



Cultivating Prosperity in Chautauqua County

Leveraging the Food System as a Catalyst for Economic Development



Report prepared on behalf of the Chautauqua County Department of Planning and Economic Development and the Chautauqua County Growing Food Connections Steering Committee.

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Chautauqua-grown blueberries for sale at Cassadaga Shur-fine, owned and operated by Paul Lehnen. [Photo credit: Paul Lehnen]



Executive Summary

Chautauqua County's agricultural heritage, tight-knit community, and beautiful and bountiful landscape contribute to a unique sense of place that draws in residents and visitors alike. The county is a place where leaders are excited about new ideas, where hardworking residents are ready to seize opportunity, and where the authentic character of the community carries more weight than lines on a map.

Objective

The goal of this report is to examine the potential of Chautauqua County's food system to meet the health and food security needs of the county while promoting economic development. The report provides information to help the reader understand the role of each stage of Chautauqua County's food system from an economic standpoint, as well as understand the food system's role in the economic and social wellbeing of the county and the region. The report provides county residents and leaders with the knowledge needed to make strategic policy decisions that will maximize the use of the local food system as a driving force for regional economic development. Economic prosperity leads to improved wellbeing for residents, including improved food security and health, in part through creation of additional employment opportunities.

This report was prepared by a group of graduate students at the University at Buffalo on behalf of the Chautauqua County

Department of Planning and Economic Development and the Growing Food Connections (GFC) steering committee, a group of community advisers and stakeholders from across the food system, appointed by the County Executive. The GFC project aims to "enhance food security while ensuring sustainable and economically viable agriculture and food production" through research, education and planning, and policy. The planning department and the GFC steering committee view the food system as pivotal to the culture, health and economy of the county, and work to leverage the economic, social and cultural power of the food system for the benefit of the county. This report, which is comprised of multiple sections, is intended to serve as a tool to assist the county's stakeholders by providing evidence to inform and guide specific policy actions by local governments.

Key Findings

A comprehensive analysis reveals that the food system is of substantive importance to Chautauqua County's prosperity, including food security of residents. The county is home to 134,599 residents who play multiple roles in the food system, as consumers, farmers, and business owners. The population is aging, with a median age of about 41 years old. About 19 percent of households earn annual income lower than the federal poverty line threshold of \$11,720, higher than the statewide rate of 14.9 percent. Unemployment in the county is lower than the state as a whole, but the low per capita income in the county may indicate that although jobs are available, they may not pay enough for residents to live comfortably. Food security in the county is also hindered by the twin challenges of low vehicular access and low-density retail development: low density of food retail options throughout the county make it difficult for the 11 percent of population that does not have access to a car to obtain healthy, affordable food. Despite these

food insecurity challenges, participation in food-related public assistance programs is relatively low; nearly 45 percent of households below the poverty line do not participate in the SNAP program.

A key asset for promoting both food security and economic prosperity is the county's own thriving food system, which include the agriculture, aggregation, processing and wholesale, distribution, and food waste management sectors. The agriculture sector, which is comprised of 1,515 businesses that grow a variety of crops, dairy, and other products, generates about \$174 million in revenue annually. Many farms are small in size - less than 250 acres - and only employ two people on average. The average annual net income per farming operation is only \$29,790. Sales volume per employee are low, about \$83,979 annually, compared to \$110,946 statewide. Low sales revenues and high costs - including infrastructure and labor costs - drastically reduce the net income of farmers. Agriculture is the most vulnerable sector within Chautauqua County's food system. Indeed, within the food system, the agricultural sector accounts for only seven percent of sales generated by the county's food system in its entirety.

Agriculture is important for the county's economy and food security, and receives support from the community and local government. The land is well suited for grape and dairy production. Diversification of farm products may bolster the success of agriculture in Chautauqua County, as long as such diversification ensures that the county's aggregation, processing, and distribution sectors support value-added transformation of new agricultural products. Transportation of farm products to processors, aggregators or consumers often presents a logistical and financial barrier for small farms with low volume of products and limited resources. Small-scale farmers also enter into binding contracts with large-scale aggregators that prevent them from

selling locally. Additionally, startup costs of farming, including for purchase of land and equipment, impedes new farmers from entering the agricultural sector. Investment in transportation infrastructure to facilitate movement of agricultural goods and creation of capital and knowledge-sharing networks has the potential to increase the viability of agriculture in Chautauqua County.

Aggregation, wholesale, and processing (AWP) sector generates the largest proportion (60.3%) of sales across all sectors within Chautauqua County's food system. Comprising 42% of all AWP businesses, wineries and retail bakeries are the two most prevalent types of businesses in the sector. AWP has the largest average sales volume compared to all other sectors in the food system at \$1,323,590 per employee; this sales volume per employee is six times higher than that generated by the food system overall (\$210,670). The sector depends on a few large-scale firms for economic activity. For example, two firms - Cliffstar LLC and Maplevale Farms - generate 81 percent of the total sales in the AWP sector. The concentration of sales volume and employment opportunity within two major businesses can be risky to the overall economic well-being of the sector and the county. The departure of large businesses from the county - such as Welch's Inc. headquarters and ConAgra Foods in the past - can leave high rates of unemployment and a destabilized local economy in their wake.

Like the agriculture sector, businesses in the AWP sector struggle to transport raw materials from farmers and deliver value-added products to distributors and other end users in the supply chain. A lack of shared-use space and capital limits entrepreneurs' from launching and growing small-scale processing companies. Larger-scale businesses in this sector have the capacity and resources to afford transportation costs, but may not source from farms within the county nor sell to

end users in the county. For example, a local large-scale manufacturer of dairy-based desserts purchases milk from an aggregator that sources milk from outside of the county. Additionally, there is limited processing infrastructure in the county. For example, bakeries are the second most frequent business type in the AWP sector, yet they must procure inputs from outside of the county since there are no grain mills, even though grain is the second most common crop by sales volume. Creating a stronger localized supply chain in grain would enhance the economy of the county's food system by keeping more money within the county.

The county is home to a strong food distribution sector, which includes all operations from which customers obtain food such as supermarkets, farmers markets, restaurants, and food banks. The distribution sector includes 459 operations. This sector accounts for the second largest percentage of sales, 26.9 percent, while employing almost 55 percent of all employees within the county's food economy. Limited and full-service restaurants employ 51.6 percent of the employees in the distribution sector; restaurants employ roughly 25 percent of all employees within the county's food system. Although restaurants provide many jobs, residents are unable to experience stable employment or professional development, which may lead to food insecurity and poor health outcomes. Restaurants tend to be in high demand during the summer tourist season but may not offer full time employment in the winter. Food service jobs are also likely to pay less and often do not provide health insurance or other benefits.

The county's retail stores that do offer healthy food are concentrated in the urban centers limiting physical access for residents in remote areas of the county. The county's low population density makes it challenging for entrepreneurs to launch or sustain retail stores in more remote areas. As noted earlier, lack of food stores

with healthy food options is exacerbated among households living in poverty, with individuals who are unable to drive such as seniors and disabled residents, or that do not have access to a vehicle.

Across each of the food system sectors, food is lost without being consumed or in the form of post-consumer waste. A number of organizations, businesses, and institutions are currently implementing innovative ideas to reduce, reclaim, and reuse lost and wasted food. Information and data on loss and waste of food is not readily available. Loss and waste of food can be reduced in all sectors of the food system – but to do so a comprehensive analysis of loss and waste of food is essential.

Overall, the food system of Chautauqua County is a significant economic asset. The food system generated \$2.48 billion in annual sales in 2012, which accounts for nearly quarter (23.2%) of all sales generated by the county's economy. The food system is two times more crucial to the county's economy than the statewide food system is to New York State's economy (11.4%).

Chautauqua County's food economy has great but yet untapped market potential within the region and country. For example, the county's geographic location in proximity of urban markets of Buffalo, Pittsburgh, and Cleveland offers a significant market for the county's food system. The GDP of these three metropolitan areas is \$323.8 billion, compared to Chautauqua County's total sales volume of \$11.2 billion. Strategies to capture even a bigger share of this customer market with Chautauqua's food system, even if it is a small increment, would contribute to the county's economic regeneration, and in turn, promote greater health and wellbeing of residents.

Ideas for the Future

The report identifies leverage points that can bolster the economic power of Chautauqua County's food system and catalyze the countywide economy and improve challenges related to health and food security among residents. These Ideas for the Future draw on the research in the report as well as conversations with community stakeholders. The ideas call for strengthening the connections between sectors of the food system and its ancillary networks, providing financial support to start and growth of new enterprises, and encouraging ongoing support of the food economy through strategic policy decisions at the county level. The report identifies 18 ideas for the future, six of which were ranked as high priorities by community stakeholders, and are reported here.

1. Create a position in the county government for a Food System Coordinator

Catalyst – Chautauqua County Legislature

2. Incentivize the formation of a food system transportation network

Catalyst – Chautauqua County Department of Planning and Economic Development

3. Facilitate partnerships and secure funding to establish food system-based educational programs in high schools, technical schools, Jamestown Community College, and SUNY Fredonia

Catalysts - Chautauqua County Legislature; County school districts; Cornell Cooperative Extension; Erie-2 BOCES; State University of New York at Fredonia; Jamestown Community College

4. Conduct food security assessment to determine additional barriers residents face in geographic access to healthy, affordable foods in rural and urban areas

Catalysts - Chautauqua County Department of Health and Human Services; Chautauqua

County Health Network; Department of Planning and Economic Development; Cornell Cooperative Extension; Jamestown Renaissance Corporation

5. Establish a micro-lending and discounted land, infrastructure, and equipment leasing program to assist new food system related businesses with startup or scaling-up costs

Catalysts - Chautauqua County Department of Planning and Economic Development; Chautauqua County Legislature

6. Form an Advisory Council to strengthen and sustain the food system to shepherd systemic change within the food system in partnership with public, private, and civic sectors through new ways of governance and policy

Catalysts - Chautauqua County Department of Planning and Economic Development; Chautauqua County Department of Health and Human Services; Farm Bureau; Cornell Cooperative Extension; Food systems business leaders

Chautauqua County's food system is foundational to cultivating prosperity for the county's residents. The Ideas for the Future in this report build upon the county's assets and opportunities while leveraging the food system for economic development. These ideas will come to fruition only through the collaborative and collective energy and leadership of stakeholders in the food system and support of the local government. The food system can invigorate Chautauqua County's local economy and enhance the health, security, and well-being of all those who call the county home.



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1. Introduction

Through humanity's journey across a brief moment in time, we have experienced enormous changes in the ways we live, work and play. We live in an exciting time of technological and scientific discovery that continues to astound with revelations into the mysteries of life. Despite humanity's rapid evolution, one thing has remained constant : humans must eat to survive. Understanding a region's food system has larger implications than simply helping people make well-informed decisions as consumers. Analyzing the food system empowers citizens, businesses, and local governments to leverage the food system as a catalyst for economic development, leading to enhanced quality of life for residents.

A food system is the "life cycle" of food; it is the system that enables food to be produced, aggregated, processed, distributed, prepared, consumed, and reclaimed from being wasted. An analysis of the strengths and challenges of the food system provides insights into opportunities for improving the efficiency of each sector of the system. The result of these improvements can vary depending on the goals, opportunities, and

challenges specific to a region; they may include, but are not limited to: better access to healthy food for food insecure families, improved health outcomes, increased farm sales, reduced food waste, and/or new job availability. Although food system analysis (FSA) is crucial to improving the way people acquire and consume food, it can also be used as a means of promoting economic development, as this report aims to do in Chautauqua County.

The county's stakeholders recognize the strong possibility for cultivating prosperity and wellbeing by leveraging their agriculture and food systems. Chautauqua County has a strong tradition of neighbors-helping-neighbors and community-level support systems. Many organizations are going beyond their individual organizational missions to work collectively to strengthen food systems and food security, including the Jamestown Renaissance Corporation, Chautauqua County Health Network, Cornell Cooperative Extension, CHQ Local Food, Southern Tier West, school districts, and more. In 2015 the County Executive led a successful bid to establish the county as a

Figure 1.1 Location of Chautauqua County, New York



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries; U.S. Census Bureau: State Boundaries; Statistics Canada: Territory and Province Boundaries. Map prepared by Kyle Fecik, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Community of Opportunity (COO) as part of the national Growing Food Connections project, which aims to alleviate food insecurity and promote agricultural viability. With support from the Growing Food Connections team, the county government appointed a Growing Food Connections steering committee to provide guidance on ways in which local government policy can strengthen the county’s food system. As part of this effort, the county’s planning department and the county’s steering committee collaborated with the Department of Urban and Regional Planning at the University at Buffalo to conduct a graduate student practicum in which students were charged to explore and document ways in which the county’s food system can enhance rural economic development, especially by leveraging policy strategies.

Goals of the Report

This report aims to examine the potential of Chautauqua County’s food system to meet the food, health and employment needs of the county, and promote economic development. The report provides information to help the reader understand the role of each stage of Chautauqua County’s food system from an economic standpoint, as well as understand

the food system’s role in the economy of the county and the region. The objective of the report is to provide county residents and leaders with the knowledge needed to make strategic policy decisions that will maximize the use of the local food system as a driving force for regional economic development, in turn supporting the health and wellbeing of residents.

Client and Planning Area

Cultivating Prosperity has been prepared on behalf of the Chautauqua County Planning Department and the Growing Food Connections (GFC) steering committee. The GFC steering committee is comprised of community members from public, private, and philanthropic sectors that share the common goal of improving food access, connecting consumers to local foods, supporting agribusiness, promoting agritourism, and training farmers in Chautauqua County. Members of the steering committee represent businesses and organizations that are working across the four sectors of the food system, or championing the relevance of food systems to their missions. GFC’s vision for the county is “to strengthen the local food system by developing a sustainable agricultural industry that produces affordable, high

Figure 1.2 Multiphase planning approach used in preparing *Cultivating Prosperity*

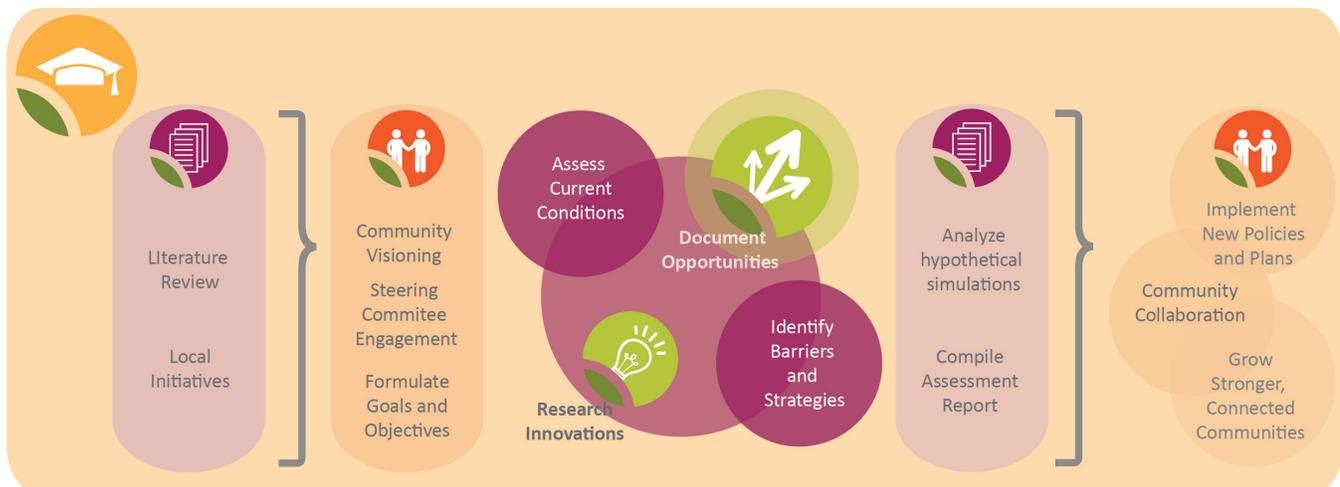


Image Source: Kelley Mosher, *Cultivating Prosperity Studio*

quality, accessible, culturally appropriate, and nutritious food to enhance production and distribution, and promote food security in Chautauqua County. We will educate and connect producers, processors, government agencies, and consumers to work towards an efficient, effective, and secure food environment that strengthens the economy and promotes a healthy lifestyle". This vision guides the work of this report.

The geographic scope of the report is the entire county of Chautauqua (Figure 1.1). The information contained in the report is aggregated at the county level although where appropriate variations in conditions in the County's major municipalities –such as Dunkirk and Jamestown – and more rural areas are highlighted.

About the practicum

The Cultivating Prosperity report is the result of a semester-long practicum^{iv} completed by graduate students at the University at Buffalo Department of Urban and Regional Planning, building on the department's tradition of offering purposeful, civic-minded educational experiences and rigorous training in planning. This practicum, a 6-credit course required for students earning a professional graduate degree in urban and regional planning, is one of the latest among a series^v of collaborative efforts between the University at Buffalo and Chautauqua County stakeholders that integrate research, education, and policy collaborations.[1] Studio members gain valuable real-world experience in applying scientific and technical skills while honing judgement and decision-making skills. At the same time, stronger relationships between the University and the community are built, and the community gains research that can be used to inform future decisions.

Cultivating Prosperity is supported by the Growing Food Connections (GFC)

iv The words 'practicum' and 'studio' are used interchangeably.

v For example, prior to this practicum, in 2013, graduate students at UB prepared *Invest in Fresh* on behalf of the Chautauqua County Health Network.

research project, a national project led by the University at Buffalo.^{vi} The GFC project aims to “enhance food security while ensuring sustainable and economically viable agriculture and food production” through research, education and planning, and policy. [2]

Planning Process and Methods

The practicum team used a multi-phased and iterative process to complete the report, including preparation, scoping, data collection, data analysis, deliberation (or, review), and dissemination (Figure 1.2).

Preparatory work by the team included a review of existing food systems-related literature, a review of food systems initiatives in Chautauqua County, including a review of materials prepared by the GFC steering committee.

During the *scoping* phase, the team conducted several field visits to Chautauqua County to meet county stakeholders. Initially, the team met with representatives of the Chautauqua County Department of Planning and Economic Development as well as with the Growing Food Connections steering committee to fine-tune the scope of this report. The meeting with the GFC steering committee, conducted as a facilitated workshop, refined the goals and objectives of the studio team.

The team's *data collection* phase, which began in tandem with the scoping phase, kick-started with collection of secondary data. Primary data collection began after scoping was complete. Each section of the report uses a variety of quantitative, qualitative, and spatial secondary and primary data. Quantitative and secondary sources of data include the U.S. Census Bureau, U.S. Agriculture Census, U.S. Economic census, and data from IMPLAN. Spatial data included land use and transportation network data, which was analyzed along with quantitative data using Geographic Information Systems

vi The course instructor is also the Principal Investigator of Growing Food Connections project.

(GIS). Qualitative data was generated through interviews with individuals representing different sectors of the food system, and a focus group with college students. Information on data sources used is provided throughout the report.

Beyond assessing the current state of each food system sector, this report also includes hypothetical scenarios to strengthen the food system. The economic impact of these scenarios is simulated using input-output analysis. The report also portrays stories of successes of rural communities from across the country to provide insights into the possibilities present in Chautauqua County. Equipped with data, simulations, and case studies, the authors synthesize ideas for the future of the food system in Chautauqua County. By harnessing the opportunities in each sector of the food system, it is possible to improve food access, reduce waste, and boost the prosperity of businesses across the food system in the county.

Layout of the Report

The report includes ten chapters. Following this introduction, the report provides background information about the county in Chapter 2. This section provides describes the demographic composition of the county as well as the factors influencing how residents acquire and consume food and view and take care of health-related needs. After establishing a background on the county, Chapters 3 - 6 of the report provides an assessment of the current conditions in four food system sectors: i) agriculture and food production, ii) aggregation, processing, and wholesale, iii) distribution, and iv) food excess management. Each sector also features case examples of businesses in each sector. The Chautauqua County food system functions within a public policy landscape that involves a diverse hierarchy of governments. The county's policy environment comprises 84 governments (including one county-wide government), 17 municipal governments, 27

township governments, 18 school districts, and 21 special district governments.[3] In recent years, these local governments have responded enthusiastically to residents' proposals to transform the county's food system. The county must also adhere to state and federal policies that affect the local food system, which are described in detail in Appendix C.

The description of food sectors is followed by an analysis of the food economy of Chautauqua County, and a summary of strengths, challenges, and opportunities for leveraging change, presented in Chapters 7 and 8.

Innovative policies and practices from the county, state, and national levels in Chapter 9 provide creative ideas for the food system in Chautauqua County. The concluding Chapter 10 suggests ideas for the future that are grounded in current conditions and opportunities offered by the food system in Chautauqua County.

The report also provides supplemental information. Views of residents and representatives of organizations as well as case studies in Chautauqua County are highlighted throughout the report as inserts. A set of appendices provides a list of resources that may be of use to the county leadership as they prepare to implement strategies to promote rural economic development using the food system as a lever, as well as methodological information, and the bibliography.



2. Background: Wellbeing, Health and Food Security

Rolling fields of corn and acres of grape vines dot the landscape of Chautauqua County. Miles of cultivated land offer a flavor of Chautauqua County's vast agricultural wealth to visitors driving along the I-90 highway that connects the Midwest to the rest of New York State. The county's residents, who live in 27 towns, 15 villages and 2 cities, are not as easily visible from this highway perspective.[4] The county's residents are at the heart of the food system, in their roles as growers, consumers, and business owners. This section provides an overview of the community of residents in Chautauqua County, and offers a snapshot of the opportunities and barriers residents face in accessing food and related health challenges.

2.1 Overview

Chautauqua County is a rural, sparsely populated county located on the western edge of New York State. The county is situated south of the Buffalo metropolitan area in Erie County, and borders Pennsylvania to the south and

Ohio to the west (Figure 2.1). Chautauqua County possesses an advantageous climate, even amongst the often harsh weather of Western New York, in the form of a microclimate along Lake Erie, which is favorable for grape cultivation. Nestled in the corner of a tristate region, the county has a locational advantage in its proximity to the major market shares of Cleveland, Pittsburgh, and Buffalo. The Interstate highway directly connects Chautauqua County to people and products from the Midwest and New York City.

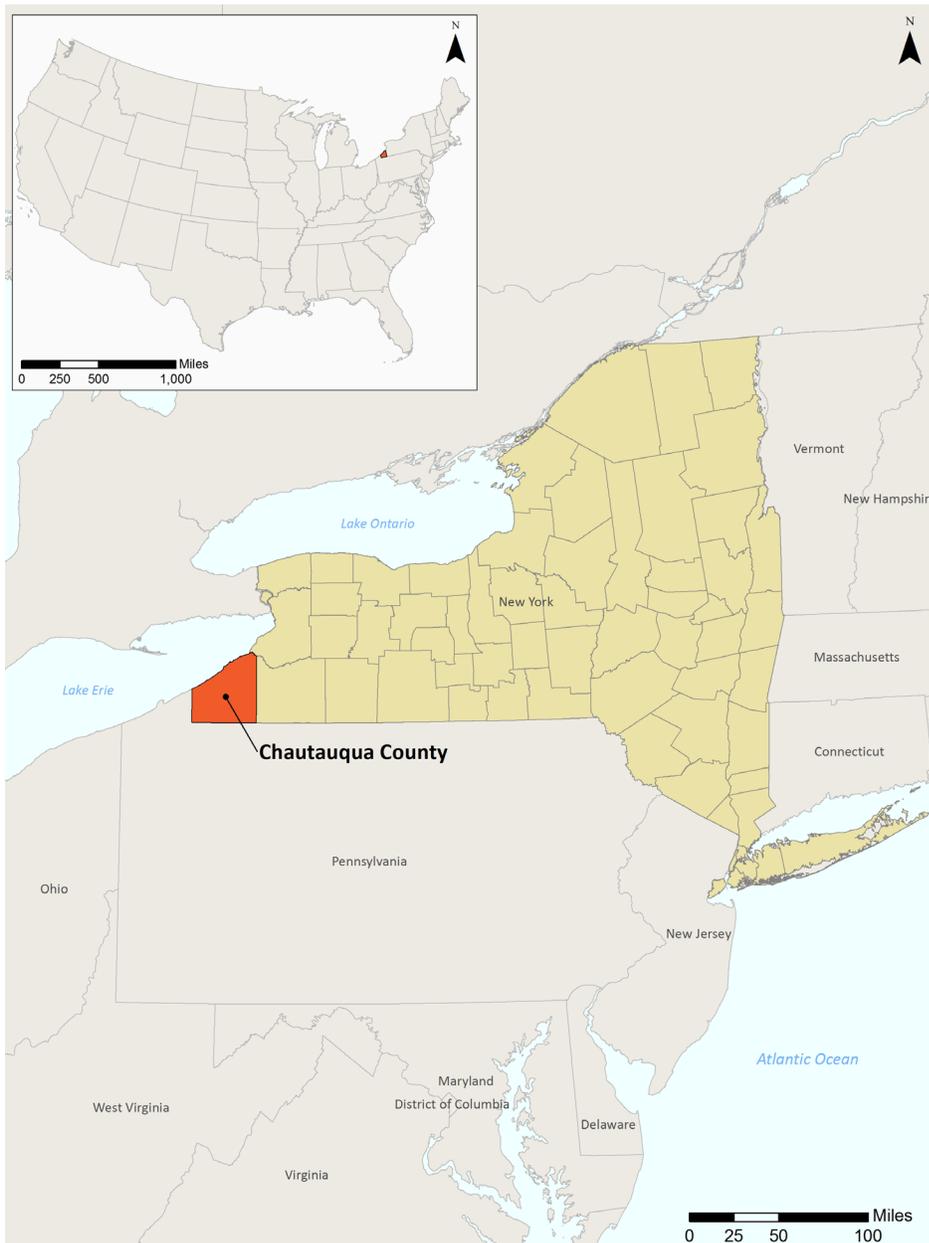
The county's land area of 1,060 square miles covers three percent of the entire area of New York State. The water resources in the county are significant; 29 percent of the county's area is water, compared to 13 percent across New York State (Table 2.1). Lake Erie runs along the entire western edge of the county. Chautauqua County benefits from a climate well suited for agricultural production due to the warm lake winds, and from soil that is rich in natural fertilizers deposited by waterways.

Table 2.1 Land Area, Chautauqua County and New York State

Area	Chautauqua County		New York State	
	Sq. Miles	%	Sq. Miles	%
Land	1,060.2	70.7	47,126.4	86.4
Water	440.0	29.3	7,428.6	13.6
Total Area	1,500	100	54,555	100

Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.1 Location of Chautauqua County Relative to New York State and Major Surrounding Cities



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries; U.S. Census Bureau: State Boundaries; Statistics Canada: Territory and Province Boundaries. Map by Kyle Fecik, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Table 2.2 Population Change in Chautauqua and surrounding Western New York Counties

County	1980		1990		2000		2010		30 Years Change	
	No.	%	No.	%	No.	%	No.	%	No.	%
Chautauqua	146,925	-	141,895	-3.4	139,750	-1.5	134,905	-3.5	-	-8.2
Allegany	51,742	-	50,470	-2.5	49,927	-1.1	48,946	-2.0	-	-5.4
Cattaraugus	85,697	-	84,234	-1.7	83,955	-0.3	80,317	-4.3	-	-6.3
Erie	1,015,472	-	968,532	-4.6	950,265	-1.9	919,040	-3.3	-	-9.5
Wyoming	39,895	-	42,507	6.5	43,424	2.2	42,155	-2.9	-	5.7
Total	1,339,731	-	1,287,638	-3.9	1,267,321	-1.6	1,225,363	-3.3	-	-8.5

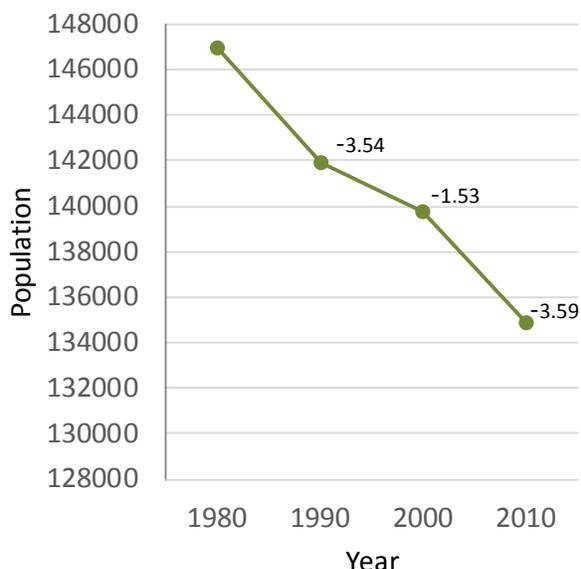
Data Source: American Community Survey, 2012 5-year Estimates

2.2 Population Trends

The county is home to 134,599 residents. The population in Chautauqua County declined steadily from 146,925 in 1980 to 134,905 in 2010, an 8.2 percent decrease (Figure 2.2). In the 1980s, manufacturing plants began to shut down across the region, stalling economic growth and employment opportunities in the region.[5] This population change is representative of a regional trend. The four surrounding Western New York counties of Allegany, Cattaraugus, Erie, and Wyoming experienced similar steady population decline over a 30-year span (Table 2.2). As jobs move to dense urban centers, residents are left with fewer opportunities for employment and infrastructure to meet their daily needs, and farmers have to find markets outside the county for their products.

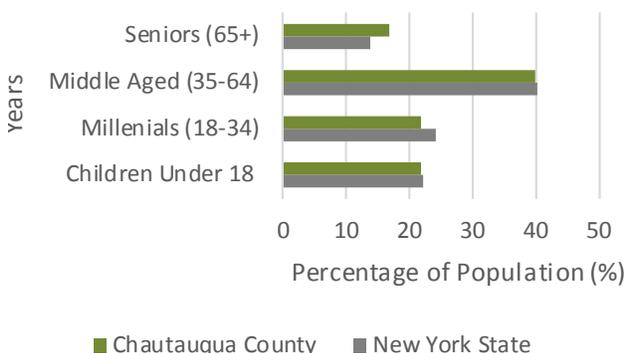
Conditions in the food system impact segments of the county’s population differently. Children and seniors, for example, may be at greater risk of food insecurity. As is the case with many rural counties, Chautauqua County has an aging population.[6] The population aged 65 and older comprises 16.7 percent of the population in Chautauqua County, compared to less than 14 percent of the New York State population (Figure 2.3). In contrast, children under age 18 comprise 21.8 percent of the county’s population. The millennial generation (ages 18-34) comprises 21.7 percent of the

Figure 2.2 Decennial Population Change, 1980-2010



Data Source: U.S. Decennial Census Estimates 1980, 1990, 2000, 2010

Figure 2.3 Population Distribution by Sex and Age, Chautauqua County and New York State



Data Source: American Community Survey, 2012 5-year Estimates

Table 2.3 Unemployment Rate of Chautauqua County, New York State and the United States

Geography	2000			2012		
	Labor Force (No.)	Unemployed Workers (No.)	Unemployment Rate (%)	Labor Force (No.)	Unemployed Workers (No.)	Unemployment Rate (%)
Chautauqua County	67,248	4,219	6.3	64,595	5,277	8.2
New York State	9,023,096	640,108	7.1	9,943,091	869,729	8.7
United States	137,668,798	7,947,286	5.8	156,533,205	14,536,657	9.3

Data Source: American Community Survey, 2012 5-year Estimates

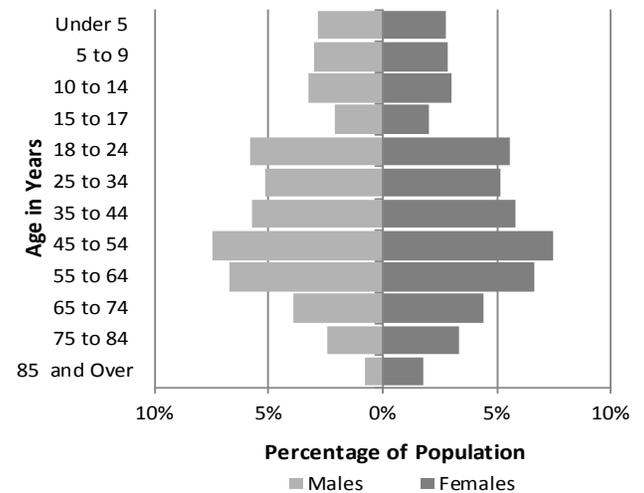
population, compared to 24 percent across the state (Figure 2.3). Residents ages 45 to 54 make up the county’s largest 10-year adult cohort, while the percentage of the population in younger groups is much lower (Figure 2.4). The New York State population reflects a similar trend (Figure 2.5). The concentration of population in the older cohorts signals that as Chautauqua County’s overall population is declining, it is aging at a rate faster than the New York State population.

2.3 Education and Employment

Educational attainment in a community partially drives the types of jobs available to residents as well as their earning potential. Educational attainment rates affect employers’ decisions to locate businesses in a rural community.[7] Chautauqua County boasts a higher percentage of residents with a high school diploma compared to the state (Figure 2.6). Residents in Chautauqua County are less likely to obtain a degree beyond that level however, as only 10 percent of county residents older than 18 years have a bachelor’s degree, compared to 17.9 percent across the state. A smaller proportion of individuals older than 18 years (7.8%) have a graduate degree or higher, compared to 12.5 percent statewide (Figure 2.6). The lower rates of higher education limit economic mobility and economic development.

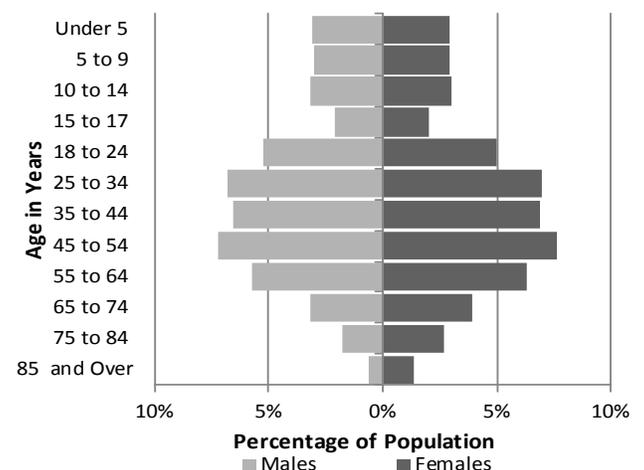
The unemployment rate in the county is 8.2 percent, about the same as the New York State rate of 8.7 percent, and lower

Figure 2.4 Population Distribution by Age and Sex, Chautauqua County



Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.5 Population Distribution by Age and Sex, New York State



Data Source: American Community Survey, 2012 5-year Estimates

Table 2.4 Population by Race, Chautauqua County and New York State

Race	Chautauqua County		New York State	
	No.	%	No.	%
White Alone	125,574	93.3	12,756,269	65.4
Black or African American Alone	3,161	2.3	3,033,052	15.6
Two or More races	2,284	1.7	525,129	2.7
Some Other Race Alone	1,868	1.4	1,632,383	8.4
Asian Alone	894	0.7	1,465,733	7.5
American Indian and Alaska Native Alone	699	0.5	70,910	0.4
Native Hawaiian and Other Pacific Islander Alone	119	0.1	6,897	0
Total	134,599	100	19,490,373	100

Data Source: American Community Survey, 2012 5-year Estimates

than the national rate (9.3%) (Table 2.3). The unemployment rate increased to 8.2 percent in 2012 from 6.3 percent in 2000, which suggests a need for additional or diversified job opportunities and workforce development in the county.

Almost 60 percent of the employed civilian population works in the private sector, and 20 percent works in the public sector (Figure 2.7). The non-profit sector also employs 11.5 percent of the population (Figure 2.7). Self-employment rates are also high, as almost ten percent of the population works for themselves, including many of the county’s farmers.

2.4 Ethnic and Racial Diversity

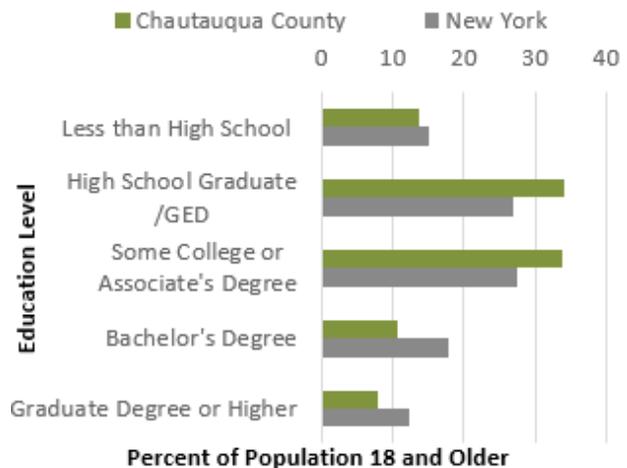
Chautauqua County is racially homogenous with small pockets of minorities, especially compared to New York State (Table 2.4).^{iv} The majority of residents, 93 percent, identify as white. Residents identifying as African American comprise 2.3 percent of the population, and the remaining identify as some other race or two or more races (Table 2.4).

Chautauqua County is home to a community of residents of Hispanic origin, who represent 6.1 percent of the population (Table 2.5).^v The majority of Hispanic residents identify as two or more races (67 percent) while some

^{iv} The U.S. Census Bureau treats ethnicity as distinct from race. Residents of Hispanic origin may select any of the seven race categories on the census.

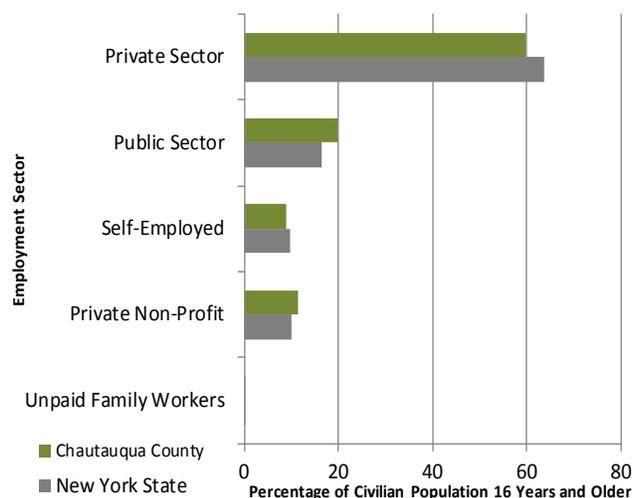
^v The percentage was based on residents who identify as being of Hispanic origin, regardless of race.

Figure 2.6 Educational Attainment among Residents, Chautauqua County and New York State



Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.7 Employed Civilian Population 16 Years and Older by Employment Sector



Data Source: American Community Survey, 2012 5-year Estimates

Table 2.5 Hispanic Population

Ethnic Group	No.	%
Non-Hispanic Population	126,342	93.9
Hispanic Population	8,257	6.1
Total Population	134,599	100

Data Source: American Community Survey, 2012 5-year Estimates

identify as white (21 percent) (Figure 2.8). This ethnic diversity in a primarily homogenous county may be due to the presence of families of migrant workers who meet the agriculture sector’s demand for farm labor.[8]

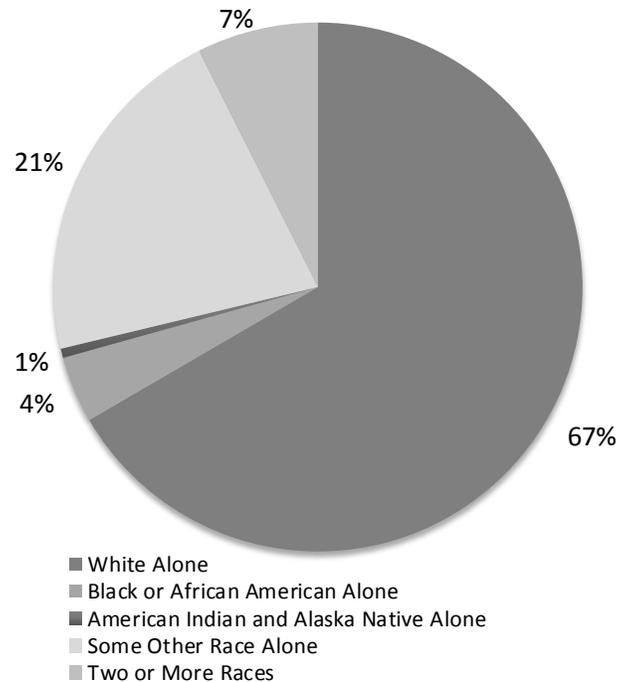
Chautauqua County is also home to a small population that speaks a language other than English at home (7.6 percent). Spanish is the most common language spoken by over 50 percent of households where a language other than English is spoken, possibly due to the presence of farm laborers and their families (Figure 2.9).

2.5 Income and Poverty

The per capita income in Chautauqua County is \$21,742, significantly lower than the statewide per capita income of \$32,104 (Table 2.6). Disparity in income is compounded within particular sub-groups of the population (Figure 2.10). For example, African Americans earn \$11,896 per capita, almost 50 percent less than white residents who earn \$22,500 per capita, and Asian residents who make \$22,043. The Native American population earns even less, at \$8,460 per capita, which is significantly lower than the federal poverty line of \$11,720.[9]

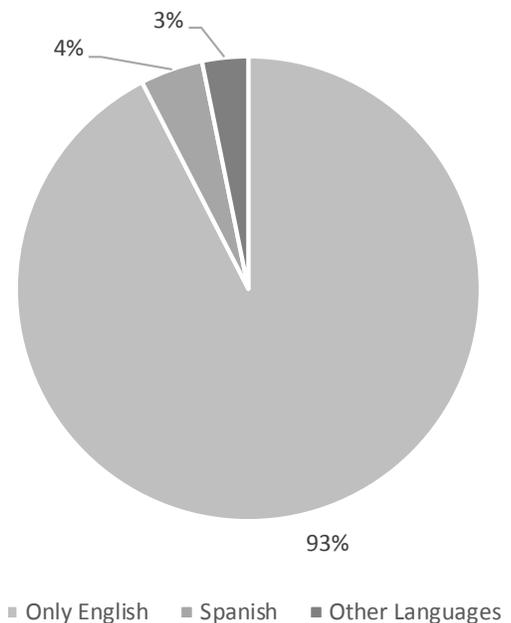
The population living below the poverty line – or individuals earning less than \$11,720 per year is – 19.1 percent, higher than the prevalence of poverty in both New York State and United States (Table 2.7). This trend is comparable with other rural counties across the

Figure 2.8 Hispanic Population by Race



Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.9 Languages Spoken at Home by Individuals Ages 5 and Older



Data Source: American Community Survey, 2012 5-year Estimates

Table 2.6 Per Capita Income, Chautauqua County and New York State

	Chautauqua County	New York State
Per capita income (\$) <i>In 2012 Inflation adjusted dollars</i>	21,742	32,104

Data Source: American Community Survey, 2012 5-year Estimates

Table 2.7 Population in Poverty

Population for Whom Poverty is Determined	Chautauqua County		New York		United States	
	No.	%	No.	%	No.	%
Below Poverty Line	24,540	19.1	2,814,409	14.9	44,852,527	14.9
At or Above Poverty Line	104,006	80.9	16,071,516	85.1	256,480,883	85.1
Total	128,546	100	18,885,925	100	301,333,410	100

Data Source: American Community Survey, 2012 5-year Estimates

United States that experience higher rates of poverty than their urban counterparts.[10]

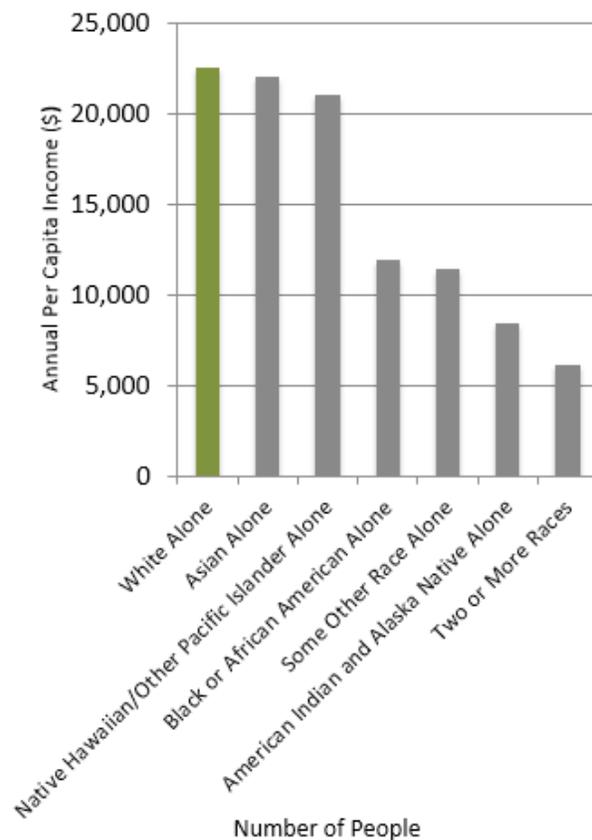
2.6 Household Structure

The prevalence of particular types of household structures in Chautauqua County may influence how people, especially children, are able to acquire, prepare, and eat food. For example, households with children that are headed by one caregiver are more likely to have only one income, and caregivers may be limited by financial constraints and available time for acquiring or preparing food, particularly in rural areas.[11] In Chautauqua County, among households with children younger than 18 years, 35.6 percent have just one head of household (Table 2.8), suggesting that these households juggle multiple time demands.

2.7 Food (In)Security in Chautauqua County

Residents' ability to obtain affordable, nutritious, and culturally preferred foods depends on a range of socio-economic characteristics, geographic indicators, and the ability of the community food system to

Figure 2.10 Per Capita Income by Race



Data Source: American Community Survey, 2012 5-year Estimates

meet the needs of community residents. By some measures,^{vi} the food insecurity rate is 13 percent in Chautauqua County, the same as the statewide rate.[12] Chautauqua County residents' food behaviors regarding obtaining, preparing, and eating of affordable, nutritious and culturally preferred foods are impacted by availability and price of healthy food, distance to stores, availability of public assistance programs, and a whole host of other factors. In turn, these behaviors impact residents' health. These factors are explored in the sections below.

Food Availability and Price

Neighborhood food availability is a challenge for rural residents. In a 2014 survey,^{vii} 18.6 percent of county residents surveyed said it was not easy to purchase healthy foods in their neighborhoods, a rate higher than the 13 percent of respondents statewide (Table 2.9). Having enough money for food was slightly less challenging for Chautauqua county residents compared to residents statewide: about 18 percent of county respondents reported that they felt [sometimes, usually or always] stressed about having enough money for nutritious meals, a lower rate than 28 percent of respondents statewide (Table 2.10). This suggests that the lack of proximity to food rather than the price of food is a concern for residents of Chautauqua County.

The public and private transportation options available to consumers may influence their level of ability to access food, especially in rural areas.[13] Previous studies in the county showed that the biggest barrier to food access was a lack of personal or public transportation. [14] In rural areas, access to a personal vehicle

vi Food security rates are reported in the Map the Meal Gap assessment conducted by Feeding America in 2014. Their assessment analyzes the indicators of food security such as poverty, homeownership, and unemployment at the state level, and estimate county-level rates of food insecurity.

vii The Behavioral Risk Factor Surveillance System (BRFSS), organized at the federal level by the Center for Disease Control and Prevention, is a survey conducted in New York by the Department of Health.

Table 2.8 Household Structure

Structure of Households with Children Under 18	Number of Households (No.)	Percentage of Households (%)
Married-Couple Household	18,475	63.5
Single Head of Household	10,365	35.6
Non-Family Household	266	0.9
Total	29,106	100

Data Source: American Community Survey, 2012 5-year Estimates

Table 2.9 Ease of Purchasing Healthy Foods in Neighborhoods

Level of Agreement	People Who Responded to the Statement 'It is easy to purchase healthy foods in my neighborhood.'	
	Chautauqua County N=449 %	New York State N=29,557 %
Strongly agree	27.0	39.3
Agree	49.5	42.1
Neutral	4.9	5.4
Disagree	13.8	8.6
Strongly Disagree	4.8	4.7
All Respondents	100	100

Data Source: New York State Department of Health, 2013-14

Table 2.10 Stress Regarding cost of Nutritious Foods

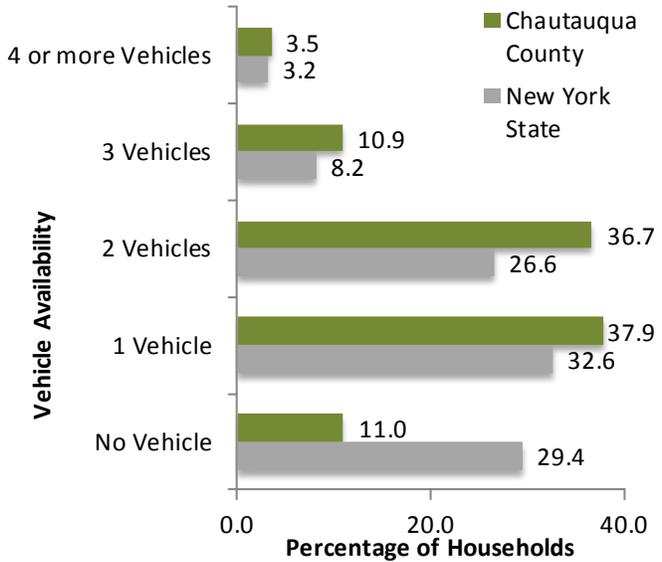
Level of Agreement	People Who Responded to the Statement 'How often in the past 12 months would you say you were worried or stressed about having enough money to buy nutritious meals?'	
	Chautauqua County N=459 %	New York State N=30,135 %
Always	5.2	5.5
Usually	1.9	5.1
Sometimes	11.2	18.3
Rarely	17.1	14.8
Never	64.6	56.2
All Respondents	100	100

Data Source: New York State Department of Health, 2013-14

is more essential due to long distances to travel to jobs or shopping; yet 11 percent of households in Chautauqua County do not have access to a vehicle, compared to the state average of 29 percent (Figure 2.11). The urban areas of the state, including New York City, do not rely as heavily on personal transportation.

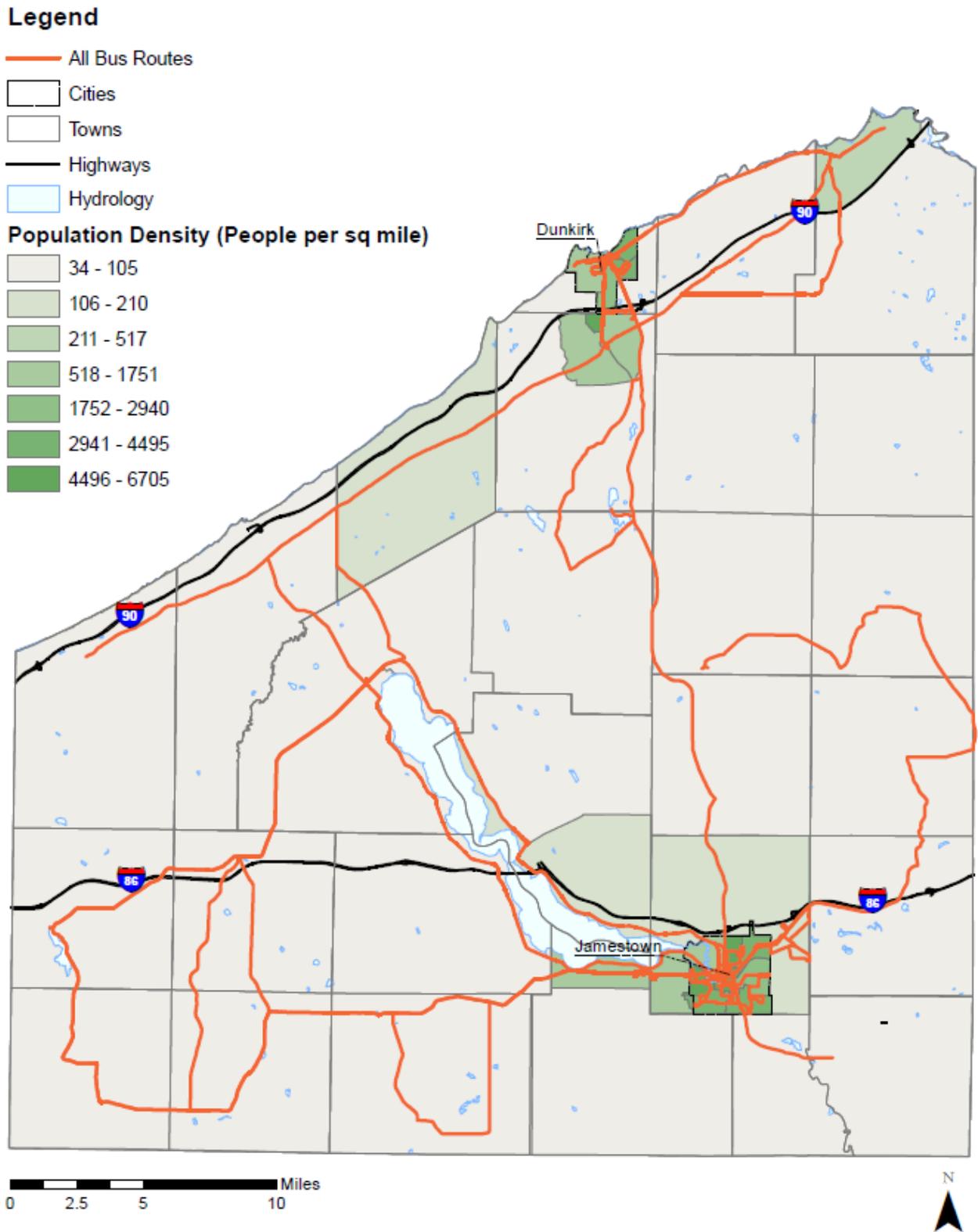
Due to the rural nature of the county, the 14,800 residents without cars may experience significant barriers to buying food because grocery stores are not as likely to be within walking distance. Seniors and disabled people face an additional challenge, as they may not be physically able to drive. Bus routes run between the major population centers of Jamestown and Dunkirk, but do not extend to all areas of the county (Figure 2.12). The population density is much lower in the rural areas of the county which creates a lack of demand for public transportation. However, the lack of bus routes in rural areas may negatively affect the populations who may not be able to drive to food retail locations (disabled residents, senior citizens, those without vehicles) and therefore those populations may experience heightened food insecurity.

Figure 2.11 Vehicle Availability among Households



Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.12 Population Density with Public Transportation Routes



Data sources: NYS GIS Clearinghouse: NYS County Boundaries; Chautauqua County Information Technology Services CARTS KMZ; U.S. Census Bureau: ACS 5-year estimates, Chautauqua County Census Tracts, Total Population. Map by Erin Sweeney, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

A Planner's Perspective on Food Insecurity in Chautauqua County

[15]

As the Epidemiology Manager, and former junior planner, for the Chautauqua County Department of Health and Human Services, Bree Agett works to promote the health and well-being of the county's residents, focusing on populations and places that are at greatest risk of food insecurity.

Agett has observed the prevalence of food insecurity among seniors, children, and Hispanic communities. According to her, the most food-insecure groups in the county are the elderly, specifically those aged 75 and up, and households with low income. Efforts to reduce food insecurity among seniors are underway through the Nutrition Outreach Education Program which aims to increase enrollment of seniors in the Supplemental Nutrition Assistance Program (SNAP).

Increasing children's consumption of fruits and vegetables is beneficial for their health, and influences their food choices later in life. Yet children in the county are also at risk of food insecurity especially during the summer months when schools are on recess. During the summer recess, children lose access to school lunch and breakfast programs, creating seasonal food insecurity. According to Agett, during the summer months the number of food pantry visits are higher. The United Way of Southern Chautauqua County convened community stakeholders to develop a plan to summer feeding program attempts to address food insecurity for youth during the summer. Additionally, Chautauqua County stakeholders are working to build stronger relationships between school leaders and

farmers. Pilot programs have led to more school districts purchasing locally grown produce (though not in the summer). In the case of Sherman Central Schools, grants have provided equipment to process locally grown produce.

Within the Hispanic community in the county, Agett points to barriers that residents experience in accessing culturally preferred foods, as well as language barriers that prevent residents from accessing resources. The Chautauqua County Health Network, a rural healthcare provider, has been working to increase access to food by facilitating healthy corner stores.

