.⁸⁹ The farm also hosts receptions and caters events carrying food sourced within a hundred-mile radius of the farm.⁹⁰

Sport fishing is identified as an agritourism growth area. While the plan recognizes the sport tourism potential of fish, it fails to acknowledge that fish can be both a healthy and dangerous source of food in the area. Although local fish are not the sole source of food for most families, they can supplement people's diets. Consuming

89 Ibid.; "Becker Farms: Welcome," Becker Farms, 2012, accessed August 20, 2012, <http://www.beckerfarms.com/welcome>.

90 Ibid.

local fish has risks, however, as many fish in the waters surrounding Niagara County contain environmental contaminants from pollution.⁹¹

A Strategy for Prosperity in Western New York

In 2011, in response to the establishment of the Regional Economic Development Councils, the counties of Allegheny, Chautauqua, Erie, and Niagara—collectively known as the Western New York Council—submitted to the state A Strategy for Prosperity in Western New York (A Strategy for Prosperity). In response, the Western New York Council was awarded \$100.3 million in 2011 and \$52.8 million in 2012.⁹² Within these

91 "Niagara Communities Comprehensive Plan 2030," Niagara County.

92 "2011 CFA Awards," The Western New York Regional Economic Development Council, 2011, accessed January 24, 2014, <http://regionalcouncils.ny.gov/content/western-new-york>; "2012 CFA Awards," The Western New York

awards, some funding went to food-system projects; \$30,000 was allotted to promote agritourism on the Niagara Wine Trail in 2011.⁹³

A Strategy for Prosperity recognizes the role that agriculture plays in western New York and acknowledges the need to improve access to markets, create new products and processes, and reduce regulations on farms. To address these needs, the plan seeks to create and promote a regional brand for local food and agriculture products; increase innovation to improve products, processes, and market links; and to promote careers in agriculture.⁹⁴

A September 2013 progress report to the Regional Economic Development Council includes a discussion of projects related to the western New York agriculture and food sectors. The projects focus on scaling up local production and procurement. They include funding sources for capital improvements and a regional branding initiative. Future projects include feasibility studies for food hubs in western New York and the Southern Tier.

WNY Regional Sustainability Plan

In 2013, the Western New York Regional Sustainability Plan (WNY Sustainability Plan) was released. A five-county plan (for Erie, Niagara, Chautauqua, Allegany, and Cattaraugus), the WNY Sustainability Plan is led by a regional planning consortium and focuses on six areas critical to achieving sustainability: energy, land use and livable communities, transportation, agriculture and forestry, water management, and waste management. Economic development and climate adaptation overlap all of the focus areas.⁹⁵

The WNY Sustainability Plan touches on the food system in four goals listed in its agriculture and forestry section. First, the counties need to “strengthen

the economic viability of agriculture and forestry enterprises.”⁹⁶ The second goal is to “achieve more efficient uses of energy inputs and maximize use of agriculture and forestry by-products for energy production.”⁹⁷ Third, the counties need to “increase support from government officials and the public for the protection of farmland, continued use of farmland for agricultural purposes, and for strengthening the business climate for agriculture and forestry in the region.”⁹⁸ Fourth, the region must “promote environmentally sustainable management systems for the agriculture and forestry sector.”⁹⁹ Achieving these goals will strengthen the economic viability of the agriculture industry while reducing GHG emissions. Funds from New York State may be available for implementing elements of the WNY Sustainability Plan. The WNY REDC uses the following core criteria to select projects for funding:

1. Does it create, retain, or fill jobs?
2. Will it maximize return on investment?
3. Is the project ready for implementation?

Projects that meet these requirements will have a higher likelihood of being funded by the Western New York Regional Economic Development Council than projects that don’t meet those criteria. Successful applicants’ projects, however, will match with additional WNY REDC priorities, as listed below:¹⁰⁰

1. Inclusive
2. Promotes smart growth
3. Oriented to young adults
4. Builds upon strengths
5. Regional impact
6. Improves region’s image

Agricultural and farmland protection plans

New York State provides funds for the creation of agricultural and farmland protection plans to municipalities through the Agriculture Protection Act. Farmland protection plans seek to develop a framework for action to

slow farmland loss and improve farm viability.