Agett also points to place-based disparities in food insecurity. She notes that areas with limited availability to healthy food are concentrated in Jamestown around East Second Street and neighborhoods within Dunkirk. Additionally, the western portion of the county near the towns of Clymer and Sherman also have limited access to food options. These areas are also home to the Amish community, who are engaged in agriculture. However, little is known about the extent of food insecurity in their community.

Food insecurity results from a variety of factors. A survey conducted by the Chautauqua County Department of Health and Human Services points to a number of issues including the limited availability of fresh fruits and vegetables, lack of affordable access to healthcare and to a far lesser degree, limited access to transportation.[16] Agett speculates that the limited role of transportation as a barrier to food security in the survey results may be due to sampling bias as most of the respondents were employed, more likely to own an automobile, and therefore less likely to view limited transportation as a barrier. Among populations with low-mobility, however, transportation remains a major obstacle for acquiring food in rural settings.

2.8 Public Assistance Programs to Reduce Food Insecurity

Several publicly funded programs are available to reduce food insecurity among Chautauqua County residents by increasing their economic ability to purchase food or by providing food through public institutions such as schools. Adults and children are eligible for the programs, and several programs assist seniors, women, and children, specifically. These programs are: Supplemental Nutrition Assistance Program (SNAP), Women, Infants and Children (WIC), National School Lunch Program (NSLP), and the Farmers Market Nutrition Program (FMNP). In addition to reducing food insecurity, these programs can have a positive economic impact since they bring federal dollars into the local economy by increasing purchasing power of residents.

Residents of Chautauqua County can turn to the federally-funded Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamp program, to supplement their income to buy food. Residents must meet income guidelines to qualify for the program.[17] For example, for a household of one person without an elderly or disabled person, the annual income limit is about \$15,444 (see Appendix F), an allocation based on the federal government’s “Thrifty Food Plan” which estimates the price of feeding families based on the number of people in the household.[17] About 15 percent of the county’s households rely on SNAP to meet their food needs, a slightly higher rate of participation than the 13 percent statewide (Table 2.11).

SNAP funding may be insufficient in helping families choose nutritious and/or local foods due to high price of food. In Chautauqua County, 9,169 households make less than \$15,000 per year (Table 2.12). In 2010, the average SNAP benefit per person was \$150.63,[18] which meets the monetary requirements for the “Thrifty Food Plan” but

Table 2.11 Participation in the Supplemental Nutrition Assistance Program (SNAP)

Household Participation in SNAP	Chautauqua County		New York State	
	No.	%	No.	%
Households Receiving SNAP	8,658	15.8	976,011	13.5
Households Not Receiving SNAP	46,292	84.2	6,254,885	86.5
Total	54,950	100	7,230,896	100

Data Source: American Community Survey, 2012 5-year Estimates

Table 2.12 Participation in SNAP by Poverty Level

Household Characteristic		Chautauqua County		New York State	
		No.	%	No.	%
Below Poverty Line	Receive SNAP	5,317	55.2	513,575	50
	Do Not Receive SNAP	4,321	44.8	514,531	50
	Total	9,638	100	1,028,106	100
Above Poverty Line	Receive SNAP	3,341	7.4	462,436	7.5
	Do Not Receive SNAP	41,971	92.6	5,740,354	92.5
	Total	45,312	100	6,202,790	100

Data Source: American Community Survey, 2012 5-year Estimates

falls below the national thresholds of \$180 to \$225 per month to meet an individual's food needs for low or moderate-cost plans, respectively.^{viii}

Note that among the county households below the poverty line, 55.2 percent receive SNAP, while 44.8 percent do not (Table 2.13).^{ix} Chautauqua County experiences a low level of SNAP participation among eligible families, possibly due to stigma or lack of information related to the SNAP program.[14]

Households with children, seniors and disabled members are highly represented among SNAP recipients, as they may be particularly vulnerable to food insecurity in Chautauqua County.[14] In Chautauqua County, households with people over age 60 comprise 40 percent of all households, and those with children under age 18 comprise 7.9 percent (Figure 2.13). Chautauqua County has higher rates of people with disabilities and more children younger than 18 than both the state and nation. Out of the total 8,658

Table 2.13 Household Income in the Past 12 Months

Household Income Level (\$)	Number of Households (No.)	Percentage of Households (%)
Less than \$10,000	4,996	9.1
\$10,000 to \$14,999	4,173	7.6
\$15,000 to \$19,999	4,040	7.4
\$20,000 to \$24,999	3,610	6.6
\$25,000 to \$29,999	3,540	6.4
\$30,000 to \$34,999	3,217	5.9
\$35,000 to \$39,999	2,659	4.8
\$40,000 to \$44,999	3,115	5.7
\$45,000 to \$49,999	2,885	5.3
\$50,000 to \$59,999	4,798	8.7
\$60,000 to \$74,999	5,342	9.7
\$75,000 to \$99,999	5,963	10.9
\$100,000 to \$124,999	3,460	6.3
\$125,000 to \$149,999	1,298	2.4
\$150,000 to \$199,999	1,301	2.4
\$200,000 or more	553	1
Total	54,950	100

Data Source: American Community Survey, 2012 5-year Estimates

viii The USDA Center for Policy and Nutrition has determined that basic nutritional needs can be met with a Thrifty Food Plan (which is based on a family of four and provides the basis for SNAP allotment at household levels), but that the low or moderate cost food plans provide more balanced, nutritious meals (all calculated for food made at home).

ix Although the poverty line is not the exact definition for SNAP eligibility, it provides a good way to determine how many households could be eligible for SNAP but do not participate.

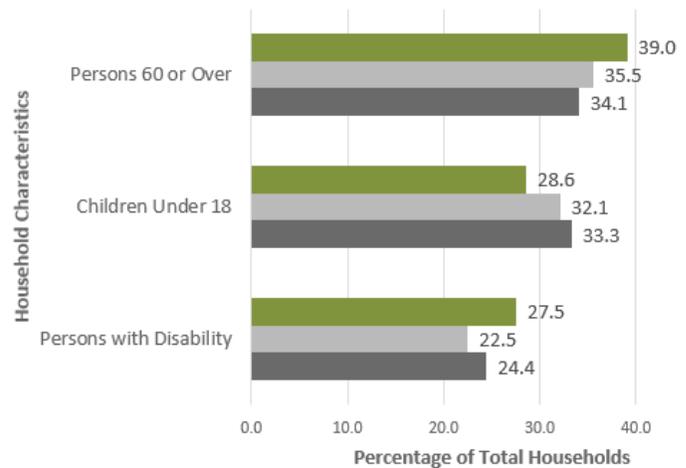
households that receive SNAP, over half have at least one child or a disabled person, and almost one-third have a person over 60 years old (Figure 2.14).

The majority (89 percent) of households that receive SNAP are white (Figure 2.15).^x Additional disparities are present within each racial group: 38 percent of black residents, 31 percent of Native Americans, and 14 percent of white residents receive SNAP (Figure 2.16).^{xi}

SNAP recipients live throughout the county, with most residing within the city limits of Dunkirk and Jamestown, perhaps because services, goods, and resources are more densely available in the city centers (Figure 2.17). The two westernmost census tracts in Jamestown have the highest rate of SNAP use, with over 40 percent of the households receiving SNAP living in those tracts.

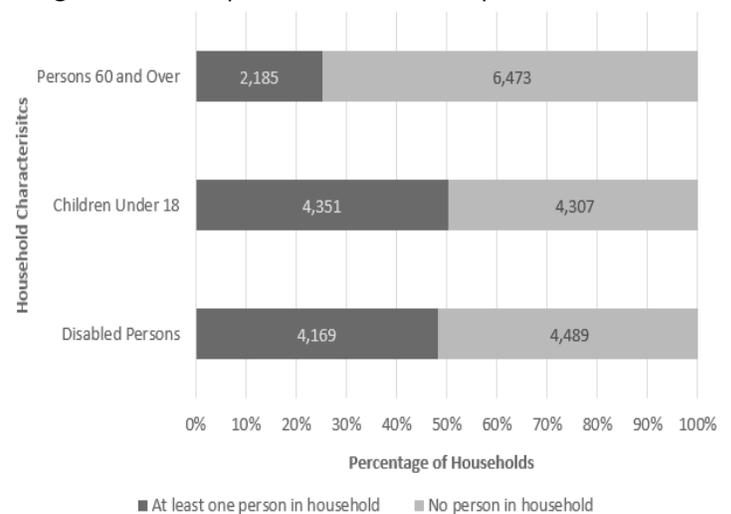
Overall, SNAP continues to be an important safety net for residents, and participation of eligible households should be encouraged. Strengthening SNAP enrollment is not only important for food security but for the county’s economy as well. Spending of SNAP dollars annually has a significant positive economic impact in the county’s food retail environment, with \$367,872 redeemed at 118 retail locations that accept SNAP benefits across the county in 2012,[19] an increase from \$232,755 in 2008.[20]

Figure 2.13 Households with Person with Disability, Children and/or Seniors Present



Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.14 Composition of SNAP-Recipient Households

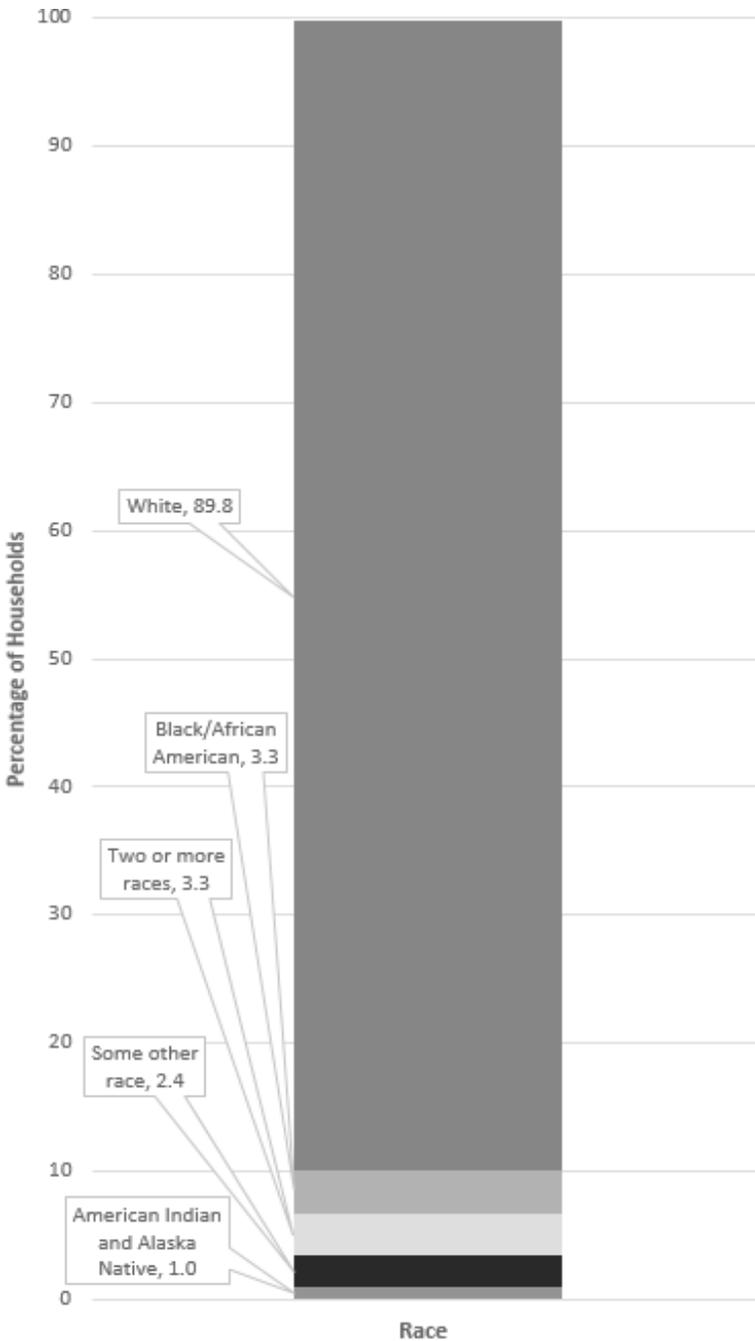


Data Source: American Community Survey, 2012 5-year Estimates

x Two races are not visible in the graph due to small percentages (Asian at 0.1% and Native Hawaiian and other Pacific Islander at 0%). The associated table can be found in Appendix F, Additional Tables.

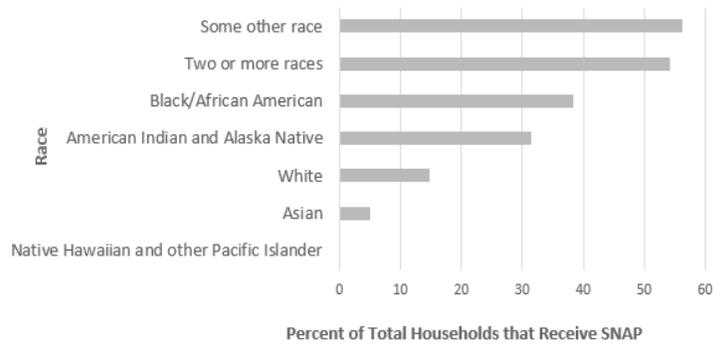
xi The Hispanic population may be represented in any one of the racial categories, but tend to self-identify as either white alone (66.6%) or some other race (21 percent) (Figure 2.8), and could be considered part of those populations receiving SNAP.

Figure 2.15 Racial Composition of SNAP-Recipient Households



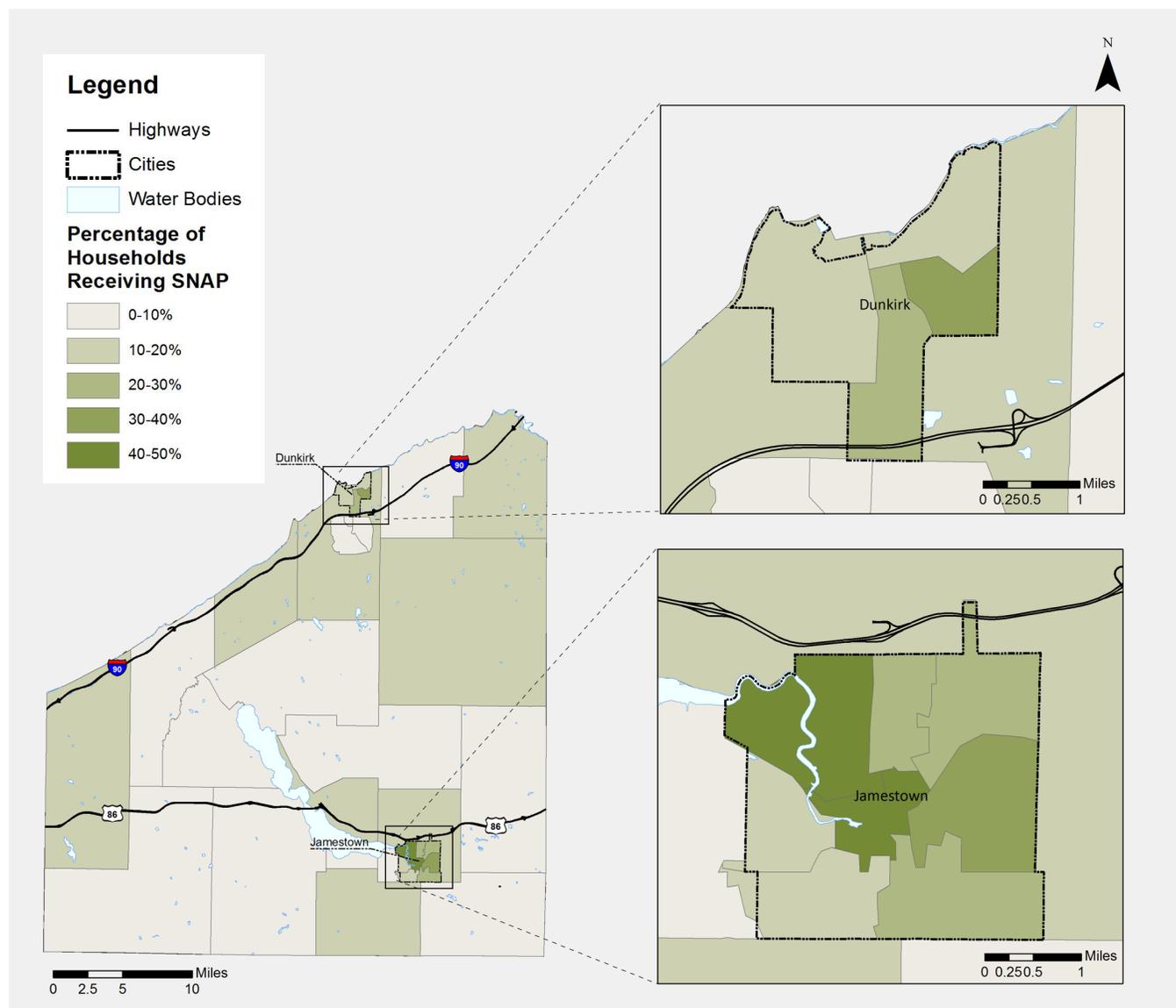
Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.16 Percent of SNAP-Recipients Receiving SNAP Benefits by Race



Data Source: American Community Survey, 2012 5-year Estimates

Figure 2.17 Spatial Distribution of Households Receiving SNAP Benefits



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries; U.S. Census Bureau: ACS 5-year estimates, Chautauqua County Census Tracts, Households Receiving Food stamps/SNAP, Total Population. Map by Kyle Fecik with assistance from Samantha Bulkilvish, 2017

Residents’ Participation in Women, Infants and Children Program (WIC)

Pregnant women or mothers with children under age five who have incomes at or below 185 percent of the poverty level, and who face significant “nutrition risk” are eligible to receive benefits through Women, Infant, and Children Program (WIC). WIC participants can buy authorized foods to supplement their own and their children's diets with certain nutrients.[21] In Chautauqua County, only 2.5 percent of eligible women participated in WIC in 2009 and 2014.[20]

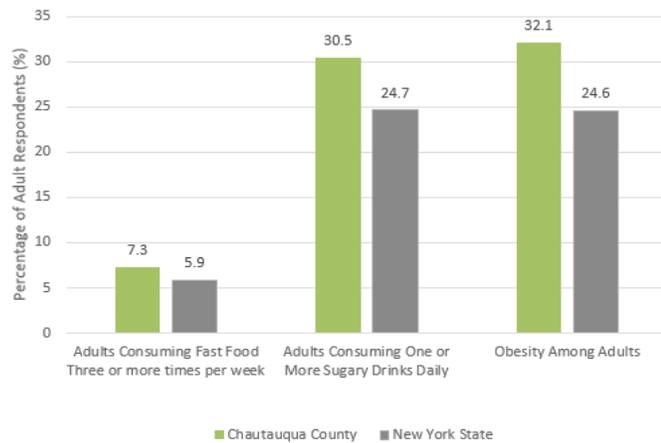
WIC benefits can be used by participants only at authorized retailers. Retailers must apply through the USDA to become WIC-authorized.[21] In 2012, \$89,470 were redeemed in WIC purchases at 21 authorized retail locations, an increase from \$68,115 in 2008.[22] Since the participation rate has remained steady but WIC redemptions have increased, women may be relying more heavily on their benefits checks to meet their families’ food needs.

Programs to Support Purchase of Foods Directly from Farmers

Some residents in the county also receive support to buy locally grown and healthy foods directly from farmers. Seniors over age 60 who meet income requirements can enroll in the federally-funded Senior Farmers Market Nutrition Program (SFMNP), which provides vouchers to buy produce at farmers markets. Pregnant mothers or mothers with children under the age of five can enroll and receive financial support from the Women and Infant Care (WIC) Fruit and Vegetable Program. Additionally, people who receive Supplemental Assistance Nutrition Assistance Program (SNAP) benefits can double their purchasing power at farmers markets through Double Up Food Bucks (DUFb),^{xii} as described in Chapter 5.[22]

xii The DUFb program is coordinated in WNY by the Farm-to-Field Network, a non-profit organization, and is funded through the Fair Food Network.

Figure 2.18 Selected Health Behaviors and Outcomes Related to Diet



Data source: Jamestown Renaissance Corporation, 2017

Table 2.14 General Health of Residents

Level of Agreement	People Who Responded to the Statement 'Would you say that in general your health is...'	
	Chautauqua County	New York State
	N=483	N=31,391
	%	%
Excellent	10.9	19.8
Very good	34.0	31.3
Good	36.9	32.3
Fair	13.8	12.1
Poor	4.3	4.5
All Respondents	100	100

Data Source: New York State Department of Health, 2013-14

Table 2.15 Prevalence of High Blood Cholesterol among Residents

Level of Agreement	People Who Responded to the Statement 'Have you ever been told by a doctor, nurse or other health professional that your blood cholesterol is high?'	
	Chautauqua County	New York State
	(N= 429)	(N=27,661)
	%	%
Yes	35.6	37.7
No	64.4	62.3
All Respondents	100	100

Data Source: New York State Department of Health, 2013-14

2.9 People’s Health Behaviors

Food acquisition, preparation, and consumption behaviors of people can be linked to several major health conditions, including obesity, heart disease, and diabetes. Food-related behaviors vary depending on geographic location, race, socio-economic class, and gender. A 2013 survey of county residents identified several health-related concerns.^{xiii} Access to healthy food, nutrition/eating a healthy diet, and heart-related conditions such as high blood pressure, heart disease, or stroke, were listed as concerns by approximately 25 percent of residents. In addition, overweight/obesity/weight management were listed as concerns by over 37 percent of respondents. When asked what barriers prevent residents or their community from being healthier, 36 percent of respondents pointed to limited incomes. Slightly over 8 percent responded that they did not have transportation to make healthy lifestyle choices such as purchasing fruits and vegetables.^{xiv} [23]

In response to the question “What could help you or your family make healthy changes in the future?”, nearly 55 percent of respondents noted that “having more affordable fruits or vegetables or more healthy food choices at local convenience stores” would help them, and another 7.6 percent responded that transportation could help. The residents’ responses indicate that the presence of healthy food options at small food outlets in addition to at larger stores are important for improving healthy choices. Although only 7.6 percent of respondents indicated a need for better transportation systems, this could be due to the sample population surveyed, which may not be representative of the population without access to a vehicle. [23]

xiii Health concerns of residents were reported in the 2014-2017 Chautauqua County Community Health Survey (22 questions) conducted by a partnership of local healthcare institutions in the county.

xiv Survey question asked residents to list up to five concerns from a given list of 15 given choices with the last choice reserved as ‘Other (please specify).’

Table 2.16 Diabetes Deaths and Hospitalizations

	Cases per 10,000 residents
Deaths due to diabetes (per 100,000)	19.2
Diabetes hospitalizations (primary)	15.6
Diabetes hospitalizations (any diagnosis)	146.2
Diabetes hospitalizations among patients ages 6-17 years	5.3
Diabetes hospitalizations among patients ages 18+ years	9.4

Data source: New York State Department of Health, 2014 County Indicators of Health

Table 2.17 Health Care Coverage among Residents

Level of Agreement	People Who Responded to the Statement <i>‘Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?’</i>	
	Chautauqua County (N= 485)	New York State (N=31,522)
Yes	87.1	87.4
No	12.9	12.6
All Respondents	100	100

Data Source: New York State Department of Health, 2013-14

Table 2.18 Financial Barriers to Residents’ Health Care

Level of Agreement	People Who Responded to the Statement <i>‘Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?’</i>	
	Chautauqua County (N= 485)	New York State (N=31,595)
Yes	9.9	13.1
No	90.1	86.9
All Respondents	100	100

Data Source: New York State Department of Health, 2013-14

Consumption of sugary drinks and fast food can cause negative health outcomes, including weight gain.[24] Compared to the state, Chautauqua County residents are more likely to consume fast food three or more times per week, and drink one or more sugary drinks each day. Obesity rates in the county (32%) are also higher than those statewide (24%) (Figure 2.18).

2.10 Health Conditions, Health Care, and Healthy Environments in Chautauqua County

Chautauqua County residents report themselves to be in good health. In response to a 2013-2014 survey,^{xv} 82 percent of Chautauqua County respondents rated their health as good, very good, or excellent while 4.3 percent said it was poor (Table 2.14). This response is mirrored in the statewide results.

Despite positive reports by the county’s population experiences a number of chronic disease conditions and risk factors. High cholesterol in adults, a condition that can be linked to poor diet, afflicts the cardiovascular system through the arteries and is a major cause of heart disease. About 35 percent of residents in Chautauqua County have at one time been told by a healthcare professional that their blood cholesterol was high (Table 2.15).

Type 2 diabetes has been linked to diets high in sugar and/or processed foods and low in fruits and vegetables. Prevalence of diabetes is one way to measure the connection between health outcomes and diet, which is influenced by the types of food a household can access.[25] In 2014, there were 15.6 diabetes-related hospitalizations per every 10,000 people, and 146.2 hospitalizations of patients with diabetes in Chautauqua County. There were about 210 hospitalizations due to diabetes complications and 1,965 hospitalizations of patients with

xv Information regarding consumer actions is regularly collected through the Behavioral Risk Factors Surveillance Survey (BRFSS). The survey, organized at the federal level by the Center for Disease Control and Prevention, and is conducted in New York by the state’s Department of Health.

Table 2.19 Walkability of Neighborhoods

Level of Agreement	People Who Responded to the Statement 'Overall, how would you rate your neighborhood as a place to walk or be physically active?'	
	Chautauqua County (N= 459)	New York State (N=30,135)
Very pleasant	63.8	57.1
Somewhat pleasant	30.0	34.2
Not very pleasant	4.5	5.0
Not at all pleasant	1.7	3.7
All Respondents	100	100

Data Source: New York State Department of Health, 2013-14

diabetes in the county (Table 2.16).^{xvi} Although it is difficult to know if these cases were directly linked to diet, improvements in healthy food options may improve these health outcomes.

Affordable access to health care plays a large role in managing disease among county residents. Approximately 87 percent of respondents to a survey in the county reported having health care coverage, similar to statewide coverage rates (Table 2.17). Furthermore, only about 10 percent of survey respondents in the county said they could not see a doctor due to cost in the past 12 months, a rate lower than the 13.1 percent rate statewide (Table 2.18).

Health and well-being can also be promoted by creating social and environmental conditions that enable healthy behaviors. For example, the walkability of a neighborhood can influence local residents’ likelihood to walk for leisure/exercise or for functional purposes such as to buy groceries. When asked to rate their neighborhood on how pleasant it is for physical activity, 63 percent of Chautauqua County survey respondents rated their neighborhood as very pleasant while only about 6 percent rated it as either not very pleasant (Table 2.19). A smaller proportion of respondents statewide rated their neighborhoods as very pleasant while slightly more assessed their neighborhood as not very or not at all pleasant.

xvi Calculated based on the county population of 134,599.

Perspectives of Community College Students on Chautauqua County's Food System^[26]

Young adults are the future of Chautauqua County, and their ideas and perspectives can steer the county to a stronger future. This vignette captures the ideas and perspectives of young adults at Jamestown Community College (JCC), a rural community college serving residents of Chautauqua County.^{xvii}

Young adults in the county are involved in the food system in diverse ways. Aside from being consumers, young adults report engaging in home gardening and hydroponics, working on farms, hunting, and fishing. This direct engagement in the food system is not an uncommon experience for young adults in rural settings. Some young adults also reported working as part-time employees at grocery stores, a marker that the food system may be a formative introduction to work for young adults.

JCC students see both strengths and challenges in Chautauqua County's food system. Students pointed to the county's agricultural potential through its good soil and climate, access to water, and

^{xvii} The studio team conducted a focus group with college students at the Jamestown community college on April 11, 2017. Approximately 20 students participated in a focus group. Focus group discussion focused on four main questions: young adults' role in the food system; their perception of how the food system works in the county; young adults' perspective on their ability to impact the food system; and their plans to work in the Chautauqua county food system. Discussion was preceded by a brief presentation by focus group facilitators on how a food system works.

abundance of land. Additionally, students view their community's self-reliance as a major strength.

Echoing the sentiments of other stakeholders in the county, students pointed to concerns about food insecurity. They noted that food insecurity was worsened by limited income, high cost of food, limited time, and limited access to transportation. Students pointed to the dispersed development patterns of the county, limited number of young farmers, and limited access to healthy options for food as additional challenges in the county.

When asked how they could affect positive change in the food system, some students pointed to the work they had already completed in establishing/sustaining community gardens. Students also suggested they could affect positive change by working to reduce waste, supporting local producers, and lobbying for policy change.

Although JCC students see many strengths in their community, and are committed to positive change, they are less certain about their own future in the county and its food system. When asked about their intention to work in the food system and/or their intention to make a life in Chautauqua County, few responded affirmatively. Very few students were enthusiastic about careers in the county's food system. However, those who responded affirmatively were passionate about community health, agriculture, and the potential of alternative agricultural methods, including hydroponics. Young people may need additional opportunities to see the viability of careers in the food system to encourage more entrepreneurship in the county.

2.11 Summary

Residents of Chautauqua County have varied experiences based in part on their social, economic and cultural backgrounds and circumstances. The county has high rates of self-employment, which demonstrates an entrepreneurial spirit among residents. Additionally, the rate of unemployment is lower than the state average. Yet, the high poverty rate and lower per capita income (compared to the state averages) may indicate that while there are jobs for people in the county, they do not pay enough for residents to live comfortably.

Food insecurity is a challenge. Although many residents are eligible for food assistance, the participation rates in federally funded programs are low or declining. The rural, low-density, development pattern of the county makes it difficult for those without vehicles to reach stores that sell healthy foods. Groups vulnerable to food insecurity include low-income seniors, children, and people with disabilities.

The chapter's overview of population characteristics - including their experiences of food insecurity and related health challenges - explains how residents are faring within the food system. The next chapter details the current conditions in each sector of the county's food system, including production, aggregation, processing, wholesale, and distribution of food, and management of food and food-related waste, with a special focus on each sector's contribution to the county's economic development. Collectively, these sectors can support residents' health and economic wellbeing in the county.



3. Agriculture and Food Production

As you pour milk into a bowl of cereal or spread grape jelly onto a piece of toast for breakfast, have you ever stopped to wonder where that milk or jelly came from? Before being served up as a meal, food must undergo a journey that brings it from its original source to a table. This section of the report details the beginning of that journey, describing the portion of the food system that generates our food. The food system supply chain is the series of steps that a grape goes through, from harvesting it from the vine, to processing it into jelly at a plant, to selling it at a retail location, to throwing the leftovers in the trash. Each step represents another stage in the transformation of the grape and involves people, labor, economic activity, logistics, environmental and land use consideration, and waste. The agriculture and food production sector encompasses all activities^{xviii} that enable the production of food for human consumption.

xviii These activities include growing of food on farms, fishing, hunting, and foraging for food. Agricultural products, produced on farms, include but are not limited to livestock, crops, and value-added products.

3.1 Agricultural Land Use

In Chautauqua County, 410,946 acres, or almost 61 percent of the county's land area, is designated as prime^{xix} farmland (Figure 3.1). Of the 678,545 acres of all the land in Chautauqua County, 35 percent, or 236,546 acres, is agricultural land (Table 3.1). Chautauqua County agricultural land is comprised of four major categories^{xx}:

xix Prime farmland is "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses", as defined by the USDA.[27]

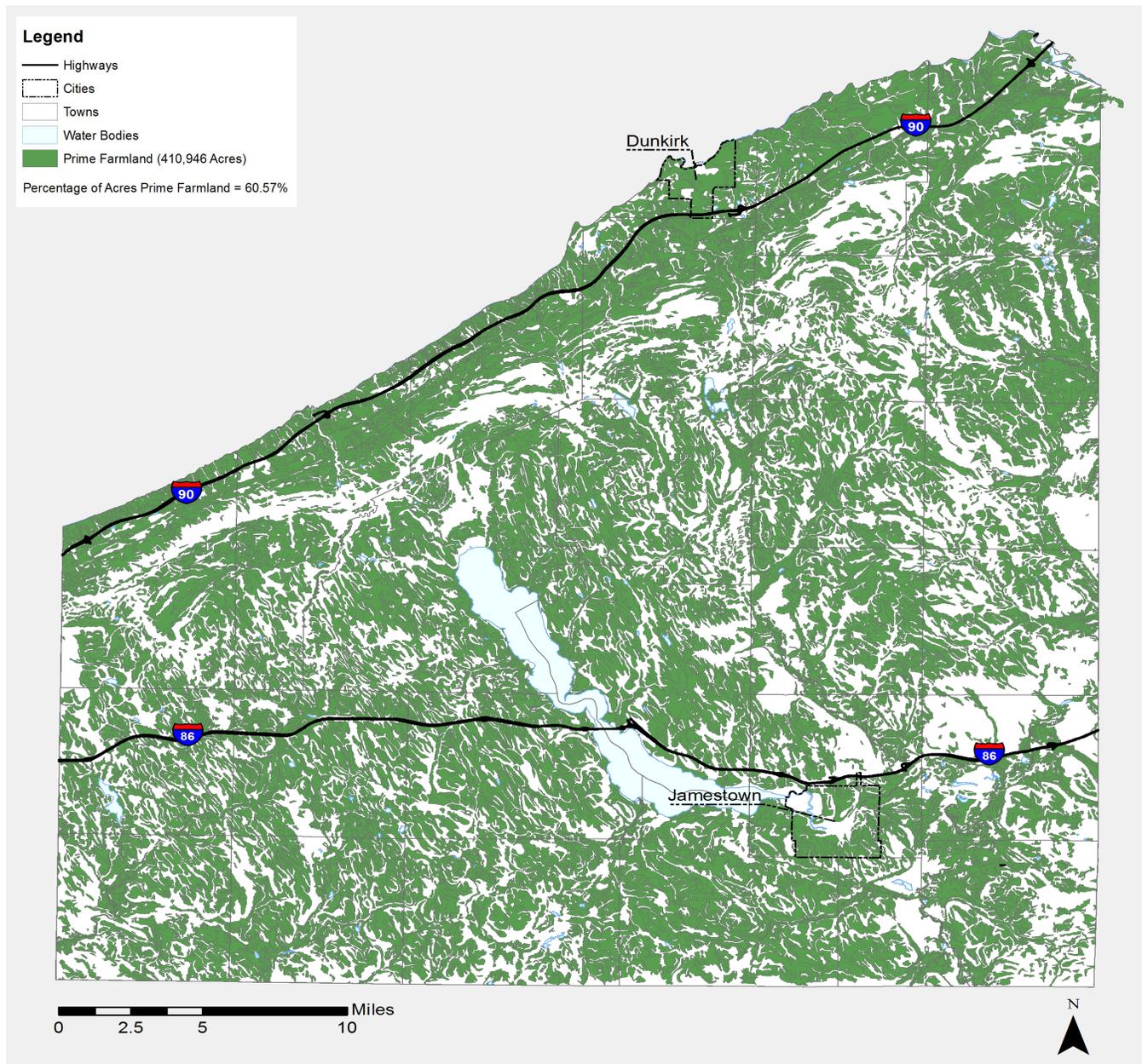
xx Agricultural land categories are defined by the USDA. Cropland is all land that can support growing crops without additional improvements, even if the land is not currently used for growing crops. Pastureland is defined as land that can be grazed, even if the land can otherwise be defined as cropland or woodland. Woodland is defined as "natural or planted woodlots or timber tracts, cutover and deforested land with young growth which has or will have value for wood products and woodland pastured". Because cropland and woodland can also be used as pastureland, agricultural land use in this report is represented in the following categories: land only used as cropland, land

Table 3.1. Agricultural Land Area

All Land (Acres)	Agricultural Land (Acres)	% of Land in Agriculture
678,545	236,546	35

Data Source: U.S. Census Bureau 2010; 2012 U.S. Census of Agriculture

Figure 3.1 Prime Farmland



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries; Chautauque County Information Technology Services Prime Agriculture Land. Map prepared by Erin Sweeney, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Table 3.2. Share of New York State Agriculture Land and Operations, 2012

Size (Acres)	Acres Operated		% of all acres operated in NYS	Number of Operations		% of all NYS Operations
	Chautauqua County	New York State		Chautauqua County	New York State	
Total	236,546	7,183,576	3	1515	35,537	4

Data Source: 2012 U.S. Census of Agriculture

cropland, pastureland, woodland, and other agricultural land (not used as cropland, pastureland, or woodland). Of the available agricultural land, cropland comprises the largest proportion at 55 percent. [28] Woodlands (excluding pastureland) constitute the second largest proportion of the agricultural land at 24 percent, followed by agricultural land used exclusively as pastureland at 11 percent (Figure 3.2).[29]

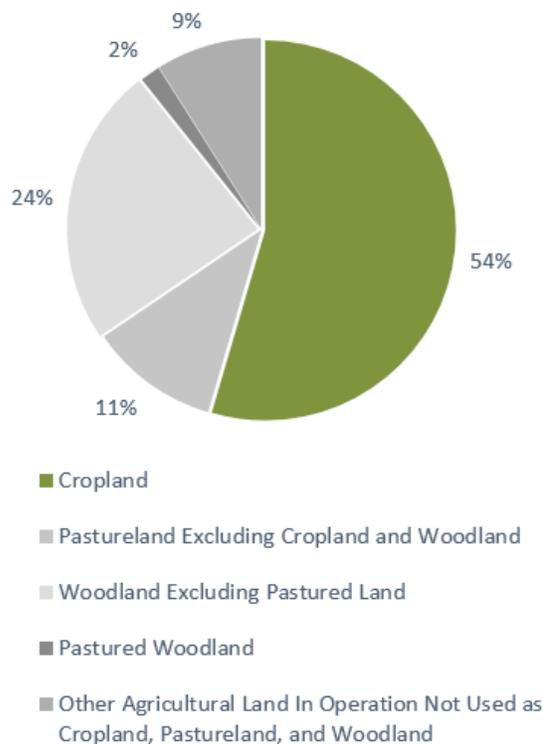
3.2 Farm Size

Chautauqua County’s agricultural land accounts for approximately three percent of all New York State farmland, and the county claims four percent of the state’s total number of farming operations (Table 3.2).

There are 1,515 farming operations in Chautauqua County, ranging from small farms 1 to 259 acres in size, to very large farms that are 2,000 acres or more. Many of Chautauqua County’s farms are concentrated along a band of prime farmland in the north half of the county, along the shore of Lake Erie (Figure 3.3). Farms in Chautauqua County are smaller on average compared to farms statewide. In Chautauqua, the average farm size is 156 acres, compared to an average of 202 acres statewide (Table 3.3). However, other comparisons between the county and the state reveal that the share of farms in each operation size is similar. The percentage of agricultural land in large farms in Chautauqua County is 45 percent, compared to 50 percent

only used as pastureland, land only used as woodland, woodland also used as pastureland, and land not used as cropland, pastureland, or woodland.

Figure 3.2 Agricultural Land by Type of Use, 2012



Data Source: 2012 U.S. Census of Agriculture

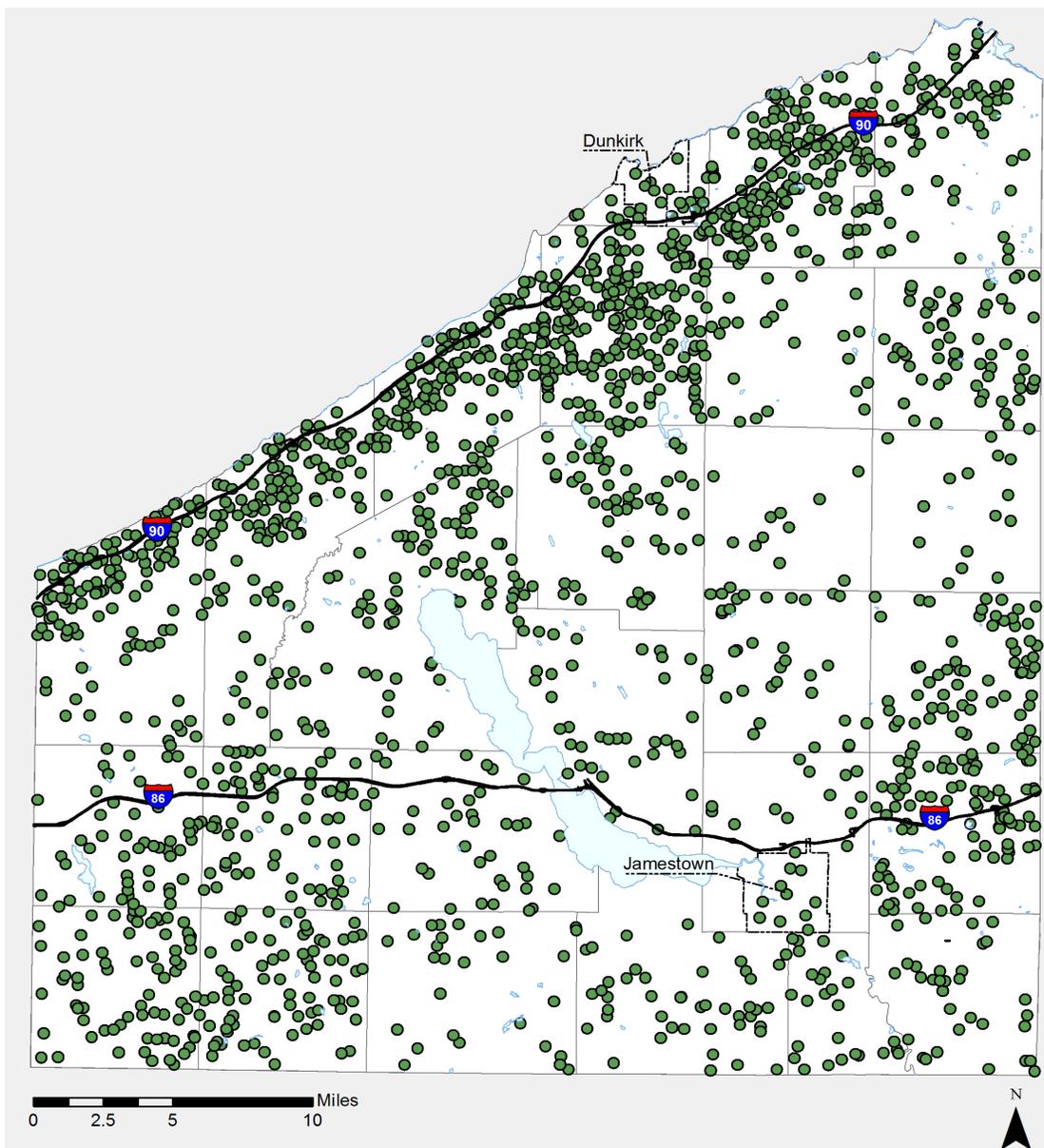
Table 3.3. Classification of Farms, by Acreage, 2012

Size (Acres)	Agricultural Land (Acres Operated)		% of all acres operated		Number of Operations		% of total number of operations		Acres per Operation	
	CHQ	NYS	CHQ	NYS	CHQ	NYS	CHQ	NYS	CHQ	NYS
1.0 to 259 (Small Farm)	106,981	2,381,698	45	33	1301	28,659	86	81	82.2	83.1
260 to 1,999 (Large Farm)	105,913	3,624,318	45	50	207	6,534	14	18	511.7	554.7
2,000+ (Very Large Farm)	23,652	1,177,560	10	16	7	344	0.5	1	3378.9	3423.1
Total	236,546	7,183,576	100	100	1515	35,537	100	100	156.1	202.1

Data Source: 2012 U.S. Census of Agriculture

Figure 3.3 Distribution of Farms

- Legend**
- Farms (1,752)
 - Highways
 - ⬜ Cities
 - ⬜ Towns
 - ⬜ Water Bodies



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries; Chautauque County Information Technology Services, Farms. Map by Munsung Koh and Erin Sweeney, Cultivating Prosperity Studio with assistance from Samantha Bulkivish.

in New York State (Table 3.3). The percentage of operations in each size designation is also consistent between the county and the state. An exception is the percentage of agricultural land acreage in small-sized farms; in Chautauqua County, 45 percent of agricultural land is in small farms, which is notably greater than it is for New York State at 33 percent (Table 3.3).[29]

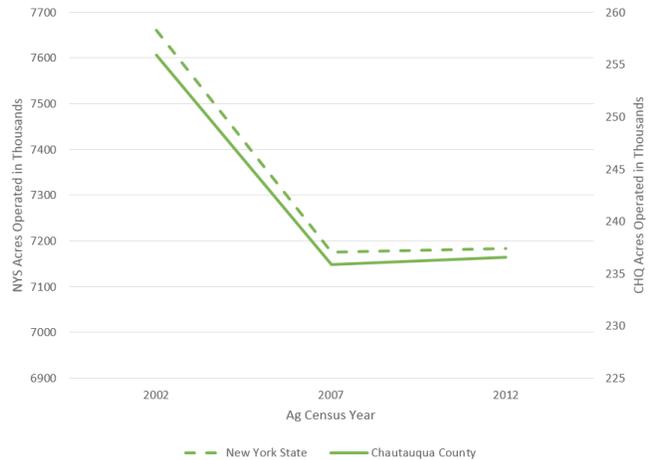
Major shifts are occurring in agricultural land use in Chautauqua County. Between 2002 and 2007, the county experienced decline of 7.8 percent in overall farming acreage, mirroring trends statewide. Subsequently, between 2007 and 2012, the trend reversed as acreage of land in farming increased (Figure 3.4). However, in terms of shifts in the number of farm operations, the opposite trend occurred.

Although both the county and the state have had continuing decreases in the number of farming operations, Chautauqua County is losing farming operations at an increasing rate. Between 2002 and 2007, the number of farming operations in the county decreased by 4.4 percent (Figure 3.5). Farming operations continued to decrease by 8.6 percent between 2007 and 2012 (Figure 3.5). In the same period, the rate of decrease in farming operations statewide has remained relatively constant.[29]

3.3 Farm Production Practices

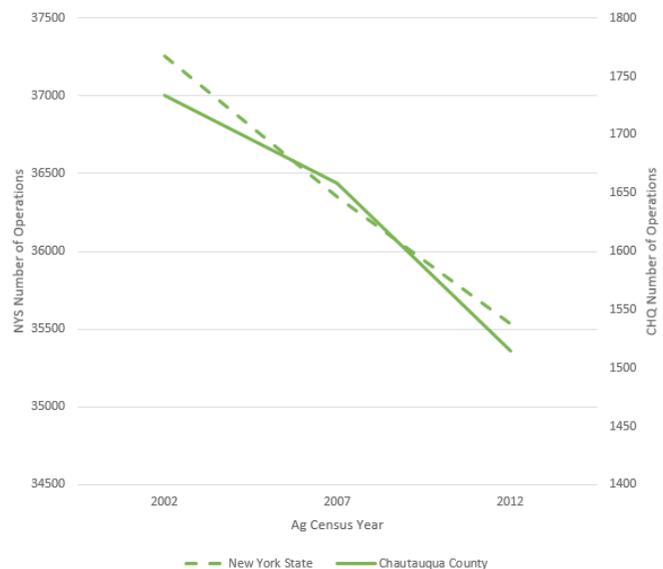
Farmers engage in a variety of conventional and alternative practices tied to how they grow, how they market produce to customers, how they prepare farm products for distribution, and how they manage the farm environment.^{xxi} Practices such as rotational or management-intensive grazing practices (203, or 13% of operations) were more commonly reported than community-supported agriculture (3 operations), as

Figure 3.4 Farm Acreage over Time in Chautauqua County and New York State, 2002-2007-2012



Data Source: 2012 U.S. Census of Agriculture

Figure 3.5 Farm Operations over Time in Chautauqua County and New York State, 2002-2007-2012



Data Source: 2012 U.S. Census of Agriculture

xxi In each Census of Agriculture, the USDA polls farm operations on their use of selected farm practices.

Table 3.4. Alternative Farm Practices, 2012

Description of Practice	Chautauqua County		New York State	
	N= 1,515		N=35,537	
	Number of Operations	% of County Operations	Number of NYS Operations	CHQ's Share of Statewide Operations Using Each Practice (%)
Rotational or management-intensive grazing	203	13.4	5878	3.5
Value-added production	75	5.0	2593	2.9
Direct to retail outlet	50	3.3	2533	2.0
On-farm Crop packing facility	27	1.8	1065	2.5
Community-supported agriculture	3	0.2	578	0.5
Alley cropping or silvopasture	3	0.2	186	1.6

Data Source: 2012 U.S. Census of Agriculture

Table 3.5. Agricultural Land Treatment, 2012

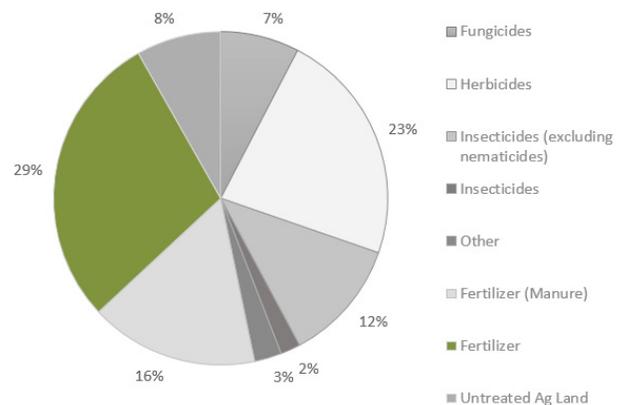
Agricultural Land	Area (acres)	%
Total treated land	217,046	91.8
Total untreated land	19,500	8.2
Total Agricultural land	236,546	100

Data Source: 2012 U.S. Census of Agriculture

displayed in Table 3.4.^{xxii} Twenty-seven farm operations identified as having on-farm crop packing facilities and 75 operations practice value-added production (Table 3.4).

Chautauqua County’s farms use a range of soil amendment practices to protect crops against disease. Out of the total agricultural land of 236,546 acres, about 29 percent of the agricultural farmland, or 67,967 acres, is treated with fertilizer (Figure 3.6). Additionally, 23 percent of the county’s farmland is treated with herbicides. Only 16.3 percent of the fertilized land is fertilized using manure and 8.2 percent of agricultural land is left untreated. Moreover, 708 operations, or 26 percent of all farm operations in the county, use fertilizer (Figure 3.6, Table 3.5).

Figure 3.6 Agricultural Farmland by Type of Treatment, 2012



Data Source: 2012 U.S. Census of Agriculture

xxii Totals are not presented in this table because each category is not mutually exclusive. For example, some farms may participate in several of the farm practices in the table, so calculating a total could potentially result in an over estimate.

Table 3.6. Organic Farming in Chautauqua County, 2012

	Number of Operations	% of all operations	Total Sales (\$)	% of all sales	Avg. Sales per Operation (\$)
Organic (National Organic Program USDA Certified & Exempt) Operation Sales	18	1	1,528,000	1	84,889

Data Source: 2012 U.S. Census of Agriculture

Organic farming

As of 2012 there were 18 organic farming operations in the county, with sales per operation (\$84,889) averaging 21 percent lower than their non-organic counterparts (\$106,830) (Table 3.6, 3.16).

3.4 Characteristics of Farmers

Among the principal operators, or the persons primarily responsible for the day-to-day operation of the farm, 1,333 (88%) are male operators and 182 (12%) are female (Table 3.7). Over half of farming operations are run by just one operator, and very few operations have more than 3 operators. Almost 76 percent of farm operators, or 2,296 farmers, self-identify as white (Table 3.8).

As shown in Figure 3.7, individuals older than 45 years of age operate majority of the farm operations in Chautauqua County. Farm operators between the ages of 45 and 54 years operate about 24 percent of all farm operations, whereas 14 percent of the farms are operated by operators younger than 45, and only five percent of farms are operated by individuals younger than 35 years old.[29]

Table 3.7 Principal Farm Operators by Sex, 2012

Principal Operators	No. of Operations	% of Operations
Female	182	12
Male	1,333	88
Total	1,515	100

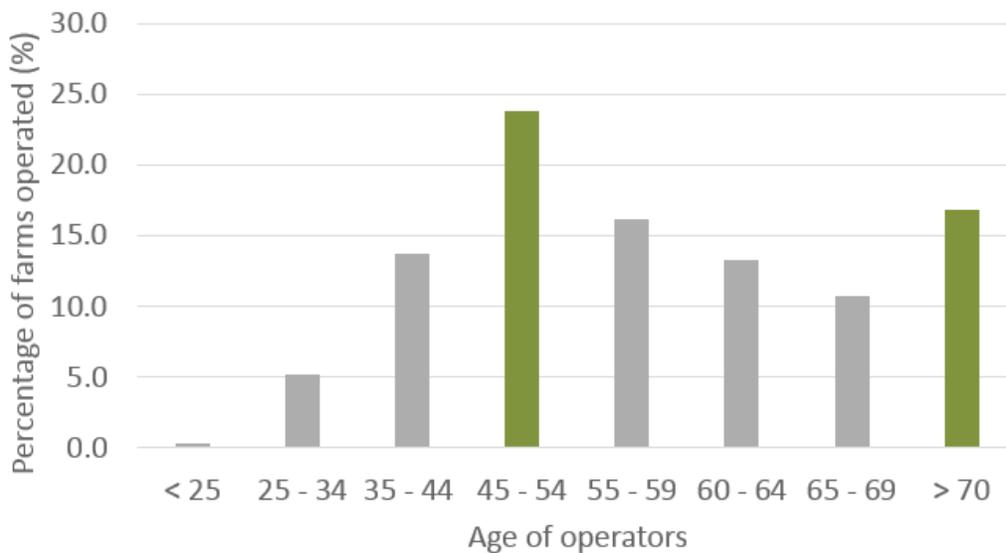
Data Source: 2012 U.S. Census of Agriculture

Table 3.8 Race of Operators, 2012

Race of Operators	No. of Operators	%
White	2,296	98.7
Hispanic	22	0.9
Multirace	5	0.2
American Indian or Alaska native	2	0.1
Asian	1	0.0
Total	2,326	100

Data Source: 2012 U.S. Census of Agriculture

Figure 3.7 Percent of Farms Operated and Age of Operators, 2012



Data Source: 2012 U.S. Census of Agriculture

Growing Success through Organic Farming: Abers Acres

[31]

Every year, a woman from Chicago travels to Chautauqua County to visit her family. Before each visit, she calls Sue Abers, co-owner of Abers Acres, to make arrangements to pick up her annual order of fresh, USDA Organic Certified produce. This annual tradition of a regular buyer points to the draw of delicious, organic produce grown in Chautauqua County.

Abers Acres is a family-owned organic farm situated along Route 394 in the town of Kennedy, NY, just a few minutes outside of Jamestown, NY. Co-owners Sue and John Abers manage the farm with their son Adam.

What began in 1984 as a non-organic farm that produced strawberries on a few acres of land, the operation has grown to over 100 acres and produces a wide variety of certified-organic fruits and vegetables.

Locals and tourists alike visit the farm's roadside stand to purchase ready-picked produce like kale, spinach, lettuce, carrots, raspberries, blueberries, strawberries, sweetcorn and much more. The farm also provides a location where families can pick their own raspberries and strawberries, a cheaper and more fun alternative to buying organic produce in the store or at the farmstand.

Both Sue and John have roots in agriculture. Sue met John while he worked at her father's dairy farm in Chautauqua County. After marriage, Sue attended Cornell to study dairy farming while John worked on a research farm. After graduating, the young farmers decided to start their own

farm separate from Sue's father's farm. Fortunately, they were able to borrow a small piece of land to start their business, which they envisioned would become a landscaping plant nursery. However, the necessity of providing enough income to support their young family drew them into growing strawberries and sweet corn.

The success of these two products prompted Sue and John to branch out into other vegetables and fruit. As they saved money, they were able to purchase the land they were farming from Sue's father and buy additional land to expand their operations.

According to Sue Abers, the farm's early success would not have been possible without the support of her family. The young farmers were able to use the dairy farm's equipment and machines at the cost of helping out at the dairy farm, enabling them to start out their business without investing in their own equipment.

Sue and John always believed in using more sustainable and environmentally friendly farming practices, but it was not until their son Adam came back from college to work on the farm that they decided to go certified organic. According to Sue, the easy part of going organic is changing your practices, especially if the farm is already using organic practices; the hard part comes when you need to complete the paperwork. Adam had a knack for paperwork, so with his assistance John and Sue decided to take the leap and become a USDA certified-organic farm. Sue has a strong belief in working the farm as naturally as possible. As part of going organic, a lot of the farm work requires manual labor, which allows Abers Acres to provide local employment opportunities during peak months of the year.

For Sue, going organic has been a win-win; they have fewer expenses from chemical

bills, while creating jobs in Chautauqua County. In fact, Sue admits that the farm occasionally receives calls for orders of organic produce from processors that the farm does not have the capacity to fulfill, an indication that Chautauqua County may have an increasing market demand for organic produce without the supply to fulfill it.

Today, Abers Acres is a leading example of how farmers can grow their business in Chautauqua County through adapting to new trends and conditions. Sue believes that their success would not be possible without the support of the family network. In the

future, she hopes to see the county provide more education and financial support for young farmers who wish to operate their own farming business. Although she admits that farming is not the most lucrative career, she believes that young people are hungry for an opportunity to live a fulfilling lifestyle where their work positively impacts their community.



Abers Acres produce stand in Kennedy, NY during the late-spring growing season. Available for purchase were this season's fresh asparagus, rhubarb, kale and chard. [Photo credit: Kelley Mosher]

3.5 Types of Agricultural Products

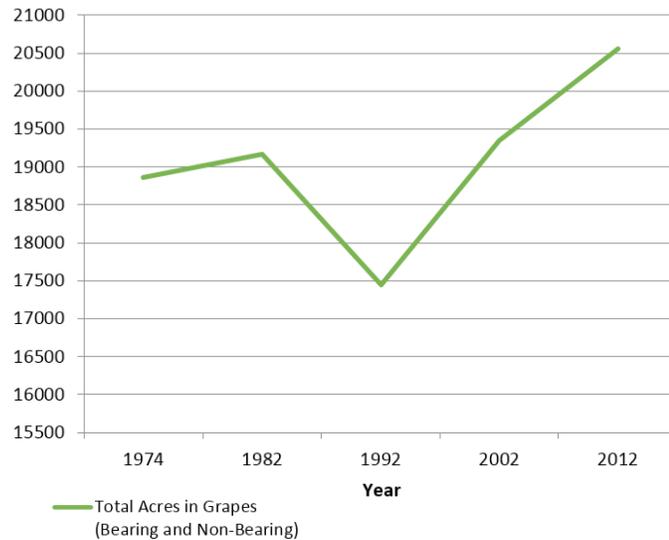
Chautauqua County farmers grow a wide variety of agricultural products, such as fruits, vegetables, and livestock-related products, including dairy. The county has a long agricultural history of being a premier grape producer in New York and the country. Today, farmers produce an abundant variety of crops and livestock products, as detailed in this section.

Crop production and sales

Sales of crop products generated nearly \$73 million in 2012 (Table 3.9). Across various crops, sale of fruit and tree nut products account for approximately 51 percent of all crop sales, followed by grain products (22%) and field crops including hay (12%). Operations with sales of field crops including hay account for approximately 42 percent of all farm operations, creating the largest concentration of operations by crop product sales (Table 3.9). Alternatively, fruit and tree nut products constitute the greatest monetary value of sales – more than \$37 million– but account for a small proportion (2.3%) of all farm operations with sales of crop products (Table 3.9).

Grapes comprise an important part of agricultural production in terms of sales and overall value, within the fruit and nut production category. The microclimate created by Lake Erie creates ideal growing conditions for Concord grapes. The number of acres in grape production has remained steady over the past fifty years. The region did experience a decrease in grape production during the early 1990s, but it has been on the rise since then (Figure 3.8).

Figure 3.8 Change in Land Area in Grape Production, 1974-2012



Data Source: 2012 U.S. Census of Agriculture

Table 3.9 Production and Sales of Crop Commodities, 2012*

Commodity	Sales Value (\$)	% of Total Sales Value	Number of Operations with Sales	% of Operations with Sales
Fruit and Tree Nut Totals, including Berries	37,472,000	50.8	22	2.3
Grain	16,340,000	22.1	232	23.7
Other Field Crops, including Hay	8,620,000	11.7	406	41.6
Open-air Vegetable Totals, including Seeds and Transplants	6,267,000	8.5	88	9.0
Soybeans	2,339,000	3.2	28	2.9
Floriculture Totals	972,872	1.3	28	2.9
Maple Syrup	386,000	0.5	53	5.4
Wheat	168,000	0.2	9	0.9
Under-protection Tomatoes	81,876	0.1	7	0.7
Potted Flowering Plants, for indoor use	61,168	0.1	4	0.4
Cut Cultivated Greens and Flowers	38,036	0.1	7	0.7
Cut Christmas Trees	18,000	0	11	1.1
Under-protection Fruit Totals	(D)	--	1	0.1
Horticulture Totals	(D)	--	45	4.6
Mushrooms	(D)	--	1	0.1
Nursery Totals	(D)	--	17	1.7
Propagative Material	(D)	--	2	0.2
Short-term Woody Crops	(D)	--	1	0.1
Sorghum	(D)	--	6	0.6
Commercial Vegetable and Strawberry Under-protection	(D)	--	2	0.2
Vegetable Totals, including Fresh Cut Herbs	(D)	--	7	0.7
Total	72,763,952	100	977	100

Data Source: 2012 U.S. Census of Agriculture

* (D) indicates data withheld to avoid disclosing information about individual farms.

Livestock production and sales

Chautauqua County produces a variety of livestock products, including milk. In 2012, the county's farmers recorded milk sales of \$73 million, accounting for 83 percent of livestock-related sales. The second highest proportion, 15.5 percent of total revenues, was raised through sale of cattle including calves, about \$13 million (Table 3.10).[29]

Milk is another important product from Chautauqua County farms. Dairy comprises a significant percentage of the total sales across the county, and therefore is 45 percent of the total agricultural sales in the county (Table 3.11).



A sow with a fresh litter of piglets that will be pastured-raised on an organic farm and sold by liveweight to customers for meat. [Photo credit: Jessica Runge]

Table 3.10 Livestock Commodity Sales in Chautauqua County, 2012

Commodity	Sales (\$)	% of Sales
Milk	73,157,000	83.1
Cattle (incl calves)	13,664,000	15.5
Equine	600,000	0.7
Hogs	200,000	0.2
Sheep & Goat total	189,000	0.2
<i>Sheep, Incl Lambs</i>	80,000	0.1
Speciality Animal Totals, (Excl Equine)	140,000	0.2
<i>Honey</i>	61,000	0.1
<i>Rabbits, live</i>	7,000	0
<i>Wool</i>	2,000	0
Goats	63,000	0.1
<i>Goats, Meat & Other</i>	36,000	0
Total (Measured in \$)	88,061,000	100

Data Source: 2012 U.S. Census of Agriculture

* Note: Equine includes (horses & ponies, owned) & (mules & burros & donkeys, any); Sheep and goat totals include wool & mohair & milk. Although there are poultry farms in the county, no sales data was available; therefore, poultry is not represented in this table. However, the total sales represent all livestock commodity sales for the county, including poultry.

Table 3.11 Percent of Dairy Sales in Chautauqua County, 2012

Type of Agricultural Commodity	Gross Sales	
	\$	%
Non-Dairy	88,061,000	54.6
Dairy	73,157,000	45.4
Total	161,218,000	100

Data Source: 2012 U.S. Census of Agriculture

Price Takers, Not Price Makers: Perspectives from the Milking Parlor^[32]

Richard “Dick” Kimball is a fourth-generation dairy farmer. Originally from Central Massachusetts where his great-grandfather began farming, Kimball calls himself a “transplant” to Chautauqua County. Lured by the lush landscape and the opportunity to start a new, larger operation that could sustain his growing family, Kimball reveres Chautauqua County as an exceptionally farming-friendly community. He views New York State as having a competitive advantage for new farming operations: start-up costs are manageable, and support for farmers exists in local communities and government organizations.

Kimball attended Cornell University where he earned a degree in animal sciences. He also met Joan, a Central New York-native who would eventually become his wife. Kimball's 40-plus year tenure in the dairy industry began soon after college when he returned to Central Massachusetts, where he began work full-time on a dairy operation. Kimball became a first-time owner of a dairy operation when his employer, a dairy farmer with whom he had a strong relationship, retired. The dairy farmer sold the farm to Kimball while other associated businesses – specifically, a milk trucking company – were passed on to the farmer's family members. Years of hard work and developing relationships allowed Dick and Joan Kimball to purchase their first dairy farm. Kimball testifies that cultivating connections between beginning and seasoned farmers is crucial for the success of younger generations of farmers.

Chautauqua Lake and rolling, green hills form the backdrop for the Kimballs' Chautauqua County-based dairy farm, known as Country Ayre Farm. The farm has approximately 750 head of cattle on 2,300 acres of land. The farm structures and the family homes are situated on approximately 600 acres. Each head produces about 27,000 pounds of milk per year, resulting in an annual production of close to 17 million pounds of milk. The herd is composed of Holstein (80 percent) and Jersey (20 percent) breeds, which the Kimball family has focused on breeding for quality milk and showmanship. Country Ayres is registered as a concentrated animal feedlot operation (CAFO). The Kimballs sell the milk produced on the farm to Sorrento Cheese. They also contract with Heil's, a business located in the town of Clymer, to transport the raw milk product to the Sorrento Lactalis plant in Buffalo, NY. Previously, the Kimballs were members of a dairy cooperative but opted out a few years to have more control over their profits. Dick Kimball noted that the present economic climate hinders scaling-up the farm operation.

The Struggle for Profit

“I'm a price taker, not a price maker,” Kimball exclaims. The phrase points to the primary obstacle dairy farmers face across the United States. Milk prices are federally regulated, and fluctuate based on nutrient quality of the milk and the dairy product that is being produced. In recent decades, the federal government has set low prices of milk, squeezing the already slim profit margins of dairy farmers. It is common to hear farmers discuss “taking a loss,” referring to their cost of production being higher than the lower prices of their products.

The costs of running a farm play a key role in determining profitability. Many farms in Chautauqua County are members of a dairy cooperative, which allows members to take

advantage of reduced transportation costs through shared hauling and shipping of raw product to processors. Cooperatives also sell to larger markets because of the collective volume of raw product they aggregate, and in some cases, process. Dairy farmers that choose not to be members of a cooperative operate as ‘independents,’ tasked with securing transportation and markets for their product.

Dick Kimball, whose farm operates independent of a cooperative, explains that he regularly weighs the risk versus reward of opting out of a cooperative. Kimball notes that the fixed costs of dairy cooperatives are attractive to many farmers. However, the amount of money the farmer receives is not linked to the quality of the milk provided by the farmer. Kimball’s relationship with Sorrento Lactalis developed over time. The relationship with Sorrento allows Kimball to negotiate a premium for the milk his herd produces. On average, Kimball receives a premium of approximately \$0.50 per hundredweight^{xxiii} more than the set milk price from Sorrento.

The Future of Dairy Farming

Kimball is optimistic about the future of dairy farming, particularly in Chautauqua County.

Kimball notes that the arrival of a new dairy processing operation, for example, could reduce transportation costs for farmers, but the benefits are uncertain because the quality and compliance of such a facility would mean paying farmers a premium price for the raw milk product, and there is no guarantee the final product would have a market in the county.

Kimball expects change in technology for agricultural practices to be a key factor. Modern milking equipment and machinery are equipped with advanced technology

xxiii A unit of measurement equal to approximately 100 pounds.

that make production processes more efficient. With a chuckle, Kimball notes that he is not going to need to hire milking parlor operators, but rather milking robotics managers. There is untapped potential, especially with technology, to re-engage the new generation in the agricultural industry.

Kimball notes the perceived benefits of rural, agricultural communities having programs such as Future Farmers of America (FFA), and agriculture and technology education within the public school system. Skills and knowledge in agriculture and technology are invaluable to future generations. Kimball stressed the importance of emphasizing agricultural opportunities and the economic opportunity that exists in Chautauqua County to young generations as well.

In the eight years Kimball has spent living and working in Chautauqua County, he has been actively involved in the local government. After about three years of establishing himself and the farm in the county, Kimball was named president of the Chautauqua County Farm Bureau. Farm Bureau is a grassroots organization that works on behalf of farmers and rural landowners. For Chautauqua County, Farm Bureau has been an avid proponent of revising the agricultural districts, balancing increases in sales taxes and property taxes, ensuring there are staff positions focused on agricultural policy, and at the state level, supporting a tax cap on agricultural land.

Kimball points to policy as a mechanism that supports, or undermines, the agricultural industry. The future of Country Ayre Farms is in the well-educated hands of Kimball’s children and grandchildren. Dick will continue to push for technology and education of younger generations as a means of strengthening the next agricultural workforce, and working with farmers and landowners to encourage policy change.

Table 3.12 Wage Status of Farm Labor, 2012

Wage Status of Labor	Number of Workers	Number of Operations
Unpaid Labor	1,782	725
Hired Labor	3,207	495
Total	4,989	1,220

Data Source: 2012 U.S. Census of Agriculture

3.6 Agricultural Labor Force

The agricultural labor force is essential to the success of the Chautauqua County food system, and provides jobs in the county. Of the 1,515 farm operations in the county, only 495 operations use hired labor while 725 operations, or 48 percent, use unpaid labor (Table 3.12).^{xxiv}

Workers are concentrated in operations that hire ten or more workers; 56 percent of all hired laborers work on just 15 percent of all operations that use hired labor (Table 3.13).

Of all hired on-farm labor, nine percent is migrant labor. Migrant labor is comprised of workers whose employment requires travel that prevents the worker from returning to his/her permanent place of residence the same day; designation of

^{xxiv} Unpaid labor is defined by all workers who performed labor activities on farms without being on the payroll.

“migrant” status in the USDA data does not

refer to workers’ citizenship status in the United States.[28]

3.7 Farm Expenditures

Collectively, farms in Chautauqua County incurred \$128,945,000 in expenditures annually. Farmers in Chautauqua County incurred annual expenses averaging \$35,537 per operation in 2012, which is lower than average farm expenditures statewide of \$127,617 (Table 3.14). The largest share of farm expenses in Chautauqua County came from purchase of animal feed with 21 percent share of all expenses. Hired labor was the second largest expense with 16 percent of the share of expenses. However, because fewer operations reported having expenses from hired labor, the average expense at \$40,756 per operation for hired labor is the highest out of all types of expenses (Table 3.14).[29]

Table 3.13 Characterization of Farm Labor on Farms with Hired Workers, 2012

Level of Hired Workforce	Number of Operations	Percentage of all operations with hired labor (%)	Number of Workers	Percentage of Hired workers (%)
1 Hired Worker	103	21	103	3
2 Hired Worker	90	18	180	6
3 to 4 Hired Workers	118	24	404	13
5 to 9 Hired Workers	110	22	722	23
10 or More Hired Workers	74	15	1,798	56.1
Total	495	100	3,207	100

Data Source: 2012 U.S. Census of Agriculture

Table 3.14 Expenditures of Farm Operations, 2012

Type of Agricultural Expense	Chautauqua County				New York State	
	Amount (\$)	% of Expenditures	Number of Operations that Incurred Expenditure	Expense per Operation by Type (\$)	Amount (\$)	
Hired Labor Expenses	20,174,000	16	495	40,756		
Feed Expenses	26,952,000	21	798	33,774		
Other Expenses	12,411,000	10	871	14,249		
Rent, Cash, Land & Fertilizer Expenses (Including Lime & Soil Conditioners)	3,745,000	3	361	10,374		
Supply & Repair Expenses	8,161,000	6	794	10,278		
Seed and Plant Expenses	13,101,000	10	1,331	9,843		
Customwork Expenses	5,199,000	4	536	9,700		
Interest Expenses	4,580,000	4	510	8,980		
Animal Expenses	5,742,000	4	654	8,780		
Contract Labor Expenses	2,918,000	2	363	8,039		
Machinery Rental Expenses	1,366,000	1	213	6,413		
Fuel Expenses (Including Lubricants)	613,000	0	104	5,894		
Chemical Expenses	8,669,000	7	1,487	5,830		
Taxes, Property, Real Estate & Non-Real Estate (Excluding Expenses Paid by Landlord)	4,508,000	3	774	5,824		
Utilities Expenses	6,940,000	5	1,465	4,737		
Total Expenditures	128,945,000	100	--	--		4,535,138,000

	Chautauqua County	New York State
Total Farm Operations (No.)	1,515	85,113
Total Expenditures Per Farm Operation (\$)	35,537	127,617

Data Source: 2012 U.S. Census of Agriculture

Table 3.15 Gross Revenue of Farm Operations with Income, 2012

Income Source	Number of Operations with Income	Income (\$)	Income per Operation (\$)	% of All Revenue
Gross Sales	1,515	161,848,000	106,830	92.8
Income from Patronage Dividends & Refunds				
From Co-Ops	300	3,164,000	10,547	1.8
Income From Federal Government Programs	300	2,502,000	8,340	1.4
Income from Crop & Animal Insurance Payments	76	1,921,000	25,276	1.1
Income from Agricultural Services, Customwork & Other Categories	134	1,906,000	14,224	1.1
Income from Forest Products (Excluding Christmas Trees, Short Term Woody Crops, Maple Syrup)	97	1,243,000	12,814	0.7
Income from Rent on Land & Buildings	206	677,000	3,286	0.4
Other Farm-Related Income	95	556,000	5,853	0.3
Income from Agricultural Tourism and Recreational Services	30	395,000	13,167	0.2
Income from Government Programs (State & Local)	11	167,000	15,182	0.1
Total	--	174,379,000	115,102	100
<i>Total for Farm-Related Income (not from gross commodity sales)</i>	<i>680</i>	<i>10,030,000</i>	<i>14,750</i>	<i>5.8</i>

Data Source: 2012 U.S. Census of Agriculture

Table 3.16 Gross Sales of Agricultural Products in Chautauqua County, 2012

Range of Sales Volume (\$)	Number of Operations with Sales	% of Operations with Sales	Sales Amount (\$)	% of All Sales	Sales Per Operation (\$)
≤ 9,999	693	46	1679000	1	2,423
10,000 to 99,999	535	35	21,017,000	13	39,284
100,000 to 249,999	158	10	24,882,000	15	157,481
> 250,00	129	9	114,270,000	71	885,814
Total	1,515	100	161,848,000	100	106,830

Data Source: 2012 U.S. Census of Agriculture

Table 3.17 Net Cash Farm Income, 2012

	Chautauqua County	New York State	United States
Operations with Gain	772	15,689	964,046
% of all Operations	51	44	46
Avg. Gain/Operation (\$)	77,499	1,709,565,000	105,921,490,000
Operations with Loss	743	19,848	1,145,257
% of all Operations	49	56	54
Avg. Loss/Operation (\$)	19,781	504,399,000	23,897
Net Income Total (\$)*	45,132,000	1,205,166,000	78,553,368,000
Net Income/Operation (\$)	29,790	33,913	37,241

Data Source: 2012 U.S. Census of Agriculture

3.8 Farm Revenues

Farm revenues are generated from sales of farm products as well as revenues from other sources. Sales of farm products, which generate \$161,848,000 annually, account for a significant majority (93%) of all farm revenue (Table 3.15). Seventy-one percent of all gross sales are attributable to just nine percent of operations with sales, whereas 46 percent of operations with sales produced only one percent of the total sales volume of agricultural products (Table 3.16).

Other revenue sources for farms include income from patronage dividends and refunds from co-ops in which farmers participate (\$3,164,000; 1.8% of all farm revenue), income from federal programs (\$2,502,000; 1.4% of all farm revenue), and several other modest sources of revenue including from agritourism, an area of interest to county leaders (Table 3.15). Only thirty operations reported income from agritourism and recreational services in 2012,

averaging \$13,167 per operation, annually, which may indicate that agritourism is not viable for single farms or is more effectively leveraged through regional or county-wide entities that highlight agricultural products such as the Grape Discovery Center in Westfield.[33] Provision of agricultural tourism and recreational services generates only 0.2 percent of all agriculture revenue in the county (Table 3.15). Collectively, other revenue sources – i.e. not from sales of farm products – contribute about \$10 million to the farm-related income of 680 operations (Table 3.15).

Net Farm Income

Net farm income of farm operators is the difference between all revenues and all expenses paid by the operators. The average net income for farming operations in the county is \$29,790, which is less than both the state and the national average (Table 3.17).^{xxv}

xxv The Net Income Total (\$) numbers are directly from the Agriculture Census 2007. The discrepancy in actual totals in the table may be for a variety of reasons, but data is reported as stated in the census here.

Table 3.18 Hunting and Fishing License Sales, 2012-13

	Licenses Sold	% of All Licenses Sold	Total Pop. (2012)	Licenses Sold per 100 Residents
Chautauqua County	39,316	1.9	134,599	29
New York State	2,041,202	100	19,398,125	11

Data source: New York State Department of Conservation, 2013; American Community Survey, 2012 5-Year Estimates

Interestingly, the percentage of operations that saw an overall gain in 2012 was greater in Chautauqua County (51 percent) than it was in New York State (44 percent) and nationwide (46 percent) (Table 3.17).[29]

3.9 Food Production through Other Means: Gardening, Fishing, and Hunting

In addition to food being produced by farmers in Chautauqua County, residents engage in self-provisioning of food using multiple means, as in many rural communities. Anecdotal reports and the literature suggests that there is considerable production of food by residents in their backyards, as well as a modest amount of food production on community gardens in the city of Jamestown through the Jamestown Renaissance Corporation.[34]

Residents also raise food through hunting and fishing, which are often seen as recreational activities. Although data on volume of food produced from hunting and fishing cannot be easily determined, the number of sporting licenses sold to residents in the county provides an estimate of the rate of participation in this activity. In Chautauqua County during the 2012-2013 licensing season, 39,316 sporting licenses were sold, which accounts for approximately two percent of all licenses sold in New York State that year (Table 3.18).[35] Per capita, more than twice as many licenses are sold in

Chautauqua County than in New York State as a whole. Licenses are based on residency, duration of permit, type of animal (fish, small game, big game), age (junior or non-junior, senior), and tool (bow, firearm, trapping, etc.).

3.10 Agriculture and Food Production Education

The viability of the agricultural sector in a community depends on the rich skills, knowledge, training, and experiences of farmers. With an aging agricultural workforce, training and professional development in agriculture (and food systems education) is critical. In Chautauqua County, the Cornell Cooperative Extension (CCE) provides residents with numerous resources for agricultural education. CCE caters to new, beginning, and seasoned farmers with “workshops, business planning, and consulting on technical production and marketing.”[36] CCE also offers a range of educational programs and resources on food processing, soil and climate, season extension, and sustainable food production practices. In 2016, they launched a farmer “Vegetable School” taught by CCE specialists to provide new and seasoned farmers with information about pest management, soil health, processing, season extension, and food safety regulations, among others.[33] In addition, the Jamestown Community College

Small Business Development Center offers consulting for small businesses, including farmers, to develop business plans, gain information permitting and licensing, and receive start-up and loan support, among others.[37]

Although CCE provides educational opportunities for residents, the formal educational institutions within the county broadly lack food systems education programs. Erie2 of Chautauqua-Cattaraugus BOCES offers several career and technical training programs for adults and youth, but none of the programs listed at the county's two educational centers include agriculture-related education.[38,39] Additionally, the county's two colleges, State University of New York (SUNY)-Fredonia and SUNY-Jamestown Community College (JCC), do not offer any agriculture-focused training programs.[40,41]

3.11 Summary

A review of the landscapes of agricultural production in Chautauqua County reveals several opportunities and challenges. On the positive side, the county has a rich agricultural industry with ample room to grow. Chautauqua County's strong concentration of grape and dairy farms may also provide opportunities for more robust relationships with other sectors of the food system. Agriculture in Chautauqua County may have opportunities to adapt to new practices or crops in order to meet new demands.

Agriculture also faces several challenges. The county's farmer population is aging with fewer young residents joining farming as a career. This demographic shift in the agricultural workforce could result in a shortage of farmers and loss of farmland for development as farmers retire. Although overall farmland acreage has increased, the number of farms is decreasing more rapidly in Chautauqua County than across the state. The difference may be linked to the lack of young farmers to keep farmland in agricultural

production. Additionally, few farms engage in diversified activities such as on-farm retail, packaging, or value-added activities, which limits their income generation opportunities. Instead, farmers in Chautauqua County rely heavily on the aggregation, wholesale and processing (AWP) sector to bring their product to customers. The AWP sector, thus, is critical for the economic wellbeing of farmers and the larger county, an issue addressed in the next chapter.



4. Aggregation, Wholesale, and Processing of Food

For some, a community food system might conjure images of farmers selling a variety of produce at a farm stand. A significant majority (65%) of food items in the United States are not sold directly by farmers to consumers however.^[5] Instead, unprocessed products from farms pass through the hands of farmers to aggregators, packers, processors, and wholesalers who prepare and deliver value-added products to buyers. Some of the post-production handling of raw product also happens on farms but most happens off-farm. In Chautauqua County, only 27 farms (2%) have their own packing facilities, and 75 farms (5%) conduct value-added processing on the farm site (Chapter 3, Section 3.3).^{xxvi}

Like many agricultural counties in the US, Chautauqua County has a strong

^{xxvi} This section does not describe the ways in which food is distributed to the end consumer. Distribution of food to the end consumer through retail, direct sale from farmer to consumer, and through other means are addressed in the subsequent chapter.

aggregation, wholesale, and processing (AWP) sector. In addition to several large-scale AWP businesses in Chautauqua County that employ residents, several small-scale businesses are creating new supply chains linking producers to customers. This section describes the current state of the small, mid-sized, and large-scale businesses in the AWP sector in the Chautauqua County food system.

4.1 Defining Aggregation, Wholesaling and Processing (AWP) of Raw Agricultural Products

Aggregation, wholesale, and processing of food is a multi-step process. Consider an example. A grape grown in Chautauqua County is aggregated with millions grown across multiple vineyards, processed into wine, juice or jelly, and/or sorted and/or sold to wholesale operations. *Aggregation* is the process of bringing raw

agricultural products such as fruits, (e.g. grapes), vegetables, grains and animal products from farms and orchards to create a larger and more consistent supply to meet the demand of a processor or wholesale purchaser. Aggregation requires coordination to establish efficient supply chains. In some cases, aggregators and wholesalers also sell directly to customers, as is the case with CHQ Local Food, a recently formed business that aggregates produce from farmers and sells to customers in Chautauqua County.[42]

Food processing transforms raw agricultural products into forms that are directly edible, e.g. grape jelly, or ready to cook. Food processing industries include a variety of activities: washing, trimming, cooling, cooking, baking and/or packaging of fresh foods for final sale. Industries in this sector include slaughterhouses, canneries, dairy processors, jelly manufacturers, and other food manufacturers.[43] Some processors change the physical form of the product, e.g. making grapes into juice and wine, or add ingredients or cook the food to enhance the product value. Adding value to the product adds additional marketing opportunities and expands the customer base.

The work of food processors is not confined to processing alone. To maximize profits, food processing businesses might diversify their operations.[2] For example, many wineries in Chautauqua not only produce wine, but also grow grapes, sell bottled wine as retailers, and offer agritourism activities. Entities such as the Grape Discovery Center bring tourists to the area without burdening individual producers with the costs of running their own agritourism enterprises.[33]

Wholesale refers to the activities in the food system in which food products are gathered from producers, aggregators, and processors and are then stored and transported to retailers, institutions, and other types of food distributors.[44] Wholesalers operate in three ways: i)

merchant wholesalers, or third-party buyers, who purchase from processors and resell directly; ii) manufacturer/processor sales branches and offices (MSBOs), which are maintained by grocery stores to market their own products; and iii) brokers or agents who buy or sell for a commission and do not directly handle the products.[44]^{xxvii}

xxvii According to the U.S. Census Bureau's 2007 Economic Census

Voices of the Community: CHQ Local Food^[57]

Jason Toczydlowski started CHQ Local Food in 2013, after leaving his position as Director of Marketing for Chautauqua Institution. CHQ Local Food is Jason's solution to the logistical and financial challenge of connecting local chefs to local farmers – an entrepreneurial venture, and a way to give back to the community. The goal of CHQ Local Food is to aggregate products from small, sustainable farms and make weekly deliveries through a no-commitment CSA model to individual homes and chefs at restaurants. Through small business grants and use of his personal Subaru Outback, Toczydlowski launched the business, relying on his experience and networks from the Institution, as well as aggregation best practices gleaned from Vermont to Spain. Toczydlowski utilized the Jamestown Community College Small Business Development Center to sharpen his business plan, and has collaborated with the Cornell Cooperative Extension office to better understand farmers' needs.

CHQ Local currently runs from mid-June through late October. Toczydlowski, the only full time operator/owner, hires seasonal workers during his operating season. Once a week, CHQ Local Food customers, most of whom are seasonal residents, receive an email with a list of fruits, vegetables, herbs and add-ons, such as meat, dairy, eggs, available through partnerships with 20 to 30 participating farms. Customers select what they want, Toczydlowski places orders with the farms, and then CHQ Local Food picks items up from the farmers and delivers straight to the homes of 30 to 60 customers each week (depending on the time of the season). Toczydlowski also sells shelf-stable

products made in Chautauqua County at a retail shop, the BioDome, in Jamestown.

Farmers who work with CHQ Local Food value the reduction in time and cost of transporting products to markets (such as restaurants and institutions) outside of their usual customer base, and appreciate having guaranteed business. Toczydlowski notes that customers have predictable patterns in their product preferences throughout the season, so farmers can plan ahead to plant certain crops that meet the demand. Customers receive a box filled with many grocery staples, and they know how the foods were grown.

Toczydlowski faced several challenges initially, as farmers did not know what to expect, and customers and chefs had little knowledge or education about when produce would be available and why locally grown items had higher prices than produce at grocery stores. Pricing is a challenge, because although Toczydlowski uses the standard market price, some items cost more due to the small scale of the business. Toczydlowski spends a lot of time marketing the products to his customers, and creating a relationship between the CSA members and their farmers through recipes, photos, and local food events. Toczydlowski has learned that flexibility is the key ingredient to CHQ Local Food's success. Farmers must be flexible with the ordering process, chefs and customers must be flexible with the type and frequency of products available, and Toczydlowski must be flexible about meeting both parties' needs.

The need for flexibility limits Toczydlowski from expanding his business, e.g. by selling to school districts. Due to certain limitations, including federal regulations requiring food safety certifications on farms, and school kitchens' lack of kitchen space and processing equipment, Toczydlowski has not

worked with school food service providers. Toczydlowski believes that for him to sell to a large institution, demand for local food among clients of the institution, such as students' parents, would be essential.

Looking ahead five to ten years, Toczydlowski has aspirations for the future of the local food sector in Chautauqua County. He hopes to see the proportion of country-grown food consumed in county residents' homes, as well as restaurants and institutions, to double. There is a need for additional small-scale manufacturers and processors, and opportunities for processing foods for post-season consumption. CHQ Local Food is

trying to increase sustainable production of food that remains in the county, and boost the market share among a broader, more food system-educated customer base. Toczydlowski sees great potential for a soil-to-soil system in Chautauqua County, through collaboration and flexibility between business owners, institutions, and local government.



A sample of the “drop-off boxes” available through CHQ Local Food’s home delivery system. Product offerings are based on what is available throughout the harvest season. [Photo credit: Jason Toczydlowski]

4.2 Location, Number and Type of AWP Businesses

Chautauqua County is home to a variety of aggregation, wholesale, and processing businesses, including wineries, bakeries, juice manufacturers, and dairy processing businesses. The majority of AWP businesses are located along the two major highways in the county, Route 86 and Interstate 90 (Figure 4.1). Those locations likely make it simple for distributors to pick up and deliver products across the food system. Due to the strong agricultural base described in the prior chapter, Chautauqua County has the opportunity to further strengthen the supply chain between growers and AWP businesses in Chautauqua County.

Across Chautauqua County, 56 businesses are engaged in the aggregation, processing and wholesale of food.^{xxviii} The AWP food businesses employ 1,131 people and generate \$1,496,981 in sales.^{xxix} Sixty-six percent of the 56 businesses in the AWP sector engage in food processing and aggregation, and 34 percent are engaged in wholesale (Table 4.1).

Some, but not all, AWP businesses are inter-linked with the county's farmers.^{xxx} Wineries (n=16; 27% of the AWP sector) as well as juice and grape concentrate makers (n=3; 5% of the sector) are strong actors in the AWP sector, as they capitalize on the

xxviii This number was determined by NAICS code definitions for manufacturing (31-33) and wholesale (42), and based on an estimate developed between data from the U.S. Economic Census (2012) and ReferenceUSA (2017). Two businesses were included in this analysis that were classified as Distribution (44-45) but that also conduct wholesale and processing activities on site: Brigiotta's Produce and Sam and Son's Produce Company. See Appendix A for specific methods and explanation of the sources used.

xxix The estimated number of businesses and values was derived to create an accurate comparison to other sectors for Economic Conditions. The rest of this section will use numbers based on the actual businesses, verified through quality control including phone call verification and web research.

xxx Quantitative information about the extent to which AWP businesses purchase local produce is not clear.

availability of grapes in the region's food supply chain. Chautauqua County farmers grow grapes on over 20,000 acres of land (Chapter 3, Section 3.5).

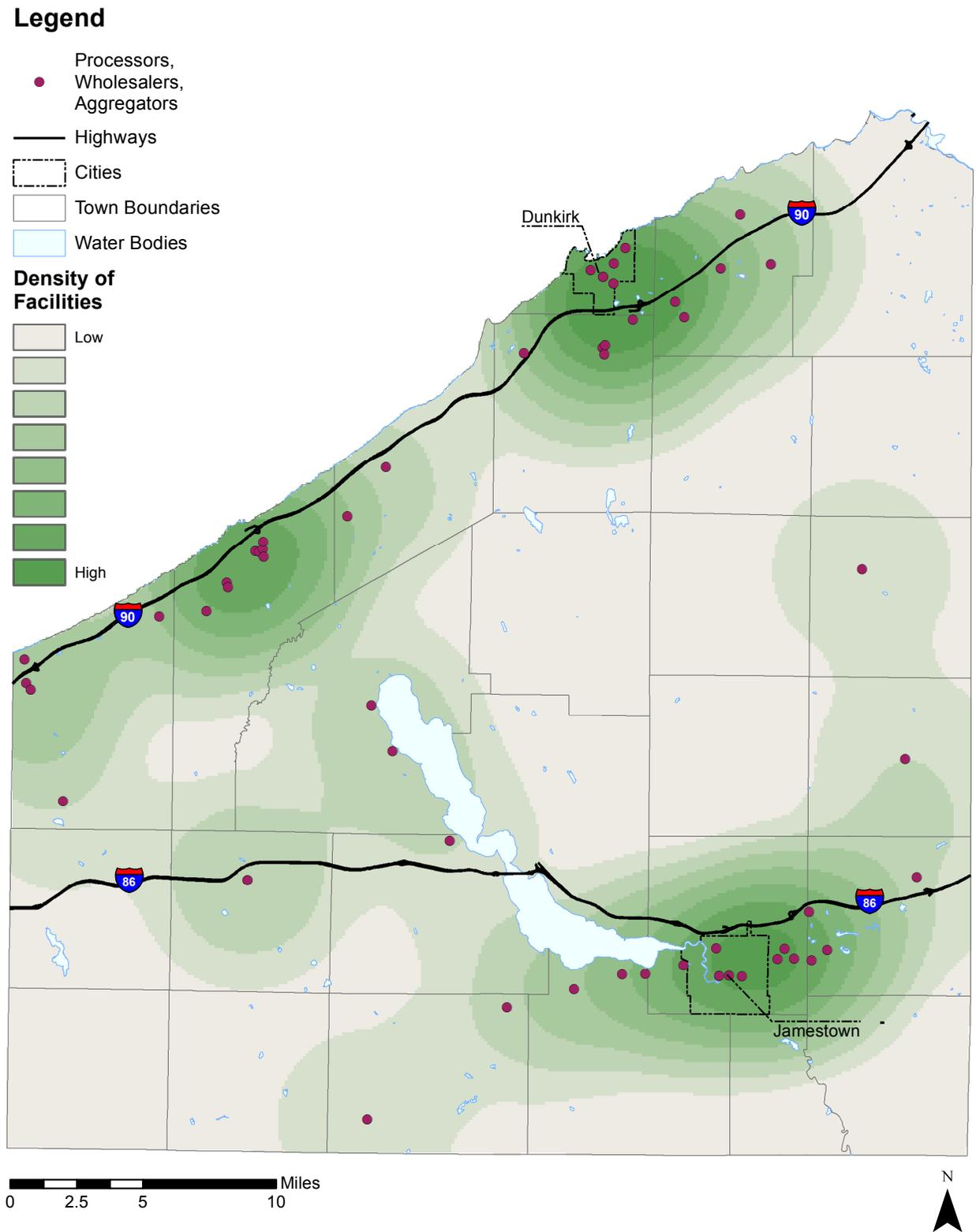
The second most common business in the AWP sector is retail bakeries, which comprise 14 percent of the establishments in the sector. The large number of bakeries in the county could provide an opportunity to use county-grown and milled flour. Yet, there is not a grain mill in Chautauqua County to capture the county's production of grain, which comprises 23 percent of all agricultural crop sales (Chapter 3, Section 3.5). The only functioning grist mill in the county, Busti Mill, closed in 1959 and although it has been preserved, it remains a historic site and is not an active milling operation.[46]

Dairy processing comprises about five percent of the businesses in the AWP sector, although as noted in the prior chapter, county dairy farms represent 13 percent of total farm operations and generate 42.5 percent of total agricultural sales (Chapter 3, Section 3.5). Dairy processing, therefore, offers an opportunity to grow the AWP sector, particularly among small-scale dairy farmers.

Two meat processors within the county serve the livestock industry. The meat processing industry may have room to grow because of the significance of cattle operations in the county, which generate the second highest annual sales after dairy production (Chapter 3, Section 3.5). Many livestock farmers must individually bring their cattle to and from the processing plants, placing burden on them with the time and cost of transportation.[47] Southern Tier West Regional Economic and Planning Board, which provides oversight for planning and economic development decisions across three counties, conducted a study of meat processors to determine the opportunities in the tri-county region. The study found that farmers across the Southern Tier region travel an average of 1.2 hours to bring their livestock to be processed.[47]

There is currently not a specified

Figure 4.1 Distribution of Wholesalers, Processors, and Aggregators



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Reference USA 2016 selected NAICS codes 31-33 (Manufacturing), 42 (Wholesale); Map prepared by Erin Sweeney, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Table 4.1. Types of Food Aggregation, Wholesale and Processing (AWP) Businesses, 2016

Part of the Sector	Type of Business by NAICS Code	NAICS code	No.	%	
Aggregation and Processing	Wineries	312130	15	26.8	
	Retail Bakeries	311811	8	14.3	
	Breweries	312120	3	5.4	
	Cheese Manufacturing	311513	2	3.6	
	Meat Processed From Carcasses	311612	2	3.6	
	All Other Miscellaneous Food Manufacturing	311999	2	3.6	
	Soft Drink Manufacturing	312111	2	3.6	
	Fruit & Vegetable Canning	311421	1	1.8	
	Commercial Bakeries	311812	1	1.8	
	Other Snack Food Manufacturing	311919	1	1.8	
	Total Aggregation and Processing			37	66.1
	Wholesale	Packaged Frozen Food Merchant Wholesalers	424420	5	8.9
		Dairy Product (Exc Dried Or Canned) Merchant Wholesalers	424430	3	5.4
Fresh Fruit & Vegetable Merchant Wholesalers		424480	3	5.4	
Other Grocery & Related Products Merchant Wholesalers		424490	2	3.6	
Livestock Merchant Wholesalers		424520	2	3.6	
General Line Grocery Merchant Wholesalers		424410	1	1.8	
Dairy Product (Exc Dried Or Canned) Merchant Wholesalers		424450	1	1.8	
Other Farm Product Raw Material Merchant Wholesalers		424590	1	1.8	
Beer & Ale Merchant Wholesalers		424810	1	1.8	
Supermarkets/Other Grocery (Exc Convenience) Stores		445110	0	0	
Total Wholesale			19	33.9	
Total				56	100

Data source: Reference USA, 2016

transportation system or network that serves the AWP sector in the county to connect small-scale producers to local processors and wholesalers. Products produced locally (e.g. milk, meat, grains) are not necessarily used by the associated processing facilities (e.g. Fieldbrook Foods, an ice cream processor or Maplevale Farms, an aggregator and wholesaler that distributes meat). This may be due to the lack of a transportation system that would meet the regulations of the AWP sector and relieve producers of the time and cost of personally transporting their products. Currently, two regional entities, Latina Boulevard Foods (Buffalo, NY) and Regional Access (Ithaca, NY), make deliveries between producers, processors, and retailers in Western New York but not specifically between Chautauqua County enterprises.[48,49] In addition, the Western New York Food Hub, run by Eden Valley Growers, launched in 2017.^{xxxi} The hub could act as a large-scale aggregator and wholesaler for Chautauqua County products. However, the food hub is located in Erie County, and producers must deliver products to the hub site in Eden, NY.[51] The lack of a transportation network could make it challenging for small-scale producers to sell to the food hub.[52]

4.3 Grapes for Growth: AWP in the Grape Industry

The history of Chautauqua County's AWP industry is tied closely to its heritage of grape growing. Grape production comprises a significant component of the agricultural sales in the county (Table 3.8), an economic opportunity capitalized on by two important companies in the AWP sector: Welch's Grape Juice, Inc. and Growers' Cooperative Juice Company. Welch's Inc. is a large-scale, nationally recognized food processing ^{xxxi} The USDA working definition of a food hub is 'a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.' [50]

company, while the Grower's Cooperative Juice Company is a large-scale business that works with farmers located Western New York and Northeastern Pennsylvania, and sells some product in Chautauqua County through regionally-owned retailers.[53]

In 1896, the founder of Welch's Inc. located the company's plant in Westfield, NY, where Concord grape supply was abundant. [54] Westfield quickly became known as "the Grape Juice Capital of the World".[55] The company benefited from, and may have spurred, the increase in grape production in the region from the late 1990s to 2012 (Chapter 3, Section 3.5). In 2001, Welch's closed its Westfield headquarters office, which employed 93 workers. The company cited lower than expected grape yields, as well as the national economic downturn, as the primary reasons for moving the headquarters to Massachusetts.[54]

Using a model where grape farmers are also share-holders of the company (member-owners), the Growers Cooperative Juice Company has grown from eleven original member-owners in 1929 to the current 81 member-owners who farm over 3,000 acres of grapes across Chautauqua and Erie (PA) counties. The company's only plant, in Westfield, NY, processes up to 18,000 tons of grapes per day, an increase from 20 tons in 1929. The plant employs 22 workers, five fewer than were employed when the plant first opened. The Cooperative processes the grapes into juice and concentrate, and sells to wineries and store brand bottlers such as Old Orchard and Minute Maid in eastern US states, Canada and South Korea, as well as to 16 retailers located in Chautauqua County. [53]

Both Chautauqua County-based companies focus only on processing grapes into juice and concentrate, and do not engage in additional value-added activities such as production of jams.

Since large-scale food processing companies are important to the economic fabric of rural areas, their exodus can create

Table 4.2 Annual Gross Sales Volume of AWP Businesses, 2016

Range of Sales Volume (\$)	Number of Businesses	%
<500,000	16	28.6
500,000-1 Million	9	16.1
1-2.5 Million	4	7.1
2.5-5 Million	4	7.1
5-10 Million	6	10.7
10-20 Million	7	12.5
20-50 Million	4	7.1
50-100 Million	1	1.8
100-500 Million	1	1.8
Over \$1 Billion	1	1.8
Sales Volume Unknown	3	5.4
Total	56	100

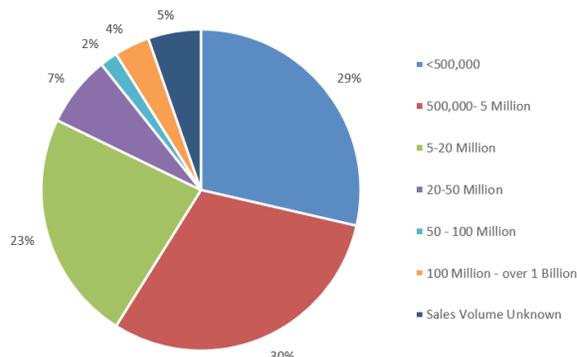
Data Source: Reference USA, 2016

an economic downturn through decreased employment opportunities and loss of ancillary businesses.[56] The departure of the Welch’s Inc. headquarters office in 2001, as well as ConAgra Foods in 2015, have had effects beyond immediate job loss at the facilities; there was a ripple effect that impacted farmers, retailers, and other ancillary sectors such as transportation that depended on the business from the companies.[57] Therefore, strategies such as localization of food supply chains, small-scale business development, and diversification of businesses across the AWP sector is useful (see case studies in Chapter 9).

4.4 Annual Sales Volume of AWP Businesses

The food aggregation, wholesale and processing industry in Chautauqua County brings significant capital into the region. Most AWP businesses are small-scale operations

Figure 4.2 Sales Volume among AWP Food Businesses



Data Source: Reference USA, 2016

with annual sales less than \$10 million. Twenty-eight percent of AWP businesses have an annual sales volume of less than \$500,000 (Table 4.2). Businesses with total sales volumes of more than \$100 million annually comprise less than four percent of the total sales across the sector (Figure 4.2).

A handful of large businesses generate majority of sales in the sector. The combined sales volume of one beverage processor, Cliffstar LLC, which operates several juice bottling plants in the county under the Cott Beverages label, and one aggregator, Maplevale Farms, generate 81 percent of the total annual sales in the AWP sector (Table 4.3).

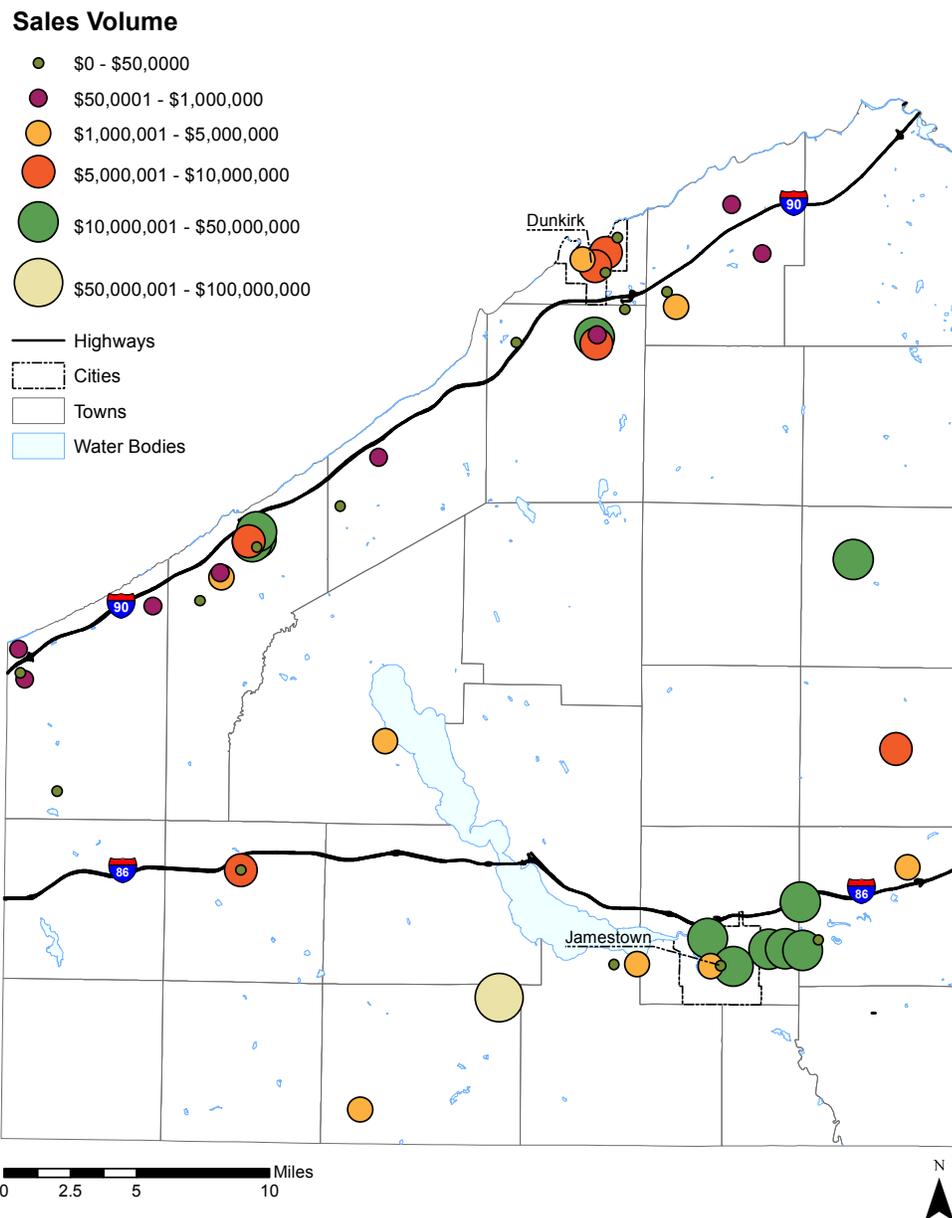
Although the aggregation, wholesale, and processing businesses are spatially distributed across the county, the high sales volume businesses are concentrated in Jamestown and along Interstate 90 (Figure 4.3).

Table 4.3 Two Businesses with Highest Sales Volume in AWP Sector, 2016

Business Name	Location Sales Volume (\$)	%
Cott Beverages (formerly Cliffstar Inc)	1,284,572,000	81.9
Maplevale Farms Inc	231,506,000	
All other businesses (54)	334,177,000	18.1
Total	1,850,255,000	100

Data Source: Reference USA, 2016

Figure 4.3 Distribution of Processors, Wholesalers and Aggregators by Sales Volume



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Reference USA 2016 selected NAICS codes 31-33 (Manufacturing), 42 (Wholesale). Map prepared by Erin Sweeney, Cultivating Prosperity Studio with assistance from Samantha Bulkilish.

Voices of the Community: Reverie Creamery^[63]

Reverie Creamery is a micro-scale business with a macro-scale impact on Chautauqua county's product processing industry. Riko Chandra, co-owner and cheesemaker, decided to open an artisan cheese shop in Mayville in 2015. Reverie processes 2,500 pounds of milk per week procured from grass-fed cows in Chautauqua County. Although the business is young, Reverie reported annual sales between \$250,000 and \$500,000 in 2016.

Chandra spent the two years prior to opening the shop learning from various cheesemakers across the world. Reverie received support from the New York State Department of Agriculture and Markets (NYSDAM) to launch the business, with additional input from the Cornell Cooperative Extension. Chandra has chosen to keep the shop small in scale for now, procuring milk from just one dairy farmer, and in the 2017 season, one goat farmer.

Chandra has specific requirements when choosing to work with a farmer, due to the creamery's small size and dedication to taste.

According to Chandra, Reverie's partner farmer is happy to work with Chandra, who is transforming the raw product through a "labor of love", and the farmer is willing to deliver the milk once a week – which is a challenge (and barrier to participation) for farmers who operate large-scale farms. Although Chandra had to search for his first partner farm, several other farms now hope to work with him as he grows the business and his infrastructure to accommodate

additional supply. As the first artisan creamery in the county, Chandra hopes to inspire more dairy processing businesses to open and provide an outlet for the demand from dairy farmers and increasingly, from customers.

Chandra notes several factors that motivated him to open shop in the county, and these factors have helped the business become successful. The shop is located near Chautauqua Institution, which was a motivating factor for why he decided to move to the county. Tourists from Buffalo, Cleveland and Pittsburgh visiting the Institution, or the many nearby wineries, make up 60 percent of Reverie's customer base. Due to Reverie's commitment to quality and consistency over quantity, the cheese won an award at the state fair, and is now sought out by major grocery stores. Chandra notes that his business growth has been largely due to quality and networking – he found his farmer, distributor, and new retail outlets through connections with knowledgeable people in the region.

The greatest challenges Reverie faces are linked to the location and demographic characteristics of the county. The seasonality of the customer demand, linked to the tourism at Chautauqua Institution, slows business in the winter months. Chandra wants to stay open year round to demonstrate his commitment to the community residents. Chandra intentionally varies the types of cheeses, and the prices, to encourage customers who may not be accustomed to artisan cheese to try it. Many artisan cheese shops like Reverie charge \$25 per pound, but Chandra keeps several wheels at prices starting at \$8 per pound.

Chandra is committed to the success of the food system, across sectors, in Chautauqua County. He sources other ingredients for the cheese from maple, honey, and herb

producers, and sells locally-crafted cheese boards in the shop. Reverie collaborates with other retail shops, a restaurant, and Chautauqua Institution to sell his cheese. Chandra hopes to see a stronger focus on value-added production in Chautauqua County in the future, which will require a branding strategy and commitment to local purchasing. As a board member of the Cornell Cooperative Extension, Chandra hopes to help bring about systematic change in the county. Chandra noted that due to the number of farmers, especially in the dairy industry, a shared use kitchen or other processing and value-added space would create the infrastructure

needed to scale-up smaller and mid-sized food businesses. With additional support, those businesses would contribute to the local economy by purchasing other local products and hiring area residents. Chandra employs five people from the county, and is committed to leveraging Reverie and other small processing businesses to boost the local economy and support young county residents to bring their own ideas to fruition. Because, Chandra notes, “young people are the future.”