Erie County Agriculture and Farmland Protection Plan

In October 2012, Erie County released the Erie County Agricultural and Farmland Protection Plan.¹⁰¹ The plan, developed over two years, acknowledges that “[f]arms provide jobs, use less in services than they pay in property taxes, maintain wildlife habitat and water quality when well-managed, create beautiful scenic vistas, highlight the cultural heritage of many rural areas in the county, and offer fresh, local food to county residents.”¹⁰² It identifies two key strategies to ensure the viability of farming in Erie County. The first strategy is to “keep land in agricultural production by protecting farmland, helping a new generation to farm, and improving the viability of all farms in the County.”¹⁰³ The second strategy is to “inform the public, local leaders, and elected officials about the benefits that agriculture provides and support policy and legislative changes that will improve farm viability.”¹⁰⁴

Niagara County Agricultural and Farmland Protection Plan

The current Niagara County Agricultural and Farmland Protection Plan was finished in 1999. A response to community concerns over the development of farmland, it was designed to protect productive agricultural lands and grow the local farming economy. The plan’s recommendations are categorized into three groups: agricultural economic development; education, promotion and public relations; and government policies and farmland protection strategies.¹⁰⁵

The plan lists numerous recommendations for developing the agricultural economy. They include strengthening a Buy Local campaign,

Regional Economic Development Council, 2012, accessed January 24, 2014, <http://regionalcouncils.ny.gov/content/western-new-york>.

93 “2011 CFA Awards,” The Western New York Regional Economic Development Council.

94 “A Strategy for Prosperity in Western New York,” The Western New York Regional Economic Development Council, November 2011, accessed January 24, 2014, http://regionalcouncils.ny.gov/themes/nyopenrc/rc-files/westernny/A_Strategy_for_Prosperty_in_Western_New_York_November_2011.pdf.

95 “Western New York Regional Sustainability Plan,” NYSEDA, 2013, accessed January 24, 2014, <http://www.sustainable-ny.com/documents/Home/FrontMatter.pdf>.

96 “Western New York Regional Sustainability Plan,” NYSEDA.

97 Ibid.

98 Ibid.

99 Ibid.

100 “A Strategy for Prosperity,” The Western New York Regional Economic Development Council.

101 Erie County Department of Environment and Planning and Erie County Agricultural and Farmland Protection Board, “Erie County Agricultural and Farmland Protection Plan,” Erie County Department of Planning and Environment, October 24, 2012, accessed October 26, 2012, <http://www2.erie.gov/environment/sites/www2.erie.gov/environment/files/uploads/AgFarmlandProtectionPlan.pdf>.

102 Ibid.

103 Ibid.

104 Ibid.

105 Niagara County Agriculture & Farmland Protection Board, “Niagara County Farmland Protection Plan,” Niagara County Agriculture & Farmland Protection Board, 1999, accessed January 24, 2014, <https://docs.google.com/gview?url=http://uploads.oneregionforward.org/content/uploads/2012/12/Niagara-County-Agricultural-and-Farmland-Protection-Plan.pdf>

performing a study of energy input costs for farms, developing a marketing packet to attract agricultural businesses, and creating a cooperative food-processing kitchen.¹⁰⁶

The Niagara County Agriculture and Farmland Protection Plan also provides recommendations related to educating people about agriculture. Some of the strategies include informing residents, decision makers, and farmers about agriculture's economic values; educating farmers' neighbors about how to coexist with farms; educating school children about farms; and working with the media to provide an accurate image of farming to the public.¹⁰⁷

Lastly, the plan recommends several strategies relating to farmland protection and governmental policy impacting farm viability. Some are to educate local government officials about creating more supportive policies for farming, to ensure that the Agricultural and Farmland Protection Board reviews municipal comprehensive plans before they are adopted, and to develop on brownfields and do infill development.¹⁰⁸

¹⁰⁶ Niagara County Agriculture & Farmland Protection Board, "Niagara County Farmland Protection Plan."

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

APPENDIX D

MATRIX OF IDEAS FOR THE FUTURE, HUD LIVABILITY PRINCIPLES, AND WNY REDC FUNDING CRITERIA

The following matrix associates this report's *Ideas for the Future* with HUD's livability principles and the Western New York Regional Economic Development Council's criteria for funding projects.

Growing Together is part of a regional planning grant from the Partnership for Sustainable Communities, a joint effort of the U.S. Department of Housing and Urban Development, the U.S. Department of Transportation, and the U.S. Environmental Protection Agency. The Partnership has established six livability principles that are the foundation for sustainable growth and development at the local, state, and federal levels. These principles are as follows:

Provide more transportation choice

Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

Promote equitable, affordable housing

Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.

Enhance economic competitiveness

Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers as well as through expanded business access to markets.