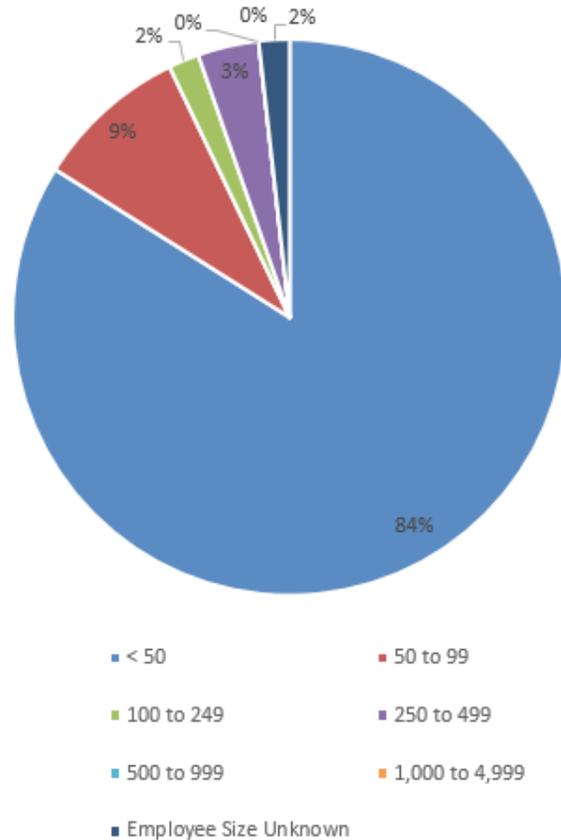
A busy afternoon at the Reverie Creamery farm shop in Mayville, NY. The shop specializes in artisan cheese-making using locally-sourced raw products. [Photo credit: Kai Sun]

Table 4.4 Employment in the AWP Sector, 2016

Size of Employee Base	Number of Businesses	%
1 to 4	27	48.2
5 to 9	9	16.1
10 to 19	7	12.5
20 to 49	4	7.1
50 to 99	5	8.9
100 to 249	1	1.8
250 to 499	2	3.6
500 to 999	0	0
1,000 to 4,999	0	0
Employee Size Unknown	1	1.8
Total	56	100

Data Source: Reference USA, 2016

Figure 4.4 Range of Number of Employees among AWP Businesses



Data Source: Reference USA, 2016

4.5 Employment in the AWP Sector

The AWP sector plays a crucial role in providing employment to county residents. Almost half of the food processing, aggregation, and wholesale businesses in Chautauqua County employ between one and four employees (Table 4.4), and the vast majority, 84 percent, of the businesses in this sector have fewer than 50 employees (Figure 4.4). These “small” businesses qualify for certain loans and credit lines, according to the U.S. Small Business Administration.[59]

Table 4.5 Size of Facility of AWP Food Businesses, 2016

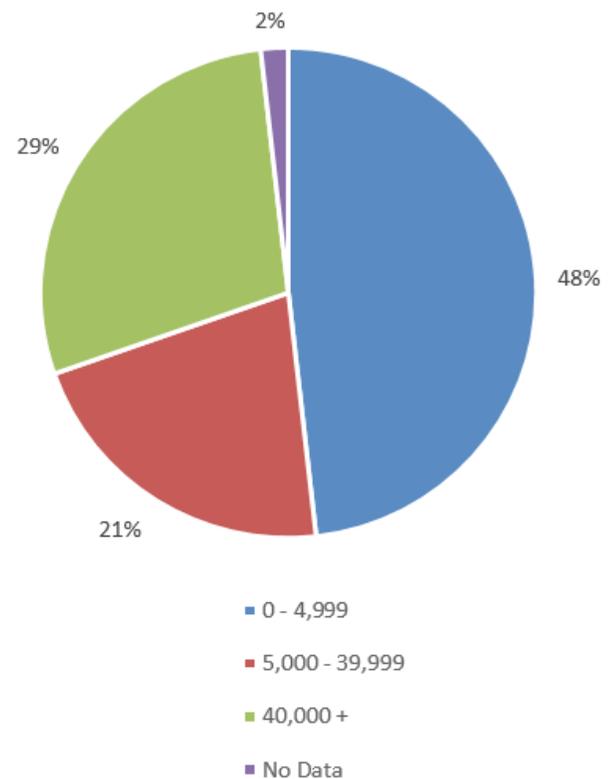
Range of Size of Facility (sq. ft)	Number of Businesses	%
1,500 - 4,999	15	26.8
2,500 - 2,499	12	21.4
40,000 - 99,999	8	14.3
100,000+	8	14.3
5,000 - 9,999	4	7.1
10,000 - 19,999	4	7.1
20,000 - 39,999	3	5.4
< 1,500	1	1.8
Size of Facility Unknown	1	1.8
Total	56	100

Data Source: Reference USA, 2016

4.6 Size of Facilities in the AWP Sector

Aggregation, wholesale and processing facilities vary in size of facility, which impacts their current and future operational capacities. Almost half of the facilities have small footprints, between 1,500 and 4,999 square feet (Table 4.5), while facilities larger than 40,000 square feet comprise 29 percent of AWP businesses (Figure 4.5). If demand for aggregated and processed food products increased from Chautauqua County, new or expanded facilities could bring additional economic development to the region. Growth in the AWP industry may require modifications in land use and zoning policies that permit a range of AWP facility sizes and types in strategic locations that simplify systems of transportation and sales.

Figure 4.5 Size of Facility of AWP Food Businesses



Data Source: Reference USA, 2016

Table 4.6 Credit Scores among AWP Food Businesses, 2016

Level of Credit Rating	Number of Businesses	%
A+	13	23.2
A	7	12.5
B+	12	21.4
B	12	21.4
C+	7	12.5
C	4	7.1
Credit Rating Not Available	1	1.8
Total	56	100

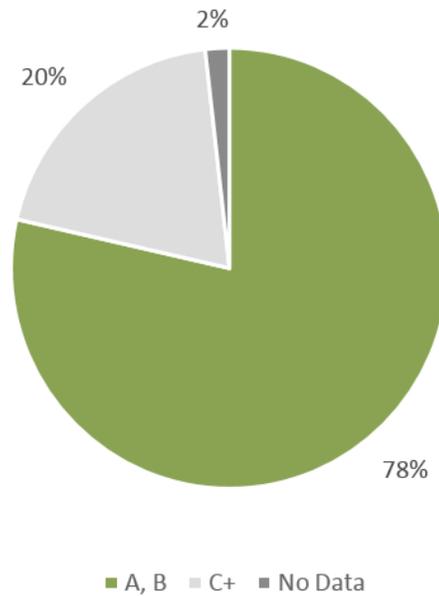
Data Source: Reference USA, 2016

4.7 Credit Worthiness of AWP Food Businesses

Credit ratings of the 56 AWP facilities in Chautauqua County are an important element to understanding their potential for longevity and growth. Good credit ratings enable businesses to access capital to develop their businesses. Businesses in Chautauqua County have credit ratings ranging from A+ to C,^{xxxii} with A+ as an excellent rating and C or lower as a poor rating. Almost 80 percent of businesses in the AWP food sector have a credit rating above a C, which situates them well for potential loan and investment opportunities for expansion and development (Figure 4.6). Only 7 percent of food businesses in the AWP sector in the county have a C (lowest score possible) credit rating (Table 4.6).

^{xxxii} Credit ratings are obtained from Reference USA, a private vendor.

Figure 4.6 Credit Scores among AWP Food Businesses



Data Source: Reference USA, 2016

4.8 Summary

The aggregation, wholesale and processing (AWP) sector in Chautauqua County has many strengths and challenges. The sector currently capitalizes on the county's agricultural asset of grapes, with a wealth of juice processors and wineries. The dairy processing industry offers opportunity for development. Since the majority of the businesses in this sector are small-scale in terms of annual sales volume and number of employees, there are opportunities for small business loans and other financial supports for increasing capacity.

As the two case studies demonstrate, this sector has strength among the entrepreneurs who build on the existing agricultural assets and ready customer base that includes both tourists and local residents. Small processors and aggregators cannot meet the demand from farmers however, as Reverie Creamery and CHQ Local Food have discovered. Transportation of products between farms and processing sites is a challenge because of the cost of trucking. The lack of small-scale or multi-purpose regionally-focused food transportation systems constrains economies of scale, as major processors and wholesalers maintain their own trucking fleets.

The essential AWP step in the food system transforms Concord grapes from raw product into beverages, jellies, and jams ready for consumers to enjoy. After the juice is bottled, it is shipped to store shelves or a school cafeteria. The process by which food is distributed to consumers via market, non-market, and emergency food channels in Chautauqua County is documented in the next chapter.



5. Distribution of Food

The most direct interaction people have with the food system occurs when they make a choice about where and how to obtain their jelly or milk. People make this choice at a variety of locations, including at a grocery store, a farmers' market, a school cafeteria, restaurant, or a food pantry.[60] Collectively, these locations comprise the distribution sector of the food system, or the link in the food supply chain that delivers food from AWP businesses or directly from farms to consumers.[61, 62]

In this report, the food distribution sector is defined through three pathways by which food is supplied to county residents: a) market-based supply chains such as food retail and food service; b) non-market supply chains such as emergency food providers, bartering, sharing, etc.; c) large institutions such as schools, universities, prisons, and hospitals that have a membership or institutional clientele. Each pathway directly links food supply outlets to residents, impacting residents' food security and health outcomes.

5.1 Market-Based Food Distribution Supply Chain

Residents in Chautauqua County acquire food through a variety of market-based supply chain sources, where economic transactions occur between the purchaser and supplier of food products, including food retail stores, restaurants, and direct sales outlets by farmers themselves. Chautauqua County is home to 459^{xxxiii} market-based food distribution operations that provide food to customers through two main venues: food retail stores^{xxxiv} and food service

xxxiii The estimated number of businesses was derived to create an accurate comparison to other sectors for Economic Conditions and was based on estimates derived from the U.S. Economic Census and ReferenceUSA. The rest of this section will use calculations about the 459 businesses based on quality control including phone call verification and web research.

xxxiv Each industry classification was sorted to identify businesses most likely involved in or related to the food system, based on NAICS code description. Retail classifications include 20 business types; transportation and warehousing includes 17 business types; and eight business types comprise the accommodation and food services classification.



Residents and visitors attend the Chautauqua Food Festival 2017 held at the Chautauqua Institution. Vendors had fresh and local products available for sale, there were various demonstrations, and food was prepared on site for attendees. [Photo credit: Chautauqua Institution]

Table 5.1 Profile of Market-based Food Distribution Supply Chain, 2012

Type of Market-based Food Distribution Businesses	Number of Businesses	% of Businesses	Sales Volume (\$1000)	% of Sales	Number of Employees	% of Employees
Retail (44, 45)	151	32.9	499,697	74.8	2,464	38.1
Accommodation and Food Services (72)	308	67.1	168,465	25.2	4,001	61.9
Total	459	100	668,162	100	6,465	100

Data source: U.S. Economic Census, 2012

Note: Number in parentheses is the North American Industrial Classification (NAICS) Code for the business

and accommodation (FSA) businesses^{xxxv} such as restaurants and cafeterias. The 459 businesses in the market-based food distribution category generate sales of about \$668 million per year, two-thirds of which is attributable to FSA businesses (Table 5.1). Market-based supply chains employ almost 6,500 individuals, most of whom are employed in food service and accommodation establishments (Table 5.1).

Food Retail Stores

Food retail stores in Chautauqua County include supermarkets, specialty foods stores, convenience stores, gas stations (with convenience stores), and warehouse stores that sell food to consumers (Table 5.2). Chautauqua County is served by 151 food retail stores that are concentrated in areas of high population density, and around Chautauqua Lake, which draws tourists (Figure 5.1). The food retail stores, which employ 2,464 individuals, generated nearly \$500 million in sales in 2016 (Table 5.2).

The predominant type of food retail stores that sell food in the county are gas stations that include convenience stores (n=38), and comprise 25 percent of all food retail stores. Supermarkets and other grocery stores (n=28) are the second largest type

xxxv Includes businesses with the NAICS code 72.

of food retail establishment comprising 18 percent of all food retail stores (Table 5.2).

Supermarkets and other grocery stores report the highest aggregated annual sales volume among food retail stores at \$199 million, and employ the highest percentage (47%) of employees among food retail stores (Table 5.2).

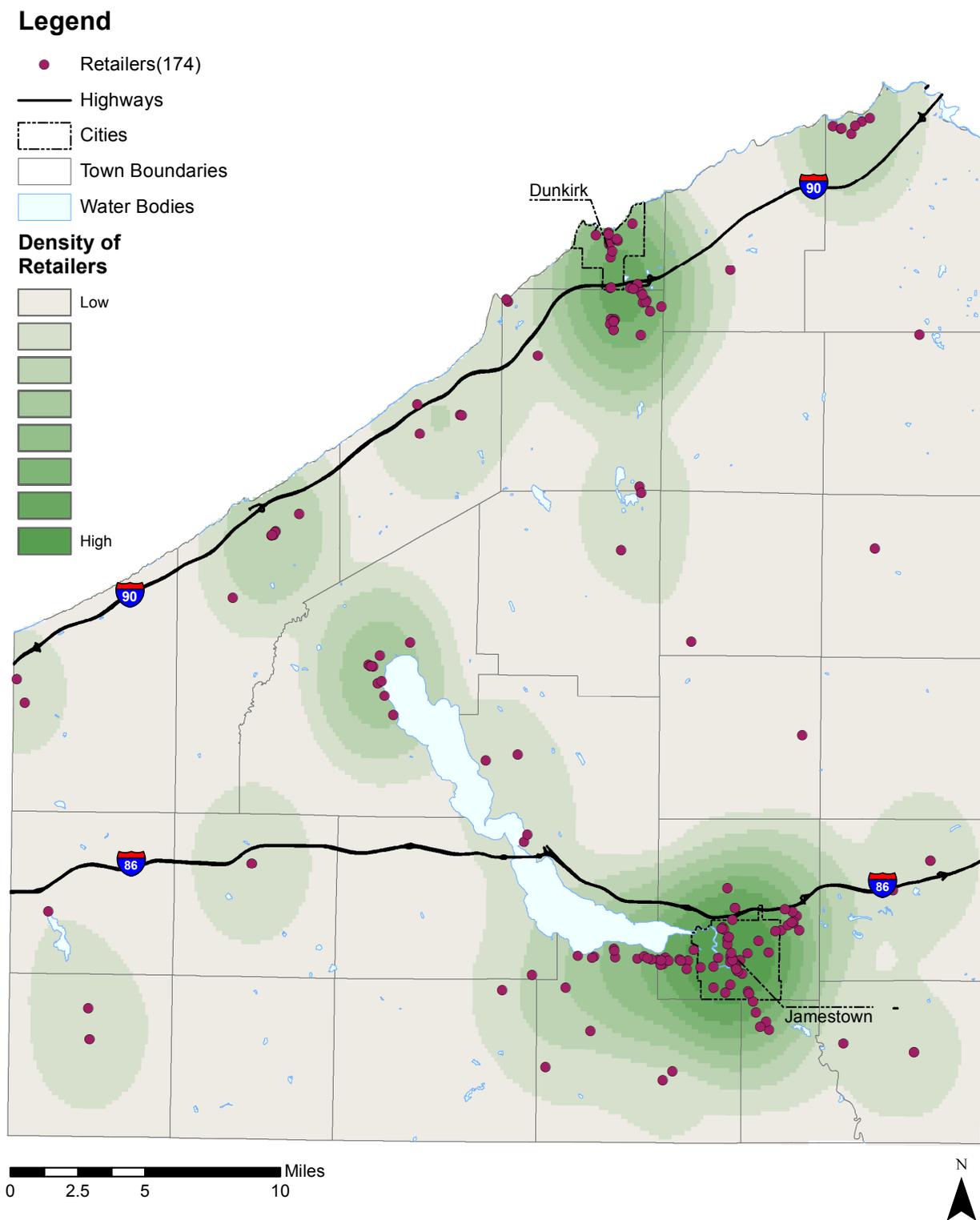
Supermarkets and grocery stores are an important element of the food retail environment. In Chautauqua County, supermarkets and grocery stores have varied ownership structures. More than half (54.3%) are locally-owned, independent establishments and the remaining (45.7%) are branches of larger companies (Table 5.3).

Locally-owned companies, such as the Cassadaga Shur Fine (see *Local Feature*), commonly occupy building footprints between 40,000 - 99,999 square feet, employ an average of 11 employees, and report annual sales around \$2.6 million (Table 5.3).

Branch companies operate at larger scales: businesses occupy facilities over 100,000 square feet, employ an average of 61 employees, and report average annual sales of about \$9.3 million (Table 5.3).

Branch companies operating supermarkets and grocery stores in Chautauqua County include regional chains

Figure 5.1 Geographic Distribution of Food Retail Stores



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Reference USA 2016 selected NAICS codes 44-45 (Retail). Map by Munsung Koh, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

such as Wegmans and Tops, and national supermarket chains such as ALDI and Save-a-Lot. Both ALDI and Save-a-lot advertise discount grocery items, including some private, company-specific labels and few national brand names.[67, 68] Tops Friendly Markets and Wegmans Food Markets are branch companies that have historic roots in Western New York, as both companies began as family business ventures in Niagara Falls, NY and Rochester, NY, respectively.[69, 70] They now operate regionally across New England, the Great Lakes, and East Coast region states; Tops Friendly Markets has brick-and-mortar stores in four states, while Wegmans operates stores in six states.[71,72]

Healthy Corner Stores

Healthy Corner Stores are convenience stores that have committed, often through non-profit or government support, to stock fresh fruits and vegetables to provide nutritious options for residents in an area where other food retail stores with produce might not exist. The Healthy Corner Store program was piloted in 2004 by the Food Trust in Philadelphia, and the organization now offers technical assistance and training to launch other programs across the country through the National Healthy Corner Store Network.[63] A pilot Healthy Corner Stores initiative was launched in Chautauqua County by community-led efforts to create positive changes in the food system in 2013.^{xxxvi}[65] A convenience store in Jamestown, Noe Place, was established as a Healthy Corner Store with support from the Chautauqua County Health Network (CCHN). CCHN and the Chautauqua County Department of Health and Human Services are collaborating to establish another store in Jamestown, and several in Dunkirk. An additional store in Sherman has agreed to engage in the process to become a Healthy Corner Store. [66]

xxxvi This effort was supported by a 2013 planning studio conducted by University at Buffalo Masters of Urban Planning students for Jamestown, called “Invest in Fresh: A Plan for Promoting Healthy Food Retail in Jamestown, New York”. [64]

Table 5.2 Profile of Retail Stores that Sell Food, 2012

Type of Food Retail Store	No. of Stores	Percentage of Food Retail Stores (%)	No. of Employees	Percentage of Employees (%)	Sales Volume (\$1,000)
Gasoline stations with convenience stores (447110)	38	25.2	335	13.3	123,760
Supermarkets and other grocery (except convenience) stores (445110)	28	18.5	1,190	47.1	199,163
Pharmacies and drug stores (446110)	23	15.2	433	17.1	119,984
Beer, wine, and liquor stores (445310)	17	11.3	93	3.7	15,109
Convenience stores (445120)	12	7.9	72	2.8	10,550
Nursery, garden center, and farm supply stores (444220)	11	7.3	73	2.9	15,220
Food (health) supplement stores (446191)	7	4.6	13	0.5	1,492
Other Direct Selling Establishments (454390)	12	7.9	64	2.5	8,824
Warehouse Clubs and Supercenters (452910)	3	2	255	10.1	14,419
Total	151	100	2528	100	499,697

Data source: U.S. Economic Census, 2012

Note: Number in parentheses is the North American Industrial Classification (NAICS) Code for the business

Table 5.3 Profile of Supermarket and Grocery Store Retail Outlets, 2016

Type of Company Ownership	Percentage of Outlets (%)	Average Number of Employees Per Outlet	Average Sales Volume Per Outlet (\$)	Typical Footprint (Square Footage)
Local Company	54.3	11	2,670,105	40,000 - 99,999
Branch Company	45.7	61	9,317,625	>100,000
Total/Average	100	36	5,993,865	—

Data source: Infogroup, Inc., 2016

Understanding Challenges in Geographic Access to Food for Chautauqua County Residents^{xxxvii}

Food retail in rural communities is often limited due to low population density development patterns. Low population density means less demand for food retail, and can influence the location and type of stores that chose to locate in rural areas, as well as the availability of certain foods stocked by those stores.

In Chautauqua County, geographic access to food retail varies across different parts of the county, and for different populations. For residents with access to a vehicle, food retail businesses seem easier to reach. The majority (91%) of residential parcels are within a 15 minute drive of one of the county's supermarkets and grocery stores (Figure 5.2).^{xxxviii} Households without access to a vehicle may find it significantly more challenging to reach food retail destinations to make food purchases, particularly due to the limited bus routes which do not reach certain areas of the county (Figure 5.3). The population density and subsequent demand must be considered however, as additional food retail businesses may not wish to locate, or may not survive, in the parts of the county with fewer residents.

The geographic distribution of food retail businesses in cities within the county

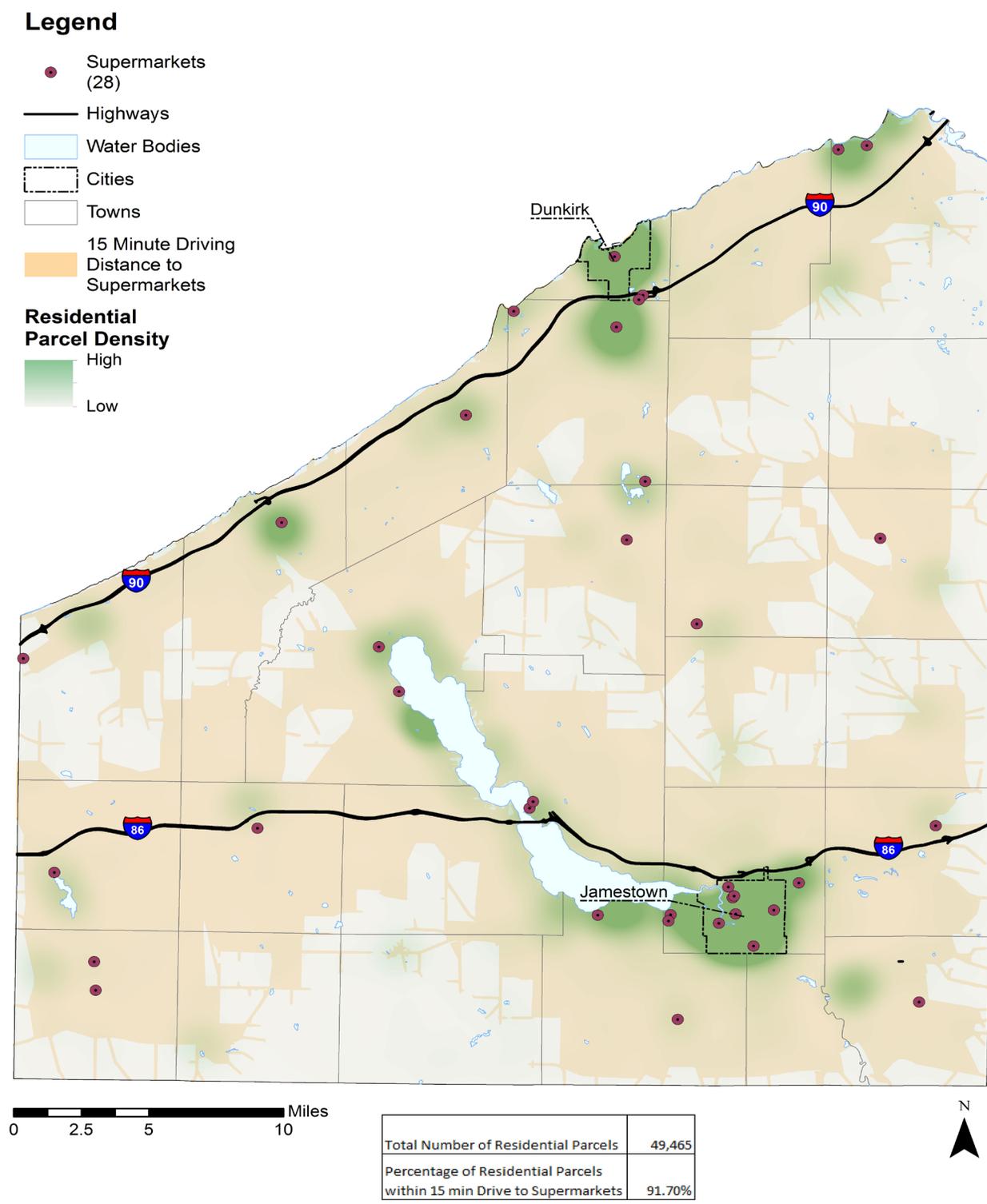
xxxvii The analysis for this section is based on a Geographic Information Systems (GIS) analysis of the food retail environment in the county. Details about methodology and data are available in Appendix A.

xxxviii Includes stores with NAICS codes 44, 45 (Retail trade).

can also present a challenge for residents without access to vehicles. Researchers recommend that residents in urban areas should be able to reach food retail stores within a 10 minute walk or less.[20] Residents in 30 percent of homes can easily walk to food retail locations in the city of Jamestown (Figure 5.4). Only residents in 14.8 percent of residential homes can easily walk to food retail businesses in Dunkirk (Figure 5.5). These data suggest that in both cities, residents without cars may need to rely on public transportation to shop for food. Although the supermarkets in both cities are located along public transportation routes, not all residential neighborhoods are served by public transportation. In Jamestown, the bus routes appear to be in proximity of majority of the residential land parcels (Figure 5.4). In Dunkirk however, the residential parcels on the southwestern side appear to be outside the bus route service area (Figure 5.5).

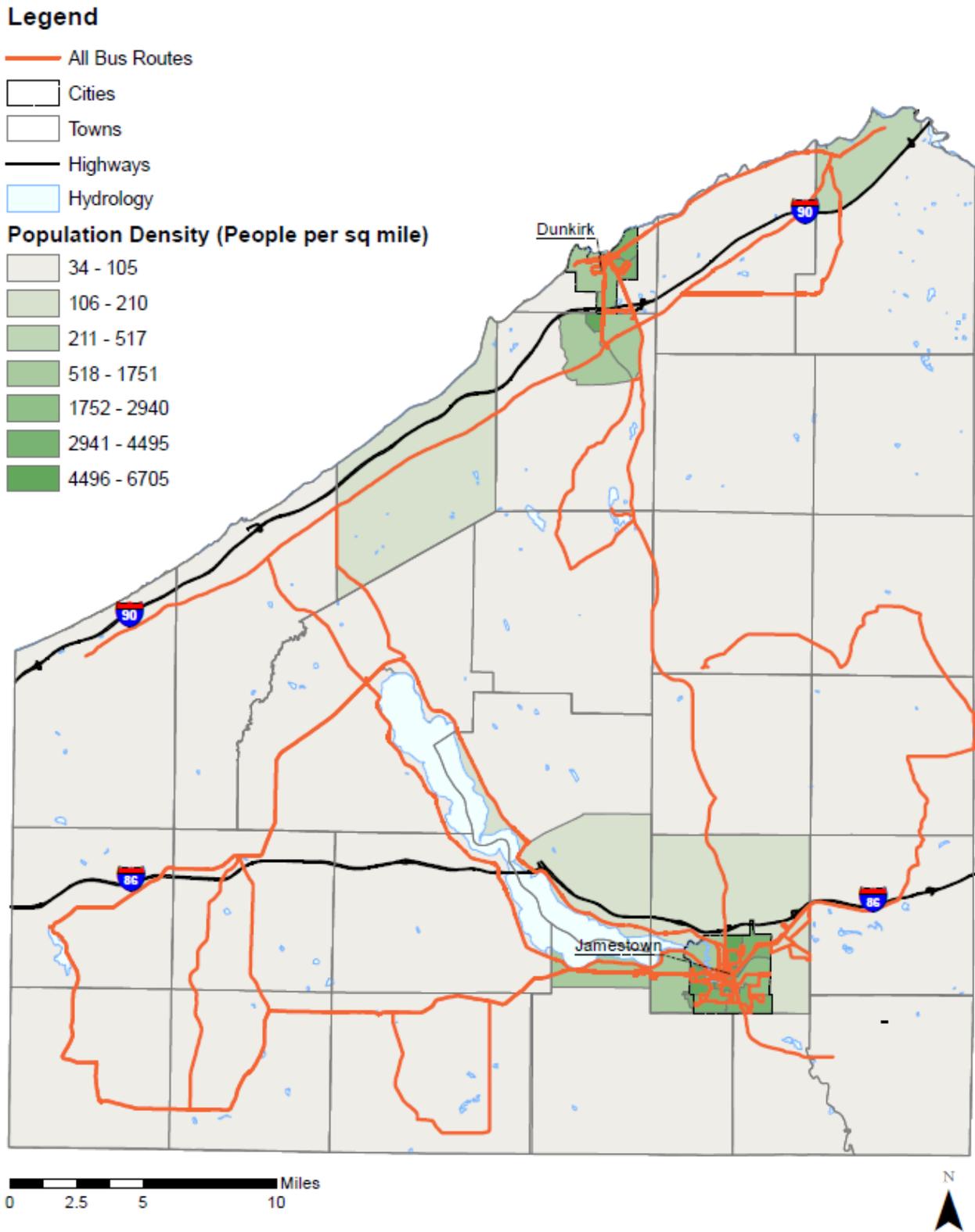
Geographic location and distribution of food retail stores are not the only factors that influence consumers' ability and decisions to purchase, prepare, and eat healthy food. Factors such as consumers' level of education, physical health and ability, income, availability of other shopping opportunities around the food retail stores, incentives to purchase healthier foods, and household characteristics and food preferences may have a greater effect on consumers' behaviors and level of food security. These important factors, which are linked to key components of the food system such as employment and transportation, **must** be considered when developing strategies to improve food security.[73]

Figure 5.2 Residential Areas Served by Supermarkets and Grocery Stores



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Chautauque County Information Technology Services, Parcels 2017 (codes residential 200); Reference USA 2016 selected NAICS codes 44-45 (Supermarkets and Grocery stores). Map by Munsung Koh, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Figure 5.3 Population Density with Public Transportation Routes

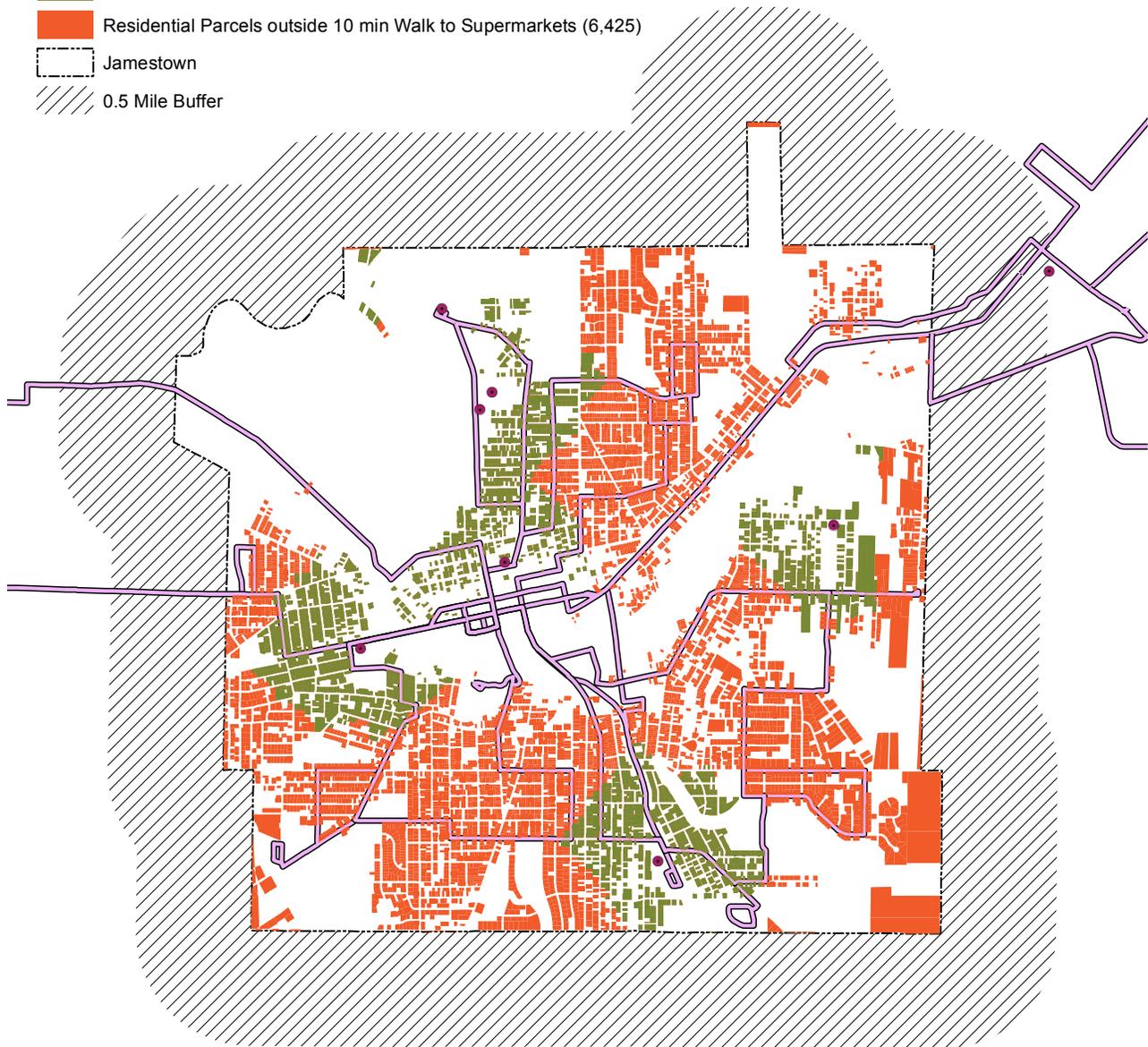


Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Chautauqua County Information Technology Services, Parcels 2017 (codes residential 200); Reference USA 2016 selected NAICS codes 44-45 (Supermarkets and Grocery stores). Map by Munsung Koh, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

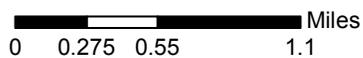
Figure 5.4 Residential Areas Located Farther than Ten Minute Walk to Supermarkets and Grocery Stores in Jamestown, NY

Legend

- Supermarkets (7)
- Public Transit Routes
- Residential Parcels within 10 min Walk to Supermarkets (2,843)
- Residential Parcels outside 10 min Walk to Supermarkets (6,425)
- Jamestown
- 0.5 Mile Buffer



Total Number of Residential Parcels	9,268
Percentage of Residential Parcels within 10 min Walk to Supermarkets	30.67%

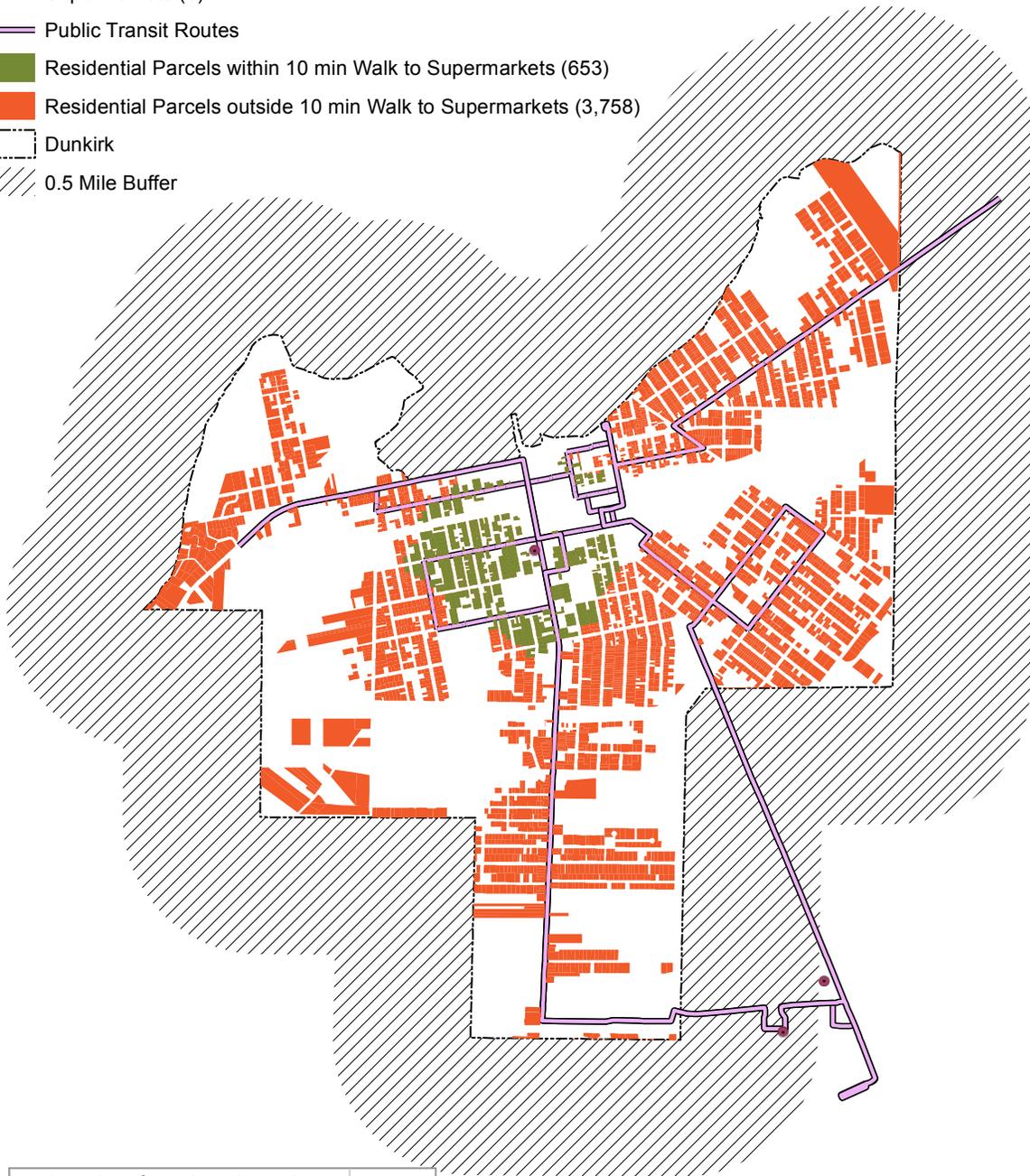


Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Reference USA 2016 selected NAICS codes 44-45 (Supermarkets and Grocery Stores). Map by Munsung Koh, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

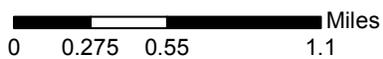
Figure 5.5 Residential Areas Located Farther than Ten Minute Walk to Supermarkets and Grocery Stores in Dunkirk, NY

Legend

- Supermarkets (3)
- Public Transit Routes
- Residential Parcels within 10 min Walk to Supermarkets (653)
- Residential Parcels outside 10 min Walk to Supermarkets (3,758)
- Dunkirk
- ▨ 0.5 Mile Buffer



Total Number of Residential Parcels	4,411
Percentage of Residential Parcels within 10 min Walk to Supermarkets	14.80%



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Reference USA 2016 selected NAICS codes 44-45 (Supermarkets and Grocery Stores). Map by Munsung Koh, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Local Feature: Cassadaga Shur Fine^[74]

The Cassadaga Shur Fine is a cornerstone in the Chautauqua County community of Cassadaga. The grocery store operates under the leadership of Paul Lehen, a second-generation owner, who found his way back to the region after a period post-college when he lived and worked near Buffalo. The Lehen family assumed ownership and operation of the store in 2010. The store stocks a variety of essential products, ranging from fresh produce to cleaning supplies, and offers additional services such as sale of hunting and fishing licenses.

The Lehen family has a dedicated base of customers, although their presence fluctuates seasonally. Demand for the store's goods and services is higher from June through August when the region is bustling with activity from tourists and seasonal residents. The regulars, or "core customers", account for 90 percent of the business. Lehen estimates that close to 50 percent of his customer base relies on some food assistance program, a proportion that has increased over time. Paul notes that retaining the local customers, and encouraging them to shop for weekly groceries solely at Cassadaga Shur Fine, is a struggle. Large retailers, such as Wal-Mart and Big Lots, are a short drive away in the Dunkirk-Fredonia area, and recently a Dollar General store moved in on an adjacent lot, which creates stiff competition. Large retailers undercut smaller stores by selling high volumes of product at lower prices.

After close to a decade of ownership, Lehen admits that some of the thrill of the work has faded since the first day he

opened, but he still sees opportunity for growing the business. Despite the direct competition from large retailers, Lehen invests in relationships with local producers and growers to stock and sell healthy, local produce, including corn, strawberries, and squash. He is happy to offer county-produced items to customers at a lower price compared to large retailers.

Still, the Lehen family face several barriers that limit them from stocking and selling local goods. One barrier is the shopping preferences and expectations of the local customers. Lehen prefers to purchase local meat from 4-H, because the organization handles the butchering and processing then delivers the meat to Shur Fine. The price of 4-H meat is a deterrent for customers as it is higher than meats supplied by the cooperative warehouse where Lehen sources majority of Shur Fine's products. Certain higher-price products, e.g. organic milk, have become profitable to stock regularly, but popularity took time to grow.

As someone who grew up in the community, Lehen is deeply committed to Cassadaga and Chautauqua County, a dedication he demonstrates daily at the Shur Fine. Shur Fine makes regular donations to local organizations that support hunger relief and provide supplementary food assistance. Lehen actively engages the local government to support small businesses owners throughout the county. He notes that facilitating conversations between business owners and local government officials is vital to the success of small business owners. For local retailers such as Cassadaga Shur Fine, better connectivity to food producers, warehousing, and transportation services in the county are likely to increase the ability of food retail store owners - like Lehen - to stock and sell local products and specialty items, a connection that can be facilitated by local government.

Food Service and Accommodation

Food service and accommodation (FSA) establishments, which include restaurants, caterers, and snack or beverage bars, provide prepared foods to customers.^{xxxix} In the United States, consumers spend a significant proportion of their food-related expenditures at these locations. In Chautauqua County, there are 308 food service and accommodation (FSA) establishments, outnumbering food retail stores. FSA establishments employ 4,001 individuals and generate nearly \$170 million in sales (Table 5.4).^{xl} Restaurants comprise nearly two-thirds of FSA businesses: 45.5 percent are full-service restaurants^{xli} and 31.5 percent are limited-service restaurants (Table 5.4).^{xlii}

Businesses in the food service and accommodation industry in Chautauqua County are primarily local companies operating independently from a single location.^{xliii} The businesses in this sector are concentrated specifically around the two major cities and Chautauqua Lake, and are less dispersed than the food retail stores where raw food products can be purchased (Figure 5.6).

A number of FSA operations have begun to source locally with support from the *Chautauqua Grown* initiative,^{xliv} managed by the Cornell Cooperative Extension. The initiative identifies links between potential buyers, locally-owned independent food service businesses, and area producers. *Chautauqua Grown* provides a list of food service businesses that utilize agricultural and food products produced within the county in their available offerings: currently 14 food service and accommodation (FSA) businesses participating in local product sourcing.[75]

xxxix For a complete list of businesses included in the Food Service sector, refer to Appendix E.

xl There are a total of eight business classifications for the accommodation and food service industry.

xli NAICS code 722511: This industry is composed of establishments where food is served to patrons while seated and pay after eating (InfoGroup 2017).

xlii NAICS code 722513: This industry is primarily composed of establishments where patrons order food and pay prior to eating (InfoGroup 2017).

xliii The North American Industrial Classification System polls businesses on the “type” of business and the “type” of location, identifying privately and publically-owned businesses, and single location or branch locations. These metrics are used to determine if businesses are locally owned and operated, locally-owned franchises, or owned and operated as part of regional or national holding company.

xliv Chautauqua Grown is an initiative of Cornell Cooperative Extension – Chautauqua County to support and promote the agricultural resources of Chautauqua County. The initiative takes the form of an interactive database available on CCE – Chautauqua County’s website, providing information about the importance of buying local and a variety of search parameters to filter through the information. Agriculture Program Community Educator Katelyn Walley-Stoll is the primary contact for questions regarding Chautauqua Grown. The initiative began around 2013 with a grassroots collaboration of local stakeholders in the food system of Chautauqua County attempting to compile a farm-to-table resource. CCE Chautauqua County took on the responsibility of completing the work in late 2014.

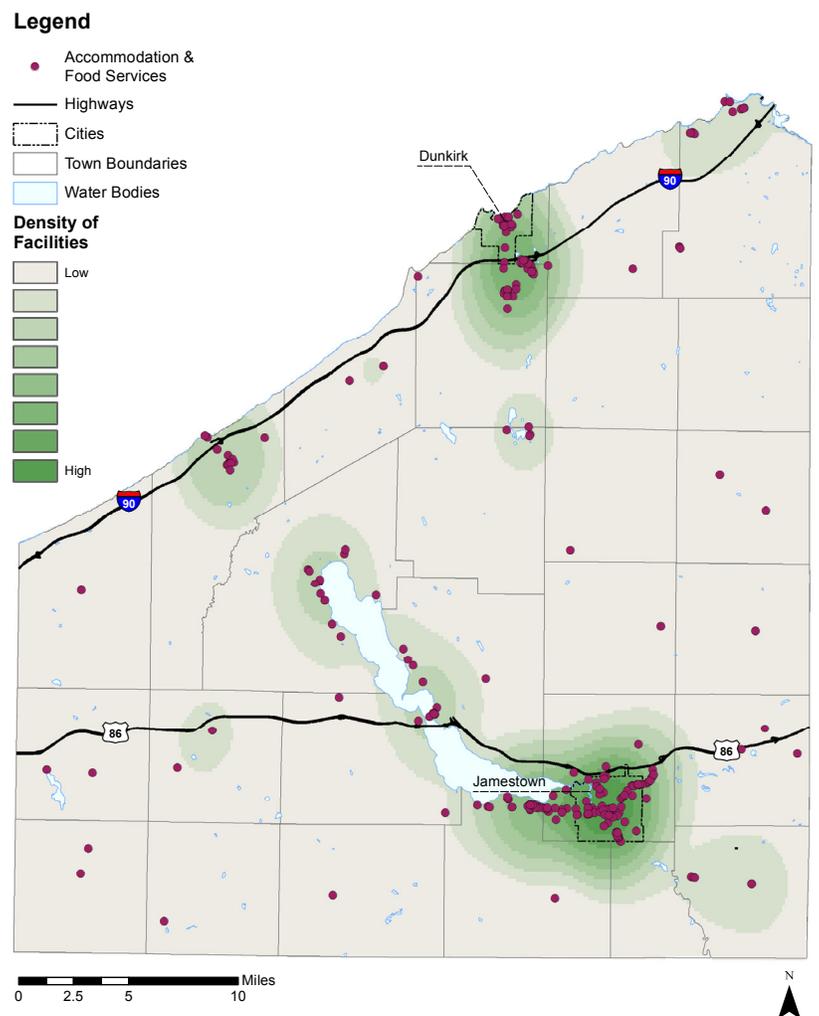
Table 5.4 Characterization of Food Service and Accommodation (FSA) Businesses, 2012

Business Classification	Number of Businesses	Percentage of Businesses (%)	Number of Employees	Percentage of Employees (%)	Sales Volume (\$1,000)
Full-Service Restaurants (722511)	140	45.5	1745	43.6	66,127
Limited-Service Restaurants (722513)	97	31.5	1241	31.0	64,618
Drinking Places Alcoholic Beverages (722410)	37	12.0	255	6.4	7,397
Snack & Nonalcoholic Beverage Bars (722515)	19	6.2			
Cafeterias, Grill Buffets & Buffets (722514)	1	0.3	104	2.6	6,087
Food Service Contractors (722310)	9	2.9	646	16.1	23,513
Caterers (722320)	3	1.0			
Mobile Food Services (722330)	2	0.6	10	0.2	723
	308	100	4,001	100	168,465

Data source: U.S. Economic Census, 2012

Note: Number in parentheses is the North American Industrial Classification (NAICS) Code for the business

Figure 5.6 Distribution of Food Service and Accommodation Businesses



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; Reference USA 2016 selected NAICS codes 72 (Food Service and Accommodation); Map by Mun-sung Koh, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Farmstands, farmers markets, and other direct sales by farmers

Food also reaches customers through direct sales by farmers to consumers without an intermediary. These supply chains occur in Chautauqua County through community-supported agriculture (CSAs), farmer's markets, and roadside or farm stands.^{xlv} In Chautauqua County, direct-to-consumer distribution occurs at eight farming establishments (Table 5.5).

Direct-to-consumer methods of distribution function primarily as seasonal supply chains, operating during the growing season when producers have the freshest products. This period extends from April to October in Chautauqua County. New York State has approximately 6,300 producer operations distributing through direct-to-consumer sales, and the products from these operations amount to \$237 million in sales (Table 5.6).^{xlvi} Producers' sales of value-added goods total \$230 million across New York State (Table 5.6).

The three CSA operations in the county specialize in meat (beef, poultry, and chicken) and cut flowers, while also offering a selection of diversified fruits and vegetables.[75] Out of all other states, New York has the second largest number of direct consumer sales by sales volume, about \$100 million, and is among the top ten states for participation in direct farm to retailer sales (7% of all farms).[76]

The five farmers markets in Chautauqua County are another form of direct connection between farmers and customers (Table 5.5). Farmers markets in Chautauqua County have used innovative ways of attracting new customers and supporting low-income shoppers. Since 2014, two farmers markets (Fredonia and Jamestown) in Chautauqua County have offered a "Double Up Food Bucks" (DUFB)

xlv There are no data available about roadside or farm stands in the Agriculture Census.

xlvi According to the USDA's 2015 Local Food Marketing Survey.

program for Supplemental Nutrition Assistance Program (SNAP) recipients. Both markets also have vendors who accept WIC^{xlvii} and SFMNP^{xlviii} checks.[78,79] In 2016, the Jamestown Farmers Market sold \$8,011 worth of produce through SNAP and DUFB sales. Over the course of the three years the market has participated in the program, organizers report a total of \$30,753 in SNAP/DUFB sales (Table 5.7). According to market manager Christina Breen, the market has had 20 to 40 SNAP transactions per week, many of which were returning customers' purchases. The market has also seen five to eight new customers each week.[80] Although the number of customers is increasing, SNAP and the matching DUFB sales have decreased steadily since 2014 (Figure 5.7).

The Fredonia Farmers Market has also offered a DUFB program since 2014, and SNAP sales increased 173 percent from 2013 (without DUFB) to 2014 with the launch of the program (Table 5.8). Margaret Bruegel, Fredonia Farmers Market President, noted that the 27 percent decrease in SNAP/DUFB sales from 2015 to 2016 may be due to an increase of other markets in the area.[79]

To determine the percentage of local food being purchased by SNAP recipients in Chautauqua County, the total SNAP sales at all retailers were compared with SNAP redemptions at the two farmers markets that offered DUFB (Table 5.9).^{xlix} SNAP sales at two farmers markets (for five months of the year) may represent more than 1 percent of total SNAP redemptions.

xlvii Federally-funded program that serves pregnant women or mothers with children under age 5 who have incomes at or below 185% percent of the poverty level, and who face significant "nutrition risk". WIC participants can buy certain authorized foods to supplement their diets.[21]

xlviii Seniors over the age of 60 and meet income requirements can enroll in the federally-funded Senior Farmers Market Nutrition Program (SFMNP), which provides vouchers to buy produce at farmers markets. [77]

xlix Information on farmers market spending among SNAP recipients was available only for the Jamestown and Fredonia farmers markets.

Table 5.5 Direct Farm Sales, 2015

Direct Farm Sales Outlets	Number of Operations	Percentage of Total (%)
Farmer's Market	5	62.5
Community Supported Agriculture	3	37.5
Total	8	100

Data source: U.S. Economic Census, 2012

Note: Number in parentheses is the North American Industrial Classification (NAICS) Code for the business

Table 5.6 Operations with Products Marketed for Sale to Consumers, New York State, 2015

Operations by Available Goods	Number of Operations	Sales (\$)
Operations, including value-added goods	7,865	440,609,297
Operations with direct-to-consumer sales	6,279	237,048,337
Operations of value-added goods	5,011	230,129,046
Operations, excluding value-added goods	4,177	210,480,251
Operations with direct-to-consumer sales accepting food-assistance program payment	691	--

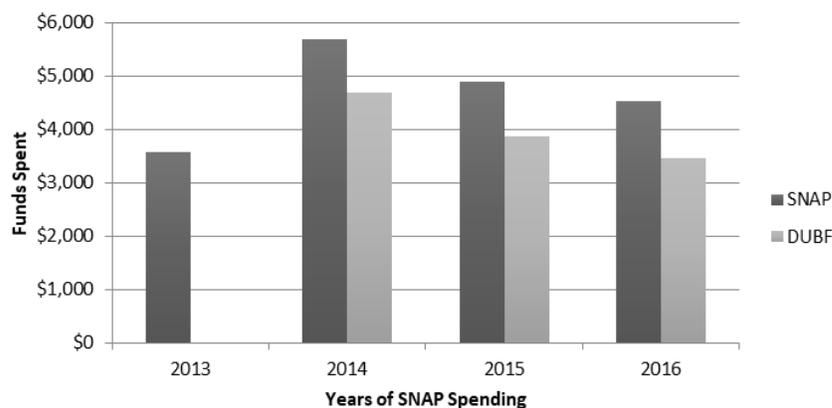
Data Source: USDA Local Food Marketing Survey, 2015

Table 5.7 Jamestown Farmers Market SNAP/Double Up Food Bucks (DUBF) Sales

	2013	2014	2015	2016	All years
SNAP (\$)	3,583	5,696	4,893	4,542	18,714
Annual % Change in SNAP	--	59.0	-14.1	-7.2	--
DUBF (\$)	--	4,698	3,872	3,469	12,039
Total (\$)	3,583	10,394	8,765	8,011	30,753

Data source: Jamestown Renaissance Corporation, 2017

Figure 5.7 Customer Spending Patterns at the Jamestown Farmers Market



Data source: Jamestown Renaissance Corporation, 2017

Table 5.8 Fredonia Farmers Market SNAP/DUFB Sales

	2010	2011	2012	2013	2014	2015	2016	All years
SNAP alone (\$)	614	1,241	441	1,372	-			3,668
SNAP and DUBF (\$)	-	-	-	-	3,750	6,678	4,872	15,300
Annual % change in SNAP	-	102.1	(64.5)	211.1	173.3		(27.0)	
Total	614	1,241	441	1,372	3,750	6,678	4,872	18,968

Data source: Margaret Bruegel, President, Fredonia Farmer's Market, 2017

Table 5.9 Percentage SNAP Sales at Two Farmers Markets of Total County SNAP Sales

SNAP Retailers	SNAP sales (\$)	Farmers Market SNAP Sales Percentage of Total Sales
Total Chautauqua County retailers (2012, year round)	367,872	1.3
Selected Farmers Markets (2013, seasonal)	4,955	-
Jamestown Farmers Market	3,583	-
Fredonia Farmers Market	1,372	-

Data Sources: USDA Food Environment Atlas, 2012; Jamestown Renaissance Corporation, 2017; Margaret Bruegel, President, Fredonia Farmer's Market, 2017

Farm stands and roadside stands located on or near the production site are common in direct-to-consumer supply chains throughout Chautauqua County, but this distribution method presents unique assessment challenges. About 12 percent of producers in the countyⁱ market to consumers through a farm stand, roadside stand, or an equivalent method.[81] However, sufficient data do not exist for on-farm stand sales to adequately report. Local challenges to reporting include: defining the types of stands (e.g. roadside stand, farm stand, etc.); determining whether goods are produced on site, sourced locally, or brought in from another distributor; record-keeping of product sales and revenue generation; and understanding whether the stand owners are on- or off-site operators. [82]ⁱⁱ An additional challenge to reporting

ⁱ According to Cornell Cooperative Extension.

ⁱⁱ The USDA Local Food Marketing Practice Survey (2015) probes for values for these reporting metrics,

direct-to-consumer sales in the county is the significant population of Amish producers whose sales are likely not represented. Amish producers may prefer not to participate in official documentation procedures including the agriculture census, and may not wish to be included in advertisements or published materials such as the *Chautauqua Grown* database.

5.2 Non-Market Supply Chains

Food is also distributed to consumers through non-market supply chains that exist outside of the economic marketplace, connecting consumers to supplementary and emergency food sources. Although these distribution methods are not a principal supply chain in the food system, they are an important safety net for residents. Food pantries and soup kitchens are less often

but there are not available state-level data for New York.

Table 5.10 Non-market Supply Chain Sources, 2017

	2013	2014	2015	2016	All years
SNAP (\$)	3,583	5,696	4,893	4,542	18,714
Annual % Change in SNAP	--	59.0	-14.1	-7.2	--
DUBF (\$)	--	4,698	3,872	3,469	12,039
Total (\$)	3,583	10,394	8,765	8,011	30,753

Data source: Food Bank of Western New York, 2017

a temporary source of hunger relief, and more often an important supplement to a household's regular food supply.[83] There are 23 non-market-based food distribution points in Chautauqua County, both food pantries and soup kitchens. Food pantries are primary source (87 percent) of non-market food distribution (Table 5.10).

Individuals and families visit non-market food suppliers to supplement their daily food needs, but also utilize these suppliers in times of emergency or crises.[84] These operations are members of the Food Bank of WNY distribution network, which provides food products and financial support to emergency food suppliers. The Food Bank of WNY services Cattaraugus, Chautauqua, Erie, and Niagara counties. Emergency food suppliers also receive in-kind and monetary donations from community organizations, individuals, churches, and local businesses. [85]

Food Bank of WNY estimates that 13.4 percent of the population of the four-county region is food insecure.[84] Food pantries function as the “arms” of the food bank network and all operate under slightly different models, primarily functioning as suppliers of grocery items for clients.[86] Potential clients may experience challenges

accessing food from pantries due to variance in eligibility criteria. Most pantries require clients to provide photo identification and proof of residency at a minimum.[87, 88]

The three soup kitchens are The Friendly Kitchen in Dunkirk, St. Susan Center in Jamestown, and Westfield Community Kitchen in Westfield. Soup kitchens, otherwise referred to as ‘meal programs’ by the hunger-relief industry, are different from food pantries because they primarily serve hot, prepared meals at a free or reduced price to clients.[89] Relying primarily on monetary and food product donations, the soup kitchens are open year-round.[90, 91]

5.3 Institutional Supply Chains

Large institutions, such as educational, correctional, and health care facilities, act as food distributors to the members and clients they serve. In Chautauqua County, there are 67 large institutions that distribute food to consumers, majority (76 percent) which are public schools (Table 5.11).

Table 5.11 Institutional Suppliers of Food

Type of Institutional Source	Number	Percentage of Total (%)
Public Schools (56)		--
Public Schools in county	51	76.1
Public Schools serving county	5	7.5
Colleges and universities	6	9
Hospitals	3	4.5
Prisons and jails	2	3
Total	67	100

Data Sources: NYS Education Department, 2017; NYS Corrections Department, 2017; NYS Department of Health, 2017

Table 5.12 Percent K-12 Student Enrollment as a Percentage of the Total County Population, 2015

	Number	Percentage (%) of County
Total population (2015)	131,646	--
Students enrolled School (K-12)	20,363	15.5

Data Source: American Community Survey, 2015 5-year Estimates

Public School Food Distribution

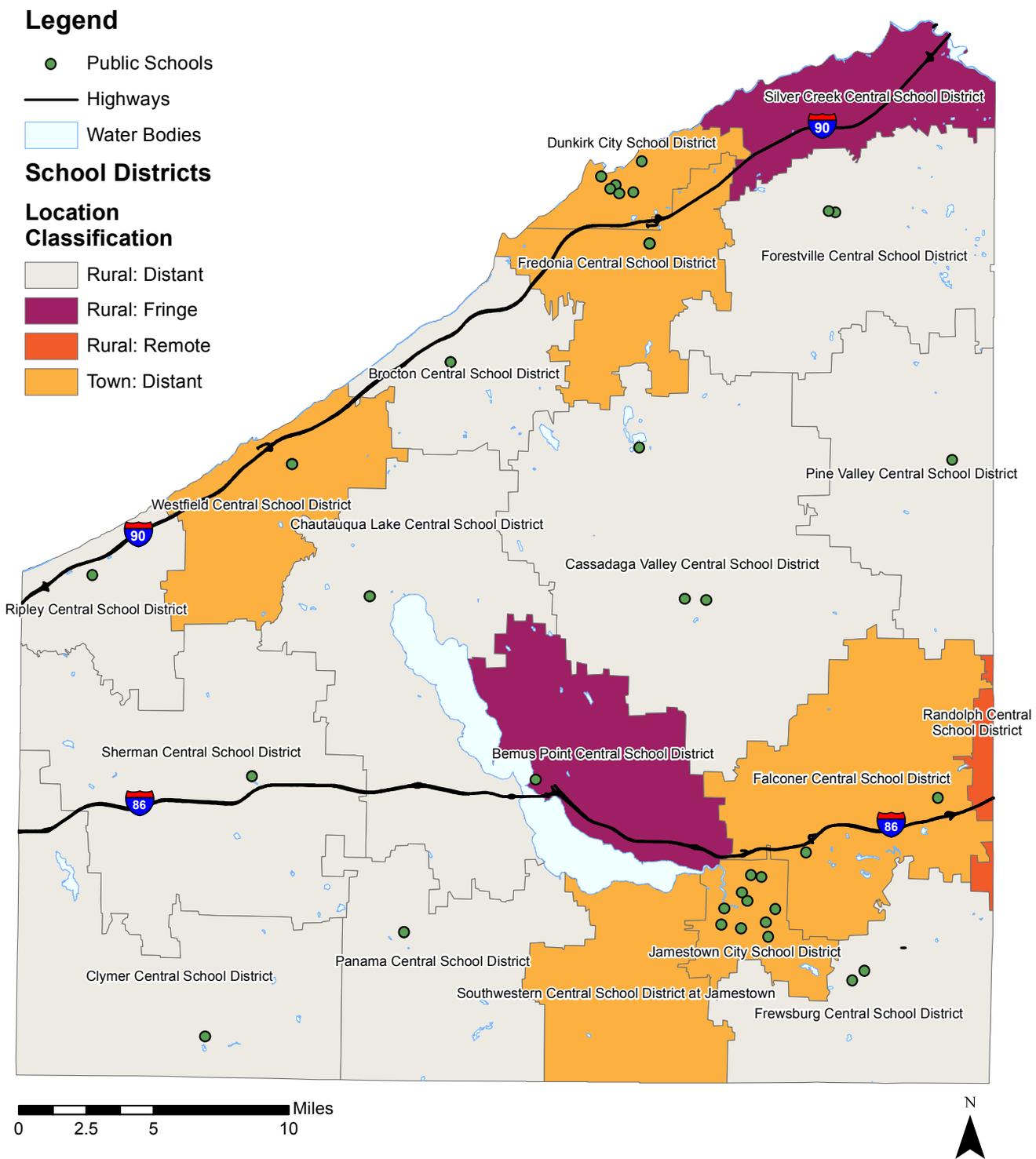
Public schools serve food to over 19,000 students, comprising 15.5 percent of the county's population, majority (39%) of whom are enrolled at the elementary level (Tables 5.12, 5.13). The differences in student population at each school district in the county may present varying challenges for the schools' food budgets. Cassadaga School District covers the largest geographic area, followed by Sherman School District (Figure 5.8). Jamestown School District has the highest student enrollment (5,021 students) in Chautauqua County, followed by Dunkirk City School District (2,074 students).[92] The districts of Jamestown and Dunkirk may have more flexibility in school food purchasing decisions than their more rural counterpart of Sherman (423 students) due to the higher levels of student enrollment (Table 5.14).

Chautauqua County school districts provide food based on the needs of the student population and budget limitations. The National School Lunch Program (NSLP) meals are available at a reduced price to

students whose families' income levels are 185 percent and free to those whose families are at 130 percent of the federal poverty level.[95] Across the county, 50 percent of the 19,708 enrolled students were eligible for the NSLP in the 2014-2015 school year. [94] For each child who participates in NSLP, schools receive a maximum reimbursement of \$3.33 for free lunches and \$2.93 for reduced price lunches.[96] In the urban areas of the Jamestown and Dunkirk School Districts, which as of 2015 both offer a Universal School Lunch Program,^{lii} 69 and 66 percent of students are eligible for free or reduced price lunches, respectively (Table 5.14). Jamestown schools have seen a slight increase in lunch purchasing through the Universal program: in the 2016-2017 school year, 3,754 students (77 percent) participated in the free meal

^{lii} The USDA's Universal School Lunch Program is offered to qualifying school districts so that meals are free to all students who choose to participate. Schools with 40% or more students qualifying for free lunches can participate. Schools are reimbursed by federal and state funds for 100 percent of the meals that are eaten (not the total number of students at the school).[97]

Figure 5.8 School Districts by Geographic Distance Type



Data Sources: NYS GIS Clearinghouse: NYS County Boundaries, NYS Streets; NYS Department of Education, Chautauque County Schools; Chautauque County Information Technology Services, School Districts. Map by Erin Sweeney, Cultivating Prosperity Studio with assistance from Samantha Bulkilvish.

Table 5.13 Distribution of Schools by Grade Level, 2017

Type of School	Number of Schools	Percentage of Total (%)
Elementary School	22	39.3
Middle School	12	21.4
High School	10	17.9
Combined School	12	21.4
Total	56	100

Data Source: NYS Education Department, 2017

Table 5.14 Student Eligibility for National School Lunch Program (NSLP), 2014-2015

	Students, 2014-2015		
	Total	Eligible for NSLP	% Eligible for NSLP
Bemus Point Central School District	741	199	26.9
Brocton School District	556	393	70.7
Cassadaga Valley Central School District	955	520	54.5
Chautauqua Lake Central School District	882	375	42.5
Clymer Central School District	454	199	43.8
Dunkirk City School District	2,074	1,369	66
Falconer Central School District	1,216	555	45.6
Forestville Central School District	493	230	46.7
Fredonia Central School District	1,556	527	33.9
Frewsburg Central School District	849	331	39
Jamestown City School District	5,021	3,453	68.8
Panama Central School District	527	216	41
Pine Valley Central School District (South Dayton)	632	360	57
Ripley Central School District	172	112	65.1
Sherman Central School District	423	240	56.7
Silver Creek Central School District	1,079	602	55.8
Southwestern Central School District at Jamestown	1,419	477	33.6
Westfield Central School District	659	318	48.3
Total	19,708	10,476	
		Average	49.8

Data source: National Center for Education Statistics (NCES), 2014-2015

program, and 1,897 students (39 percent) participated in the free breakfast program each day.[98]

Additional programs exist to increase the abundance of healthy foods available in schools, and simultaneously promote student consumption of more nutritious foods through curriculum changes and varied food options.[99] Farm-to-School programs are on the rise in Chautauqua County, reflecting a national trend as schools work to improve student health and nutrition, and offer locally-sourced food options.[100] As

of 2015, 55.5 percent of Chautauqua County school districts participated in farm-to-school activities, including Brocton, Cassadaga Valley, Chautauqua Lake, Clymer, Forestville, Fredonia, Jamestown, Pine Valley, Sherman, and Westfield. Jamestown School District recently added a facility to process and store produce as it is ready during the growing season, and to store the food for year-round student consumption.[48] Of the participating districts, 80 percent report serving local fruit; 70 percent report serving local vegetables; 60 percent report serving local dairy or milk

products; and 30 percent report serving local eggs.[101] Obstacles to utilizing local products in school meals included: lack of year-round access to key ingredients; local producers not bidding on food supply contracts; lack of proper kitchen equipment; and, barriers to procurement and competitive pricing. School districts participating in Farm to School activities spent \$134,000 on average per year on local foods, with the exception of Jamestown School District and Dunkirk City School District.^{liii, liv} Of the institutions surveyed, five identified that they expect their local food purchasing to increase in the future. Since almost 50 percent of the student population in the county is eligible for NSLP, the federal reimbursement could comprise a significant portion of the school districts' food purchasing budgets (Table 5.14). With an increase in student participation in the NSLP, particularly in the two districts with the Universal Food Program, the combined purchasing power of the school districts could increase institutional food purchases from Chautauqua County producers.

5.4 Summary

Chautauqua County's food distribution sector serves the county, but also faces some challenges. The types of food distribution channels – market-based, non-market, and institutional supply chains – each have a strong presence in the county. A variety of market-based food retail outlets exist in Chautauqua County, including a network of individually-owned food retail stores whose operators can be more flexible in sourcing and stocking local foods than operators of
 liii Jamestown and Dunkirk have much larger annual food budgets than the eight other participating school districts due to the higher number of enrolled students. The annual operating budget for the universal school food program in Jamestown is greater than \$3 million, and the Universal Food Program budget for Dunkirk School District (which does not have a Farm to School program) is approximately \$1.2 million annually.
 liv Data collected during the 2015 National Farm to School Census conducted by the USDA Food and Nutrition Service (FNS).

branch stores. A network of emergency food sources exists to serve customers with limited financial resources. Large institutions move a considerable amount of food within the county. For example, schools offer food to over 19,000 students (15.5% of the county's population) and 55 percent of schools offer locally sourced foods to students at some point during the year.

Despite its many strengths, the distribution sector faces several challenges. Small-scale food retail store owners are struggling to compete with larger companies. Additionally, food distribution sources – including supermarkets – are not all geographically accessible to people without cars, both in urban and rural areas. The availability of fresh, healthy, and locally grown foods may be limited in stores that may be more common in remote areas, such as convenience stores. Emergency food may not provide nutritional diversity or be locally sourced. Finally, the lack of data about direct farm-to-consumer sales, especially at farms or road stands, is a challenge, and limits a full analysis of consumer utilization of direct farm-to-consumer sources.

Stronger links among local food producers, intermediaries, and food distributors may allow consumers to purchase and/or consume locally grown foods more easily, and enhance their food security. [75]^{lv} Such linkages also have the potential advantage of reducing food loss and food waste along the food system, a possibility explored in the next chapter.

lv According to the Chautauqua Grown program of Cornell Cooperative Extension.



6. Management of Food Waste and Food Loss

The food system generates a significant amount of waste that could be reduced, reclaimed, and reused in ways that promotes the health, economy, and environment of a community. Edible food is lost in every sector of the food system. Consider the following examples: on the farm, grapes may remain un-harvested; at a beverage processing plant, milk may spill during packaging; at a retail store, cheese may remain unsold past its sell-by date; and at a school or work cafeteria, consumers may toss uneaten jelly packets from their tray (Figure 6.1).[102] The loss of perfectly edible food and poor management of food-related waste from the food system has negative economic, health, and environmental consequences. This chapter explores the ways in which food is lost and wasted in each sector of the food system,^{lvi} and documents the ways in

^{lvi} Due to limited availability of data some information in this section is based on data for the country as a whole.

which Chautauqua County organizations are trying to reduce loss of food, and reclaim, reuse, and recycle food.[103]system,^{lvii} and documents the ways in which Chautauqua County organizations are trying to reduce loss of food, and reclaim, reuse, and recycle food. [103]

6.1 Introduction

Two key terms are commonly used to describe the underutilization of food generated in the food system. Food loss is the “amount of edible food, postharvest, that is available for human consumption but is not consumed for any reason”.[104]^{lviii}

^{lvii} Due to limited availability of data, some information is based on data for the country as a whole.

^{lviii} This is the USDA definition. Food waste and food loss are defined differently depending on the agency, or may be used interchangeably depending on the context. The Food and Agriculture Organization of the United Nations represents food that gets spilled or spoilt before it reaches its final product or retail stage.

Figure 6.1 Loss and Waste across the Food System

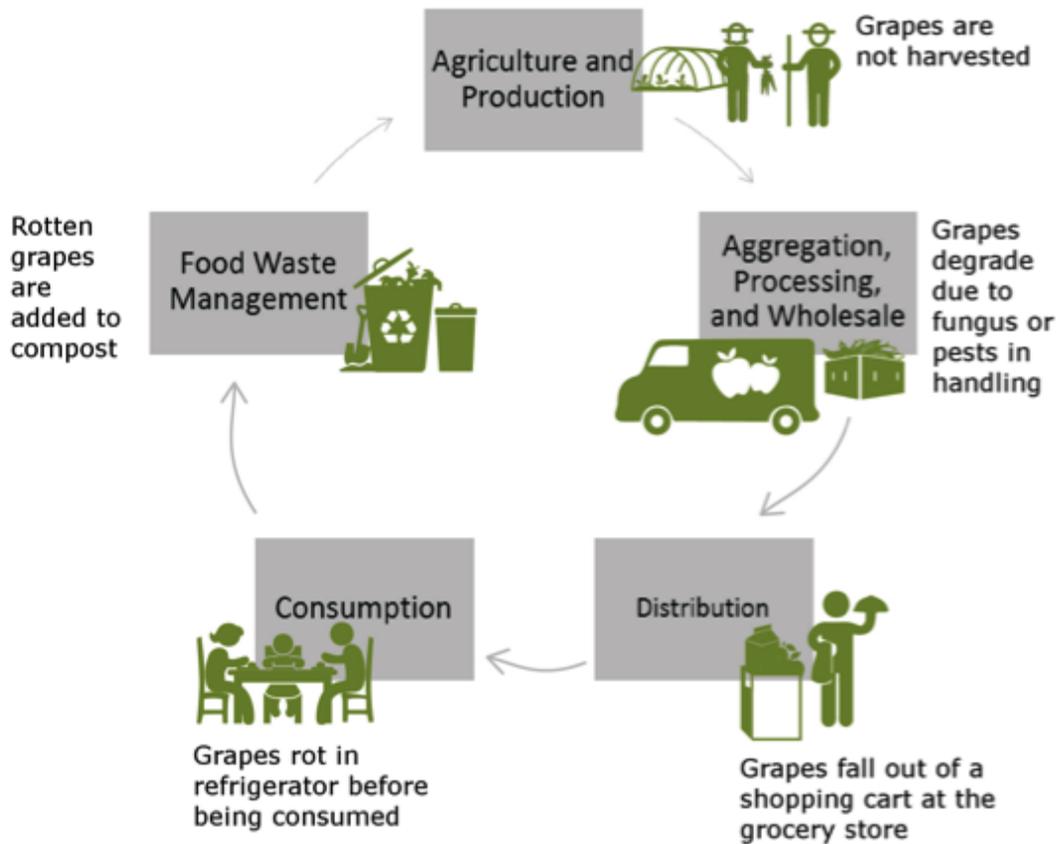


Image credit: Kelley Mosher, 2017

Food waste is when an edible item is not consumed as a result of human behavior, such as consumers wasting food on their plates or supermarkets discarding produce due to discoloration.[102] For example, harvested grapes that fall off a shipping truck are food loss, but day-old grapes thrown away at a grocery store are considered food waste. Although the definitions of food loss and food waste differ, in both cases, food fit for human consumption is not eaten. Efforts to manage food loss and reduce food waste positively impacts people, planet, and profits, as detailed below.

and food waste represents edible food that is lost due to retailers' and consumers' behavior at the end of the food system.[105]

Impact on People

In 2010, the food supply provided about 3,796 calories per American per day, but 1,249 of those calories were wasted.[102] At the same time, 42.2 million households in America are unsure about how they will acquire their next meal.[106] Although this paradox can be discouraging, reducing food loss and food waste can lessen food disparities. Policies that help prevent food loss across the supply chain are likely to increase the amount of food available for human consumption and improve food security. Policies such as the Bill Emerson Good Samaritan Food Donation Act^{lix} provide protection for producers, retailers, or individuals who wish to donate excess

^{lix} This act is detailed further in Appendix C.

products. Additional incentives may be necessary to encourage higher rates of food donation. Reducing food waste and finding alternative markets or uses for foods that would otherwise be lost can reduce hunger and improve quality of life for people.

Impact on Planet

Good management of food that would otherwise be lost or discarded is also good for the planet. When food is discarded, it typically ends up in a landfill. Of the 250 million tons of municipal solid waste (pre-recycling) collected in the United States in 2010, 34 million tons, or almost 14 percent, was food waste.[102]^{ix} After removing recyclable plastic and paper products from the total solid waste generated, food waste still constituted 21 percent of all municipal solid waste by weight in 2010, and was the largest proportion among all waste types.[102] Municipal solid waste facilities recover only three percent of food received, leaving the rest destined for a landfill or incinerator.

The contribution of food waste to landfills is an environmental concern as landfills are the third largest source of methane emissions in the United States.[107] Food and other organic matter decompose anaerobically and create methane, a greenhouse gas that has 25 times greater impact on global warming than carbon dioxide.[107] A decrease of food waste in landfills could reduce methane emissions. As technologies advance and the food system becomes increasingly global, landfills should be a last resort for food waste.

Although discarded food cannot be recovered for human consumption because it is unsanitary or unsafe, municipalities can encourage businesses, institutions, and residents to compost. Using compost as a soil amendment “improves soil health and structure, improves water retention, supports more native plants, and reduces the need for fertilizers and pesticides.”[44]

^{ix} According to the US Environmental Protection Agency.

Reduction in food waste can also indirectly reduce loss of energy and resources. [101] Agricultural production is resource intensive and demands large amounts of water, petroleum, land, and labor.[44] For example, the inputs needed to grow grapes that are then discarded consequently means that those inputs were wasted as well.

Impact on Profit

Underutilization of food generated by the food system also has a negative economic impact. It cost the United States \$1.3 billion to put food into landfills in 2010.[102] Landfill costs aside, \$42.8 billion in estimated retail prices of fresh fruit and vegetables were lost from the United States food supply chain.[109] Recovering and repurposing food can result in savings that may be recuperated by both farmers and consumers.

When food is lost in the food supply chain before it reaches the consumer, the producers or business owners receive less return on their investment.[110] For example, if a grape farmer cannot harvest all the grapes in the field and grapes are left to rot, the farmer incurs a financial loss on her investment. If a dairy processing plant makes a supply of ice cream that exceeds customer demand, and a portion of ice cream expires and is discarded, then the ice cream maker does not earn a financial return on the inputs including ingredients, labor, time, and energy.

Consumers also experience economic loss tied to food waste. The average family in the United States wastes an estimated \$1,500 worth of food every year.[110] This may happen because consumers do not have the infrastructure or knowledge to store, prepare, or cook perishable foods or that they discard expired or unused groceries at home.

In summary, food waste impacts the economic success of producers, processors, distributors, and consumers. The prevention and management of food that is lost or wasted is essential for the success of people, environment, and profits in a region.

Table 6.1 Summary of All Waste Management Businesses

Type of Waste Business	Number of Businesses	Percentage of Businesses (%)	Number of Employees	Percentage of Employees (%)	Sales Volume (\$)	Percentage of Sales Volume (%)
Other Nonhazardous Waste Treatment & Disposal	10	71.4	130	81.8	17,463,000	81.1
Other Waste Collection	2	14.3	22	13.8	3,346,000	15.5
Remediation Services	2	14.3	7	4.4	732,000	3.4
Total	14	100	159	100	21,541,000	100

Data source: Reference USA, 2016

6.2 Preventing and Managing Loss and Waste of Food in Chautauqua County

Food waste and loss can be managed in a variety of ways. Food loss can be reduced at the source; food can be reused; or once no longer edible, can be recovered as an organic resource. For example, by composting food waste, farmers or consumers can transform the nutrients into fertilizer, reducing expenditures on other fertilization methods. [44] By using an anaerobic digester,^{ixi} the gas generated can be harnessed to produce electricity for a farmer's own use or sale back to the electrical grid.[111]

Chautauqua County currently has 14 waste management businesses, in categories including nonhazardous waste treatment and disposal, other waste collection, and remediation services (Table 6.1). The businesses collect food in addition to other types of waste, but there are no data about the amount of food waste generated by

^{ixi} According to the American Biogas Council, anaerobic digestion is "a series of biological processes in which microorganisms break down biodegradable material in the absence of oxygen. One of the end products is biogas, which is combusted to generate electricity and heat, or can be processed into renewable natural gas and transportation fuels."

any of the preceding food systems sectors - agriculture and production, aggregation/wholesale/processing, or distribution - that is collected among these three business categories. It is therefore difficult to determine which categories (n=3, Table 6.1) are likely to deal with any type of food waste in Chautauqua County.

Chautauqua County offers both opportunities and challenges in reducing loss and waste of food. The dispersed population within Chautauqua County makes implementing a municipal program for food waste reduction and reclamation difficult but not impossible. The county's recycling program depends on government subsidies, and the same could be applied to a municipal food waste collection service.[112] The rich fabric of agriculture within Chautauqua County provides unique opportunities that may not be present in a more densely populated area. The next sections describe three ways – reducing food waste by consumers, recovering organic nutrients from food waste, and redistributing edible food that would otherwise be lost – to reduce loss and waste of food in Chautauqua County.

Reducing Waste of Food by Consumers

Reduction of food waste requires careful monitoring of supply and demand of before it reaches consumers.[113] The following example provides insight to strategies for reducing food waste by consumers.

Recovering Organic Nutrients from Waste

Food waste can be used to create organic nutrients for soil through composting or anaerobic digestion. Chautauqua County has had examples of both strategies with mixed success. For instance, in 2012 SUNY Fredonia acquired a small 35-gallon composting tumbler for post-consumer food scraps generated by the university, but the program lasted only one year. The university did not have enough staff to assign to fully support the composting effort, and they could not meet the labor requirements to transport food waste to a destination other than the trash site. Further, the tumbler experienced different levels of efficiency during different seasons. The tumbler was most effective after students left for summer break when the supply of food scraps diminished. The university has not indicated a desire to reinstitute another composting program.[114] Although it may want to compost or use other waste reduction strategies, implementation requires time, flexibility, and funding.

Food nutrient reclamation efforts have also included anaerobic digestion, a larger-scale process. At least one farm in Chautauqua County offers anaerobic digestion, as described in the Ridgeline Farms case study.

Conventional Disposal of Food

Due to practical barriers and prohibitive start-up costs associated with some alternatives to recycling food waste, discarding food along with other solid wastes remains the commonly used option for handling food waste in Chautauqua County.

Case Study: Ridgeline Farms Anaerobic Digester^[114]

Ridgeline Farms, which has been under new management since 2005, runs the only anaerobic digester in Chautauqua County, which processes cow manure from its herd of 600 cows, as well as by-products from processing dairy products, grapes, and salad dressing from area food businesses. Prior to installing the digester in 2001, Ridgeline Farms stored the manure in a lagoon and used it for spray-fertilizer. The village of Clymer is downwind from the farm and residents complained about the odor from the spray fertilization. Further, concerns arose about the manure polluting Clymer's groundwater supply after an investigation showed the water surpassed the maximum allowed nitrate-nitrogen levels. The digester was installed with support from New York State Energy Research and Development Authority (NYSDERA) to reduce smell-related nuisance for neighboring residents and help the farm reduce its fuel and electricity costs. The digester may reduce the farm's electric and natural gas costs by \$41,000 per year.

In addition to the manure from cows, the digester processes food by-products. The farmers sell excess power to National Grid, a local utility company. After replacing the original generator with an energy-efficient engine in 2012, the farm now sells over 50 percent of the energy the digester generates to National Grid.[115] The annual operating cost of the anaerobic digester is \$115,900, and cost savings from the digester is \$94,939. The farm earns an additional \$145,236 in tipping fees paid by area businesses for waste processing.[116] The deal is attractive to businesses because the anaerobic digester is a cheaper and more environmentally friendly way to handle waste to other alternatives.

Table 6.2 Comparison of Waste Reduction by Tray Use at SUNY Fredonia, 2010

	Meal With Tray	Meal Without Tray	% Change	% Change
Number of Customers	292	363	71	24.3
Total Waste (lbs)	91.25	61.68	-29.57	-32.4
Waste Per Person (oz/customer)	5	2.72	-2.28	-45.6
Waste Reduction (oz/customer)		2.28		

Data Source: SUNY Fredonia Student-Faculty Association flyer, 2010

Table 6.3 Amount and Cost of Food Waste at SUNY Fredonia, 2010

	Waste per Semester	Waste per Year
Average waste (lbs)	108,032	216,065
Average cost of food waste (\$)	399,719	799,439

Data Source: SUNY Fredonia Student-Faculty Association flyer, 2010

Case Study: Reduction of Food Waste by Students at State University of New York (SUNY)- Fredonia^[117]

Students at SUNY Fredonia, a large public institution, have attempted to implement a variety of projects to reduce both pre- and post-consumer food waste. One among these was an effort by students to measure and raise awareness about food waste on university campus. Starting in 2008, students began measuring the amount of post-consumer food waste generated in school dining facilities. Students used the data on food waste to educate the campus and instill less wasteful eating habits. For example, the students created a poster of the result from one of their audits that read, “On March 30, 2010, 91.25 pounds, or 12 buckets, of waste were discarded and 292 customers were served. That’s 5 ounces of waste per person,” with 12 large buckets illustrated on the poster.^[118] Awareness campaigns

can help individuals visualize their role in producing food waste. As a result, students might be more deliberate in the amount of food they choose to put on their plates and the amount they choose to discard.

During their waste audits in 2009, the Fredonia Student Association (FSA) also implemented a “Trayless Tuesday” campaign to determine how using trays might influence food waste. The waste audit showed that on Trayless Tuesdays, food waste decreased by more than two ounces per person (Table 6.2). SUNY Fredonia subsequently removed trays from their dining halls. Since the student-initiated campaign removed trays altogether, the amount of food waste has decreased by 32 percent, and utility costs related to dish washing have decreased as well (Table 6.2).

Moreover, data from the waste audit show how food waste has an economic impact. The students calculated that SUNY Fredonia loses \$799,439 annually due to food purchased but not consumed (Table 6.3). The university could use the audit to calculate the level of greenhouse gases generated from food waste. Results from the audit may build a stronger case for implementing innovations such as anaerobic composting or other institutional-level changes.

Case Study: Chautauqua County Rural Ministry Gleaning Project^[119]

Collecting and donating underutilized crops and excess food to feed hungry people is called gleaning. The concept may sound simple, even intuitive, but this practice is relatively new. In Chautauqua County, the Gleaning Project was launched in 1999 after it was discovered that a large population of the poor, working poor, elderly, and children in the county were not receiving enough fruits and vegetables, while at the same time, good quality produce was left unharvested in farmers' fields. Volunteers gleaning a second harvest of crops from farmers' fields was a huge success in the first couple of years on project, and in 2003, the Gleaning Project was expanded to include an entire food recovery program that rescues food from other sites as well.

The Gleaning Project was initiated by the Chautauqua County Rural Ministry (CCRM) in partnership with the Cornell Cooperative Extension (CCE) and the Lakeview Shock Incarceration Facility. CCE provided the network of farmers and agricultural resources, Lakeview provided a workforce to do the harvesting, and CCRM provided a means of distribution through their warehouse, emergency food pantry, and Friendly Kitchen.

From small coffee shops to large manufacturers, the Gleaning Project collects excess food from a diverse array of establishments, including Upper Crust Bakery, Bob Evans, Pizza Hut, Walgreens, CVS, and Goya, in addition to farms big and

small. For example, CCRM collects 10,000 pounds of food from Walmart five times a month, all year.^[118] Further, the Gleaning Project takes an unscheduled request from a farmer to collect spare strawberries in addition to their pick-ups from regularly scheduled farm locations. Since 2000, the Gleaning Project has prevented 725,000 pounds of food from rotting in a field or a landfill and has given 725,000 pounds of food to residents of the county.^[120]

The Rural Ministry regularly distributes over 30 varieties of produce to 60 different sites around the county, and uses the gleaned food in other programs such as the Friendly Kitchen and emergency food pantry. Practicing what they preach, CCRM does not let any of the food that they glean go to waste, finding creative ways to make each piece of food useful in some way, whether making croutons out of extra bread or dehydrating vegetables and using them as spices in soups. Dehydrating food has become an essential practice at CCRM, creating small meal packages that can be distributed at a later date.

The success of the Gleaning Project is due to the hard work and dedication of the Rural Ministry's staff and extensive network of volunteers, ranging from service organizations, youth programs, work experience programs, student groups, as well as from individual citizens. CCRM logs over 35,000 volunteer hours a year and 75 percent of their budget comes from in-kind support. Their management and fundraising costs account for less than one percent of expenses.^[121] Although they have the helping hands of many volunteers, CCRM has a paid staff of fewer than ten people, who are responsible for running their 15 programs. The small staff is kept busy, so if a volunteer does not show up for a shift to harvest or collect food, it may cause challenges for CCRM.

The ability to hire additional staff members would allow CCRM staff to expand their capacity. Additionally, more processing equipment would benefit the Gleaning Project and the many other programs CCRM has to offer. The Rural Ministry never denies an opportunity to collect food, but as fresh produce has a short shelf life, the ability to collect, process, and store food quickly and efficiently would help the Gleaning Project benefit residents and reduce food waste throughout Chautauqua County.

Case Study: Chautauqua County Landfill

The Chautauqua County Landfill receives food waste from a variety of sources. Although the municipalities of Dunkirk and Jamestown collect and haul their own solid waste to the Chautauqua County Landfill, the majority of solid waste is collected by private haulers that vary in business size.

Chautauqua County Landfill operators do not control the type of waste collected.[112] Residential waste comprises the majority of food waste, followed by commercial waste. Industrial waste may also contain food products, such as waste from Purina Pet Foods.[112]

The county government is not currently pressuring the landfill operators to engage in food waste reduction efforts.[112] The low population density and the economies of scale within Chautauqua County cannot support the municipal collection of organic

waste (compost) or the separation of food wastes from other types of waste. The Chautauqua County Landfill receives only half of its maximum yearly capacity. Inorganic (or nonbiodegradable) waste makes up the majority of waste at the landfill, and the majority of the organic waste is sewer sludge from wastewater treatment plants.[112]

As a sustainability method, the Chautauqua County Landfill operators use landfill-gas capturing technology that collects most of the methane produced by the breakdown of food and other organic materials. This technology collects over 1 billion cubic feet of gas from the landfill each year, and generates 45.8 million kilowatt hours (KWH) of electricity for both onsite and offsite use. [122] The electricity generated creates a source of revenue that has economic benefits in other sectors of the county. Since local governments do not regulate the amount or types of waste that businesses send to the landfill, the responsibility is on individual businesses that contribute waste to use or create sustainable practices and guidelines before the waste reaches the landfill.

6.3 Challenges to Reducing and Reusing Excess Food in Chautauqua County

A number of ideas and innovations to reduce loss and waste of food in Chautauqua County are underway, but many barriers remain as well. Programs may be short-lived, such as the composting tumbler on the SUNY Fredonia campus. Other efforts have been thwarted due to lengthy proceedings and regulatory deadlock. Although regulations are instituted to protect public health, they can limit the opportunities for alternative methods for reducing food waste. One of the greatest challenges is the lack of data about strategies for reducing, recycling, or reusing food both within Chautauqua County and around the country. Without data to demonstrate the positive long-term economic and environmental impacts of innovations in food waste management, policymakers are unlikely to support increased knowledge sharing and funding for this area.

6.4 Summary

A number of innovative efforts to reduce, reuse, and reclaim excess and lost food are underway in Chautauqua County. Individual institutions such as SUNY Fredonia, businesses like Ridgeline Farms, and emergency food providers like Chautauqua County Rural Ministries are engaging in a number of efforts. Yet, many challenges remain. One of the major challenges in addressing food waste is the difficulty in collecting information about excess food at a local level. The lack of food system-wide collaboration or policies to support food reclamation and waste mitigation hinders the reduction of excess food. Cross-sector strategies to repurpose excess food and reduce food waste in Chautauqua County may however also provide economic opportunities. By funding municipal composting or supporting stronger connections between sectors of the food system, Chautauqua County could address food insecurity, prevent waste, generate profits, and improve environmental outcomes. Capturing excess food and preventing loss creates a food system that recycles its own outputs for future food production, closing the loop in the soil-to-soil cycle.



7. Economic Conditions and Impacts

This chapter synthesizes the strengths and opportunities of the food economy to demonstrate the food system's capacity to cultivate economic prosperity in Chautauqua County. The chapter aggregates the economic power of food system sectors described in Chapters 3 to 6 of the report as well as ancillary businesses that support the food system sectors. This chapter also describes several *potential* economic development scenarios based on existing conditions within the food system and demonstrates the possible impact those scenarios could have on the county's economy.

7.1 The Food Economy^{lxii}

Just as human beings cannot live

lxii Note that there may be modest discrepancy between economic data reported in this chapter and prior chapters as this aggregation required a synthesis of data from multiple sources and years. Attempts have been made to offer conservative estimates.

without food, communities' economies cannot exist without food systems. The economic benefits of a community's food system can be amplified using multiple strategies. For example, when the supply chain in a community's food system is interlinked and localized, money spent in one sector is re-invested in labor and supplies from another sector, and tends to remain circulating within the community economy. [123] Therefore, in addition to improving food security, investing in food systems can support businesses, create jobs, and efficiently circulate money in a community. [124]

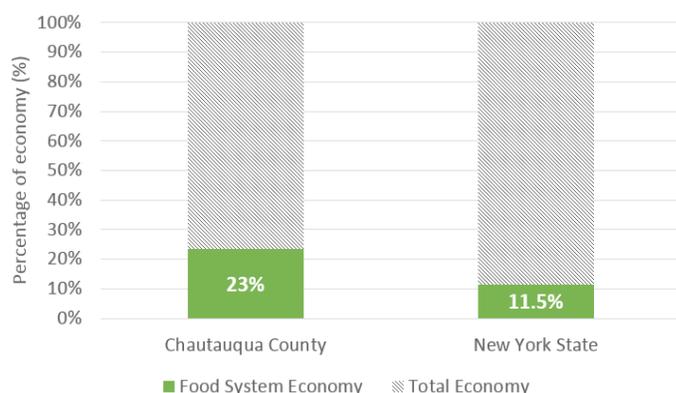
The food system of Chautauqua County is a significant economic asset. The food system itself includes agriculture and production (Chapter 3), aggregation, wholesale and processing (AWP) (Chapter 4), distribution (Chapter 5), and food waste management (Chapter 6). The food economy includes the four sectors of the

Table 7.1 Sales Volume Generated by the Food Economy

Economic Sector	Sales Volume (\$1,000)	Percentage of Total Sales (%)
Aggregation, Processing and Wholesale	1,496,981	60.3
Distribution	668,162	26.9
Agriculture	174,379	7
Ancillary Food Related Businesses	135,238	5.4
Waste Management	9,232	0.4
Total	2,483,992	100

Data Source: U.S. Agricultural Census (2012) & U.S. Economic Census (2012)

Figure 7.1 Food Economy as a Share of the Total Economy



Data Source: IMPLAN, Chautauqua County, 2015

food system, as well as ancillary food-related businesses including utilities, transportation, warehousing, finance, insurance, real estate, renting, entertainment, and other professional services.^{lxiii} The food sectors, as well as ancillary food-related businesses, generated \$2.4 billion in annual sales in 2012 (Table 7.1), which is about 23.2 percent of sales generated by the entirety of the county’s economy (Figure 7.1). Comparatively, Chautauqua County’s food economy is twice as important to the county’s economy as the statewide food economy is to the state’s economy. The proportion of Chautauqua County’s food economy (23.3%) to the

^{lxiii} Ancillary or other food related businesses include utilities, transportation, warehousing, finance, insurance, real estate renting, entertainment and other professional services (see Figure 7.4 for full list). The two largest subsectors of these ancillary businesses include long-distance truck deliveries and non-residential lessors. These businesses are included in this chapter since they are interlinked with the food system.

county’s total economy is almost twice that of the statewide food economy (11.5%) to the state’s economy (Figure 7.1).

Chautauqua County’s food system serves community and regional population centers. However, Chautauqua County’s food system has not lived up to its full market potential within the region and country. For example, the county’s food system has the potential to serve demand generated by the larger and adjacent urban markets of Buffalo, Pittsburgh, and Cleveland. The Gross Domestic Product (GDP) of these three metropolitan areas is \$323.8 billion, which is 28 times larger than Chautauqua County’s total economy of \$11.2 billion (Table 7.2). [125] Recognizing the internal and external opportunities offered by the food system, this chapter describes the state of Chautauqua County’s food system so it can be leveraged for the county’s economic development.

Agriculture

The agriculture sector is a critical component of the food economy. The sector generates \$174 million in annual sales volume, but only accounts for seven percent of all sales generated by the food system and ancillary businesses (Table 7.1). The agricultural sector is comprised of 1,515 food production establishments, such as farms, greenhouses, and cattle ranches (Table 7.3). Most farms are of small size and only employ two people on average (Table 7.3), and the annual average net income per farming operation is \$29,790 (see Chapter 3.8).

Despite its centrality to the food system, the agriculture sector is the most vulnerable sector in Chautauqua County's food economy. Estimates^{lxiv} suggest that the county's agriculture sector has relatively low sales volume per employee, about \$83,979 annually, which is 25 percent less than the sales per employee in the agriculture sector across New York State (Table 7.4).^{lxv} The low productivity may be explained in part by challenges explained earlier, including a faster than average decrease in number of farms over time, and an increasing average size of farms.^{lxvi} Moreover, agricultural operators may have limited business linkages with aggregators and customers in Chautauqua County, and may not be able to capture value-added sales for their products.

lxiv As a private source by MIG, Inc., IMPLAN, which is short for IMPact analysis for PLANning, provides economic impact data for input output modeling. In this analysis, the most recent data from 2015 was used. Therefore, there may be a discrepancy between data reported by the U.S. Economic Census and IMPLAN because of year of data collection and estimation methods.

lxv Data for the aggregation, processing and wholesale (AWP) sector may differ from actual data since wholesale industry contains non-food related wholesalers.

lxvi In Chautauqua County, the average age in the agricultural workforce is 56. The percentage change of number of operations in Chautauqua County is -8.6 between 2007 and 2012, while that in NYS is -2.2. The percentage change of farm acres in Chautauqua County is 0.3 between 2007 and 2012, while that in NYS is 0.1.

The agriculture sector may have an opportunity to generate additional sales by processing products on site and selling aggregated products to retailers and large institutions. This may help farmers increase their average net incomes and transform farming into a more economically viable occupation.

Aggregation, Wholesale and Processing (AWP) in the Food Economy

As noted in Chapter 4 of the report, aggregation, processing, and wholesale businesses contribute to turning raw product into value-added products. In addition to food manufacturing businesses, this sector includes food product machinery manufacturing, farm supplies merchant wholesalers, raw materials wholesalers, beer and ale wholesalers and more (Figure 7.2). Chautauqua County is home to 40 businesses in this sector (Table 7.3).^{lxvii} The highest number of businesses in this sector are wineries (Figure 7.2).

The aggregation, processing, and wholesale sector generates the largest proportion (60.3%) of sales across all sectors within Chautauqua County's food economy (Table 7.1). This percentage could increase if Chautauqua County was able to market its firms and products to the larger metro areas in close proximity to the county, such as Buffalo, Cleveland, and Pittsburgh.

The AWP sector has the largest average sales volume per employee of \$1,323,590 compared to all other sectors; six times higher than the average generated by the food system overall (\$210,670) (Table 7.5). Although the AWP sector is responsible for the highest percentage of sales in the county, it is not responsible for the largest share of jobs in the county.

lxvii This number is lower than the 56 businesses reported in the aggregation, processing and wholesale sector in Chapter 4. This is because of the different survey year between the U.S. Economic Census (2012) and Reference USA (2016). This chapter offers more conservative estimates (40).

Table 7.2 Gross Domestic Product (GDP) of Buffalo, Cleveland and Pittsburgh

Metropolitan Area	Buffalo-Cheektowaga-Niagara Falls, NY	Cleveland-Elyria, OH	Pittsburgh, PA	Total
GDP (\$ millions)	56,456	128,448	138,873	323,777

Data Source: U.S. Bureau of Economic Analysis, Gross Domestic Product by Metropolitan Area, 2015

Table 7.3 Businesses and Employees Connected to the Chautauqua County Food Economy

Economic Sector	Number of Businesses	Number of Employees	Number of Employees per Business	Percentage of Food Economy Employees
Agriculture	1,515	3,207	2.12	27.2
Aggregation, Processing and Wholesale	40	1,131	28.5	9.6
Distribution	459	6,465	14.1	54.8
Waste Management	6	68	11.4	0.6
Other Food Related Businesses	121	919	7.60	7.8
Total	2,141	11,790	6	1

Data Source: U.S. Agricultural Census (2012) & U.S. Economic Census (2012)

Table 7.4 Sales Volume per Employee in Key Sectors

Economic Sector	Chautauqua County's Sales Volume per Employee (\$)	New York State's Sales Volume (\$ per Employee)
Agriculture	83,979	110,946
Aggregation, Processing & Wholesale	471,755	307,010
Distribution	63,465	74,471
Waste Management	137,372	211,579

Data Source: IMPLAN, Chautauqua County, 2015

Table 7.5 Food System's Average Sales Volume per Business and per Employee

Economic Sector	Average Sales Volume per Business (\$1,000)	Average Sales Volume per Employee (\$1,000)
Agriculture	115.1	54.4
Aggregation, Processing and Wholesale	37,739	1,323.7
Distribution	1,455.7	103.3
Waste Management	1,538.6	135.5
Other Food Related Businesses	1,117.7	147.1
Food Economy (Average)	1,160.4	210.7

Data Sources: U.S. Agricultural Census (2012) & U.S. Economic Census (2012)

This high sales volume does not necessarily mean that the AWP sector is the most *profitable* sector in Chautauqua County's food system economy: net profit and industrial outliers should be considered. First, aggregation, processing, and wholesale sector's gross profit ratio (GPR)^{lxviii} is significantly smaller than other sectors, because the cost of production differs by industry characteristics. In general, gross profit ratio is lower in the AWP sector than in other food system sectors.[126] Between the two types of AWP businesses in the sector, food manufacturing's gross profit ratio of sales volume is 37.4 percent and wholesale's is 22.7 percent. On the other hand, one category in the food distribution sector is much higher: food service's GPR is over 60 percent.[126]

Second, the total sales volume for the AWP sector is skewed by the presence of two large firms: Cliffstar LLC, a beverage processor, and Maplevale Farms, an aggregator. The two firms generate 81 percent of the total sales in the sector. Once adjusted for these two outliers, the comparative prominence of sales volume in the AWP sector is likely to be less.

Food Distribution

As noted in Chapter 5, the food distribution sector in the county is comprised of 459 retail businesses (Figure 7.3). Examples of businesses that make up this sector include supermarkets, convenience stores, gasoline stations, pharmacies, and restaurants. The distribution sector generates 26.9 percent of sales within the county's food economy (Table 7.1), second only to the AWP sector, and employs almost 55 percent of all employees within the county's food economy (Table 7.3).

lxviii The gross profit ratio is expressed in percentage form, calculated as gross profit divided by net sales. For example, for the food manufacturing sector, gross profit ratio was computed as subtracting cost of revenue (62%) from net sales (100%) as demonstrated by a private consulting company.[126]

Food Waste Management

Businesses that comprise the waste management sector include remediation services and hazardous waste treatment and disposal. As noted in Chapter 6, several waste management businesses operate outside of Chautauqua County.^{lix} The waste management sector is the smallest sector of the food economy; it only accounts for 0.4 percent of sales in the county's food economy, and employd 0.6 percent of all food economy employees (Table 7.2, 7.3). The annual average sales volume per employee in this sector is \$135,764 (Table 7.5). Although waste management facilities account for the lowest volume of sales, these operations have the potential for recapturing and reusing underutilized products and resources to make the food economy more effective and efficient.[127]

Ancillary Food Related Businesses

The food system sectors in Chautauqua County influences and is supported by ancillary businesses^{lxx} such as utilities, transportation, warehousing, finance, insurance, real estate renting, entertainment and other professional services (Figure 7.4). The two largest subsectors of these ancillary businesses include long-distance truck deliveries and non-residential lessors. In total, there are 121 businesses (Table 7.3) with a combined worth of \$135.2 million (Table 7.1). This sector is the second smallest in terms of its total number of employees (919) and sales per employee are \$147,157 annually (Table 7.5).

lix The Food Waste Management chapter shows 14 businesses in this sector from Reference USA data, while the U.S. Economic Census reports six businesses. The discrepancy exists because of the different survey year between the U.S. Economic Census (2012) and Reference USA (2016). This chapter offers more conservative estimates.

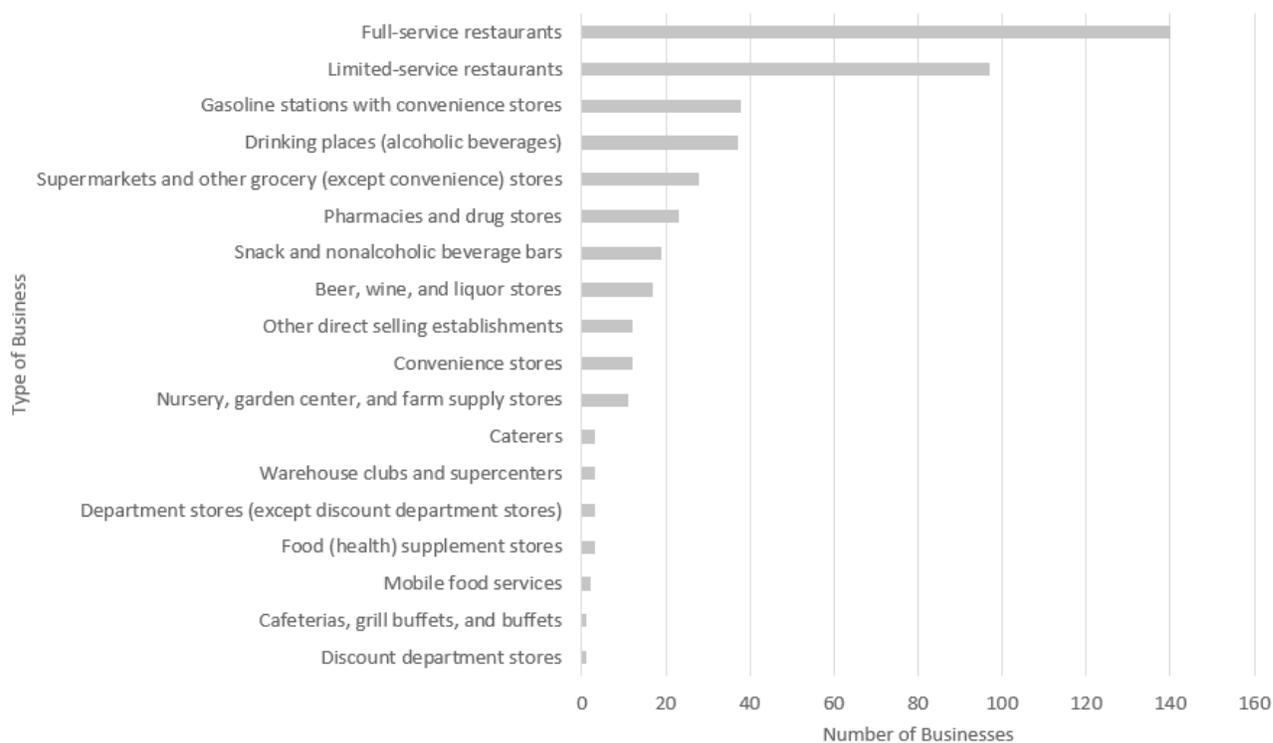
lxx The term ancillary businesses refers to the businesses not within the food system but that support its ability to function at various levels.

Figure 7.2 Number of AWP Business Types



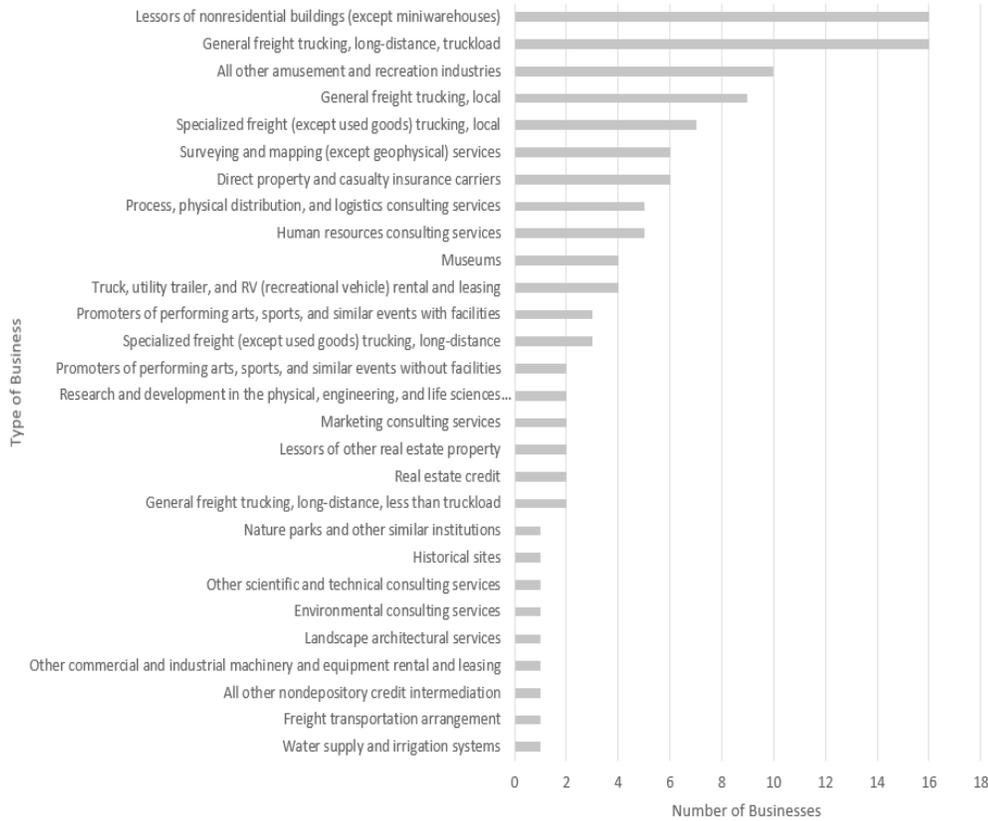
Data Source: Reference USA (2016)

Figure 7.3 Number of Retail Store Types



Data Source: U.S. Economic Census (2012)

Figure 7.3 Number of Ancillary Business Types



Data Source: U.S. Economic Census (2012)

Summary of the Food Economy

The food system is a big part of Chautauqua County’s economy - twice the food system's economic proportion across New York State (Figure 7.1). The role of the food system can be leveraged to improve Chautauqua County’s economic condition.^{lxxi} Agriculture currently struggles to be profitable in Chautauqua County. Challenges in the agriculture sector could present an opportunity to increase productivity and economic impacts in the economy. An effective approach may be to use planning and policy to facilitate the agriculture sector’s linkages to aggregation, wholesale and processing (AWP), one of the most powerful sectors in the county's food system.[128, 129] Such linkages may improve the agriculture sector’s growth, which in turn improves Chautauqua County’s economy as a whole and subsequently the wellbeing of residents.

^{lxxi} Chautauqua County’s income per capita (\$21,742) is 47 percent less than that of NYS (see Chapter 2).

Table 7.6 Food-Based Economic Development Scenarios in Chautauqua County

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Utilization and localization of school food programs in Jamestown increases	Utilization and localization of the Supplemental Nutrition Assistance Program increases	Addition of Dairy Processing	Addition of Slaughterhouse Facilities	Expansion of Truck Transportation Operations
100% of enrolled students utilize school food programs	75% eligible residents enroll as SNAP recipients	Increased demand for one new dairy processor (sales volume \$500,000)	Increased demand for one new slaughterhouse generates (sales volume \$2,283,000)	Increase demand for food-related truck transportation industry (increase in sales volume by 25%)
25% of purchases of fruits, vegetables, meat, and bread are local	\$2.5 million of purchases of fruits, vegetables, meat, and bread by SNAP recipients are local			

Data Source: Assumptions from Chapter 7; IMPLAN, Chautauqua County 2015. Credit: Munsung Koh

7.2 Assessing Economic Impact of the Food System

There are a number of ways to use the economic power of the food system economy to cultivate prosperity in Chautauqua County. For example, a county-level food supply chain is more likely to include independent community businesses, and data for the retail industry suggest that the proportion of economic return is more than three times higher in independent community businesses than in chain retailers.[130] This section reports five hypothetical food-based economic development scenarios to leverage the county's food system for prosperity.

Economic Impact Scenarios

Five food-based scenarios for economic development are considered, as described below and summarized in Table 7.6.

1. Increasing utilization and localization of school food programs in Jamestown and the county

Countywide, 49 percent of the student population is eligible for the free and reduced price school lunch program (NSLP), which is available at all 56 schools in the county. Not all students who are eligible purchase school meals, and therefore the school districts cannot receive federal reimbursement for those unclaimed meals (Chapter 5). The Jamestown School District announced in August 2015 that it would offer a Universal Meal program, which provides free meals to all students, not just those who are income eligible.[98] During the 2016-2017 school year, 77 percent of students choose to purchase school meals in the district (Chapter 5). Jamestown School District uses about three percent of its \$1,864,620 in federal funding for meal reimbursements to purchase

locally produced foods.[100] This scenario envisions an increase in the utilization of the Universal Free Meal school program in the Jamestown School District and based on the calculations for the district's increase, extrapolates the assumptions to all 18 school districts in the county. The objective of this scenario is to increase the number of Jamestown School District students, as well as students in all districts across the county, who participate in the school meal program to 100 percent. In addition, it assumes an increase in all school districts' local food procurement^{lxxiii} to 25 percent of their total food purchases (Table 7.6). Procurement assumptions are based on the county schools' current local purchasing of vegetables, fruit, milk, bread and meat (Chapter 5).[100]

2. Increasing utilization and localization of the Supplemental Nutrition Assistance Program (SNAP)

Currently, only 55 percent of *eligible* county residents receive Supplemental Nutrition Assistance Program (SNAP) benefits in Chautauqua County (Chapter 2). Additionally, the farmers at two county markets earn 1.3 percent of their total market sales from SNAP purchases (Chapter 5). This scenario envisions the impact of increasing utilization and localization of the SNAP program in Chautauqua County (Table 7.6). Specifically, the model assumes an increase in demand for fruits, vegetables, milk, bread, and meat^{lxxiv} by increasing overall enrollment of

lxxii As of the 2015 Farm to School census, only ten districts choose to procure local foods.[100] However, this analysis assumes all districts (18) would begin to procure some local foods.

lxxiii When procuring local foods using federal funding from the National School Lunch Program, districts may choose and report their own definitions of "local", including (a) Produced within a 50 mile radius, (b) Produced within a 100 mile radius, (c) Produced within a 200 mile radius, (d) Produced within a day's drive, (e) Produced within the state, (f) Produced within the region, and (g) Geographic along with other restrictions.[100]

lxxiv These food groups were selected based on their

eligible residents in the SNAP program to 75 percent, and increasing SNAP purchasing of the five food groups from Chautauqua County producers by 25 percent. This scenario is based on data from the two markets in Chapter 5. Increased demand may benefit farmers' sales trajectory, and increase food security of SNAP-eligible residents.