Support existing communities

Target federal funding toward existing communities—through such strategies as transit-oriented, mixed-use development and land recycling—to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes.

Coordinate policies and leverage investment

Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

Value communities and neighborhoods

Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, and suburban.

WNY REDC criteria

The Western New York Regional Economic Development Council has identified three criteria that projects seeking funds or grants through the Regional Economic Development Council should meet. The criteria for projects are

1. Does it create, retain or fill jobs?
2. Will it maximize return on investment?
3. Is the project ready for implementation?

The 2011 Strategy for Prosperity also states that, "[b]eyond these vital factors, projects need to reflect the priorities that are most important to address Western New York's opportunities and challenges." These are

4. Inclusive—A project should promote diversity and reduce disparities within the region.
5. Promotes Smart Growth—A project should adhere to smart growth principles to integrate economic development and job creation with community quality of life by preserving and enhancing the built and natural environment.
6. Oriented to Young Adults—A project should try to attract and retain young adults (ages eighteen to thirty-five) to

counteract a lack of in-migration to the region.

7. Builds Upon Strengths—A project should enhance the region's existing strengths to achieve the largest impact with limited resources.

8. Regional Impact—The Strategic Plan is intended to be regional in scope. A project that has an impact (jobs, investment, or visitors) in three or more counties would be directly aligned with this criterion.

9. Improve Region's Image—A project should enhance the perception of the region to grow business and attract and retain workers.

APPENDIX E

SPECIALIZATION OF FOOD INDUSTRIES

Location Quotients

NAICS	Industry	Employment			Location Quotient	
		Region	New York	U.S.	New York Base	U.S. Base
10	Total - All Industries	426,600	6,905,804	106,201,232	1.00	1.00
11**	Agriculture, Forestry, Fishing, and Hunting	746	22,532	1,146,962	0.54	0.16
111	Crop Production	813	10,816	528,867	1.22	0.38
1111	Oilseed and Grain Farming	19	359	42,105	0.86	0.11
1112	Vegetable and Melon Farming	211	2,837	93,881	1.20	0.56
1113	Fruit and Tree Nut Farming	226	3,916	183,733	0.93	0.31
1114	Greenhouse, Nursery, and Floriculture Production	314	3,461	145,600	1.47	0.54
11133	Non-citrus Fruit and Tree Nut Farming	226	3,916	173,345	0.93	0.32
11141	Food Crops Grown Under Cover	48	297	20,693	2.62	0.58
11142	Nursery and Floriculture Production	54	3,164	124,907	0.28	0.11
111219**	Other Vegetable (except Potato) and Melon Farming	136	2,467	79,198	0.89	0.43
111331	Apple Orchards	190	3,235	36,635	0.95	1.29
111332**	Grape Vineyards	34	494	31,754	1.11	0.27
112	Animal Production and Aquaculture	394	8,580	225,138	0.74	0.44
1121	Cattle Ranching and Farming	281	6,535	132,878	0.70	0.53
1152**	Support Activities for Animal Production	43	1,515	27,087	0.46	0.40
311	Food Manufacturing	5,147	49,016	1,442,112	1.70	0.89
3113	Sugar and Confectionery Product Manufacturing	510	2,679	66,422	3.08	1.91
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	666	6,629	173,220	1.63	0.96
3115**	Dairy Product Manufacturing	1,597	7,749	130,198	3.34	3.05
3116	Animal Slaughtering and Processing	743	3,613	485,702	3.33	0.38