3. Adding a dairy processing facility

There are currently four dairy processors in Chautauqua County, and of those, only one is small-scale (i.e. less than \$1 million in annual sales volume) (Chapter 4). The single small-scale processor, with an annual sales volume of \$500,000, has capacity to purchase milk from just one dairy farmer.[58] Many dairy farmers work with cooperatives to sell their milk, which require contracts that prevent farmers from selling to any other outside purchasers like a local processor (Chapter 4). However, a few stakeholders noted that there is demand among some small-scale and grassfed dairy operations for local processors that is not being met.[52, 58] This scenario imagines that the county is able to attract a new dairy processor to the region that would generate the sales volume of the existing small-scale processor (\$500,000/year) so that products produced within the county are aggregated and processed within the county and the economic benefits are retained (Table 7.6). This scenario does not count other dairy-byproduct industries, such as ice cream and frozen manufacturing, etc.

4. Adding slaughterhouse facilities

A meat processing study found that there is need for improved communication between producers and processors, and recommended a plan be developed to implement new facilities that could serve the Southern Tier region including neighboring counties.[47]

prevalence and popularity at among shoppers at farmers markets and foods that are allowed purchases with SNAP benefits.

Table 7.7 Truck Transportation Industry

NAICS code	Industry Name	Sales Volume(\$)	25% Increase of Sales Volume (\$)
484110	General freight trucking, local	12,725,000	3,181,250

Data sources: US Economic Census 2012; IMPLAN, Chautauqua County 2015

Table 7.8 Estimated Economic Effect of Increased Utilization and Localization of School Lunch Program in Jamestown School District

Scenario 1	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Employment	1.7	2.1	1.8	5.6
Labor Income (\$)	307,367.2	61,219.6	61,371.3	429,958
Value Added (\$)	320,266.2	74,842.6	117,337.9	512,447
Output (\$)	621,895	172,226.5	213,279.3	1,007,401

Source: IMPLAN, Chautauqua County, 2015

Table 7.9 Estimated Economic Effect of Increased Utilization and Localization of School Lunch Program in All Chautauqua County School Districts

Scenario 1	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Employment	22.7	8.6	7.3	38.6
Labor Income (\$)	1,231,095.0	245,202.2	245,810.0	1,722,107.0
Value Added (\$)	1,282,759.2	299,766.3	469,972.4	2,052,498.0
Output (\$)	2,490,870.0	689,817.0	854,245.5	4,034,933.0

Source: IMPLAN, Chautauqua County, 2015

Table 7.10 Estimated Economic Effect of Change in Demand for Local Vegetables, Fruit, Milk, Bread and Meat by SNAP recipients

Scenario 2	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Employment	21.3	8.6	7	36.9
Labor Income (\$)	1,159,291	246,101	234,001	1,639,394
Value Added (\$)	1,207,942	300,865	447,394	1,956,202
Output (\$)	2,500,000	692,346	813,207	4,005,553

Source: IMPLAN, Chautauqua County, 2015

Table 7.11 Estimated Multiplier Effect of Dairy Processor Scenario in Chautauqua County

Scenario 3	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Employment	0.3	1.4	0.5	2.2
Labor Income (\$)	27,396	81,539	17,932	126,867
Value Added (\$)	44,656	108,677	34,253	187,586
Output (\$)	500,000	261,333	62,304	823,637

Source: IMPLAN, Chautauqua County, 2015

Table 7.12 Estimated Multiplier Effect of Slaughterhouse Scenario in Chautauqua County

Scenario 4	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Employment	3.2	28	3.6	34.8
Labor Income (\$)	119,369	602,105	119,954	841,428
Value Added (\$)	269,675	659,228	229,318	1,158,221
Output (\$)	2,283,000	1,924,311	416,857	4,624,168

Source: IMPLAN, Chautauqua County, 2015

Table 7.13 Estimated Multiplier Effect of Food-related Truck Transportation Scenario in Chautauqua County

Scenario 5	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Employment	17.8	6	7.2	31
Labor Income (\$)	1,210,189	293,769	243,814	1,747,772
Value Added (\$)	1,440,825	414,117	465,158	2,320,100
Output (\$)	3,181,250	707,761	846,879	4,735,889

Source: IMPLAN, Chautauqua County, 2015

Currently, there are two meat processing facilities in Chautauqua County, both which make more than \$1 million annually (Chapter 4). This scenario imagines that the county is able to attract an additional slaughterhouse, or invest in a mobile slaughterhouse operation, that would help increase the power of processing in the county's food economy by generating about the same sales volume as one of the existing slaughterhouses (\$2,238,000 per year).[47]

5. Expanding truck transportation operations

Currently, the county experiences challenges with distribution of products from farmers to small-scale processors and aggregators.[45, 52] The need for improved transportation options for raw, processed, ready-to-eat, and spoiled/uneaten food has been noted across each food system sector (Chapters 3 - 6). This scenario imagines that the county is able to increase food-related truck transportation to help facilitate the logistical power of the county's food economy. The scenario simulates a 25 percent increase in demand for the food-related truck transportation

industry in Chautauqua County, equivalent to an additional purchase volume of \$3.2 million (Table 7.7).

To measure economic impact, economic multipliers for each industry were utilized in an input-output model using IMPLAN software.^{lxxv} The detailed model results below show the effect of change in demand in a specific part of the food system on Chautauqua County's economy as a whole. Impacts are shown in terms of employment, labor income, value-added, and output.

Model Results

Scenario 1: Increase in Utilization of School Food Program and Local Food Procurement

Modeling results show that when utilization of the Universal Meal program as well as local food procurement is increased in the Jamestown School District, the economic activity generates almost six new jobs in the economy and about \$1 million of new economic output across the Chautauqua County's economy (Table 7.8).

When demand is modeled for increase in utilization and localization across all school districts in Chautauqua County, the economic impact is estimated to generate about \$4 million in economic output as well as about 39 new jobs in the economy (Table 7.9). In other words, an increase in utilization of the school lunch program and local food procurement is not only beneficial for student

^{lxxv} An economic multiplier describes how an initial increase in economic activity has a cascading impact on an economy. The economic multiplier measures three effects: direct effects, indirect effects, and induced effects. Direct effects represent the initial change in the industry in question. Indirect effects are changes in inter-industry transactions when supplying industries respond to increased demands from the directly affected industries. Induced effects reflect changes in community spending that result from income changes in the directly and indirectly affected industry sectors. Unlike indirect effects, these are impacts from wage expenditures.[130] Each industry has different multiplier effects, and each effect shows different impacts on employment, labor income, value-added, and output.

food security, but also for Chautauqua County's economy.

Scenario 2: Increase in Enrollment in SNAP Program and Increase in Demand for Local Foods

The economic impact of increasing enrollment in the SNAP program and localizing the purchases of vegetables, fruit, milk, bread, and meat is associated with \$4 million in economic output and 36 new jobs (Table 7.10). Therefore, an increase in enrollment of eligible residents in the SNAP program and their purchases of county-produced foods is not only helpful in alleviating food insecurity but also to Chautauqua County's economy.

Scenario 3: Addition of a Dairy Processing Facility

The addition of a dairy processing facility estimates that almost two new jobs and \$0.8 million in new economic output will be created through the addition of a small-scale dairy processing operation (Table 7.11).

Scenario 4: Addition of a Slaughterhouse

Model results suggest that this scenario is associated with almost 35 new jobs as well as roughly \$4.6 million in new economic output (Table 7.12). The average sales volume per slaughterhouse is \$2.3 million in Chautauqua County.^{lxxvi} Currently, the county may benefit from an additional slaughterhouse, particularly if it was USDA certified or mobile.[123]

Scenario 5: Increase Food-related Truck Transportation Industry

This scenario estimates that almost 31 new jobs as well as roughly \$4.7 million in new economic activity will be generated (Table 7.13).

^{lxxvi} According to Reference USA 2016 data.

Table 7.14 Multiplier Effect in Output by Selected Food Industries

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Fruit farming	1	0.09	0.58	1.67
Vegetable and melon farming	1	0.1	0.55	1.65
Dairy, cattle and milk production	1	0.24	0.24	1.48
Bread and bakery production	1	0.11	0.16	1.27
Animal except poultry slaughtering	1	0.84	0.18	2.02
Dry, condensed, and evaporated dairy product manufacturing	1	0.52	0.12	1.64
Truck Transportation	1	0.22	0.27	1.49

Source: IMPLAN, Chautauqua County, 2015

Table 7.15 Multiplier Effect in Employment by Selected Food Industries

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Fruit farming	23.6	0.78	4.95	29.33
Vegetable and melon farming	8.58	0.77	4.72	14.07
Dairy, cattle and milk production	4.36	2.59	2.08	9.03
Bread and bakery production	7.55	0.83	1.4	9.78
Animal except poultry slaughtering	1.39	12.28	1.57	15.24
Dry, condensed, and evaporated dairy product manufacturing	0.58	2.82	1.07	4.47
Truck Transportation	5.6	1.87	2.29	9.76

Source: IMPLAN, Chautauqua County, 2015

Table 7.16 Multiplier Effect in Labor Income by Selected Food Industries

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Fruit farming	0.94	0.05	0.17	1.16
Vegetable and melon farming	0.89	0.05	0.16	1.1
Dairy, cattle and milk production	0.32	0.09	0.07	0.48
Bread and bakery production	0.26	0.03	0.05	0.34
Animal except poultry slaughtering	0.05	0.26	0.05	0.36
Dry, condensed, and evaporated dairy product manufacturing	0.05	0.16	0.04	0.25
Truck Transportation	0.38	0.09	0.08	0.55

Source: IMPLAN, Chautauqua County, 2015

Table 7.17 Multiplier Effect in Value Added by Selected Food Industries

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Fruit farming	0.83	0.06	0.38	1.28
Vegetable and melon farming	0.8	0.07	0.3	1.16
Dairy, cattle and milk production	0.39	0.13	0.13	0.65
Bread and bakery production	0.44	0.05	0.09	0.58
Animal except poultry slaughtering	0.12	0.29	0.1	0.51
Dry, condensed, and evaporated dairy product manufacturing	0.09	0.22	0.07	0.38
Truck Transportation	0.45	0.13	0.15	0.73

Source: IMPLAN, Chautauqua County, 2015

Table 7.18 Comparison of Economic Impacts of Alternative Scenarios

Scenario	1. Increasing utilization and localization of school food programs in Jamestown	2. Increasing utilization and localization of the Supplemental Nutrition Assistance Program	3. Addition of Dairy Processing Facilities	4. Addition of Slaughterhouse Facilities	5. Expansion of Truck Transportation Operations
Input (\$)	621,896	2,500,000	500,000	2,283,000	3,181,250
Employment	5.6	36.9	2.2	34.8	31
Labor Income (\$)	429,958	1,639,394	126,867	841,428	1,747,772
Value Added (\$)	512,447	1,956,202	187,586	1,158,221	2,320,100
Output (\$)	1,007,401	4,005,553	823,637	4,624,168	4,735,889

Source: IMPLAN, Chautauqua County, 2015

7.3 Summary

Although all scenarios are associated with positive economic benefits, some yield a greater return depending on their direct and indirect effects.^{lxxvii} The scenarios with greater

^{lxxvii} For example, when the demand for cheese goes up (direct effect in cheese), then demand for milk will go up. Then, cheese processors will need more milk, and the dairy farmer will expand her herd and sell more milk. The dairy farmer will make more money, and buy a new refrigerator for the cheese (indirect effect on the refrigerator industry). The cheese manufacturer, dairy farmer's family, and laborers' families will have more income to spend – and all of these households will spend more on other items unrelated to agriculture, such as movie tickets (induced effects). Industries that are labor intensive tend to have higher induced effects than indirect effects.

indirect and/or induced effects are more likely to create a greater ripple effect to the county economy.^{lxxviii} For example, increased

^{lxxviii} The selected food industries listed in each multiplier effect result (see Tables 7.14 - 7.17) reflect the industries most likely to be impacted by each scenario. The categories were selected from NAICS classifications. *Fruit and vegetable farming, dairy/cattle/milk production, and bread/bakery production* are most likely to be impacted by Scenario 1 (increase in school food programs) and Scenario 2 (increasing utilization and localization of the SNAP program). *Dairy product manufacturing* is likely to be impacted by Scenario 3 (adding of dairy processing), *Animal except poultry slaughtering* is impacted by Scenario 4 (addition of slaughterhouse facilities), and *Truck Transportation* is likely to be impacted by Scenario 5 (expansion of truck transportation operations).

demand for meat processing, through the addition of slaughterhouse facilities, is associated with a significant total effect, or ability increase demand in other industries: the indirect effect represents 84 percent of the direct effect (Table 7.14). Thanks to the significant multiplier effect, the **Addition of Slaughterhouse Facilities** scenario shows one of the greatest total output (\$4,624,168) among the five scenarios (Table 7.18). Therefore, the **Addition of Slaughterhouse Facilities** has the greatest indirect effects and is likely to increase outputs of both the direct industry and the ancillary industries that contribute to Chautauqua County's economic development.

The employment effect is likely to be greater in more labor-intensive industries. For example, the employment effect is greater in fruit farming (29.3) or vegetable and melon farming (14) than in dairy processing (4.5) or the trucking industry (9.8) (Table 7.15). Thanks to the significant employment effects in the agriculture sectors, **Increasing and Localizing SNAP** scenario shows the greatest employment effect (36.9) among the five scenarios (Table 7.18). Likewise, **Increasing and Localizing SNAP** scenario shows the second highest labor income effect of \$1,639,394 (Table 7.18) due to the agriculture sector's strong multiplier effects in labor income: fruit farming (1.2) and vegetable and melon farming (1.1) (Table 7.16). Therefore, **Increasing and Localizing SNAP** is the most likely scenario among the five to improve employment and labor income conditions in the direct industry and the ancillary industries.

The **Truck Transportation** scenario shows the highest labor income effect (\$1,747,722) among the five scenarios due to its highest initial input from the change (\$3,181,250) and greatest value-added effect (\$2,320,100) (Table 7.18). The value-added category consists of compensation of employees, proprietor income, other property type income and tax on production and imports. Therefore, the **Truck Transportation**

scenario is the most likely scenario of the five described in this chapter to contribute the direct industry and the ancillary industries in Chautauqua County.

These model results are not intended to be prescriptive, but are meant to aid Chautauqua County decision makers in thinking about the food system as a lever for economic development, and provide information about possible future scenarios that could have the greatest impact in the county. To utilize the food system as a lever for change, decision makers will have to build on local assets or strengths and overcome some challenges, which are synthesized in the next chapter.

7.4 Conclusion

The food economy represents almost 25 percent of sales in the county's total economic activity. Because of the strong role the food system plays in the economy, the strengths, challenges, and levers for change deserve attention from a diverse group of players, including those who are not usually at the table, such as temporary work-placement agencies, real estate developers, law firms, or banks (to name a few). The future economic health of the county rests squarely on the health of the food system, and each opportunity to leverage the economic power of the food system presents an opportunity to improve the overall economic outlook of the county, and food and financial security of residents. Strategies to fund initiatives or invest in the food system, modify policies to support the food system, and strengthen cross-sectoral connections within the food system present exciting opportunities to leverage the economic power of the food system. The effective implementation of these types of strategies will likely require a coordinated effort among multiple stakeholders across the food system and its ancillary industries, as described in the next chapter.



8. Making Sense of It All

Implementation of actions to strengthen the food system depends upon first identifying ways in which the food system is functioning well and where there are opportunities for improvement. This section distills the in-depth findings about the current conditions of the food system from the prior sections into key strengths and challenges of the Chautauqua County food system. The synthesis is accompanied by brief descriptions of potential opportunities that may enhance existing strengths in Chautauqua County and help overcome barriers.

8.1 General Strengths and Challenges

Chautauqua County is a county of entrepreneurial and hardworking individuals. The county has high rates of self-employment, which demonstrates an entrepreneurial spirit among residents, and perhaps a culture of support from policymakers and organizations for new ventures and ideas. Although the rate of unemployment is the same as the state average (8%), the lower income per capita

compared to the state average of \$32,104 may indicate that while there are jobs, those jobs may not pay enough to live comfortably. Despite the county's high poverty rate (19%), which allows households to apply for public safety nets, participation rates in SNAP, WIC, and NSLP programs are low or declining (Chapter 2). Only 11 percent of the population does not have access to a car, but the rural, low-density nature of the county makes it difficult for those without vehicles to get to food retail stores. Groups who might be more vulnerable to food insecurity, including low-income seniors, children, and people with disabilities, are also less likely to be able to get to healthy food retailers on their own. Those vulnerable groups also represent high percentages within the population that receives SNAP benefits. Health outcomes demonstrate consumer behaviors related to food access or available options for fresh, healthy food; the obesity rate is higher than the state average, and residents struggle with high cholesterol and rates of diabetes (Chapter 2).

Sector	Strengths	Challenges
Agriculture and Production	Increasing amount of farmland in production	Aging farmer population
	Strong production in dairy and fruit and tree nuts	Decreasing number of farms
	Ample amount of prime agricultural land	Lack of formal opportunities for education in agricultural and food-related industries
	Increasing demand for organic products	High labor costs for farmers and producers
	Well-established community and culture around agriculture	Cost of land and equipment are barriers for new farmers

Agriculture and Food Production

A review of agricultural production in Chautauqua County reveals several opportunities and challenges. The county's farmer population is aging, and few young farmers are entering the profession, which could result in a shortage of farmers and loss of farmland to development as farmers retire. Young farmers may be dissuaded from farming due to the financial barriers to entry (high prices of land, equipment, labor), or the lack of educational programs to prepare and train young people for the profession of farming. Although overall farmland acreage has increased, and there is plenty of prime agricultural land still not in farming across the county, the number of farms is decreasing more rapidly in Chautauqua than it is across the state.

There is a concentration of grape and dairy farms in Chautauqua County, which may provide opportunities for cross-sectoral development between these two production areas, such as sharing processing or transportation facilities. Unfortunately, farmers who produce certain crops (e.g. milk)

are often under contract with cooperatives or larger processing businesses and the prices are regulated, making it difficult for farmers to make a profit. Due to the small number of farms who conduct on-farm retail, packaging, or value-added activities, farmers in Chautauqua County rely on next step in the supply chain - aggregation, wholesale, and processing - to reach consumers. Another challenge arises as food moves beyond the production sector: many farmers do not have the capacity or capital to invest in trucking or transportation to bring their products to processing or wholesale facilities. Selling to AWP businesses would increase farmers' profits due to the price increase associated with value-added products, or access to broader consumer markets, but the startup and maintenance costs of trucking systems are too high for most producers (Chapter 3).

Aggregation, Wholesale, and Processing (AWP) Sector

The AWP sector in Chautauqua County has many strengths and challenges. The sector is comprised of major national-

Sector	Strengths	Challenges
Aggregation, Wholesale and Processing	Many processors for grapes	Lack of transportation network to connect small and mid-sized producers and processors/aggregators/wholesalers and move local products around the county more easily
	Businesses play multiple roles in the food system by acting as processors and wholesalers or aggregators, and having on-site retail	Lack of processors for dairy
	Creative wholesale/aggregation business practices	Departure of major businesses
	Diversity in business types with a variety of local and national brands	Sales contracts with cooperatives or large-scale purchasers limit new connections between farmers and small-sized local processors
	High number of employees in large-scale businesses	Regulations and required certifications are barriers to entry for new entrepreneurs
	Public support for entrepreneurship	No shared-use processing facilities for individual or small-scale producers or entrepreneurs
	Support for keeping products local	Few opportunities for grain processing for bakeries and breweries

brand processing facilities, such as Welch’s Inc., as well as many small-scale, local facilities, such as Reverie Creamery and CHQ Local Food. Several large-scale processing companies have left the county, including Welch’s Inc. headquarters and ConAgra, which has negatively impacted all sectors of the food system and ancillary sectors, such as transportation. This sector in the food system has the highest number of employees (1,113) compared to the other three sectors. The sector currently capitalizes on the county’s agricultural asset of grapes, with the wealth of juice processors and wineries. However, the dairy processing realm is underdeveloped, presenting an area for potential development. Although bakeries are the second most common processing business in the sector, and grain ranks second highest in agricultural sales among all crops, there are no grain mills to directly link the grain produced to the bakeries in Chautauqua County. Since the majority of the businesses in the AWP sector are considered small in terms of annual sales volume and number of employees, they qualify for scaling-up

support in the form of small business loans, grants, and other financial supports.

Small-scale processing and aggregation businesses do not meet the demand from farmers in some cases due to several factors. Transportation between farms and processing sites is a challenge because of the cost of trucking for either the farmer or processor. Contract agreements between farmers and buyers or cooperatives prevent farmers from also selling to smaller-scale processors or aggregators. The lack of larger AWP facilities creates challenges due to economies of scale; large-scale processors and wholesalers such as Welch’s can afford trucking systems to retrieve the grapes, while smaller processors cannot. Large-scale processors may also demand certain quantities of product that small-scale producers cannot provide.

The AWP sector has strength in the entrepreneurial spirit of individuals who build on existing agricultural assets and the diverse and ready customer base that includes both tourists and local residents. Business owners often conduct more than one food system

Sector	Strengths	Challenges
Distribution	Food distribution sites are located throughout the county	Limited access to supermarkets and grocery stores due to their uneven spatial distribution especially for those without vehicles
	Prime opportunities for small-size producers and processors to sell products directly to small-scale or locally-owned businesses	Locally-owned/operated companies report lower annual sales volume than branch companies
	Increasing direct farm sales and purchasing by large institutions including school districts	Low participation in SNAP, WIC, and FMNP programs may limit low-income residents' ability to purchase local foods
	Food service and food retail businesses are the sources of many jobs in the food economy and the county	Unstable profits from seasonal nature of demand may have negative effect on job stability
		Jobs in food retail and food service may not provide high wages

activity, and find creative solutions to increase sales. For example, Reverie Creamery has a processing facility directly behind their retail space, and they aggregate other local products both to include in the cheese and to sell in the shop. Although business owners utilize the small business support systems from the local community colleges, Cornell Cooperative Extension, and one another (informally), there is a lack of shared-use processing spaces for new entrepreneurs or very small businesses trying to scale up.

Food Distribution Sector

Food distribution to residents through market-based, institutional, and non-market/emergency supply chains serve county residents is efficient, even though some challenges remain. A variety of market-based retail outlets in Chautauqua County, including grocery stores and convenience stores, are easily accessible to most people living in town centers or cities, or to those who have cars. There is uneven geographic distribution of larger retail outlets such as supermarkets and grocery stores, which stock a wider variety of foods. A challenge remains in the freshness and variety of healthy food options at retail outlets such as convenience stores, which may be the only accessible retail outlets for residents in rural areas or residents who face

obstacles to driving in rural and urban areas. Local retail outlet owners have the flexibility to source and stock local products (more than their branch counterparts); however, local owners report lower sales volume than their regional or national counterparts and may struggle to remain economically viable. Although the distribution sector provides employment opportunities across the county, many jobs, especially in food service, may be seasonal and/or not have benefits or regular hours. Lack of steady income may lead to increased food insecurity for residents, creating a challenging cycle.

For individuals who are unable to procure food through purchase or other market-based means, a network of safety nets exists in the form of emergency food sources throughout the county. Emergency food outlets may not serve all consumers' dietary preferences or needs however. Many locations may be hard to reach for elderly, disabled, and young residents and those without a car. Institutions that run emergency food sources, such as Chautauqua County Rural Ministries, are committed to offering fresh foods whenever possible through gleaning programs (Chapter 5).

Stronger links among local food producers, intermediaries, and distributors may create opportunities for consumers to

Sector	Strengths	Challenges
Food Loss and Waste Management	Many sources of excess food and by-products	High transportation time/costs of moving excess food
	Farmland and open space for composting/ anaerobic digestion available	Organizations interested in tackling food waste depend on volunteers with limited staff
	Culture of food sharing among neighbors prevents house-hold level food waste	Inadequate food processing/storage infrastructure to collect and distribute donated food
	Large institutions and businesses are leading by example to show how food waste can be reduced	Low population density makes difficult to establish municipally-run waste management program
		Shortage of resources for adequate transportation, staffing, and infrastructure to manage county's excess food and food waste
		Limited data about food loss, waste or recovery

purchase or consume local foods more easily, which may also lead to innovative strategies for handling food waste along the supply chain.

Sector Managing Loss and Waste of Food

It is plausible to imagine excess food being recovered, reused, and reclaimed across all sectors of the food system - from farms to plates - in Chautauqua County. Education institutions such as SUNY Fredonia, businesses like Ridgeline Farms, and emergency food outlets like Rural Ministries are committed to reducing loss and waste of food. However, the lack of system-wide collaboration or policies to support food reclamation and waste mitigation in Chautauqua County is a challenge, exacerbated by the fact that food waste data is limited at the county level (Chapter 6). Without this data, it is hard to plan for or demonstrate the importance of food waste reduction, reclamation, or recycling strategies. In addition, logistical barriers such as limited staff and lack of funding prevent scaling up of existing strategies for food reclamation or reuse among individuals and institutions.

The Food Economy

A key insight from an assessment of the county's food system is its strength in the overall economy. As noted in Chapter 7, the food economy generates nearly a quarter of the economic activity (measured in annual sales) of the county. In the food economy, the average sales volume per worker, an indicator of the strength of importance in the economy, is higher than the state level. The AWP sector has the highest average number of employees per operation and sales volume out of the four sectors in the food system. An informal network exists among food system actors, which has the potential to strengthen the food economy. There are many opportunities for collaboration across the food system sectors to improve business viability and keep county-grown products processed, sold, consumed and disposed of locally, according to several economic impact scenarios (Chapter 7).

The challenges lie in the lack of systematic connections across the sectors, which impacts the viability of agriculture, small-scale processors, and retailers, and limit the possibility of reducing food loss and waste across the food system.

Summary

The objective of the report is to document the capacity of the Chautauqua County food system to act as a catalyst for economic development. The food system is a pivotal component of the overall economic output in the county (Chapter 7), and therefore deserves significant attention from the local government and regional agencies as a lever for promoting rural economic prosperity and development, therefore improving the health and wellbeing of residents of the county.

Adaptability, innovation, and openness to change are at the heart of many of the current success stories from Chautauqua County. For example, whereas the agriculture sector is already successful in producing products such as grapes, grain, and milk, all of which constitute large components of the overall agricultural output (Chapter 3), farmers and food system actors remain willing and open to future strategies, including diversifying crop types, changing production patterns, and shifting business plans to reach new customer bases. In addition, efforts to reduce food waste are linked directly to increasing healthy foods for residents who utilize emergency food sources.

There is a strong commitment among business owners in each food sector to support one another. Many businesses with high sales volume, such as the Grape Growers Cooperative, sell their products to local distributors, while small-scale businesses sell their products at one another's retail shops (Chapter 4). Business owners note a friendly environment toward start-up businesses in the county, especially due to the strong presence of the Cornell Cooperative Extension, and entities such as the Jamestown Community College Small Business Development Center (Chapters 3, 4).

In Chautauqua County's tradition of neighbors helping neighbors, many organizations are going beyond their individual organizational missions to work collectively to strengthen food systems (see

Chapters 1, 3-6). These coalitions have been instrumental in keeping Chautauqua County-grown foods accessible to as many residents as possible within the county. As noted earlier, customers can use SNAP benefits at farmers markets; public schools purchase and serve local foods; locally-owned grocery stores stock and sell products from area farms; and in keeping with longstanding tradition, farms continue to sell produce at roadside stands in rural areas that would otherwise have limited access to fresh produce (Chapter 5).

Many of the small-scale businesses in Chautauqua County are designing innovative business models to fill gaps and build upon existing assets (Chapters 3-6). These innovations demonstrate the entrepreneurial spirit of business owners that drive the Chautauqua County food system, and promote food security across the county. Some are creating interlinked, localized supply chains themselves, as evidenced by the following three businesses:

1) Abers Acres, an organic farming operation, engages in food retail by selling produce at their roadside stand and an off-farm u-pick location, aggregates and re-sells products from other area farms, and processes excess berries by freezing them and selling them to customers (including wineries) in the winter (Chapter 3).

2) Reverie Creamery, an artisanal cheesemaker, processes cheese and other products made with local ingredients from area producers and sells them in their retail store, at more affordable prices (Chapter 4).

3) Cassadaga Shur Fine, a food retail operation, acts as an aggregator, delivery service, and retailer under one business model (Chapter 5).

As demonstrated in Chapters 3 through 6 of the report, the majority of farm operations and aggregation, wholesale, and processing enterprises are small-scale businesses which do not contribute significantly to the overall economic power of the food system in the county. A few large-scale businesses (in the AWP sector)

constitute the majority of sales volume and employment opportunities in the food system. As a result, the economic well-being of the food system, and residents, is significantly impacted by the departure of large-scale businesses. As businesses such as Welch's Inc. headquarters and ConAgra Foods leave the county, towns must figure out other means to offer employment and foster economic activity to ensure financial and health security among residents.[57] **A more diverse mix of businesses, including small, medium, and large scale businesses, would offer more resiliency to the county's food system and the overall economy.** Perhaps due to major business flight or lack of educational opportunities, young people are leaving the county to seek job and education opportunities. Although the unemployment rate is low, many residents live at or below the poverty line, implying that the available jobs do not pay a living wage and residents may experience financial stress (Chapter 2). The lack of agricultural education programs may be a reason young people may not be interested in farming or other food-related careers (Chapter 3).

Although there are many food retail outlets, grocery stores that sell diverse, nutritious foods are concentrated in the major population hubs, which leaves rural-dwelling residents with limited food retail options. Convenience stores with limited fresh produce comprise 25 percent of all food retail stores (Chapter 5), and in some locations are the main food source for residents without access to vehicles, which may impact the health outcomes of those residents.

A few large institutions such as public schools are sourcing and serving locally grown and healthy foods. However, state and federal regulations on food production, processing, and handling are significant barriers for small-scale producers that may prevent them from selling to institutional markets (Chapter 4), and limiting the healthy options available to students.

Some assistance is available for small-scale businesses with start-up plans, feasibility studies, and startup costs for new operations such as slaughterhouses, but the assistance is not coordinated, and may be hard to access for many entrepreneurs.

Finally, all sectors within the food system – including agriculture, AWP, distribution, and food waste management – find transportation infrastructure and resources for moving products and waste from source to destination to be a challenge. For example, although individual farmers may work with individual processors (such as Reverie Creamery) or individual retail outlets (such as Cassadaga Shur Fine), there is not a mechanism to coordinate, provide, and share transportation costs. Instead, producers work with large-scale businesses, under binding contracts, in exchange for product transportation and aggregation. Small- to mid-scale producers may deliver products themselves, which takes significant time. Contracts limit producers' flexibility to access untapped market opportunities such as engaging in value-added processing operations or selling to schools.

A formalized group or entity of food sector entities working together could alleviate many of the infrastructure, financial, coordination, and policy challenges described thus far.

8.2 Levers for Change in the Food System

A number of levers can be used to strengthen the county's food system. Effective levers amplify strengths and overcome the challenges in the food system. If utilized, these levers can lead to improved conditions for Chautauqua County residents through a ripple effect, such as diversified and higher-paying job opportunities, stronger public service infrastructure including road and bus networks, decreased poverty levels, and higher rates of food security.

Funding/Investment in the Food System

Because the food system comprises 23 percent of the total Chautauqua County economy's sales volume, it opens opportunities for further growth. Funding for food systems work has traditionally been awarded to more urban areas of Western New York such as Buffalo, Rochester, and Niagara Falls. The county can leverage the data synthesized in this report to demonstrate the need for state and federal funding to support a variety of the ideas for the future in its more rural context (see Chapter 10).

Increased tourism has been suggested as a method for increasing economic development in Chautauqua County, with a potential focus on agritourism through the wine trail, Grape Discovery Center, and farm tours (while paying attention to the the cost-benefit trade off for farmers). Tourist spending would directly increase sales in certain industries such as accommodation and the restaurant industries in the distribution sector, which may then trickle down to positively impact other food systems sectors. While certain processing-retail businesses, such as wineries and breweries, should be highlighted in campaigns to attract additional tourists, the campaigns should not force farmers or processors to beautify or mask their operations for tourists' benefit. Tours can put undue pressure on working farms and waste valuable time and capital in the process. Tourism focused on existing opportunities will have a trickle-down effect, particularly if restaurants, museums, and other tourism-supported industries feature local products and tell stories about their origins to indirectly increase support for other food system sectors.

Finally, additional state dollars can flow into the county's higher educational system through the new New York State law that pays for students' educations who fall under an income threshold.^{lxxix}

^{lxxix} The Excelsior Scholarship (New York State Senate Bill S4749), signed into law in April 2017, makes tuition free for New York state residents at SUNY and CUNY

With higher enrollment at SUNY Fredonia and Jamestown Community College, more students may choose to stay in the area after graduation and take advantage of the low cost of land to launch new businesses. In addition, the region may become more attractive to external investment with non-manufacturing companies that are looking for a ready workforce and inexpensive land near the major population hubs of Buffalo, Cleveland and Pittsburgh. An increase in the rates of higher education attainment among residents could attract new investments as well, reducing the regional reliance on the decreasing number of blue-collar manufacturing jobs. An increase in the younger population in Chautauqua County would lead to more tax dollars and spending circulating across the county, which inevitably reaches and impacts the food system.

Policy Change to Support the Food System

Policy change can be one of the most effective levers for addressing system-wide challenges that require attention, input, and connections among multiple food system sectors. Although policy-making may take longer to implement than a program change, policies can offer long-term, countywide regulations and make connections between each food system sector to maximize economic development as outlined in Chapter 7. Policies at the county level would attract more support businesses through tax incentives, zoning regulations, public infrastructure improvement and workforce development. Policy strategies can help simplify or incentivize connections among farmers, processors, and buyers, such as through facilitating tax credits for businesses that donate excess product to food pantries,^{lxxx} supporting a food-system transportation network, adding small-scale

schools and community colleges with some associated residency requirements post-graduation.

^{lxxx} Farm to Food Bank (New York State Bill S1606/A6192), signed into law in April 2017, provides a refundable tax credit of 25 percent of the wholesale value of donated food from NY farmers.[211]

processing facilities for major agricultural products, increasing Farm to School participation and local food purchasing, establishing Healthy Corner Stores,^{lxxxi} and encouraging local procurement by government offices, programs, and events.^{lxxxii}

Local policies can adjust some state and federal requirements to better meet the specific needs of the county, or encourage businesses in the food system to take advantage of existing state or federal policies such as the state Farm Brewery and Farm to Food Bank laws, and federal Farm to School local purchasing procurement requirements (Appendix C). County-level policies can be put in place that support development of new processing facilities, formation of a transportation network, and increased participation in local food purchasing (Chapter 7). Finally, Chautauqua County's Planning and Economic Development Department (or, a collaboration among municipal and county-level planning departments) could gain a better understanding of the magnitude and capacity for harnessing the potential benefits from excess food across the county. The innovative solutions to food waste management in Chautauqua County suggest excess food may offer opportunities to improve food security, keep food out of landfills, and create alternative energy sources (Chapter 6).

Stronger Connections Across the Food System

Strong relationships among players across the food system have already catalyzed economic growth and prosperity in Chautauqua County. Neighbor-to-neighbor, business-to-customer, and business-to-business relationships are the foundation of rural communities and their economies,

^{lxxxi} Healthy Corner Stores are convenience stores that have committed, often through non-profit or government support, to stock a certain amount of fresh fruits and vegetables to provide nutritious options for residents in an area where the convenience store may be the main food source for residents.[63]

^{lxxxii} See the Cabarrus County, NC Local Food Purchasing Policy (Chapter 9).

as evidenced in Chautauqua County. For example, the members of the Growing Food Connections Steering Committee, formed in 2015, represent diverse backgrounds and experiences and they continue to work collaboratively to improve economic, social, cultural, and health conditions for residents in the county (Chapter 1). This collective social and cultural capacity and commitment of stakeholders can lead to connections across the food system.

One of the connections most worthy of attention is the link between the economic power of the food system and the overall economic future of Chautauqua County. A coalition of somewhat unlikely partners, such as farmers, food business owners, trucking companies, and real estate developers, may be able to connect the food system to other areas of economic development such as tourism and investment in education and training programs (Chapter 7).

Chautauqua County's strategic regional location between the urban hubs of Buffalo, Cleveland, and Pittsburgh positions it well to capture the increasing urban demand for regionally-produced foods. Leveraging partnerships with distributors and markets in urban centers could increase market demand for Chautauqua County products (Chapter 7).

There is a demonstrated need for transportation linkages among institutions, businesses, and individuals who wish to purchase local food, and the farmers or processors who are producing or preparing those food items. While some small businesses are successfully making these linkages between specific business and customer types (e.g. CHQ Local Food) there is an opportunity for a formalized, food-focused transportation network. A business that exists explicitly to retrieve and deliver foods to meet the growing local and regional demand would reduce the barriers of time, capital, or logistical capacity that prevent farmers, processors, wholesalers, aggregators, and retailers from reaching new markets and scaling up their operations. There may be

opportunities to both collaborate with existing non-food-related trucking companies, as well as to form relationships with regional distributors that already conduct some business in Chautauqua County, including Latina Boulevard Foods from Erie County and Regional Access from Tompkins County (Chapter 4).

As transportation networks grow stronger, relationships between buyers and sellers can form more easily. New markets for producers and processors could become available through local food purchasing by school districts (Chapter 5), regional food hubs (Chapter 4),^{lxxxiii} additional processing facilities that include value-added products (Chapter 4), and convenience stores (Chapter 5). Purchase of local foods by Chautauqua County schools may be a particularly niche market for some producers. Kitchen equipment, training, and space for processing raw products, as well as a transportation network to transport product from farms to school kitchens, could build the capacity schools need to purchase additional local food (Chapters 5, 7). A formalized regional trucking network would allow small-scale and mid-sized businesses to leverage resources and apply for funding geared towards collaborative or regional entities, through organizations such as the Southern Tier West Regional Planning and Development Board (Chapter 4). Over the past few years, Southern Tier West has convened a regional Farmers Market Network of about 30 markets, to offer professional development, training and knowledge sharing among farmers.[52] This type of network could be scaled up to include business owners across the food system.

Networks that build relationships among buyers and sellers, including knowledge sharing and physical

^{lxxxiii} The USDA working definition of a food hub is ‘a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.’[50]

transportation, may be more crucial to supporting the food system than a physical or online food hub space, which have been utilized in other parts of the country (Chapter 9). **A study conducted for Southern Tier West showed that a physical food hub may not be feasible in the Southern Tier region, particularly with the development of the Western New York Food Hub in Erie County (Chapter 4).**[48, 49] As shown throughout this chapter, opportunities exist within the county to form other types of networks that might better suit the needs of Chautauqua County producers, processors, aggregators and wholesalers, retailers and consumers.

In order to leverage the full power of the food system, the supply chains for individual products that Chautauqua County has in abundance must be linked together through a regional supply network. Partnerships between small- and mid-sized farms and processors can help support resiliency in the food system. Since 86 percent of farms in Chautauqua County are considered small-scale (Chapter 3), connections between farmers and small- to mid-scale processing and aggregation facilities could be essential to the success of the food system. Collaboration between various food producers and processors would allow different crops and products to be transported or processed at the same time, or at the same facility.

Some of these connections already exist, between dairy farmers and creameries, or individual grape growers and wineries. New connections must scale up and support the existing capacity of the food system to keep food enterprises economically viable. For example, to leverage the wealth of grain production in the county by building a grain mill, bakeries and breweries would have to commit to purchasing locally-milled grains. To make a new slaughterhouse profitable, producers would have to commit to use the local slaughterhouse, and producers would need access to a form of transport that reduces the cost for farmers, and ultimately,

the price of the product for consumers. County-level policies would need to encourage local purchasing at each stage in the food supply chain, and provide economic incentives and marketing campaigns that demonstrate the immediate and long-term benefits of investing in Chautauqua County-grown or owned products, AWP facilities, and retailers. Using this model, Chautauqua County has the capacity to reduce the price of local food for consumers and increase food security, and boost the earning potential of the county's producers, processors, retailers and ancillary businesses. To provide inspiration, the next chapter describes innovative ideas that leverage the economic capacity of the food system for greater prosperity and health, by communities across the country.





9. Innovative Ways of Using the Food System to Promote Community Wellbeing: Examples from Across the United States

Rural, agricultural communities around the country share some of Chautauqua County's challenges. Some of these communities have deployed strategies to use their food system assets to overcome challenges. These examples of innovations may inform and inspire ideas for Chautauqua County leaders to consider within the context of the county's unique, well-defined identity, and rich cultural heritage. The food-based strategies to improve community health and wellbeing must be authentic to the county itself. The innovations below are framed such that stakeholders can adapt them in ways that are appropriate for Chautauqua County.

Farm to School Collaborative: Promoting Economic Development and Children's Health [South King County, WA]

Description

This collaborative effort among food producers, an aggregator, large institutions, and a state department focused on creating a cohesive strategy for a Farm to School initiative in South King County, Washington. The once-robust farming landscape in King County has dwindled: the county has only 1,837 farms on 51,000 acres, about 3.4 percent of the land area.[131] In 2012, the Washington State Department of Agriculture

(WSDA) worked with three school districts to form the South King County Farm to School Collaborative to act as a collective purchasing group to offer new markets to farmers and improve childhood nutrition. The collaborative launched Farm to School programs at two school districts and boosted an existing program at the third. [132] The school districts work within USDA procurement model and bidding requirement guidelines to design best practices for both farmers and school food service managers. The Washington State Department of Agriculture helps farms to develop business plans that help them meet school districts' needs.

The Collaborative purchases from multiple farmers and producers in the county, including Viva Farms, an aggregator that gathers products from several producers to provide consistent supply through a simplified ordering process for school purchasers.[133] They offer farmers a simple way to reach new markets by coordinating food ordering and purchasing paperwork and delivery logistics with school districts.

The school districts purchase local foods at special events, such as Harvest of the Month, which features foods that use a seasonally available food item. The WSDA Farm to School Project Coordinator sets up visits to Viva Farms for school food service directors and nutritionists, and has partnered with local chefs to demonstrate ways to turn local foods into fun, simple meals that meet USDA nutrition guidelines.[134]

Viva Farms handles the logistical challenges so that farmers can count on a certain quantity of demand and consistent ordering of their food products, and schools have greater food purchasing power and can share the responsibility of the procurement process and associated regulations. In addition to aggregating food products for institutional buyers, Viva Farms also provides small-scale farmers with access to land, equipment, business training, and low-interest loans.

Location

Agricultural land has been under pressure from urban development in recent years, but the county has adopted agricultural protection plans to slow the loss of farmland. There are 51,000 acres of farmland in production in King County, with 28 percent (14,600 acres) preserved through the Farmland Preservation program.[131]

Although King County has almost two million residents, South King County - the focus area of the Collaborative - is home to 640,000 residents.[135] Of these residents, 11.6 percent live below the poverty line. [136] South King County has a much lower educational attainment than the rest of King County, as only 26.3 percent of the population has a bachelor's degree. Two of the three school districts (Auburn and Renton) in the area share the demographic profile of Chautauqua County. Auburn School District serves 16,000 students, and has about 75,000 residents in a 62-mile area. [137] Renton School District serves 14,000 students in an area with about 58,000 people.[138] The Kent school district serves 27,736 students, part of which includes the rural unincorporated section of King County. [139] More than 45 percent of students at all three districts are eligible for free or reduced price lunches, indicating the important role of schools in addressing food security among children and youth.[140]

Key Actors

Although Washington State Department of Agriculture (WSDA) initially launched the Collaborative, the school districts now lead the effort. The Collaborative was initially funded by a Community Transformation Grant (CTG) awarded to the Department of Public Health Seattle and King County, which funded the development of a "School's Guide to Purchasing Washington-Grown Food".[141] The school boards of each of the three participating districts agreed to join the collaborative, and school food service directors, kitchen managers,

and dietitians have committed to working together to develop meal plans, procurement requests,^{lxxxiv} and bids for local farm products.

They receive support from the WSDA Farm to School Program staff to coordinate farm visits, and offer procurement paperwork support.[134,143]

Resources

The Community Transformation Grant award seeded the formation of the Collaborative. The existence of diverse, committed and collaborative partners, much like those in Chautauqua County, helped sustain the effort. The presence of Viva Farms to aggregate food products, take orders from and deliver farm products to schools, and maintain a simple ordering process for farmers makes the innovation possible. WSDA's initial support to form the Collaborative, and continued support through training for farmers and school food service staff, and product development is crucial as well. Finally, the combination of federal, state and local government funding and administrative support helped to both launch and sustain the Collaborative.

Key Phrases

Farm to School, farmers, food distribution, food acquisition, public health, public-private partnership, federal grants

lxxxiv School districts are required to submit procurement requests including the types and prices of food items they wish to purchase from local ("local" definition determined by school districts) growers. The formal procurement requests (over \$150,000) must be a publically published request for proposals, open to the lowest bidder. For "small" purchases (under \$150,000) the school districts may contact up to three bidders for formal price quotes and choose the lowest bid. The thresholds for both processes are the same at the federal level, but can be adapted by state governments to be more or less restrictive. New York State allows public schools to make "small" purchases of up to \$20,000 through informal processes.[142]

Institutionalizing Agricultural Economic Development [Polk County, NC]

Description

Polk County, North Carolina took the initiative to form the state's first Agricultural Economic Development department with dedicated staff at the county level. The county recognized agriculture as a foundation of the county's economy and created the department in order to promote local business and agriculture as a way of protecting the agrarian nature of the county.

Broadly, the department serves the county by encouraging, supporting, and maintaining the growing agricultural enterprises in the county. The department maintains and manages the Farmland Preservation initiative, creates networking opportunities for existing and new farmers (including mentorships), and assists farms with scaling up.[144] The Polk Tool Share Cooperative is an initiative created by the Agricultural Economic Development Office, which provides local new farmers with tools and equipment to reduce start-up costs. Tools are available to rent for little or no cost to the farmer.[145]

Aside from directly assisting farmers, the department works to create new market opportunities for agricultural products and encourages value-added enterprises by identifying trends in food consumption. Several farmers' markets in the county are marketed through the Polk County Agricultural Economic Development Office's website.

Location

Polk County, North Carolina is a rural county in the southwestern area of the state, on the border of South Carolina. Polk County provides a good comparison to Chautauqua County in location, size, and character of the community. There are 290 farms in Polk County, which comprise 16 percent of the land area. The vast majority are small farms; 99 percent have an annual income of less than \$250,000. The decline in poultry and

dairy farming has led to a stronger focus on wine grapes, eggs, and fruits and vegetables. Polk County has a smaller population than Chautauqua County at 20,352 individuals.

Actors

The Polk County Agricultural Economic Development Office is supported by the Farmland Preservation Board, which advises the County Commissioners.

Resources

Chautauqua County could form a similar government entity using its existing resources. The Growing Food Connections Steering Committee could advise the department on policy and stakeholder needs, while budgeting for the department could be set aside from the budget of the Chautauqua County Department of Planning and Economic Development. The county structure of North Carolina is different from New York State, so there would be some differences in the way the Agricultural Economic Development Office is formed. For example, the North Carolina Agricultural Economic Development department may have more freedom to make policy decisions because it is governed by a board, which can make independent decisions from the county commissioners. In New York, an agricultural economic development department would likely need to rely on the county executive and legislature to make policy and budgeting decisions.

Key Phrases

Agriculture, policy, government, economic development

Making Local Food Mobile: Reaching Rural Populations with a Farmer's Market on Wheels [Polk County, North Carolina]

Description

Polk County, North Carolina, recognized as a Community of Opportunity (COO) by Growing Food Connections (GFC), is devising a strategy to make local food more accessible to rural consumers. In 2015, during an interview with the GFC team, a food bank staff member noted that for many families who are working poor, the days of the week and hours of many farmers markets are barriers to accessing local food, and that innovative ways to distribute food were necessary.[146] Now, with the support of the county government, a local non-profit has transformed a former public mobile book library into a mobile farmers' market to deliver locally grown foods to rural parts of the county. Polk County commissioners approved the resolution to convert the public library's bookmobile into a mobile farmers' market in October 2016. The resolution notes that any county departments or services can donate personal property that is no longer in use to a non-profit organization. [147]

The mobile library was donated by the county to Growing Rural Opportunities (GRO), a non-profit organization that oversaw the retrofit and is now operating the mobile market in its inaugural season. The retrofitted bus, which was in use as a mobile public library for 24 years, now has a freezer and refrigerator to keep food products fresh and safe. The mobile farmers market will also be a venue for cooking demonstrations and children's activities. This market, the first of its kind in Western North Carolina, will begin bringing locally grown produce to new markets, businesses, hospitals and underserved communities in Fall 2017.[148] This mobile farmers market is designed to provide an opportunity for residents to purchase local food on days, times, and locations that are not served by existing markets and stores.[139] GRO's Executive

Director hopes that the mobile market can reach places in the county that do not usually have access to farmers' markets, and introduce local food to residents who may not usually attend markets.

Location

Home to 20,352 residents, Polk County is smaller in population size compared to Chautauqua County, but similar in rural character. The vast majority of the county's 290 farms are small farms that occupy 16 percent of the land area. Ninety-nine percent have an annual income of less than \$250,000. The decline in poultry and dairy farming has led to a stronger focus on wine grapes, eggs, and fruits and vegetables. The majority of the county is white (91 percent), and 5.6 percent identify as Hispanic or Latino. More than 50 percent of Polk County schoolchildren qualify for free or reduced-price lunch, and 13 percent of the population lives below the poverty line. Transportation is a significant barrier with access to food, especially for seniors, people with disabilities, and children. The county uses creative strategies to get food to residents, such as an incentive program for SNAP at four farmers markets, expanded bus transportation service, and weekend backpack programs that enable students to take food home. The mobile farmers market is the latest innovation to address rural food insecurity. [149]

Key Actors

Polk County is especially well positioned to support local food initiatives such as the mobile farmers market. This project resulted from a collaboration among GRO, a not-for-profit organization, county government, and private entities including a farm credit bureau and a printing company. The county has an agricultural economic development specialist on staff who facilitates connections across the food system.

Resources

GRO received support from local

government to facilitate the bus donation from the library, and its partnerships with local businesses paid to retrofit and prepare the bus for its inaugural season.[150] The existing resource of a bus, which the Polk County library donated to GRO, made this project feasible in a short amount of time. The county's collaboration with GRO and commitment to supporting food access helped to pass the resolution that allowed the bus transfer. Partnerships with private businesses help fund the upgrades to the bus itself, and relationships with local food banks help distribute any unsold produce.[148]

Key Phrases

Mobile farmers' markets, food distribution, food acquisition, rural food policy, private-public collaboration, rural food security

Mainers Feeding Mainers: Facilitating Farm to Pantry Connections [Maine]

Description

A statewide emergency food organization has figured out how to connect farmers to low-income consumers through a win-win program. Mainers Feeding Mainers (MFM) sets up paid contracts for farmers to grow produce food banks need, so farmers and pantries can count on the demand and supply. The program, run by Good Shepherd Food Bank (GSFB) of Maine, strives to provide families in need with fresh fruits and vegetables grown by farmers in the state. The program began in 2010, when MFM purchased and distributed 350,000 pounds of food. Today, MFM works with growers to deliver 1.5 million pounds of produce each year. Over the course of five years, MFM has grown its farm partnerships from five to 43, and participating pantries from one to 26. MFM has created a new, reliable sales market for farmers by forming pre-season contracts with some farms, and purchasing late-season excess crops.[151]

Maine has a supportive policy environment in the form of a statute entitled *Limited Liability for Recreational or Harvesting Activities*, which protects farmers from being liable for injuries when they allow others to enter their property to harvest crops, which can be one way to procure the donation of foods from farms.[152] New York State is beginning to enact policies that can help in this donation process. A provision in New York State’s 2017 budget will allow farmers to claim a tax credit for donating their produce to pantries. The credit is worth 25 percent of the value of the donation and can be worth up to \$5,000. The tax credit aims to increase direct-from-farm donations to food pantries. [153]

Location

The Mainers Feeding Mainers (MFM) program is run by the Good Shepherd Food Bank in Maine’s 16 counties. Maine is a rural, New England state with an estimated population of 1,331,479 in 2016 and a population density of 43.1 people per square mile. In 2015, 17.1 percent of Maine households received SNAP benefits and 14 percent of all households within the state were considered to be living below the poverty line.[154]

Key Actors

The Good Shepherd Food Bank (GSFB) is the lead agency for this program. Maine farmers and food pantries across the state that directly distribute the foods are key actors. A staff person at GSFB coordinates logistics, payments, and relationships between the farms and pantries. The expansion of the Good Shepherd Food Bank operations to a statewide level has been made possible by state-level policies. The Emergency Food Assistance Program run by Maine’s Department of Agriculture, Conservation, and Forestry coordinates the distribution of nutritious food among organizations with the ability to warehouse and store foods and pantries and shelters across the state.[155]

Resources

In addition to key partnerships, infrastructure such as warehouses and delivery trucks are needed to run Mainers Feeding Mainers. The Good Shepherd Food Bank is funded through grants endowed to them by charitable foundations, major private companies such as Wal-Mart and New Balance, and the United States Department of Agriculture.[151]

Key Phrases

Farm-to-pantry, food recovery, nutritious foods, food security, farm economics

Reducing Waste through Public-Private Partnerships [Nashville, TN]

Description

In 2015, Nashville became a leader in designing creative solutions to food waste through building partnerships between local government and private businesses. The National Resource Defense Council, a national environmental organization made up of scientists, economists, lawyers, and other experts, selected Nashville to be its pilot city for developing “high-impact local policies and on-the-ground actions to address food waste”. Nashville was selected for its primarily rural location in Appalachia, which made it more applicable to communities like Chautauqua County. The NRDC created the Nashville Food Waste Initiative (NFWI), which aims to work with the mayor, other government agencies, and local stakeholders to pilot waste reduction strategies.[156] The policies and practices that the NFWI is testing in partnership with the local government will create model strategies and practical tools for cities to utilize across the country.

Location

The Nashville metro area is home to 1,676,419 residents. The median household income is \$50,832, with a poverty rate of 14.9

percent. SNAP-recipient households comprise 14 percent of the total households. The major employment sectors are educational services, health care and social assistance. The metro region is predominantly white at 78 percent of the population.[157]

Actors

Through the NFWI, Nashville's mayor launched the Mayor's Food Waste Challenge, which encourages restaurants to reduce waste and donate leftovers to improve the city's food security.[158] NFWI also partners with public and private entities that specialize in different areas food reuse, reclamation, and waste prevention. For example, NFWI has partnered with Zero Percent to encourage restaurants to donate to people in need. Zero Percent, a web app, provides a user-friendly online marketplace system that notifies food banks and volunteers when a donation is ready for pickup.[159] NFWI is also working with a local nonprofit called Resource Capture to advise where and how an anaerobic digester will be built in Nashville. The NFWI hopes the digester will decrease the amount of food waste being landfilled and decrease greenhouse gas emissions.

Resources

The NRDC received \$1 million from the Rockefeller Foundation to launch the multi-city food waste characterization study that launched the NFWI. The Mayor's Food Waste Challenge for restaurants is supported by the James Beard Foundation's Chef Advocacy Training program.[158] Nashville is also participating in the NRDC's multi-city food waste characterization study, which was launched in Fall 2016, in order to understand what types of organic materials are thrown away in cities including Denver and New York. [160] About 1,000 residents from each study location are asked to complete consumer surveys and keep weekly kitchen-diaries of what they throw away in order to understand the roots of post-consumer food waste. In addition, 100 businesses from each city,

such as schools, restaurants, grocery stores, and arenas, are being surveyed to better understand institutional food waste.

Key Phrases

Food waste, food recovery, food donations, food waste audit, research, policy

Local Food Promotion: County-Level Purchasing Policy [Cabarrus County, NC]

Description

The goal of the local food purchasing policy is to increase the consumption of locally produced foods among public institutions in Cabarrus County, North Carolina. The policy requires government agencies to purchase 10 percent of the food for events from local producers (within the state). The county chose to create this policy based on the following principles: to increase the consumption of locally produced foods, decrease reliance on food from outside the region and fossil fuels, increase the quality and safety of food, and decrease air and water pollution in and outside of the region.[161]

This policy would work well for Chautauqua County because of its strong agriculture industry and production of diverse crops and livestock. This policy would demonstrate a commitment to local purchasing among government entities, which could lead to increased local food purchasing among other entities and ultimately strengthen the economy of Chautauqua County.

Location

The local food purchasing policy was implemented in Cabarrus County, North Carolina. Cabarrus County is located in a rural region to the northeast of Charlotte, with a population of 201,590. The county is similar to Chautauqua County in population size and the large role that agriculture plays in the region's economy.

Actors

This policy was created by the county and covers any agencies and departments under the management of Cabarrus County or those located in a building that is owned or managed by the county. The county requires that the previously mentioned government employees comply with the policy and tasks the head of each participating agency to check compliance with the 10 percent purchasing rule.[161]

Resources

This innovation would build on existing resources Chautauqua County currently has, including a local government structure that is friendly toward local food promotion. Bringing the policy to fruition requires political will and dedication of participating agencies.

Key Phrases

Local food purchasing, local food procurement, local government, policy

Scaling Up in the Kitchen: County Incubator Spurs Growth in Processing Sector

[Douglas County, Kansas]

Description

Community kitchens have popped up all over the country including an innovative example in Douglas County, Kansas. Following its exceptional stance toward food systems planning and policy, Douglas County government laid the groundwork for an incubator kitchen. The Kansas Department of Agriculture regulations prevent food products from being sold to the public if they are produced in an unlicensed or home kitchen. The commercially-licensed incubator kitchen, “Culinary Commons”, allows residents and/or businesses to rent the space to launch small food processing enterprises so that those businesses do not have to immediately invest capital in their own infrastructure. The kitchen includes basic equipment, a full range stove,

convection oven, and an industrial-sized sink. The kitchen also provides space to institutions seeking kitchen facilities for processing or local culinary events.[162]

Location

Douglas County is home to 114,803 residents, 90,811 of whom live in the City of Lawrence. The county and city governments work collaboratively together across jurisdictional boundaries. The county’s rich soil, flat lands, and access to water has created strong agricultural communities. There is a growing number of small and medium sized specialty crop producers in the county and few farmers grow for wholesale. In the City of Lawrence urban agriculture produces vegetables, fruit, and eggs. A recent interest in re-localizing the food system in both the city and county has caused growth in direct local food sales.

The majority of the county is white (85%). The county struggles with under- and unemployment: 19 percent of the population lives below the poverty line. Lack of public transportation exists as a substantial barrier for low-income populations, especially for the elderly and those with disabilities. Supplemental Nutrition Assistance Program (SNAP) participation rates are low in the county with only about 27 percent of eligible individuals applying for benefits. In 2014 a SNAP Market Match program was funded, allowing SNAP participants to stretch their food budget at farmer’s markets. In 2015, funding grew and the program was expanded to five farmer’s markets to further encourage the use of SNAP benefits.[163]

Actors

The incubator kitchen was proposed (and later created) by the Douglas County Food Policy Council. This led to the creation of two food systems staff positions funded by the county and city governments. The food systems staff members facilitate the council meetings and help move forward projects like the Culinary Commons. In Chautauqua

County, a county incubator kitchen could be created by a county organization such as the planning department in coordination with Southern Tier West and/or the Regional Economic Development Council.

Resources

This program would require a suitable space in one of the county's main urban centers or in another central location and would require the county to purchase all the necessary tools, utensils, and machinery necessary in a commercial kitchen. The initial costs are high, but an incubator kitchen has the potential to pay for itself and become an income source for the county over time through rent and other use fees.

Key Phrases

Incubator, shared kitchen, food processing, food systems coordinator

A Sustainable Development Plan: Priming Communities for Economic Growth

[Region 5, Minnesota]

Description

A region comprised of five rural counties (Region 5) in Minnesota follows a cohesive plan for its big picture vision rooted in local economic development. The plan, *Creating a Resilient Region: The Central Minnesota Sustainable Development Plan* ("SD Plan"), is the culmination of the work of the Region 5 Resilient Region Project. The SD Plan addresses the values of the Resilient Region Project – growth, natural resources, success, stewardship, collaboration, community, and economic vitality – by proposing economic engines and action steps, some of which are related to food system development.[164] One economic initiative focuses on local foods specifically.[165] The six action steps associated with this economic initiative include: 1) creating incentives for agricultural use; 2) developing opportunities

for local foods in the distribution system; 3) exploring options for value-added products from the local food system; 4) improving training and education efforts; 5) increasing local demand and supporting a market network that can meet demand; and 6) using sustainable practices for packaging food products.[165]

There are many opportunities for Chautauqua County to borrow from strategies used in Region 5's planning process. The SD Plan for Region 5 effectively brings together knowledge from community organizations, local government, farmers, institutions, retailers, processors, and consumers and draws connections across the interests and needs of each group. For example, the micro-lending program developed in the plan provides small loans at modest interest rates of three to seven percent, to help with start-up and small business expansion costs.[164] The plan also initiated studies of direct-to-consumer sales opportunities and a food hub feasibility study, informed by business modeling, training, and technical assistance skills as provided for by the Region 5 partners. [164]

Location

Region 5 is the five-county region in central Minnesota composed of Cass, Crow Wing, Morrison, Todd, and Wadena counties. Home to approximately 163,000 residents in 65 cities and towns, the region is predominately rural and encompasses the poorest counties, by income, in the state. [165, 166] The challenges Region 5 faces – including population migration and decline in the number of farmers – are characteristic of many rural areas including Chautauqua County, but Region 5 was especially impacted by its economic reliance on large agricultural operations and a centralized distribution system.[164]

Actors

The actors involved in the plan development process and implementation

come from across Region 5, and represent each sector of the food system. Collaboration among diverse actors has been the key component to a successful process of plan making and executing objectives. Local actors include farmers and operators, the Region 5 Development Commission, the North Central Economic Development Association, financial lending institutions, school boards and representatives, private foundations, and public agencies. In 2012, the University of Minnesota Extension office received a full time staff person dedicated to offering technical assistance to producers and purchasers. This staff person's role has been integral to making connections across the food system which has facilitated the ongoing success of many Region 5 Local Foods work.[167]

Resources

The SD Plan was supported through state-level funding, allocated to all regional development organizations (RDOs) in the state of Minnesota, and a Sustainable Communities Project grant from the United States Housing and Urban Development (HUD), Department of Transportation (DOT) and the Environmental Protection Agency (EPA).[168] Region 5 leveraged the SD Plan to apply for and receive grants from various local, state, and federal agencies that have provided funding to launch the plan's initiatives. By pooling resources such as human resources, technical knowledge and skills, and access to educational institutions, Region 5 has found a way for its economy and local food system to grow and thrive. Working together with Southern Tier West and the Western New York Regional Economic Development Council, Chautauqua County could leverage its own series of strong connections within the food system to write a Sustainable Development Plan for the county – or region.

Key Phrases

Economic development, financing, collaboration, capacity building, food systems coordinator

Small Loans for Big Gain: Helping Small-Scale Farmers Scale Up [Region 5, Minnesota]

Description

As part of the Region 5 regional economic development goals, the North Central Economic Development Association (NCEDA) developed a micro-lending program with a strong focus on agriculture producers and food artisans. Loans from \$1,000 to \$50,000 with a three to seven percent interest rate are available for startup and small businesses in a 10 county region, including Region 5's counties. The Region 5 Development Commission provides technical support and requires one job to be created or retained for each \$10,000 lent. Through its micro-lending program, NCEDA has invested just under \$500,000 towards acquisition and refinancing for small businesses since 2011. [167,168]

An innovation like micro-lending in Chautauqua County will help small-scale farmers or beginners to pay for annual operating expenses such as seed, rent and insurance costs, direct marketing, vertical growing methods, and minor improvements. Micro-lending programs can be used to increase productivity, improve post-harvest practices, stabilize household cash flow, increase access to markets, and promote better risk management. Access to financing options may help farmers become more resilient to climate adaptation, which contributes to long-term food security for the county.

Location

Region 5 is the five-county region in central Minnesota composed of Cass, Crow Wing, Morrison, Todd, and Wadena counties. Home to approximately 163,000 residents with 65 cities and towns, the region is predominately rural and encompasses the poorest counties, by income, in the state. [165,166] The challenges Region 5 faces – including population migration and decline



in the number of farmers – are characteristic of many rural areas including Chautauqua County, but Region 5 was especially impacted by its economic reliance on large agricultural operations and a centralized distribution system.[164]

Actors

The North Central Economic Development Association (NCEDA) (financially supported by USDA), Region 5 Development Council (R5DC) and East Central Region Development Commission (ECRDC) are all instrumental in the funding, implementation, and management of the project.

Resources

The NCEDA is governed by a 16-member private sector group to manage specific programs and to advise the Commission on lending industry standards and best lending practices for four lending programs (gap business loans, microloans, septic system loans, and well water loans). The loans were initially funded by the U.S. Department of Commerce Economic Development Administration in the early 1980s for new and expanding businesses. The micro-enterprise fund was supported by a USDA Rural Development grant, startup funds from Otto Bremer Foundation, the Initiative Foundation and the Blandin Foundation in 201.[167,168]

In order to implement a micro-loan program, Chautauqua County must identify agencies to provide initial funding and a single entity to bridge an effective public/private partnership to manage the funds and logistics of the lending program.

Key Phrases

Farm business, micro-lending, start-up costs, technical assistance

Leveraging Private-Public Partnerships for Rural Prosperity

[Upper Peninsula Region, Michigan]

Description

This rural area of Michigan is home to the Upper Peninsula Food Exchange created through a collaborative effort of private and public entities. The food exchange established three regional food hubs that serve as resource centers for community members who wish to have a more active role in their local food system. The hubs link public and private entities, including farmers, businesses, policy makers and community members. A regional food committee was also created to inform and encourage food system-related policy.

The Food Exchange offers a variety of resources for individuals and businesses across the food system. Interested community members can receive farming education classes, attend food summits, access a Speakers Bureau, and connect with other people interested in the food system through online resources and forums. For farmers, the Upper Peninsula Food Exchange offers ongoing business, agriculture, and marketing education. Assistance is also available for farmers who need help with aggregation and distribution by providing sites for aggregation across the region. An online food and farm directory makes finding businesses across the food system easy and organized. Finally, the UP Food Exchange also provides an online marketplace where farmers can list their products for sale, and distribution institutions can purchase these products. This online marketplace not only assists with sales, but also builds stronger relationships and networks across the food system.[170]

Location

Upper Peninsula (UP) Region of Michigan is a large geographic region with 15 counties, including Marquette County. Marquette County has the largest city in the UP (Marquette), but is a rural county of about 67,000 residents along Lake Superior.[170]

Actors

The formation of the Upper Peninsula Food Exchange was led by collaboration between the Marquette Food Co-op and Michigan State University Extension, with support from the Western Upper Peninsula (UP) Health Department. The MSU Extension and Marquette Food Co-op are responsible for day-to-day activities, while the Western UP Health Department acts as a point of contact for stakeholders in the Western Upper Peninsula area.[170]

Resources

This innovation was made possible through the collaborative efforts of educational institutions, private businesses, and public entities. Chautauqua County could implement a similar program by leveraging partnerships between the Cornell Cooperative Extension, Growing Food Connections, Chautauqua County Department of Planning and Economic Development, the Chautauqua County Health Network, and other organizations that support health and food system initiatives in the county. Some of the features of this innovation are already in place in Chautauqua County (e.g. Chautauqua Grown and farmer education programs through Cornell Cooperative Extension). However, Chautauqua County could benefit from combining existing resources with new elements such as an online food marketplace.

Key Phrases

Food exchange, agriculture, food hub, partnership

Farmland Conservation: Developing Agricultural Lands in Rural Communities
 [Lancaster, PA]
Description

The Agricultural Zoning District Guidelines for Lancaster County, Pennsylvania (“Guidelines”) are a series of growth and development measures for preserving and ensuring the agricultural use of land in the primarily rural, agrarian communities of Lancaster County, PA. These guidelines developed as part of the comprehensive planning process, *Envision Lancaster County*, and set forth three interventions points to address growth and development on agricultural land. These focal points include: 1) assigning development measures for lot use(s) and subdivision standards, which emphasizes use of existing parcels for new construction; 2) determining a system for identifying maximum lot size and minimum farm size; and, 3) defining permitted uses, special uses, and the permitting process for adhering to the established guidelines.

In many ways, the composition of Lancaster County mimics that of Chautauqua County. Primarily comprised of farmland for dairy production, the county is interspersed with sects of Amish populations that operate small farms as a source of income. A key challenge is the out-sale of raw product from the county’s agricultural producers, and the financial viability of small farming operations. [171] As identified by the guidelines, supporting rural farm-based businesses, agritourism initiatives, and alternative energy production systems are three strategies for addressing the concerns and needs of small farmers, while promoting economic development throughout the county. [172] These strategies have been topics of discussions in Chautauqua County in the past, and each strategy presents an opportunity for local governments to address the needs and concerns of the agricultural community, while simultaneously supporting farm businesses and producers.[173]

Location

Lancaster County, PA is located in the southeastern corner of Pennsylvania, and is home to approximately 500,000 people. Agriculture has a long history in Lancaster County, where 25 percent of the land area is classified as farmland, and there are multiple types of farm businesses, including dairy farms and community supported agriculture (CSA) operations.[171] Lancaster County is geographically within the Chesapeake Bay Watershed area, and therefore has strict nutrient-loading and fertilizer regulations to follow, which affect farm operations of all sizes.

Actors

The lead agency on preparing and disseminating the information contained in the guidelines is the Lancaster County Planning Commission (LCPC). The guidelines apply to all of Lancaster County, but implementation of suggested measures is the responsibility of local municipalities. Townships throughout Lancaster County, with support from the county government, local organizations, and the community, have the final decision on adopting or resolving any of the parameters set forth in the guidelines. Despite a minimal ability to enact widespread policy change, the county government has maintained an active role in the management and review of policies that affect the agricultural heritage and bucolic lifestyle of Lancaster County.

Resources

A key resource for the completion and success of the Guidelines is the overwhelming public support for agricultural preservation, and the timing of the work. The guidelines were proposed as a means of implementing the planning framework set forth in the comprehensive plan, and in that effort stakeholder engagement was a primary source for information.[171] The structure of the Guidelines crafts regulations that promote flexibility of land use for land owners and long-term viability of agriculture; both are essential

elements to the lifestyle of the individuals in Lancaster County.[172] Chautauqua County could leverage its Farmland Protection Plan or the County Comprehensive Plan to implement a similar set of guidelines if desired by the agricultural community.

Key Phrases

Agriculture, economic development, farm viability, farmland preservation, zoning



10. Ideas for the Future

The success of any effort to use food systems as a catalyst of regional economic development, health and wellbeing depends on identifying actionable, realistic, detailed, and creative ideas that amplify the region's strengths and surmount barriers. The 18 interlinked ideas presented in this chapter aim to do exactly this, by drawing on the research conducted by the studio team and feedback provided by the community including the Chautauqua County Growing Food Connections (GFC) Steering Committee. During an initial review, the GFC Committee identified gaps, modifications, and priorities among the ideas, and final ideas are presented here. Each idea is explained in detail below and summarized in the table available at the end of the chapter. Each idea includes a narrative description; identifies potential actors who may implement the idea; lists resources that may be required; and describes a potential timeline for implementation. Ideas that were identified as high priorities by the GFC Steering Committee members and the student team are highlighted first (Ideas 1 - 6).

1. Hire a Food System Economic Development Coordinator

Each sector of the food system in Chautauqua County has a number of strengths (Chapters 3 - 6), but coordination across sectors could be improved (Chapter 8). A food systems economic development staff person could coordinate the implementation of many of the ideas in this report (as seen through several innovations from around the country in Chapter 9).^{lxxxv} Potentially located in the Department of Planning and Economic Development, the coordinator could also work in tandem with an advisory group, such as an Advisory Council (Idea #6), regarding programs and policies for advancing the economic value of the food system and subsequently promoting community health and wellbeing through increase food security. Hiring a food

^{lxxxv} Innovations that occurred with support from a Food Systems coordinator or similar position include: the Mobile Market from Polk County, NC; Region 5 Economic Development, MN; the Community Kitchen in Douglas County, KS; and the Food Policy Council development in the Upper Peninsula, MI.

systems coordinator would help capture the economic value across food systems sector (as outlined in Chapter 7). The position of the food systems economic development coordinator would gather data and input from stakeholders to advise county legislature how to best appropriate funding in areas with the most impact.

The Chautauqua County Legislature would approve or seek funding for the position. The position could be housed in the Chautauqua County Department of Planning and Economic Development, which would hire and oversee the direction of a food systems coordinator.

2. Incentivize the Formation of a Food System Transportation Network

A strong transportation network creates opportunities for small scale producers to access larger processing or wholesale opportunities that require product delivery to their sites, or to avoid working through buyers that require contracts. There are currently several distribution services that work in the region, but extend to only certain markets, products or regional areas (Chapter 4). There is a demonstrated need for transportation between producers, processors, and purchasers (Chapter 7). Therefore, an important next step is to identify existing trucking delivery businesses that have the capacity to transport food from farms to processors to buyers (institutional, retail, individual). This trucking business would focus solely on transportation, be equipped to handle various types of food and livestock (i.e. refrigerated trucks, animal hauling capacity), and meet food safety and management standards.

The Chautauqua County Department of Planning and Economic Development would identify and support the development of existing trucking businesses to support food systems transportation needs. This

effort may be supported by Southern Tier West due to their connections with regional supply chains. Suppliers, including farmers, producers, processors and aggregators, would be identified by the Cornell Cooperative Extension and Farm Bureau. Existing trucking companies in Chautauqua County might convert trucks in their fleet to accommodate food products, or existing distribution companies may choose to expand their services into the county, including Regional Access from Ithaca, or Latina Foods/Boulevard in Buffalo. The network would be formed through collaboration among the above entities.

3. Develop Secondary, Vocational and Higher Education Agricultural Education Programs

Farmers in Chautauqua County are aging out of work, but there is a lack of young farmers available to replace them (Chapter 3). Chautauqua County lacks agricultural education programs in secondary or vocational schools and higher education institutions. Stakeholders in the county have identified a need for more agricultural education throughout high school (including BOCES) to get young people interested in farming. However, other community members have identified a lack of capital available to young people who want to start farming as a barrier in starting their farming operations. Agricultural education should continue beyond high school and into higher education institutions such as SUNY Fredonia or Jamestown Community College, in order to provide students with both business and agricultural knowledge. Due to the recent New York State Excelsior Scholarship Law, two- and four-year colleges and universities are tuition-free for eligible students, and college is more financially attainable. Combining an associate's degree in agricultural business with internships and mentorships with area farms would provide farmers with a

skilled labor force, as well as give students firsthand experience to encourage additional entrepreneurship in food production and processing fields. Finally, students who complete a two-year degree in agricultural business should be provided with financial opportunities, such as low interest loans for land and equipment, land lease agreements.

The school districts in the county receive funding through property taxes specific to each district. In order to implement this type of program, funding should be provided by the county (potentially applying for money from the Regional Economic Development Council or through a USDA Grant). Along with funding, the county should create an agricultural education committee made up of a member from each of the school boards in the county. The committee would select a school district/school to implement a test program.

This idea would require financial approval for instructors and curriculum development from the Chautauqua County Legislature, and the County school districts as well as Erie-2 BOCES, SUNY Fredonia, and Jamestown Community College. The Cornell Cooperative Extension and Farm Bureau would assist with curriculum development and building relationships with area food businesses for internships and mentoring. Farm Credit^{lxxxvi} would support low-interest loans and access to equipment sharing. The 4-H Program could offer curriculum contributions as well as connections to existing farms and processors. The County Legislature could support facilitation of land lease agreements and easements^{lxxxvii} to facilitate simple purchase or lease of land/business spaces to new farmers or food business entrepreneurs.

^{lxxxvi} Farm Credit is a nationwide network of customer-owned bank cooperatives. There is an office of Farm Credit East in Mayville, NY. More information is at farmcrediteast.com

^{lxxxvii} An easement is the legal right of a non-owner to use land for a specific purpose, while the title remains with the land owner, which may be a municipality, business or individual.

4. Conduct Food Security Assessment to Determine Additional Barriers

Geographic access to healthy food options can be challenging in rural and urban areas of the county, based on households' access to vehicles and drivers. Although majority of households should be able to reach a food retail outlet within a 15 minute drive, the most vulnerable populations (children, seniors, people with disabilities) may not be able to drive or have access to vehicles. In addition, conversations with GFC steering committee members, food security experts, and SNAP program staff in the county indicate that there is an ongoing challenge for residents in accessing fresh, affordable food that must be addressed. Residents may be hesitant to admit their struggles, but increasing use of emergency food sources and poor health outcomes indicate that barriers to food security exist for many county residents.

County leaders need additional data to determine what and why additional barriers to food security persist; for example, determining the quality and quantity of fresh, healthy and affordable foods at outlets across the county, or the connectivity from residential areas to food retail outlets via public transportation in rural and urban contexts. A key next step is to collect further quantitative information to support data shown in food security maps in this report (see "Understanding Geographic Access" inset and maps in Chapter 5) as well as qualitative information from county residents' personal experiences. With the presence of a food systems economic development coordinator (Idea #1), there may be additional resources (i.e. to write grant applications) to pay staff to carefully analyze the conditions of food insecurity in the county. Based on the data collected, the county might choose to dedicate additional resources to public transportation, incentives for convenience store owners (e.g. Healthy Corner Stores), or mobile markets (see Chapter 9, Making Local Food Mobile innovation from Polk County).

This effort would be best coordinated through the Chautauqua County Health Network and/or the Department of Health and Human Services, with support for funding from the County Legislature and grant-making institutions, as well as staff time from the food systems coordinator. Entities such as the Cornell Cooperative Extension and the Jamestown Renaissance Corporation are well suited to offer additional assistance.

5. Launch Microlending and Discounted Facilities Program

Start up and capital costs can be prohibitive for young or new farmers, processors, distributors or retailers who wish to launch food-related businesses (Chapters 3 - 5). The Chautauqua County government should work to establish a program that offers micro-lending and discounted lease agreements for public facilities (i.e. commercial kitchens at schools or publicly-owned warehouses) to individuals who are looking to establish food system businesses or expand the capacity of their existing businesses (Chapter 9, Small Loans for Big Gain, Region 5 MN). The program could also offer small loans to farmers for startup costs and capital projects. The program would need start-up capital to begin micro-lending as well as community/organizational partners to facilitate discounted leases for facilities.

This program would be best coordinated by the Chautauqua County Department of Planning and Economic Development, with approval by the Chautauqua County Legislature. The Planning and Economic Development Department could seek out grants and funding to offer the micro-loans in partnership with the Chautauqua County Industrial Development Agency and/or Chautauqua County Chamber of Commerce.

6. Form an Advisory Council to Strengthen and Sustain the Food System

An Advisory Council made up of community leaders can shepherd systemic change within the food system in partnership with public, private, and civic sectors (Chapter 9, Food Policy Council from Upper Peninsula Region, MI and Agriculture Economic Development Office from Polk County, NC). Often called Food Policy Councils or Food and Farm Councils, such councils think across the food system and attempt to improve food security, economic development, and health outcomes through new ways of governance and policy. Such a council in Chautauqua County could provide support to a food systems coordinator within the county government for the implementation of programs and policies (Idea #1). The execution of this idea would require coordination by the Planning and Economic Development Department, possibly in partnership with the Chamber of Commerce, to bring together community stakeholders and gatekeepers across businesses, organizations, and governments for the formation and operation of the council. The Growing Food Connections steering committee could be a natural foundation for an Advisory Council.

The Advisory Council would be coordinated by the Chautauqua County Department of Planning and Economic Development, with support from a county-funded food systems coordinator (Idea #1). Other actors, especially those already involved in the Growing Food Connections steering committee, which has provided some groundwork for an advisory council, would include: Chautauqua County Department of Health and Human Services, Jamestown Renaissance Corporation, Chautauqua County Health Network, Farm Bureau, Cornell Cooperative Extension, and producers/food system business leaders, in addition to others identified by the steering committee and the Planning Department.

7. Publish a Report on the State of Agritourism

As noted, there is limited data available on the benefits of agritourism in Chautauqua County, and anecdotal evidence that it may put unnecessary pressure on producers and processors (Chapter 4, 8). A regular scan of the trends and impacts of agritourism can inform ongoing policy and programmatic decisions in the county. Data on agritourism businesses is difficult to gather and often incomplete from secondary sources, so primary collection may be best. A report, completed every few years, could report a variety of information including the number, location, and type of businesses, and employment and sales tied to possibilities for agritourism, particularly focused on wineries, breweries, and other existing processors and retail outlets that support local businesses across the food system.

Efforts to monitor and publish such a report could be a collaboration among the Chautauqua County Chamber of Commerce, Chautauqua County Department of Planning and Economic Development, Chautauqua County Industrial Development Agency, and Chautauqua County Visitors Bureau. An initial baseline effort could also be conducted in partnership with the University at Buffalo through their graduate planning practicum (similar to the one that resulted in this food system assessment) or Food Systems Planning and Healthy Communities Lab.

8. Develop Food Donation Infrastructure

Recapturing food loss and waste in a systemic way is a missed opportunity (Chapter 6). A program that provides support or collaboration with existing entities for farmers/sellers to donate their excess food to local food banks would reduce loss of food on farms and improve the environmental pressures from food waste. The program would also complement the 2017 New York

State Farm Brewery Law that provides tax credits for farmers to donate their excess crops to food pantries (Appendix C). It could expand current gleaning and donation efforts in the county run by Chautauqua Rural Ministries (Chapter 6). The program would need funding for staff who collect and distribute food from farmers, or who would coordinate donated food distribution through existing transportation systems (i.e. through existing food delivery services, or Idea #2) as well as a central location where food can be processed and distributed to area food pantries.

The program may be best coordinated by the Cornell Cooperative Extension through existing farmer networks, possibly in partnership with a regional food security entity such as the Chautauqua County Health Network and/or the Food Bank of WNY and its partners in Chautauqua County (Chapter 5). The program would need funding support, possibly through grants and/or private support, or from municipal waste management funds. Cooperative Extension staff could collaborate with the food systems staff person (see Idea #1) to seek funding from New York State.

9. Create an Environmental Resource Management Plan

There is limited data on loss and waste of food in Chautauqua County, which directly relates to the impacts of waste management on natural resources and the environment (Chapter 6). The county government should create a plan that envisions the future of the environmental resource base in Chautauqua County. This plan should emphasize the connection between farming, businesses, and consumer practices with the vitality of the natural resources (water, land) in the county. The plan should provide details about the use of certain inputs (i.e. pesticides, manure) as well as management of outputs, including food and agricultural waste. The plan should outline a

path toward sustainable management of food and agricultural resources. The Environmental Resource Management Plan could build up on the existing Lake Watershed Management Plan from 2010.[174] In addition, a food waste audit should be completed to complement the management plan. A mandate by the Chautauqua County Department of Planning and Economic Development to complete and update a food waste audit every two-years by food services, restaurants, and farms in Chautauqua County would help the county assess the current status of food loss and waste, and inform policies to support waste reduction and reuse.

This management plan and food waste audit would be a project that involves collaboration among a variety of entities: Agriculture and Farmland Protection Board; Chautauqua County Department of Planning and Economic Development; Chautauqua County Department of Public Facilities; Northern Chautauqua Conservation Club; Soil and Water Conservation District. The project would require data about air, water and land quality in Chautauqua County, human resources, and technical assistance from additional partners.

10. Increase Farm to School Participation through Network

Currently 55 percent of the 18 school districts in Chautauqua County participate in some local food purchasing and educational activities about farming during the year. The USDA 2015 Farm to School Census of school districts will enable the Chautauqua County Health Department and school districts to understand current purchases by participating districts and barriers for non-participants so that they can determine best practices for purchasing, storing, and preparing local foods. Jamestown Central School District has a facility to process and freeze produce available in the summer to store local foods for year-round consumption (Chapter 5). With

additional support from a formalized Farm to School network, Jamestown might share use of their kitchen with other local schools to process their local foods.

The initiative will require additional funding to coordinate school districts Farm to School efforts, and to hire and train kitchen staff in the summer. School districts, in partnership with the existing Farm to School work through the County Health Department and Chautauqua County Health Network, would apply for state or federal grants to build capacity of the county's Farm to School programs into a network for inter-district support. It would require school district funding for a staff person, possibly a school food service manager or kitchen manager, to coordinate the purchasing and processing of local foods, as well as conduct evaluation each year to satisfy funding requirements.

11. Encourage SNAP Education Campaigns

A countywide public awareness/marketing campaign about the benefits from SNAP should be implemented by the County Health Department to increase the participation in the program by eligible residents. The percentage of participation of those eligible for benefits is low (Chapter 2), and increasing participation would improve food insecurity, as well as increase food sales, bringing additional federal dollars into Chautauqua County's food retail economy. The campaign would attempt to reduce stigma around SNAP and other public assistance programs. The Chautauqua County Department of Health and Human Services would launch and run the campaign. Through support from a food systems coordinator (Idea #1) and/or an Advisory Council (Idea #6), the campaign could be run through various outlets, including farmers markets and grocery stores. The Health Department should collaborate with the Cornell Cooperative Extension's Expanded

Food and Nutrition Education Program (EFNEP) which offers an 8-week program about healthy food and SNAP/WIC benefits to low-income adults who are pregnant or raising children.[175] The Chautauqua County Health Network could support the effort through partnerships with hospitals and other health-related organizations. Funding for staff time to implement the education campaign would come from USDA or NYS grant sources focused on increasing SNAP awareness and participation.

12. Develop Local Wine and Beer Branding Campaign

The County Department of Planning and Economic Development should capitalize on the strong presence of the wine and beer industry in the county through a branding campaign that is associated with the existing wine trail (Chapter 4). Due to the New York State Farm Brewery Law, breweries now have to buy a certain percentage of their ingredients from NYS farmers (Appendix C). This could provide an opportunity for farmers looking to diversify their crops, as well as for breweries that would like to feature local products and shorten their supply chains, thus creating value-added products entirely out of Chautauqua County-based resources. Grape and hop producers could be featured through the branding campaign as well.

The campaign would be conducted in partnership with the Chautauqua County Visitor's Bureau and Chautauqua County breweries and wineries, and be promoted through existing attractions such as the Chautauqua County Institution, the Grape Discovery Center, and the Lake Erie Wine Country. Funding for the campaign could come from participating wineries and breweries and non-profit organizations such as the Lake Erie Wine Country, which is part of the Taste NY (a state program) to coordinate and create the overarching branding for products involved.

13. Preserve Farmland through Land-Use Succession Agreements

As farmers in Chautauqua County age, the agricultural business and lifestyle that they fulfill is put in jeopardy as they age out (Chapter 3). The county has ample prime farmland (Chapter 3), but must focus on preventing aging farmers from selling land to developers by setting up succession agreements between retiring and new farmers. As indicated in the Agricultural and Farmland Protection Plan, the county is interested in preserving and protecting land for agriculture.[173] By facilitating land use succession agreements between land owners and young or new farmers, or by supporting agricultural operations and/or organizations that desire to boost the agricultural workforce through training and apprenticeship, the County Department of Planning and Economic Development can to preserve farmland in its present use. Such work agreements would work in tandem with education programs that involve more young people in agriculture and other food systems-related businesses (Idea #3) to encourage young people to see value in purchasing farmland. A similar idea was implemented in Lancaster, PA to protect farmland from development and preserve the character of the county (Chapter 9).

This idea would be facilitated by the Chautauqua County Department of Planning and Economic Development per the Farmland Protection Plan. The department would need to set program requirements and expectations, following innovations from other communities, as well as develop a plan to facilitate the relationships between current and future land owners. The department would collaborate with Cornell Cooperative Extension and Farm Bureau to identify farmers wishing to create land use agreements to protect their land or sell to new farmers. The department may also partner with school districts to set up internships and promote education programs related to agriculture.

14. Review Feasibility of Slaughterhouse Development

Beef has the second highest volume of sales among total livestock businesses in Chautauqua County (15.5% of livestock businesses), second only to dairy (Chapter 3). There are currently only two meat processors in the county, and meat processing is identified as a need by the meat processing report conducted by Southern Tier West (Chapter 4). Farmers in the Southern Tier travel over 1.2 hours to reach slaughterhouses on average.[47] Meat processing could be implemented with the development of one centrally located facility or a mobile operation. A new slaughterhouse facility could also help reduce the price of locally raised meat for Chautauqua County residents.

To determine the feasibility of a slaughterhouse in Chautauqua County, the Planning and Economic Development Department could work in partnership with the Chautauqua County Beef Producers Association and Southern Tier West, to review the recommendations from the previous meat processing report. The development of a new slaughterhouse would also require support from the Farm Bureau and Cornell Cooperative Extension to identify farmers who would utilize a slaughterhouse, and determine whether smaller facilities, or a mobile facility, would be more effective at meeting Chautauqua County farmers' needs.

15. Support Entrepreneurs to Open Small-Scale Dairy Processing Plants

Existing small-scale dairy processors identified a need for additional processing facilities for small-scale dairy farmers (Chapter 4). Although many dairy farmers have contracts with cooperatives that prevent them from selling milk to outside processors, some farmers may be interested in specializing (i.e. organic or grass-fed milk), or new farmers

may have incentives to start small-scale dairies if there was the opportunity for local processing. Expanding dairy processing could be in the form of one facility or series of small facilities at on-farm sites that could include retail outlets or educational programming.

Cornell Cooperative Extension and Southern Tier West could help identify farmers who would be interested in exiting contract agreements with current cooperatives or those who do not have contract agreements, and assess the feasibility of a new processing plant. The Chamber of Commerce or County Planning Department could help seek funding to develop a centralized processing facility or smaller ones on individual farms.

16. Explore Feasibility of a Shared-Use Commercial Kitchen

The start-up costs of launching a new food processing business, or purchasing kitchen equipment for a smaller school, may be significant barriers that prevent entrepreneurs or school districts from using more products from Chautauqua County. A kitchen space, owned by the County, could be rented out to small-scale food systems businesses or school districts to provide access to space and equipment that they would not be able to afford on their own (see Douglas County Community Kitchen, Chapter 9). The county should spend time reviewing possible locations, as well as the existing need from local businesses and entrepreneurs, to determine whether a shared-use kitchen would be economically viable and utilized. The feasibility analysis could be conducted in conjunction with other food system reviews (Ideas #9, 17 and 18).

The facility could either be a new build or a repurposed space that is administered collaboratively by County Department of Public Facilities, Department of Planning and Economic Development, and the Cornell

Cooperative Extension (CCE). CCE could also provide food safety courses and educational programming at the site. The NYS Department of Agriculture and Markets could help with branding the local products, and the Food Business Incubator (Idea #4) or the Jamestown Community College Small Business Development Center could support new entrepreneurs in developing business plans.

17. Conduct Institutional Food Hub Location Feasibility Study

Farmers' revenues can be increased by tapping into the demand for food by large institutions such as schools, restaurants, and/or hospitals. This can be made possible by establishing an institutional food hub. An institutional food hub, different than a Food Business Incubator (Idea #4), can be a strategically located aggregation and processing facility, or an online platform, that facilitates relationships between institutional purchasers and local farmers who are looking for new markets. The Food Hub could be a public-private partnership, and would need to be developed and run by an external entity, such as CHQ Local or another private entity, or be supported by the county government. Two feasibility studies have been conducted in the past five years to determine the viability of a food hub in both Erie County and the Southern Tier (Chapter 4).[49,48] The above studies noted that a strong network among small-scale farmers and processors and efficient transportation logistics must exist prior to food hub development. Neither study considered the opportunity to launch an institutional food hub in Chautauqua County alone however, so the feasibility study would be focused on the capacity within Chautauqua County alone.

The feasibility study would be conducted and funded by the Chautauqua County Department of Planning and Economic Development, in partnership with the advisory

council members (Idea #6). Other partners should include the Cornell Cooperative Extension, Farm Bureau, school district administrators, and other major institutional purchasers (e.g. Chautauqua Institution, hospitals, prisons, and major employers).

18. Institute Five Year Update of the Food System Assessment

Planning around the food system should reflect changes in the food system, so a regular assessment to follow up this report is necessary to make informed decisions. The County Legislature should mandate a regular review and update of the food system assessment and the agriculture chapter of the Comprehensive Plan every five years. Updates should use the most current data available, including from the USDA Census of Agriculture, and the US Population Census and Economic Census. The review and update would be led by a food systems coordinator (Idea #1) with guidance from the Advisory Council (Idea #6).

The update to the food system assessment should be led by the Chautauqua County Department of Planning and Economic Development, and funding could be allocated from the county budget in order to complete the update. The County can continue to partner with the University at Buffalo Food Systems Planning and Healthy Communities Lab for technical support in this process.

Idea	Details	Actors	Resources Required	Time Frame to Implement	
1	Hire a Food Systems Economic Development Coordinator	Create a staff position in the Planning Department to coordinate the implementation of food systems goals with support from the Advisory Council (Idea #6).	Chautauqua County Department of Planning and Economic Development; Chautauqua County Legislature	Funding allocation in the county budget for the new position	1 - 3 years
2	Incentivize the Formation of a Food System Transportation Network	Identify existing trucking delivery sources that have the capacity to transport food from farms to processors to buyers (institutional, retail, individual) and form a network of trucks to create opportunities for small scale producers to access new or larger markets.	Chautauqua County Department of Planning and Economic Development; Cornell Cooperative Extension; Farm Bureau; Southern Tier West; existing transportation companies	Staff time to identify existing companies and demonstrated need for transportation between producers, processors, and purchasers	1 - 3 years
3	Develop Secondary, Vocational and Higher Education Agricultural Education Programs	Extend agricultural education opportunities and mentorships into secondary and vocational schools and higher education institutions, in order to provide students with both business and agricultural knowledge to provide farmers with skilled labor, as well as give students firsthand experience in the field.	Chautauqua County Legislature; County school districts; Cornell Cooperative Extension; Erie-2 BOCES; State University of New York at Fredonia; Jamestown Community College; Farm Bureau; Farm Credit; 4-H Program	Funding allocated by school districts and through federal grants; county-created agricultural education committee to test and implement the program	4 - 7 years
4	Conduct Food Security Assessment to Determine Barriers	Gather in-depth quantitative and qualitative data about remaining barriers to food security in rural and urban areas, building off of information gathered in this report.	Chautauqua County Department of Health and Human Services; Chautauqua County Health Network; Cornell Cooperative Extension; Jamestown Renaissance Corporation	Planning/health department staff time seeking grants; funding for staff time by all related organizations to collect data	1 - 3 years

Idea	Details	Actors	Resources Required	Time Frame to Implement	
5	Launch Microlending and Discounted Facilities Program	Establish a program that offers micro-lending and discounted lease agreements for public facilities (i.e. commercial kitchens at schools or publicly-owned warehouses) to individuals who are looking to establish food system businesses or expand the capacity of their existing businesses.	Chautauqua County Department of Planning and Economic Development; Chautauqua County Industrial Development Agency; Chautauqua County Chamber of Commerce	Administration and funding from the county and grants	4 - 7 years
6	Form an Advisory Council to Strengthen and Sustain the Food System	Create a council made up of community stakeholders that develop and advocate for policies that work across the food system to improve food security, economic development, and health outcomes.	Food systems stakeholders including (not limited to): farmers; processors; distributors; consumers; Chautauqua County Department of Planning and Economic Development; Chautauqua County Department of Health and Human Services; Cornell Cooperative Extension; Farm Bureau	Coordination at the county level to bring together community stakeholders to form and operate the council	1 - 3 years
7	Publish a Report on the State of Agritourism	Publish a report to assess the conditions of agritourism in the county, show trends and impacts of this type of business in the county, and inform policy and programmatic decisions that support agritourism.	Chautauqua County Chamber of Commerce; Chautauqua County Department of Planning and Economic Development; Chautauqua County Industrial Development Agency; Chautauqua County Visitors Bureau	Support to implement from UB Urban Planning studios, funding through Chamber of Commerce	1 - 3 years
8	Develop Food Donation Infrastructure	Establish a program that encourages the reduction of food loss and waste through volunteer teams by collecting, transporting and storing food at a central location. Leverage 2017 NYS law to provide tax credits to farmers who donate excess crops.	Cornell Cooperative Extension; Chautauqua County Rural Ministry-Gleaning Project; Food Bank of WNY	Technical support from Food Bank WNY; funding from larger food the county, and grants	7 - 10 years
9	Create an Environmental Resource Management Plan	Create a plan that envisions the future of the environmental resource base and addresses food and agricultural waste management. It should outline a path toward sustainable management of food and agricultural resources.	Agriculture and Farmland Protection Board; Chautauqua County Department of Planning and Economic Development; Chautauqua County Department of Public Facilities; Northern Chautauqua Conservation Club; Soil & Water Conservation District	Data collection on environmental and waste conditions; county staff time and funding to conduct plan-making	4 - 7 Years

	Idea	Details	Actors	Resources Required	Time Frame to Implement
10	Increase Farm-to-School Participation through Network	Increase farm-to-school purchasing among participating (and new) school districts, and determine best practices for purchasing, storing and preparing local foods.	Chautauqua County Health Network; Cornell Cooperative Extension; County school boards, food service directors, and workers	Funding through USDA Farm to School grants for a staff person to coordinate program; school district budget allocation to train kitchen staff about local food	1 - 3 years
11	Encourage SNAP Education Campaigns	Implement a countywide public awareness/ marketing campaign about SNAP to improve food insecurity, as well as increase food sales. The campaign would attempt to reduce stigma around SNAP and other public assistance programs.	Chautauqua County Department of Health and Human Services; Cornell Cooperative Extension; Chautauqua County Health Network	Funding through County budget and USDA and NYS SNAP-Education grants	1 - 3 years
12	Develop Local Wine and Beer Branding Campaign	Capitalize on the NYS Farm Brewery Law that requires breweries to use local hops by launching a branding campaign that is associated with the existing Wine Trail.	Chautauqua County breweries and wineries; Chautauqua County Institution; Grape Discovery Center; Chautauqua County Visitor's Bureau	Funding to coordinate marketing of brands and locations to outside markets and to create overarching branding for products involved.	1 - 3 years
13	Preserve Farmland through Land-Use Succession Agreements	Create land agreements for use between land owners and young farmers to preserve farmland.	Chautauqua County Department of Planning and Economic Development; Cornell Cooperative Extension; Chautauqua County Farm Bureau; County school districts; farmers and land owners	Program development, farmer engagement and funding from the county and Cooperative Extension	4 - 7 Years
14	Review Feasibility of Slaughterhouse Development	Review existing meat processing report and determine feasibility and type of facilities as well as next steps and funding plan if needed.	Chautauqua County Beef Producers Association; Southern Tier West	Meat Processing report from Southern Tier West; farm representation from Farm Bureau	4 - 7 Years

Idea	Details	Actors	Resources Required	Time Frame to Implement	
15	Support Entrepreneurs to Open Small-Scale Dairy Processing Plant	Expand dairy processing options to increase value-added dairy production through one facility or series of small facilities at on-farm sites.	Cornell Cooperative Extension; dairy farmers; Southern Tier West; existing small-scale dairy processors	Funding through grants to develop centralized processing facility; survey of farmers through Cooperative Extension	4 - 7 Years
16	Explore Feasibility of a Shared-Use Commercial Kitchen	Determine feasibility of a kitchen space to give small-scale, start-up businesses access to space, equipment, and resources to scale up their operations.	County Department of Public Facilities; Chautauqua County Department of Planning and Economic Development; Jamestown Small Business Development Center	Funding from county and grants to determine feasibility	7 - 10 years
17	Conduct Institutional Food Hub Location Feasibility Study	Conduct study to determine economic feasibility and capacity for external entity to implement. The goal of the Food Hub is to increase farmers' revenue and local food consumption by creating institutional demand from schools, restaurants, and/or hospitals.	Chautauqua County Department of Planning and Economic Development; Cornell Cooperative Extension; major institutional purchasers (schools, Chautauqua Institution, hospitals)	Funding from county for study; additional funding from state/federal grants as needed	7 - 10 years
18	Institute Five Year Update of the Food System Assessment	Review and update the food system assessment and the agriculture chapter of the Comprehensive Plan every five years. Process would be led by the Food Systems Coordinator (Idea #1) and supported by the Advisory Council (Idea #6).	Chautauqua County Department of Planning and Economic Development; UB Food Systems Planning and Healthy Communities Lab	Funding and mandate from the county to complete the study	4 - 7 years



Appendix A. Data Sources and Methodology

This section of the appendices provides an overview of the research methods used to explore and present data throughout the report. Each section of the report - background, the four food system sectors, and economic conditions - uses some similar data sources and techniques to understand data; however, each section also has several unique circumstances related to data interpretation and manipulation. Between February and May 2017, quantitative, qualitative, and spatial data were collected from a variety of sources, which are detailed below.

1. Quantitative Analysis

Quantitative data analysis was used to understand the baseline conditions and economic impact of the Chautauqua County food system. Two computer software programs were used to analyze and display quantitative data: Microsoft Excel (to create tables and graphs) and IMPLAN (to analyze the economic impact of the food system on the entire Chautauqua County economy).

Sources of quantitative data were primarily secondary sources, such as US Census of Population, Economic Census, and Agricultural Census. Data types and process of analysis are detailed below by section.

2. Qualitative Analysis

Qualitative data collection and analysis included collecting and reviewing reports, comprehensive plans, and studies as well as conducting interviews for case studies and local voices, highlights and features. Qualitative data, collected by various members of the team, included 11 interviews and three focus groups (two with the Growing Food Connections Steering Committee and one with students in a Planet Earth class at Jamestown Community College). Additional qualitative data were collected through informal phone calls with key informants to ground truth data, or collect additional information not included or captured in the quantitative sources.

3. Spatial Analysis

Spatial analysis was conducted using ArcGIS version 10.3.1 and its associated extensions. Maps were created with quantitative data sources, such as ReferenceUSA, US Census Bureau, US Department of Agriculture, as well as land parcel data containing information about census tracts, town, city, region, county and state boundaries, streets, and hydrology (downloaded from NYS GIS Clearinghouse, ESRI online). Shapefiles and KMZ files for many data sets were provided by the Chautauqua County Information Technology Services office in the Planning and Economic Development office. Information about the specific data sources for each map can be found in the citations below each map in the report.

Chapter-Specific Methodology

1. Background

To provide context about Chautauqua County, the background section incorporated multiple sources of data. For information regarding the general population characteristics of the county, 2007 - 2012 5-year estimates from the American Community Service were downloaded from the United States Census Bureau. Data were summarized for the county population land area, racial makeup, unemployment rates, educational attainment, poverty rates, SNAP participation, and household structures. Data were displayed through a combination of tables and figures. Population characteristics at the county level were often compared to those at the state and national level in order to give context to the conditions in Chautauqua County.

For food security and health outcomes, data came from two sources. Data were collected from the Chautauqua County Department of Health and Human Services' 2014-17 Community Health Improvement Survey as well as the New York State Department of Health's Behavioral Risk Factor Surveillance Survey. The two sources made

up the latter half of the background section regarding health indicators and outcomes, and experiences related to geographic distribution and cost of food. Both sources consisted of community or phone surveys that asked a sample of residents to volunteer information regarding their own health-related actions and conditions. Information about Chautauqua County residents' health was characterized by comparing data to the state level, when available.

2. Agriculture and Production

Data for the agriculture and production section of the report were sourced from the USDA Census of Agriculture for the years of 2002, 2007, and 2012 and the New York State Department of Environmental Conservation (NYS DEC) sporting license sales information by county for 2012-2013. Additional data on grape production were downloaded from the USDA Census of Agriculture Historical Archive (1974-1992). All available data for Chautauqua County were downloaded from the USDA Census of Agriculture, while select datasets were downloaded for New York State and the United States for the purpose of comparison across geographic scale.

Although almost all of the data presented in this chapter of the report are pulled directly from the Census of Agriculture, some data were aggregated for clarity. For example, the Census of Agriculture reports farmer income from federal government programs as a total of all programs, but also differentiates between federal government programs for conservation and wetlands and those not including conservation and wetlands. For the purpose of this report, only the total number of programs was reported.

The USDA Census of Agriculture provides raw data in the form of 2012 dollars, acres, number of operations, or person counts. Any instances of percentages in the agriculture and production section of the report were calculated using raw data provided in the datasets from the Census of Agriculture.

Information from the NYS DEC on sporting licenses was downloaded for all New York State counties as well as for the state as a whole for the year 2012-2013. Although data for specific types of licenses were available, only totals for Chautauqua County and New York State were reported.

3. Aggregation, Wholesale and Processing

Data for the aggregation, wholesale and processing section of the report were sourced from ReferenceUSA, a private vendor. ReferenceUSA data for 2016 was purchased for Chautauqua County from the third-party vendor. Data about the associated North American Industry Classification System (NAICS) codes^{lxxxviii} were downloaded from the US Economic Census Bureau website.

Once downloaded, the ReferenceUSA data were separated by industry code into two groups: codes starting in 31-33 for aggregation and processing, and codes starting in 42 for wholesale. The businesses were then examined for duplication. The NAICS codes were filtered to remove any primary NAICS categories not related to the food system. A few (8) remaining categories of NAICS codes were removed because although they were related to the food system, they were not a key industry: Farm Supplies Merchant Wholesalers, Commercial Equipment Merchant Wholesalers, Industrial Equipment Manufacturers, Food Product Machinery Manufacturers, Service Establishment Equipment Wholesalers, Farm & Garden Machinery & Equipment Merchant Wholesalers, Other Miscellaneous Nondurable Goods Merchant Wholesalers, and Dog & Cat Food Manufacturing. Two additional businesses from the retail sector (NAICS code 45) were added to the analysis because they also conduct processing, aggregation or

^{lxxxviii} An NAICS code is a standard code used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. The study determined the food system's NAICS codes, which are re-classified by food system sector in Appendix E.[179]

wholesale activities.

Once extraneous categories were removed, quality control was conducted. Businesses with duplicate phone numbers or addresses were called to confirm the actual number of businesses on the premises. Internet searches using sites such as yellowpages.com were conducted to find published lists of wineries and breweries to ensure that the ReferenceUSA data were complete. Additional businesses were added following interviews and conversations with Growing Food Connections Steering Committee members. One Steering Committee member also reviewed the final list for accuracy and as an additional layer of quality control. Data for new businesses were added through online research and personal referrals collected through the quality control phone calls. In total, five new businesses were added to the original ReferenceUSA list of aggregation, wholesale, and processing businesses in the county, for a reported total of 56 businesses.

4. Distribution

Food distribution facilitates the transfer of agricultural and food products between producers, processors and consumers, and is often the primary way consumers engage in the food system. Information on businesses engaging in the market supply chain of food, such as food retailers and food service or accommodations businesses, was identified using the NAICS codes and downloaded from the ReferenceUSA database. Data about market food supply chains were separated into two categories by NAICS codes (44-45: Retail and 72: Accommodation and Food Service). Multiple online searches were performed to identify food distribution points outside of food retail businesses: direct from farm distribution, institutional sources of food, and emergency food sources. Resources that were used to find this information include Cornell Cooperative Extension of Chautauqua County's Chautauqua Grown website, New

York State departmental websites, such as Education and Corrections; and Food Bank of Western New York's member affiliates; including Google Maps locations of food assistance operations. Searches were confined by the geographic scope of Chautauqua County when possible, but often required verification of location through manual review of addresses of operations. The verified businesses and operations were then sorted into three categories of food distribution: market-based; institutional; and emergency for a total of 459 operations.

5. Management of Food Waste and Food Loss

Data on food waste and loss were collected from a variety of sources. National data came from the Economic Research Service (ERS) of the United States Department of Agriculture (USDA), Feeding America, and the United States Environmental Protection Agency (EPA). Global numbers and figures came from the Food and Agricultural Organization (FAO) of the United Nations and the World Resources Institute. Data about local organizations came from the Chautauqua County Rural Ministry, SUNY Fredonia, and the Cornell Cooperative Extension.

All of the data sources about Chautauqua County were drawn from publications such as reports, plans, or web pages; data tables and figures were pulled directly from these publications and re-formatted for design purposes. No raw data were used in the making of this section, and no data were manipulated.

Estimates from about this section in the Economic Analysis utilized North American Industry Classification System (NAICS) code 56 from the US Census Bureau: Administrative and Support and Waste Management and Remediation Services. This category is then further divided into seven categories, only two of which there are data for Chautauqua County: Other Nonhazardous Waste Treatment and Disposal and Remediation Services. Data on the two categories were not

analyzed since they were unlikely to directly or indirectly impact the food system.

6. Economic Impact

This section used quantitative methods of analysis to ascertain trends in economic statistics related to Chautauqua County's food system economy. The statistics include sales volume, number of firms, and number of employees for businesses in each food system section. In the economic impact assessment section of Chapter 7, the scenarios used input-output analysis to simulate economic impact of changing factors of the food system sectors in Chautauqua County.

Economic Statistics

The economic statistics for each food system sector in Chapter 7 were generated based on data from three sources, including the US Economic Census, ReferenceUSA, and IMPLAN. The US Economic Census is conducted every five years by the United States Census Bureau with the intent of providing detailed information regarding the nation's economy; the most recent data is from 2012.[176] ReferenceUSA, a private company, conducts surveys every year to provide more detailed information regarding established firms. The most recent available data from ReferenceUSA was collected in 2016.[177] IMPLAN (IMPact analysis for PLANning) provides economic impact data and modeling to governments, universities, and public and private sectors; the most recent data estimates available are from 2016.[178]

As a public data source, the US Economic Census has a high level of reliability, although the data is not available for some variables (e.g. self-employment data). As a private data source, ReferenceUSA is more likely to provide diverse, disaggregated information about established firms, but the data reliability are limited regarding accuracy incurred by exaggeration, duplicity, self-reporting bias, etc. Therefore, this analysis used the US Economic Census as the primary data source to understand the total food

Table A-1. Formulas to Estimate Economic statistics from U.S. Economic Census

Case	In a defined 2-digit industry, is 6-digit industry identifiable?	In a defined 2-digit industry, is any unavailable economic statistic in 6-digit industries fully provided by ReferenceUSA?	Estimation formula
			(e.g. employee count)
1	No	n/a	Selected 2-digit industry's total #emp related to food system = selected 2-digit industry's total #emp in US / Selected 2-digit industry's total #emp in REF * Total 6-digit industries' #emp in REF
2	Yes	No	Selected 2-digit industry's total #emp = total 6-digit industries' #firm in US * total 6-digit industries' average #emp in REF
3	Yes	Yes	Selected 6-digit industry's total #emp = selected 6-digit industry's total #firm in US * selected 6-digit industry's average #emp in REF

Abbreviation: #emp: number of employees; #firm: number of firms; US: U.S Economic Census; REF: ReferenceUSA

system economy, and was supplemented with ReferenceUSA data for estimation, and IMPLAN data for regional comparison analysis.

To find economic statistics within Chautauqua County, the U.S. Economic Census could not be used since it does not provide local information, such as sales volume or number of employee statistics for some industries due to privacy, avoidance, multi-establishment, or unavailability issues at the local level. Therefore, this analysis estimated unavailable statistics in the U.S. Economic Census using ReferenceUSA, which provides sales volume and employee county data for all established firms. There are many methods to interpret and quantify the sales volume and employee count of the Chautauqua County food system. The estimations used in this analysis are constrained by the availability of valid data regarding the current economic status of the county. Table A-1 shows three formulas used in the analysis to estimate the number of employees for each sector. Each food system sector has multiple two-digit industry codes to identify categories of businesses, and each two-digit industry code has multiple six-digit industry codes.