NAICS	Industry	Employment			Location Quotient	
		Region	New York	U.S.	New York Base	U.S. Base
3118	Bakeries and Tortilla Manufacturing	735	19,525	276,470	0.61	0.66
3119**	Other Food Manufacturing	171	5,968	163,340	0.46	0.26
31181	Bread and Bakery Product Manufacturing	101	17,307	205,238	0.09	0.12
31194**	Seasoning and Dressing Manufacturing	29	1,387	32,531	0.34	0.22
31199**	All Other Food Manufacturing	38	2,343	59,931	0.26	0.16
311612	Meat Processed from Carcasses	732	2,373	109,315	4.99	1.67
311811**	Retail Bakeries	223	8,381	65,350	0.43	0.85
311812**	Commercial Bakeries	145	8,145	129,135	0.29	0.28
3121	Beverage Manufacturing	54	6,123	167,170	0.14	0.08
31211**	Soft Drink and Ice Manufacturing	435	2,428	94,225	2.90	1.15
33311	Agricultural Implement Manufacturing	24	711	71,193	0.55	0.08
42382**	Farm and Garden Machinery and Equipment Merchant Wholesalers	80	1,918	96,398	0.68	0.21
4244	Grocery and Related Product Merchant Wholesalers	1,904	45,937	708,842	0.67	0.67
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	559	11,243	162,096	0.80	0.86
42441**	General Line Grocery Merchant Wholesalers	914	13,434	226,026	1.10	1.01
42443	Dairy Product (except Dried or Canned) Merchant Wholesalers	25	2,499	40,474	0.16	0.15
42445**	Confectionery Merchant Wholesalers	246	2,698	51,072	1.48	1.20
42446	Fish and Seafood Merchant Wholesalers	30	1,931	22,495	0.25	0.33
42448**	Fresh Fruit and Vegetable Merchant Wholesalers	155	3,844	82,238	0.65	0.47
42449**	Other Grocery and Related Products Merchant Wholesalers	349	15,587	210,205	0.36	0.41
42491	Farm Supplies Merchant Wholesalers	36	1,471	107,813	0.40	0.08
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	241	6,740	78,803	0.58	0.76

NAICS	Industry	Employment			Location Quotient	
		Region	New York	U.S.	New York Base	U.S. Base
44422	Nursery, Garden Center, and Farm Supply Stores	447	5,061	99,747	1.43	1.12
445	Food and Beverage Stores	15,338	200,888	2,813,131	1.24	1.36
4451	Grocery Stores	13,350	165,821	2,462,730	1.30	1.35
4452	Specialty Food Stores	1,203	24,250	213,338	0.80	1.40
4453	Beer, Wine, and Liquor Stores	784	10,817	137,063	1.17	1.42
44511	Supermarkets and Other Grocery (except Convenience) Stores	12,192	156,790	2,322,824	1.26	1.31
44512	Convenience Stores	1,159	9,031	139,906	2.08	2.06
44521	Meat Markets	331	5,197	47,551	1.03	1.73
44529	Other Specialty Food Stores	636	12,184	114,332	0.85	1.38
445291**	Baked Goods Stores	60	1,855	21,937	0.52	0.68
445292	Confectionery and Nut Stores	95	1,535	18,661	1.00	1.27
445299**	All Other Specialty Food Stores	399	8,794	73,735	0.73	1.35
446191	Food (Health) Supplement Stores	140	2,878	41,578	0.79	0.84
44711	Gasoline Stations with Convenience Stores	2,127	22,995	720,278	1.50	0.74
45211	Department Stores	5,989	82,476	1,500,263	1.18	0.99
452111**	Department Stores (except Discount Department Stores)	2,440	43,607	559,736	0.91	1.09
452112**	Discount Department Stores	2,868	38,869	940,526	1.19	0.76
4841	General Freight Trucking	2,364	22,196	869,707	1.72	0.68
48411	General Freight Trucking, Local	781	10,353	203,300	1.22	0.96
48412	General Freight Trucking, Long-Distance	1,583	11,844	666,407	2.16	0.59
484121	General Freight Trucking, Long-Distance, Truckload	582	5,826	463,882	1.62	0.31
484122	General Freight Trucking, Long-Distance, Less Than Truckload	1,001	6,018	202,525	2.69	1.23
488510	Freight Transportation Arrangement	1,811	13,454	169,599	2.18	2.66
49319	Other Warehousing and Storage	210	1,059	43,107	3.21	1.21
493110**	General Warehousing and Storage	616	17,045	530,000	0.59	0.29
562111**	Solid Waste Collection	116	8,112	119,262	0.23	0.24
562212	Solid Waste Landfill	39	595	37,739	1.06	0.26

NAICS	Industry	Employment			Location Quotient	
		Region	New York	U.S.	New York Base	U.S. Base
62421	Community Food Services	181	2,401	28,887	1.22	1.56
722	Food Services and Drinking Places	40,912	511,870	9,355,821	1.29	1.09
7223	Special Food Services	5,250	51,074	534,590	1.66	2.44
7224	Drinking Places (Alcoholic Beverages)	1,942	18,948	343,236	1.66	1.41
72231**	Food Service Contractors	3,915	34,345	381,363	1.85	2.56
72232	Caterers	898	16,089	145,621	0.90	1.54
72233**	Mobile Food Services	135	640	7,607	3.41	4.42

Note: * Data unavailable for Erie County, ** Data unavailable for Niagara County