In *Case 1*, the formula estimates the

total employee count in the selected two-digit industry, if the U.S. Economic Census does not identify six-digit NAICS codes within the two-digit industry. For example, the U.S. Economic Census does not provide cheese manufacturer (NAICS: 311513) statistics. Simply, it is part of the manufacturing industry (NAICS: 31). Since the heading of “31” refers to a wide range of manufacturing firms, estimation to identify the food system’s manufacturers is necessary. To this end, the formula uses a proportion between the total number of employees in the two-digit industry (general manufacturers) and total number of employees in the six-digit industry (food system’s manufacturers) in ReferenceUSA. In turn, the final estimate is determined by the proportion between the derived proportion from ReferenceUSA and total number of employees in the two-digit industry (general manufacturers) in the U.S. Economic Census, because the survey date frame between the two is different.

In *Case 2*, the formula estimates total employee count in the selected two-digit industry, if ReferenceUSA does not fully provide U.S. Economic Census’s unavailable economic statistics in six-digit industries of the selected two-digit industry. For

example, the U.S. Economic Census identifies packaged frozen food merchants' (NAICS: 424420) existence without detailed statistics, while ReferenceUSA does not provide any data for packaged frozen food merchants. Since ReferenceUSA data does not provide smaller category data (six-digit industry), it is recommended to estimate larger category data (two-digit industry). To this end, the formula suggests estimating the number of employees in the selected two-digit industry by multiplying total six-digit industries' number of firms in the U.S. Economic Census and total six-digit industries' average number of employees in ReferenceUSA.

In *Case 3*, the formula estimates the total employee count in the selected six-digit industry, if ReferenceUSA fully provides the U.S. Economic Census's unavailable economic statistics in six-digit industries of the selected two-digit industry. For example, the U.S. Economic Census identifies food supplement stores' (NAICS: 446191) existence without detailed statistics, while ReferenceUSA provides food supplement stores' data. To this end, the formula estimates the employee count by multiplying a selected six-digit industry's total number of firms in U.S. Economic Census and selected six-digit industries' average employee count in ReferenceUSA.

For economic statistics in New York State regarding regional comparison, the study used IMPLAN data to identify each food system sector's economic proportion to the entire Chautauqua County economy. Due to different industrial categories between NAICS codes and IMPLAN classification, this analysis experienced a limitation on containing a broad industrial definition. The study determined the food system's industry codes in IMPLAN, which can be found in Appendix E. For example, Wholesale Trade (industry code 395) refers to a wide range of wholesalers, including wholesalers in the food system. Such different industrial classifications and different survey dates between the U.S. Economic Census (2012) and IMPLAN data (2015) explain the

economic discrepancies. To compare only the food system sectors' economy, this analysis did not include other ancillary businesses that are related to the food system but are not directly a part of the system (e.g. trucking).

Economic Impact Assessment

In the economic impact assessment section of Chapter 7, the study relied on input-output analysis using IMPLAN, one of the most widely used input-output analysis services. The study used 2015 IMPLAN data from Chautauqua County to estimate economic output by the multiplier effects of five most-likely scenarios. The multiplier effects are measured by the economic return of one dollar value spent in a selected industry and observe its impact on the county's economy as a whole. To ascertain the most feasible output, the input should be carefully designed. Tables A-2 to A-4 show the input designs for each scenario. The economic multiplier is used to measure the economic return of funds back to the community economy by identifying three effects: direct effects, indirect effects and induced effects. Direct effects represent the initial spending in the defined industry, indirect effects are changes in inter-industry transactions when supplying industries respond to increased demands from the directly affected industries, and induced effects reflect changes in community spending that result from income changes in the directly and indirectly affected industry sectors.[130]

In *Scenario One*, the assessment assumes that 25 percent of the increased funds from increased utilization of the school food program will be used to purchase four locally-produced foods of equal amounts at the Jamestown School District (Table A-2) and all Chautauqua County school districts (Table A-3), including: produce, milk, bread, and meats. In IMPLAN's industry description there are five industries: vegetable and melon farming; fruit farming; dairy cattle and milk production; bread and bakery product, except frozen; and animals except poultry

Table A-2. Process to Derive Input for Scenario 1-A: Increase in Utilization of School Food Program and Local Food Procurement in Jamestown

Step	Description	Dollar (\$)
A	Funds available by maximizing number of student school food purchases in Jamestown	2,711,340
B	Current funds available from student school food purchases in Jamestown (A X 69%)	1,864,620
C	Current amount of funds spent to purchase local food in five industries (B X 3%)	55,939
D	Target amount of funds to spend to purchase local food in five industries (A X 25%)	677,835
E	Increase in funds spent to purchase local food in Chautauqua County (D - C)	621,896
Increased input per industry (E/5)		124,379

Table A-3. Process to Derive Input for Scenario 1-B: Increase in Utilization of School Food Program and Local Food Procurement in Chautauqua

Step	Description	Dollar (\$)
A	Funding available by maximizing number of student school meal purchases in Chautauqua County	10,642,320
B	Current funds available from school food purchases in Chautauqua County (A X 51%)	5,657,040
C	Current amount of funds spent to purchase local food from five industries (B X 3%)	169,711
D	Target amount of funds to spend to purchase local food in five industries (A X 25%)	2,660,580
E	Increase in funds spent to purchase local food in Chautauqua County (D - C)	2,490,869
Increased input (\$) per industry (E/5)		498,173

slaughtering. The amount of fund increase (input) is derived by the process (Tables A-2, A-3). In IMPLAN, industry change was simulated based on the increased initial spending as additional revenue per each selected industry.

In *Scenario Two*, the assessment assumes that an additional \$2.5 million of the existing and increased funds will be used to purchase equal amounts of four products: produce, milk, bread and meats. The amount of fund increase (input) is derived by the process below (Table A-4). In IMPLAN, industry change was simulated based on the increased initial spending below as additional revenue per each of the five selected industries.

In *Scenario Three*, the assessment assumes that a new dairy processor (IMPLAN's industry description: dry, condensed, and evaporated dairy product manufacturing) will generate annual revenue equivalent to one of the current dairy processors (\$500,000) in the county. Such revenue increase was simulated by industry change in IMPLAN.

In *Scenario Four*, the assessment

assumes that a new slaughterhouse will generate annual revenue equivalent to one of the current slaughterhouses (\$2,283,000) in Chautauqua County. Such revenue increase was simulated by industry change in IMPLAN.

In *Scenario Five*, the assessment assumes that the food-related trucking industry (truck transportation in IMPLAN's industry description) will increase current industrial revenue by 25 percent (\$3,181,250 in annual sales) in Chautauqua County. Such revenue increase was simulated by industry change in IMPLAN.

7. Policy

Information was collected from laws, policies, plans, and publications by the New York State Senate, New York State Legislature, Chautauqua County Legislature, Chautauqua County Department of Planning and Economic Development, and other municipal governments within Chautauqua County.

Table A-4. Process to Derive Input for Scenario 2: Increase in Enrollment in SNAP Program and Increase in Demand for Local Foods

Step	Description	Dollar (\$)
A	Amount of funds available from local food spending by maximum number of SNAP recipients	22,930,824
B	Amount of funds spent on local food by current number of SNAP recipients (A X 66%)	15,030,288
C	Target amount of funds spent on local food by increased number of SNAP recipients (A X 75%)	17,198,118
D	Target amount of additional funds spent to purchase local food by SNAP recipients (C - B)	2,500,000
	Increase in input per industry (D/5)	500,000



Appendix B. Glossary of Terms

Aggregation: Brings raw agricultural products from farms and orchards to a central facility.

Agribusiness: The term agribusiness denotes the collective business activities that are performed from farm to fork. Agribusinesses cover the supply of agricultural inputs, the production and transformation of agricultural products, and their distribution to final consumers.

Agritourism: The act of tourists visiting agricultural areas. Agritourism can be an important economic development tool used to attract tourists to enjoy and experience agricultural areas, and often take part in sampling or purchasing the farm products.

Agricultural Viability: The ability of a farmer to make an agricultural production business economically beneficial and earn enough income from the operation to maintain the farm and her livelihood. Farmers may be supported in making their operation viable through programs that assist in developing

business plans to diversify and modernize farming operations. In addition, some states provide funding to help farmers implement their business plans.

Agriculture and Food Production: The first sector of the food system. It is the stage in which raw food is created or raised. This sector includes several activities, such as growing crops and raising animals. Agriculture also includes activities like maple syrup and honey production. Food production is not limited to activities on farms. It includes individual and household level food production such as hunting, fishing and gathering.

Anaerobic Digestion: A series of biological processes in which microorganisms break down biodegradable material in the absence of oxygen. One of the end products is biogas, which combusts to generate electricity and heat, or can be processed into renewable natural gas and transportation fuels.

Charter (Food Charter): A term that is used in multiple ways. A food charter outlines a community's principles and aspirations for its food system (e.g. Michigan Good Food Charter). The term charter is also used for a document that defines the organization, powers, functions, and essential procedures of city government.

Community Food Security: The state in which all community members have adequate access to healthy, affordable, and culturally acceptable food. Food security and food access are closely linked. Some communities have established visions, charters, or resolutions that define and support community food security.

Community Food System: The soil-to-soil system that connects food production, processing, distribution, acquisition, consumption, and waste disposal in food and agriculture. It is a food system in which food production, processing, distribution, and consumption are integrated to enhance the environmental, economic, social, and dietary health of a particular place. A community food system can refer to a relatively small area, such as a neighborhood, or progressively larger areas – towns, cities, counties, regions, or bioregions.

Community Supported Agriculture (CSA): A business model in farming that has been gaining momentum since its introduction to the United States from Europe in the mid-1980s. The CSA concept originated in the 1960s in Switzerland and Japan, where consumers interested in safe food and farmers seeking stable markets for their crops joined together in economic partnerships. A CSA consists of a community of individuals who pledge support to a farm operation so that the farmland becomes, either legally or spiritually, the community's farm, with the growers and consumers providing mutual support and sharing in the risks and benefits of food production. Consumers generally pay for a

subscription for a share in the harvest at the beginning of the season, so that farmers have the capital needed for food production.

Comprehensive Plan: Also known as a master or general plan, a comprehensive plan is a collection of information and materials designed to guide the future development of a city or county. It can provide a community with a firm foundation for policy and action that will allow it to function more efficiently and effectively. It provides a framework and policy context within which to make all decisions relating to land use and future development.

Conservation Easement: Permanent legal agreements entered into by a landowner and state or local government, or a non-profit land trust. Easement documents identify open space values to protect, and clearly describe the restrictions being placed on a property. First, an appraiser determines the value of the property rights given up by a landowner, and then the easement is purchased; it can also be donated, resulting in a variety of tax benefits. When the state accepts and holds a conservation easement it takes on the responsibility to monitor and enforce the terms of the easement in perpetuity (forever); the easement is recorded with the deed and is binding on future landowners.

Cropland: Portion of farmland used for raising and harvesting plants, either for animal feed or human consumption.

Distribution: The final link in the food supply chain that connects consumers and purchasers with agricultural and food products for consumption; occurs through three channels: market-based businesses, institutions, and emergency food suppliers.

Economic Multiplier: A measure of economic impact on the larger economy as a result of a change in demand measured in terms of return for each new dollar spent.

Electronic Benefits Transfer (EBT): The plastic debit card that recipients of SNAP benefits can use at food retailers to pay for food and other necessities.

Emergency Food Distribution: Food distribution methods where an economic transaction does not occur, i.e. food pantries and soup kitchens.

Excess Food: The volume of agricultural and food products that are not used for human consumption.

Excess Food Waste Reduction and

Reclamation: The process of the food system that investigates what happens to food at the end of its cycle. These terms refer to the exploration of methods to increase human consumption of food that is already produced, decrease the amount of food that is wasted, and improve the sustainable management of food waste.

Farm Income: Amount of final profits, measured per year or per acre, that farmers earn after accounting for operational costs and/or taxes. Farm income can be lower than income in other professions because of rising costs of land, fuel, and labor.

Farmland: Agricultural areas dedicated to raising livestock or growing crops, including fruits, vegetables and grains for human consumption, or cultivating animal feed.

Food Hub: The USDA uses the working definition of a food hub as “a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.’ By actively coordinating these activities along the value chain, food hubs are providing wider access to institutional and retail markets for small to mid-sized producers, and increasing access of fresh healthy food for consumers, including underserved areas...”[50]

Food Insecurity: The experiences of having limited or uncertain availability of safe and nutritionally adequate foods. In 2006, the USDA introduced new language to describe the different ranges of severity of food insecurity: very low food security, which reflects reports of multiple indications of disrupted eating patterns and reduced food intake; and low food security, which includes reports of reduced quality, variety, or desirability of diet, but with little or no indication of reduced food intake.

Food Recovery: Refers to the collection of edible food to redistribute to populations that experience food insecurity and seek out emergency food sources. Food recovery takes several forms: gleaning, perishable food rescue/salvage, non-perishable food collection, and rescue of prepared food from market supply chains or institutions.

Food Security: According to the Economic Research Service, food security is defined as access by all people at all times to enough food for an active, healthy life.[10] The definition is applicable at varying levels including individuals, communities, regional, and national. For the purposes of this guide, food security includes the availability of safe and nutritionally adequate foods without reliance on emergency food systems or resorting to scavenging, stealing, or other strategies that undermine human dignity.

Food System: Encompasses the entire life cycle of food, connecting production, processing, distribution, acquisition, consumption, and disposal of waste. A sustainable food system is a soil-to-soil system that enhances natural resources and supports the physical infrastructure, people and relationships, markets, technologies, policies, regulations, and all the other activities that shape and influence how food moves through the system—from field to fork to compost pile and back again.

Production. The use of natural resources and human resources to grow edible plants and animals in urban, suburban, or rural settings.

Aggregation/Processing. The transformation of raw food materials through value-adding, processing, manipulating, and packaging to create a usable end product for consumption.

Distribution. The direct or indirect distribution and transportation of processed and unprocessed foods to wholesalers, warehouses, retailers, institutions, and consumers.

Access and Consumption. The availability and accessibility of foods and their subsequent purchase, preparation, ingestion, and digestion.

Waste/Resource Disposal. The disposal of food-related materials, waste, and by-products and their subsequent disposal, reuse, or recycling.

Foodshed: The geographical area between where food is produced and where that food is consumed. The foodshed concept is similar to a watershed—both encompass the flow of a substance from its origin to its ultimate destination. An alternative definition of a foodshed is a geographic area that supplies a population center with food.

Gleaning: The act of collecting excess fresh foods from farms, gardens, farmers markets, grocers, restaurants, state/county fairs, or any other sources in order to provide it to those in need through emergency supply sources.

Healthy Corner Store Program (Healthy Corner Store Initiative): In 2004, The Food Trust of Philadelphia identified corner stores as potential partners in the effort to improve access to healthy, affordable foods in underserved communities. The Food Trust created the Healthy Corner Store Initiative to support corner store owners committed to increasing the healthy food inventory in their stores and to encourage customers to make

healthier choices.[63] The program has been launched by non-profits and foundations many cities across the United States.

Input-output Analysis: Depicts the flow of transactions/sales between local industries. It measures impact of the multiplier effects on all sectors of an economy by the economic return for one dollar spent in one particular sector.

Institutional Food Distribution: Food purchases are made on behalf of consumers who are typically clients or members, i.e. educational institutions, public school districts, hospitals, and prisons/jails.

Labor Force: The number of potential workers in an area, both employed and unemployed, who are physically and legally able to work for payment.

Market-based Food Distribution: Operations that distribute food and contribute to the market-based economy. Market supply chain operations include brick-and-mortar businesses, such as grocery stores, corner stores, restaurants, caterers, and direct farms sales at farmer's markets, roadside or farm stands, or CSAs, etc.

Non-market Food Distribution: Methods of food distribution that exist outside of the economic marketplace, connecting consumers to supplementary and emergency food sources. Although these distribution methods are not a principal supply chain in the food system, the food distribution outlets they create can provide an essential food source for residents.

Ordinance: Legally-binding acts issued at local level by municipalities and are applicable within the city limits only. In some cases, they supersede central laws as well (federal systems). A law is relevant to the country as a whole. However, the ordinance passed by a particular municipality is only applicable to

that municipality.

Organic Farming: Methods of limiting or excluding synthetic fertilizers or pesticides in agriculture, and antibiotics or hormones in livestock, or genetic modification of either, as opposed to the use of such methods in “traditional farming.” National and/or international legal standards may be used for guidelines in farming organically.

Public Policy: Broadly defined, public policy includes all government actions and inactions that respond to public problems. These include: plans; binding and non-binding policies; laws, ordinances, and regulations; and public investment, programs, and projects. Taking this broad view of policy making, many public actions can be taken to advance community food systems including: farm- and food-friendly land use policies and zoning; personnel dedicated to food system issues; utilities provided for free or reduced rates; public education programs; public investments, through grants and incentives; and tax relief and reductions or waivers in fees for licenses, permits, etc.

Processing: Transforms agricultural products into forms that are directly edible or ready-to-cook.

Supplemental Nutrition Assistance Program

(SNAP): Program formerly known as food stamps, which is now transferred via debit cards (EBT). It is a federally-funded program that helps families stretch their monthly food budget and purchase food for their families. SNAP benefits can be used to purchase food (only) at a variety of locations, including grocery stores, convenience stores, and some farmers' markets and co-op food programs.

Wholesale: Businesses or operations that store foods aggregated from a variety of places, and distribute food products to retailers and institutions often in bulk quantities.



Appendix C: Food System Policy Landscape

1. Municipal Policy Landscape

Jamestown Comprehensive Plan

At 30,546 residents, Jamestown is the largest city in Chautauqua County. [3] Throughout its history, hundreds of local, state, and national laws and plans have influenced the evolution of the city. The last time that Jamestown updated its comprehensive plan was almost 20 years ago, in 1998. This plan aimed to transform the city into a more livable place while also increasing the economic opportunities that the city had to offer. The plan was devoid of any mention of food systems planning, like most other plans around the county at that time.[180]

Jamestown Urban Design Plan

Eight years after the adoption of the comprehensive plan, the city introduced the Jamestown Urban Design Plan. The objective of this plan was to transform the physical

design of the city's densest areas. The plan aimed to give the city a unique urban identity that would attract residents and tourists alike. A reconnection to the Chadakoin River and infill development of the city's parking lots were planned in an effort to invite people downtown and create pedestrian activity that could drive economic growth.[181] The plan outlines the redevelopment of the former train station under the guidance of the Downtown Jamestown Development Corporation. The vision for the station includes a visitors center, multimodal transportation facilities, and an open space area for a farmers market to bring new life and activity to the West End.[182] This particular plan does not specifically address agriculture or the food economy of the county, but it promotes the design of an environment that encourages tourism, which is essential to bringing visitors from outside the county to the many agricultural destinations that the county has

to offer.

City of Jamestown: Traffic and Streetscape Enhancement Plan

The next plan, the Traffic and Streetscape Enhancement Plan, was issued in 2008. This plan was similar to the Jamestown Urban Design Plan in that it aimed to improve the physical design of downtown Jamestown, but focused primarily on vehicular and pedestrian pathways. The goal of the plan was to improve the flow of people and traffic through downtown as well as improve the aesthetic quality of the city's streetscape. [183] This plan is design-based and does not mention agriculture, but is one of the few plans that influences the evolution of Jamestown. Further, this plan, like the Jamestown Urban Design Plan, seeks to increase the aesthetics of the city in order to promote economic development and increase tourism, which should have a positive effect on the food system economy and agritourism.

2016 Downtown Revitalization Initiative Plan

Created for the New York State Downtown Revitalization Initiative competition in collaboration with the Western New York Regional Economic Development Council, this is the most recent City of Jamestown plan. Through the plan's success in the competition, the city was awarded \$10 million. [184] The funds from this competition will be used on improvements to streetscape, redevelopment of historic buildings, and riverfront development, in hopes of turning downtown Jamestown into a year-round destination for both residents and visitors alike. The city doubled down on its efforts to attract tourists to the city, repair its streetscapes, and invest in its riverfront. The Downtown Revitalization Initiative Plan is the first of the four aforementioned plans that addresses the current state of affordable food in the city, and highlights the use of farmers markets in creating an attractive downtown. The plan cites over a dozen restaurants opening or expanding since 2014 that have

created a growing cluster of new food-related businesses in Jamestown, further boosting the presence of local food in the city. [184]

Chadwick Bay Region Comprehensive Plan

The Chadwick Bay Region Comprehensive Plan was the most recent comprehensive plan for Dunkirk. The goals of this plan include improving the effectiveness of emergency response vehicles and using Dunkirk's waterfront as an anchor for recreation and tourism. This plan addresses the importance of the Chadwick Bay Region's agricultural land to the region and describes how agricultural land should be protected from new development. Although the plan discusses agriculture, it does not mention agritourism and the opportunities that it may provide. [185]

2. Countywide Policy Landscape

The Chautauqua County government consists of an array of boards and commissions, departments, and the County Executive and legislature. The general authority and restrictions of a local government's power is outlined in New York State Municipal Home Rule Law; further, this law contains a provision called the County Charter Law, which establishes the process by which counties may adopt a charter in order to define the corporate powers of the local government. [186] The Chautauqua County government functions via a county charter and an administrative code, which seeks to increase efficiency and responsibility of the government by better defining and allocating the functions, power, and duties between the executive and legislative branches of county government. [187] The Chautauqua County Charter is the governing law of the county, which lays out the form of county government and the powers and duties of the County's officers. [188] In contrast, the Administrative Code outlines the details of government under the County Charter. [187]

The Charter gives the executive power of the county to the County Executive and the legislative powers to the County Legislature. The County Executive is the head of the county government, and is elected in a countywide general election every four years. The County Executive is responsible for the proper administration of all county affairs, and has executive approval, which means the County Executive must approve or veto a legislative resolution within ten days of it being passed by the County Legislature. The County Legislature consists of one elected representative from each of the county's 19 legislative districts, and one chairperson, who serves in two-year terms.

Countywide Governance Structures for Agriculture

Food system policy in Chautauqua County dates back to 1993 when the Chautauqua County Agriculture and Farmland Protection Board was created by the County Legislature in accordance with the New York State Agriculture and Markets Law.[189] The mission of the Agriculture and Farmland Protection Board is to preserve and protect the viable farmland within Chautauqua County, while promoting the economic viability of the agricultural industry. Strategies to accomplish these goals are:

- 1. Encourage farming through local initiatives to create favorable conditions that allow farmers to operate economically viable enterprises***
- 2. Advise the County Legislature on establishing, modifying, continuing, or terminating agricultural districts***
- 3. Review Notice of Intent filings pursuant to Agriculture and Markets Law 25AA Sections 305.4 and 305-a***
- 4. Support, implement, and update the goals of the county Agriculture and Farmland Protection Plan***
- 5. Advise and recommend applications to funding agencies concerning Purchase of Agricultural Conservation Easement (Purchase of Development Rights)***

Countywide Right-To-Farm Law

In 1995, local law established the Right to Farm, which protects residents' right to farm in the face of nuisance claims.[190] As Chautauqua County is a characteristically rural area with rich agricultural lands, the Right to Farm law helps protect agricultural operations and the farming economy against lawsuits from residents that may move into the county for the aesthetics and become annoyed or offended by the externalities (e.g. smell, noise) produced by agricultural production.

Agriculture and Farmland Protection Plan

The Chautauqua County Agriculture and Farmland Protection Board created the Agriculture and Farmland Protection Plan in 2000 in order to enhance opportunities for the growth of agriculture and agribusiness in Chautauqua County, as well as preserve and protect viable farmland in the county. [191] This plan has three general strategies to preserve agriculture and farmland. Each of these main strategies outlines a number of more specific initiatives that should be pursued in order to best reach the goals of the three main strategies. Below is a list of the main strategies with one example of an initiative outlined by the Agriculture and Farmland Protection Plan:

- 1. Enhance farm and forest industry profitability and increase economic development efforts in support of farming [Example: Convene a countywide agricultural summit]***
- 2. Farmland and forestland protection-preservation and conservation [Example: Educate local governments concerning land preservation and conservation issues and techniques]***
- 3. Agribusiness and retention and development [Example: Promote continued financing for farmers, forest industries, and agribusiness]***

Despite the fact that the plan aims to protect farmland, residents have expressed that the plan does not go far enough in

promoting agriculture and encouraging residents to take up farming as their primary mode of financial support.[192] The current Agriculture and Farmland Protection Plan also does not offer strategies for how agriculture can be linked to aggregation, processing, and distribution businesses to enhance the county's economic development.

Countywide Occupancy Tax

The county government has maintained a tax of five percent on the occupancy of hotel or motel rooms since 2013.[193] The original purpose of the occupancy tax was to increase tourism and convention business within the county. It has since been amended however to dedicate three-fifths of net collections to the promotion of tourism and two-fifths to the enhancement and protection of the lakes and tributary systems of Chautauqua County.[194]

Chautauqua County Comprehensive Plan

Leadership within the county has recognized that in order for Chautauqua County to become competitive on a regional (or global) economic scale, it must be proactive in creating its future. This notion inspired the creation of the Chautauqua 20/20 Comprehensive Plan, which was published in 2011.[195] The comprehensive plan builds on both existing and future assets, while highlighting values of the citizens of Chautauqua County. The desire to preserve farmland is evident to some degree throughout the plan's language which calls for promoting Right to Farm laws, maintaining priority agriculture districts, and implementing strong agricultural zoning. Further, the comprehensive plan asserts the World's Learning Center brand, which is a tourism and economic development marketing strategy that highlights Chautauqua County as a unique vacation destination with a high number of natural resource assets, attractions, and leisure learning opportunities.[195]

In February 2017, the County Executive released a report called *On the Move and*

Thriving: A Status Report on the Chautauqua 20/20 Comprehensive Plan, which reviews and discusses the status of high priority items from the original plan, and details the county's next steps to become a thriving county in 2020.[196]

2007 Chautauqua County Tourism Assessment

The Chautauqua County Visitors Bureau contracted Destination Development, Inc. (DDI) in 2007 to help Chautauqua County develop a special identity as a unique visitor destination and attract a growing visitor market. DDI conducted the tourism assessment in order to create ideas to increase tourism spending in Chautauqua County. The assessment gives an unbiased overview of the county, illustrating the community how may be perceived by a visitor. DDI consultants did not conduct any prior research about the area or contact any community representatives, but rather "secretly shopped" the county. The assessment reviews many determinants of successful tourism, such as the effectiveness of local marketing efforts, signage, attractions, ease of getting around, and the ability to attract overnight visitors. The assessment reviews best practices that they found throughout the county and outlines recommendations for the county, such as creating more attention to gateways into cities, towns, and villages, and creating more attractive wayfinding signage for tourists.[197]

2008 Branding, Development, and Marketing Action Plan

This plan builds upon the 2007 tourism assessment by developing a brand for Chautauqua County that maximizes its current assets, amenities, and resources.[198] The plan introduces Chautauqua County as the "World's Learning Center" and outlines recommendations for making this vision a reality. The one-sentence brand statement reads: "Chautauqua County has emerged as The World's Learning Center, the premier destination for leisure learning opportunities in the Eastern U.S. and eventually the

World.”[198] Strategies for branding and marketing are outlined in the plan, in addition to an analysis of the strengths, weaknesses, opportunities, and threats within the county that have an impact on the county’s tourism industry.

Lake Erie Concord Grape Belt Heritage Area Management Plan

In 2006, the New York State Heritage Area Program created the Lake Erie Concord Grape Belt Heritage Area.[199] New York State uses this program to preserve and develop areas that have a special significance in order to promote the state’s cultural and natural resources as an expression of the state’s heritage. The Concord Grape Belt is both economically and culturally important to New York State because it offers the state, region, and local communities a unique opportunity to transform its agrarian based lifestyle into a catalyst for economic development.

The Lake Erie Concord Grape Belt consists of 30,000 vineyard acres across Chautauqua County, New York and Erie County, Pennsylvania, and is the oldest and largest concord grape growing region in the world.[199] The Heritage Management Plan for the Lake Erie Concord Grape Belt Heritage Area seeks to preserve, revitalize, support, and promote the region’s unique asset of grape production, specialty grape products, and related industries. Further, the plan encourages the sustainability and economic viability of the grape market in order to enhance the agricultural, cultural, and natural heritage of the area and improve quality of life for all residents.[199] The plan was influenced by the creation of the Grape Discovery Center, which catalyzed the concept that grape-related activities could spark economic development in Chautauqua County. The plan recommends ways to promote the viability of the grape industry and encourage sustainable community development, all while making Chautauqua County a cultural, educational heritage destination for tourism.[33]

Healthy Corner Store Initiative

A pilot Healthy Corner Stores initiative was sparked by community-led efforts to create positive changes in the food system. This effort was supported by a 2013 planning studio conducted by University at Buffalo Masters of Urban Planning students for Jamestown.[64] Residents sought to initiate the acceptance of EBT, SNAP, and Double up Food Bucks at farmers’ markets, create community and school gardens, and support farm-to-institution programs. As a result of the 2013 planning studio, Noe Place (a convenience store in Jamestown) was established as a Healthy Corner Store.[65] As of summer 2017, the Chautauqua County Health Network and the Chautauqua County Department of Health and Human Services are collaborating to establish another store in Jamestown, and several in Dunkirk. An additional store in Sherman has agreed to engage in the process of becoming a Healthy Corner Store.[66]

Growing Food Connections Community of Opportunity

Chautauqua County government and partners applied and were selected as one of eight Communities of Opportunity (COO) as part of the national Growing Food Connections project in March 2015.[65] COOs are counties whose local governments have indicated both “a need and a desire to improve food access for underserved residents and to sustain family farmers and food production.” As a COO, Chautauqua County has received training, technical assistance, and planning and public policy activities to help strengthen the food system. Each COO has a steering committee of local stakeholder partners to facilitate strong cross-sector collaborations, ensure diversity and inclusivity, and provide insights to the county government and GFC leadership team to ensure the long-term sustainability of projects and initiatives. The GFC Steering Committee for Chautauqua County is one of the clients of this report.

Perspective from the County Government^[200]

As the Executive Assistant to the County Executive, Dan Heitzenrater takes part in many committees, including Chautauqua County's Growing Food Connections Steering Committee. On the GFC Steering Committee, he brings the county government's perspective on the food system and its relation to policy and practice. The county's focus on economic development was outlined in the 2011 Comprehensive Plan, which laid out 15 focus areas within the local economy that the county hoped to grow by 2020. The second designated focus area was agriculture and food production. Mr. Heitzenrater says that in the last five years, progress has been made in the growth of the sector but more work remains to be done.

Workforce training and development for food systems sectors, ranging from summer farmhand positions to advanced equipment licensing, is an ongoing focus of the county government. Employment-focused education was also discussed as a next step in the *On the Move and Thriving* progress report. Workforce training helps meet an existing demand from farmers on all types of farms in the county who often have issues with labor shortages. Cornell Cooperative Extension (CCE) has mainly led these efforts thus far. Another aim is for better community branding of the food system. CCE works in this area by creating maps and promotional material of farmers' markets and roadside stands in the county through its "Chautauqua Grown" initiative.

Other issues on the county's radar include food access, specifically with students. Food access concerns were raised at Jamestown Community College

(JCC) where Heitzenrater spoke as part of the State of the County address. Students' concerns were rooted primarily in lack of transportation. Transportation is a difficult issue to tackle, especially in a rural setting, as Mr. Heitzenrater notes, where adding transit lines and adding off-hours service is not always feasible. Nevertheless, he sees potential in the addition of ridesharing to alleviate these challenges.

Mr. Heitzenrater highlights the importance and challenge of engaging sub-groups of residents in policymaking. To engage the Hispanic community within the county, a coalition of community leaders was assembled to help expand economic opportunities for Hispanic residents. Initially their efforts were met with success in terms of soft skills development and supplying demand for bilingual employees. However, these efforts are hard to maintain. Mr. Heitzenrater notes that more bridges must be made in order for the county to continue this productive engagement.

Policy Detail in Chautauqua County

1993: Chautauqua County Agriculture and Farmland Protection Board

Food system policy in Chautauqua County dates back to 1993 when the Chautauqua County Agriculture and Farmland Protection Board was created by the County Legislature in accordance with the New York State Agriculture and Markets Law.[189] The mission of the Agriculture and Farmland Protection Board is to preserve and protect the viable farmland within Chautauqua County, while promoting the economic viability of the agriculture industry.

1995: Countywide Right to Farm

In 1995, local law established the Right to Farm, which protects residents' right to farm in the face of nuisance claims.[190] As Chautauqua County is a characteristically rural area with rich agricultural lands, Right to Farm laws help protect agricultural operations and the farming economy against residents that may move into the county for the aesthetics and do not support the externalities produced by agriculture.

2000: Chautauqua County Agriculture and Farmland Protection Plan

The Chautauqua County Agriculture and Farmland Protection Board created the Agricultural and Farmland Protection Plan in 2000 in order to enhance opportunities for the growth of agriculture and agribusiness in Chautauqua County, as well as preserve and protect viable farmland in the county.

2003: Countywide Occupancy Tax

The county government has maintained a tax of five percent on the occupancy of hotel or motel rooms since 2013.[193] The original purpose of the occupancy tax was to increase tourism and convention business within the county. It has since been amended to dedicate three-fifths of net collections to the promotion of tourism however and two-fifths to the enhancement

and protection of the lakes and tributary systems of Chautauqua County.[194]

2007: Chautauqua County Tourism Assessment

The Chautauqua County Visitors Bureau contracted Destination Development, Inc. (DDI) in order to help Chautauqua County develop a special identity as a unique visitor destination and attract a growing visitors market.[197]

2008: Branding, Development, and Marketing Action Plan

This plan builds upon the 2007 tourism assessment by developing a "brand" for Chautauqua County that maximizes its current assets, amenities, and resources.[198] The plan introduces the Chautauqua County as the "World's Learning Center" and outlines recommendations for making this vision a reality.

2010: Lake Erie Concord Grape Belt Heritage Area Management Plan

The Heritage Management Plan for the Lake Erie Concord Grape Belt Heritage Area seeks to preserve, revitalize, support, and promote the region's unique asset of grape production, specialty grape products, and related industries. Further, the plan encourages the sustainability and economic viability of the grape market in order to enhance the agricultural, cultural, and natural heritage of the area and improve quality of life for all residents.[199]

2011: Chautauqua 20/20 Comprehensive Plan

The comprehensive plan builds on both existing and future assets, while highlighting values of the citizens of Chautauqua County. The desire to preserve farmland is evident to some degree throughout the plan's language that calls for promoting Right to Farm laws, maintaining priority agriculture districts, and implementing strong agricultural zoning.

Table C-1. Municipal Plans Relevant to the Chautauqua County's Food System

Title	Legislative Body	Summary	Year Published
Waterfront Enhancement Plan	City of Dunkirk	This plan aims to change the image of Dunkirk's waterfront. The objective of this plan is to change people's perception of Dunkirk's waterfront from a working harbor to a local and regional attraction.	1992
Chadwick Bay Region Comprehensive Plan	City of Dunkirk	This is the most recent comprehensive plan for Dunkirk and its surrounding communities. The plan discusses economic initiatives and land use but never makes a connection between the two; agritourism is absent.	1997
City of Jamestown Comprehensive Plan	City of Jamestown	Created by the Jamestown Urban Renewal Agency, this plan was meant to tackle the city's challenges head on and create a more livable city.	1998
Jamestown Urban Design Plan	City of Jamestown	This plan creates a vision for the physical design of Jamestown's core urban area. This plan focuses on place making and embraces Jamestown's historical identity.	2006
Traffic and Streetscape Enhancement Plan	City of Jamestown	This plan was created to renew the streets and pedestrian pathways in Jamestown. Improvements include aesthetic design changes, such as adding wayfinding signs and benches, and functional design changes like converting one way streets back to two way streets.	2008
Downtown Revitalization Initiative Plan	City of Jamestown	The main objective of this plan was to revitalize the urban core. This plan's goal was to follow through and expand on the urban design and streetscape enhancement plans.	2016

2015: Growing Food Connections Community of Opportunity

Growing Food Connections (GFC) team selected Chautauqua County to be one of eight Communities of Opportunity (COO) throughout the United States in March 2015. COOs were identified as counties whose local governments have indicated both “a need and a desire to improve food access for underserved residents and to sustain family farmers and food production.” As a COO, Chautauqua County has received training, technical assistance, and planning and public policy activities to help strengthen their food systems.[65]

3. New York State Policy Environment

New York State Department of Agriculture and Markets

The food and agriculture industry in New York State is regulated by the Department of Agriculture and Markets. The Department of Agriculture and Markets reviews local laws that affect composting, farmers markets, farm worker housing, greenhouses, junkyards, nutrient management, open burning, small wind energy production facilities, wetlands, zoning, wind power projects, and more. [201] In practice, local organizations and government agencies propose ordinances that are related to the agriculture industry and the New York State Department of Agriculture and Markets is responsible for reviewing those proposed ordinances. Further, the Department of Agriculture and Markets provides various guidance documents on these topics for municipalities to utilize in decision making. The Department of Agriculture and Markets also requires businesses such as food processing establishments, dealers of farm products, food salvagers, and others to obtain licenses in order to operate.[202] These licenses have fees, but there are possibilities for exemption for activities such as home processing.

New York State Department of Health

The New York State Department of Health (DOH) also has requirements for many farm and food related businesses, but in a different scope. For example, while the Department of Agriculture and Markets has requirements for kitchens about the processing procedures of certain food items, the Department of Health requires the submission of kitchen design before construction and require water quality testing for a restaurant.[203]

New York State Department of Environmental Conservation

The Department of Environmental Conservation (DEC) is New York State’s agency to protect and enhance the environment. The mission of the DEC is to conserve and protect natural resources and environment in New York State. The DEC controls and prevents pollution to the environment in order to promote the “health, safety and welfare of the people of the state and their overall economic and social well-being.”[204] The DEC carries out this mission through the implementation of various regulations that require individuals and businesses to obtain permits and licenses for activities that may have a negative impact on the environment.

Although these rules and regulations serve to protect the quality of the environment in New York State, they may pose as a barrier to farmers and other food system actors. Some regulations may make certain operations difficult and may affect a farmer’s ability to maintain profitability. For example, the strict requirements under DEC regulation 6NYCRR Part 360-5 have prevented Chautauqua County residents from creating composting facilities and drop-off locations for compost around the county because the requirements were either unattainable or made their operations unprofitable.[205] Further, the processes of applying for permits and obtaining approval can be lengthy and complicated, dissuading interested individuals from pursuing permits. Despite these perhaps

frustrating instances of regulatory gridlock, the DEC is an asset because they offer various grants for municipalities to apply for in order to promote their operations, such as in solid waste management and water protection, in sustainable and economically efficient ways. [206] The DEC also provides an abundance of guidance and policy documents for individuals, businesses, and municipalities to utilize in deciding the best course of action for their purposes.[207]

4. New York State Legislative and Executive Functions

NYS Agricultural Districts

In 1971, the Department of Agriculture and Markets introduced Article 25-AA, known as the Agricultural Districts Law, after New York recognized the extent of agriculture’s contribution to the state economy and the importance of protecting farmland as an irreplaceable asset.[208] The goal of an agriculture district is to protect farmland from development and encourage the continued use of farmland for agricultural production and farm businesses. The Agricultural Districts Law introduced the concept of “use-value assessment” in order to tax farmland owners for the full value of their land for agricultural production, rather than taxing them for its non-farm development potential. [208] The law further protects farmers from unreasonable local regulations and puts limits on the use of eminent domain or use of public funds in an agricultural district. Today, an agricultural district can be formed by a group of landowners who collectively own 500 acres of agricultural land and submit a proposal to their county to request to create a district.

NYS Agriculture and Farmland Protection Program

The Agricultural Districts Law has been amended to improve protection activities several times, and in 1992 the Agricultural

Protection Act, Article 25-AAA, was passed to strengthen these amendments.[208] This act included features such as Right-to-Farm protection and the creation of Agricultural and Farmland Protection programs to encourage the development of agriculture and farmland production.

Specifically, Article 25-AAA lays out guidelines for agricultural and farmland protection programs for the state, counties, and municipalities. The state program serves to provide technical and financial assistance to “counties, municipalities, soil and water conservation districts, and not-for-profit conservation organizations for their agricultural and farmland protection efforts”. [202]

In Section 324 and 324-a of Article 25-AAA, the state gives counties and municipalities the option to create agricultural and farmland protection plans that include the location of protected areas. These sections require an evaluation of the value of the proposed protected land, including any development pressure and how the county or municipality plans to protect the land going forward. The Agriculture and Markets Law has authorized the use of three grant programs to promote the protection of this land:

1. *The Farmland Protection Planning Grants Program (FPPG)*
2. *The Farmland Protection Implementation Grants Program (FPIG)*
3. *The Land Trust Grants Program*

Since the commencement of the Farmland Implementation Grants Program alone, more than \$140 million has been dispersed, which has protected over 50,000 acres of agricultural land on over 200 farms across New York State. [209]

New York State Farm Brewery Law

Passed into law in 2013, the Farm Brewery Law created a special license for New York State breweries, which incentivizes breweries to source a specific percentage of ingredients from New York State Farms. The

law aims to support agricultural production of hops and malts used in the brewing process.

New York State Senate

In January of 2015, the Senate passed Bill S1227B to amend the alcohol beverage control law in relation to beer center, cider centers, and incubator wine centers. Known as the Craft Beverage Act, this bill creates a regulatory mechanism to “facilitate the ability of individuals to share space, equipment, and storage to produce quality beer, cider, and wine for home consumption, and not for sale or resale, as is currently allowed for under federal regulations.”[210]

In April of 2017, Farm to Food Bank Bill S.1606/A.6192 was passed in the 2017-2018 New York State Budget. This bill encourages more donations of fresh, local food to those in need across New York State. The Farm to Food Bank Bill is bipartisan legislation that will provide “a refundable tax credit to farmers of 25 percent of the wholesale value of donated food up to \$5,000 annually.”[211] Labor and transportation costs are often a challenge for farmers in getting their food from the fields to food banks and pantries. This bill will allow farmers to offset these expenses associated with donating food and will, in turn, increase food donations and decrease the amount of food lost around the state.

New York State Initiative: A Strategy for Prosperity

The Western New York Regional Economic Development Council is part of Governor Andrew M. Cuomo’s Regional Economic Development Council Initiative to transform New York State through investment and economic development.[215] Western New York is one of 10 Regional Councils across New York State, each tasked with developing their own long-term strategic plans for regional economic growth. The Councils are made up of “local experts and stakeholders from business, academic, local government, and non-governmental organizations.”[216]

Governor Cuomo recently launched the seventh round of the Regional Economic Development Council initiative, a competition for more than \$800 million in state economic development resources. Businesses, municipalities, not-for-profits, and members of the public can apply for assistance from various state programs for projects that will create jobs and help revitalize communities.

5. Federal Legislation

Bill Emerson Good Samaritan Food Donation Act

The Bill Emerson Good Samaritan Food Donation Act of 1996, or the “Bill Emerson Act” (BEA) was passed in order to encourage the donation of food.[217] The BEA absolves food donors and recipients of food donations from civil or criminal liability for injuries that occur due to the consumption of donated food. In order to be covered by this exemption, the donated item must be an “apparently wholesome food or an apparently fit grocery product,” donated in “good faith,” and must be donated to a nonprofit and distributed to individuals in need. Donors, gleaners, and nonprofit organizations must still comply with any applicable federal, state, or local regulations regarding health and safety, but the exemption of liability to damages from donated food helps prevent individuals and businesses from throwing away food that is fit for human consumption.

Table C-2. Notable New York State Legislation

Title	Legislative Body	Summary	Year Published
New York Agricultural Districts Enabling Statutes	New York State Legislature	Established New York's Agricultural Districts.	1971
New York Farm to School Program Statutes [206]	New York State Legislature	Established a Farm-to-School program in order to: promote the direct marketing network of New York farm products to schools, universities and other educational institutions.	2002
New York Right to Farm Enabling Statute	New York State Legislature	Established the New York State Right-to-Farm law.	2005
New York Executive Order 13 [213]	New York State Executive Chamber	Established the New York State Council on Food Policy. The purpose of this council is to develop and recommend: 1) a food policy for state the to ensure the availability of an adequate supply of affordable, fresh, nutritious food to its residents; 2) policies to expand agricultural production, including locally-grown and organically grown food; 3) a strategic plan for implementation of the state food policy and measurable objectives to monitor progress; and, 4) comments on state regulations, legislation, and budget proposals in the area of food policy to ensure a comprehensive approach to food policy issues.	2007
New York Executive Order 20 [214]	New York State Executive Chamber	Established the Smart Growth Cabinet. The purpose of this cabinet is to oversee a review of state statutes, regulations, policies, practices and capital programs that impact economic development and land use, in order to encourage communities to use "smart growth" to develop in a responsible, efficient, and sustainable manner that enhances quality-of-life, environmental quality, and economic prosperity.	2007



Appendix D. Organizational and Informational Resources for Food System Development

Name of Organization/ Grant Opportunity/Guide	Web Link	Description
American Farmland Trust	https://www.farmland.org	The American Farmland Trust is an organization that works to protect farm and ranch land and promote environmentally friendly farming techniques.
American Planning Association	https://www.planning.org	The American Planning Association (APA) is the nation's overarching planning organization. The APA is charged with bringing together the nation's planning organizations and professionals to promote the growth and evolution of the field.
ChangeLab Solutions	http://www.changelabsolutions.org	ChangeLab Solutions is an organization which crafts and promotes policies that improve public health.
Connecticut Conference of Municipalities	http://www.ccm-ct.org	The Connecticut Conference of Municipalities (CCM) is the largest nonpartisan organization in the state. The CCM works to improve the lives of the state's residents.
Corporate Accountability International	https://www.stopcorporateabuse.org	Corporate Accountability International was founded in 1977 with the intent of halting corporate abuse and creating a more just and sustainable world.
Empire State Development	https://esd.ny.gov/industries/agribusiness	Empire State Development provides agribusiness in New York State opportunities such as tax-based incentives, operational support, growth support, and innovation development support.
Environmental Protection Agency (EPA) Resources for Assessing Wasted Food	https://www.epa.gov/sustainable-management-food/resources-assessing-wasted-food	The EPA provides tools help to measure and track the amount, type of, and the source of food and packaging waste.
Essential Food System Reader	http://growingfoodconnections.org/tools-resources/food-systems-reader	This resource is a collection of published resources related to community food production and community food security.
Field and Fork Network	http://fieldandforknetwork.com/ ; http://doubleupnys.com/about-the-program/	Field and Fork is a Western New York-based nonprofit organization whose mission is to build a thriving regional food system. It introduced Double Up Food Bucks to farmers markets in order to increase SNAP access to affordable, fresh, locally grown food.
Growing Food Connections	http://growingfoodconnections.org/	Growing Food Connections aims to address the concerns of struggling family farmers and underserved community residents by building capacity of local governments and their partners to create, implement and sustain food system policies and plans that both promote food access and foster a healthy agricultural sector. The National Institute of Food and Agriculture(NIFA)-funded project provides various toolkits and databases that address policy and planning.
Growing Rural Opportunities	http://growrural.org/about-us/	Growing Rural Opportunities is a nonprofit that works increase the opportunities to support agriculture in Polk County, NC and Landrum, SC.

Name of Organization/ Grant Opportunity/Guide	Web Link	Description
Institute for Sustainable Communities	http://www.iscvt.org	The Institute for Sustainable Communities is a nonprofit organization whose primary work includes finding community-based solutions to protect the environment, fighting climate change, and inspiring active citizenship by providing training, technical assistance and financial support to communities, nonprofits/nongovernment organizations, businesses and local governments.
John Hopkins Center for a Livable Future	http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/	The Center for a Livable Future is a center within the John Hopkins Bloomberg School of Public Health. The center staff conducts research regarding food production and security, and the policies that affect these two areas.
Local Government Food Policy Database	http://growingfoodconnections.org/tools-resources/policy-database/	The US-based Local Government Food Policy Database is a searchable collection of local government public policies that support community food systems.
Maine Farmland Trust	https://www.maineFarmlandtrust.org	Maine Farmland Trust is a statewide organization in Maine that works to advance farming as an occupation by protecting farmland and supporting farmers.
National Association of Regional Councils	http://narc.org	National Association of Regional Councils is an advocacy group that believes that regional cooperation between organizations is the most effective way to combat the issues that plague our society.
National Farm to School Network	http://www.farmentoschool.org	National Farm to School Network is an advocacy group that works to increase the consumption of local foods in schools as well as increase food and agricultural education.
National Good Food Network	http://www.ngfn.org	National Good Food Network is an organization that works to connect all members of the food system and increase the efficiency and effectiveness of the system.
National Institute of Food and Agriculture	https://nifa.usda.gov/	The National Institute of Food and Agriculture (NIFA) is a federal agency within the United States Department of Agriculture that aims to advance agriculture-related science through education, collaboration, and funding opportunities.
National Institute of Food and Agriculture (NIFA) Food Loss and Waste Grants Funding Guide	https://www.usda.gov/oce/foodwaste/NIFA_Food_Loss_Waste_Funding5272016.pdf	The National Institute of Agriculture (NIFA) provides information regarding programs that provide food loss and waste project funding of interest to local communities and other entities. This information is intended to serve as a guide for preliminary funding searches.
National Resource Defense Council (NRDC)	https://www.nrdc.org/issues/food-waste#priority-experts-resources	NRDC provides resources and information about food waste reduction and reclamation.

Name of Organization/ Grant Opportunity/Guide	Web Link	Description
New York State Department of Environmental Conservation	https://www.nyseda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities.aspx	New York State Department of Environmental Conservation (NYSERDA) offers several programs, incentives, and loans for farm waste management (biogas), improved energy efficiency, solar and wind generation, and innovative business practices for energy conservation, alternative energy, and energy use. Energy audits are also available.
Northeast Sustainable Agriculture Working Group	http://nesawg.org	The Northeast Sustainable Agriculture Working Group (NESAWG) is a 12-state network of over 500 participating organizations that seeks to unite farm and food system partners and allies in order to build a sustainable, just, and economically vibrant region. NESAWG promotes peer learning, advocacy, leadership development, and collaboration for change.
New York State Department of Agriculture and Markets Grant Opportunity Portal	https://www.agriculture.ny.gov/RFPS.html	The Grant Opportunity Portal will provide a one-stop shop to access all available State agency grant funding. All grant funding opportunities will require applicants to register as a user on the Grants Gateway system in order to apply. In addition, all not-for-profit organizations must be prequalified in order to do business with New York State.
Prevention Institute	https://www.preventioninstitute.org	Prevention Institute is a nonprofit organization that synthesizes research and practice with an ultimate goal of promoting innovative community-oriented solutions, better government and business practices, and policy change.
Public Health Law Center at Mitchell Hamline School of Law	http://www.publichealthlawcenter.org	Public Health Law Center promotes create healthy communities and environments by eliminating commercial tobacco, promoting healthy food, and encouraging active lifestyles. This is done through legal and strategic support to local and state health departments, health advocacy organizations, attorneys working on public health issues, and community coalitions across the US.
Sequestering Carbon, Advancing Local Economies	http://www.ruralscale.com	Sequestering Carbon, Accelerating Local Economies (SCALE) is an organization that seeks to catalyze and accelerate economies that increase community wealth and restore or sustain the ecosystem. SCALE provides consulting services such as identifying community assets, gaps and needs, building local capacity, providing technical assistance in organic and sustainable farming, and more.
Sustainable Agriculture Research and Education	http://www.nesare.org/State-Programs/New-York ; http://www.nesare.org/	Sustainable Agriculture Research and Education (SARE) supports agriculture that is profitable, protects the nation's land and water, and is a force for ensuring a rewarding way of life for farmers and ranchers whose quality products and operations sustain their communities and society through grants and other programs. Grants are given out on either a regional or a state-by-state basis.

Name of Organization/ Grant Opportunity/Guide	Web Link	Description
The Center for an Agricultural Economy	http://www.hardwickagriculture.org	The Center for an Agricultural Economy is an organization that works to connect community members and organizations with the ultimate goal of building a local food system.
United States Department of Agriculture	https://www.usda.gov	The United States Department of Agriculture (USDA) is a national organization of the United States government that aims to promote the evolution of the agriculture industry while also protecting the resources that the industry is dependent on, such as forests, farmland, and watersheds.
University at Buffalo	https://www.buffalo.edu	The University at Buffalo is the largest public university in the State University of New York (SUNY) system.
University at Buffalo Food Systems Planning and Healthy Communities Lab	http://foodsystemsplanning.ap.buffalo.edu/	The Food Systems Planning and Healthy Communities Lab ('the Food Lab'), a research group led by Dr. Samina Raja and housed in the School of Architecture and Planning at the University at Buffalo (UB) is dedicated to research that critically examines the role of planning and local government policy in facilitating sustainable food systems and healthy communities. The Food Lab's research unfolds in collaboration with other research groups within and outside UB, as well as in partnership with community and planning organizations and local governments in the United States and globally. Drawing on its research, the Food Lab provides technical assistance to community advocates, planners, and local governments on the use of policy and planning to create equitable food systems and healthy communities.
Wallace Center at Winrock International	http://www.wallacecenter.org	Wallace Center at Winrock International aims to help communities create 21st Century food systems that are healthier for people, the environment, and the economy.
Wholesome Wave	http://www.wholesomewave.org	Wholesome Wave works to improve the accessibility of healthy produce to underserved community members across the country.
WNY Regional Economic Development Council (REDC)	https://regionalcouncils.ny.gov/content/western-new-york	The WNY REDC is a council made from stakeholders in business, academia, local government, and non-government organizations. It was formed as part of New York State's Regional Economic Development Council initiative in 2011 with the goal of creating long-term economic development strategic plans specific to the WNY region. Grants through the REDC are available through the NYS Consolidated Funding Application.



Appendix E.

Specialization of Food Industries by NAICS in Chautauqua County and the United States

Table E-1. NAICS 44-45: Retail Trade Food Businesses

Code	Retail Trade	USA	CHQ
44-45	Total	1,644,673	134
444220	Nursery, Garden Center, and Farm Supply Stores	13,005	11
445110	Supermarkets and Other Grocery (except Convenience) Stores	99,769	37
445120	Convenience Stores	51,932	45
445210	Meat Markets	7,736	3
445220	Fish and Seafood Markets	2,814	0
445230	Fruit and Vegetable Markets	6,599	7
445291	Baked Goods Stores	23,529	0
445292	Confectionery and Nut Stores	8,142	6
445299	All Other Specialty Food Stores	20,269	6
445310	Beer, Wine, and Liquor Stores	32,054	18
446110	Pharmacies and Drug Stores	54,040	0
446191	Food (Health) Supplement Stores	15,866	7
446199	All Other Health and Personal Care Stores	12,754	0
447110	Gasoline Stations with Convenience Stores	313	0
452910	Warehouse Clubs and Supercenters	1,832	1
454390	Other Direct Selling Establishments	26,175	3

Table E-2. NAICS 72: Accommodation and Food Services Businesses

Code	Accommodation and Food Services	USA	CHQ
72	Total	782,446	318
722310	Food Service Contractors	1,454	203
722320	Caterers	25,512	6
722330	Mobile Food Services	3,297	0
722410	Drinking Places (Alcoholic Beverages)	58,700	26
722511	Full-Service Restaurants	324,420	50
722513	Limited-Service Restaurants	249,885	1
722514	Cafeterias, Grill Buffets, and Buffets	2,994	5
722515	Snack and Nonalcoholic Beverage Bars	958	27

Table E-3. NAICS 31-33: Manufacturing

Code	Manufacturing	USA	CHQ
31-33	Total	600,505	37
311111	Dog and Cat Food Manufacturing	413	0
311119	Other Animal Food Manufacturing	1,618	0
311211	Flour Milling	481	0
311212	Rice Milling	126	0
311213	Malt Manufacturing	57	0
311221	Wet Corn Milling	200	0
311224	Soybean and Other Oilseed Processing	170	0
311225	Fats and Oils Refining and Blending	473	0
311230	Breakfast Cereal Manufacturing	285	0
311313	Beet Sugar Manufacturing	49	0
311314	Cane Sugar Manufacturing	99	0
311340	Nonchocolate Confectionery Manufacturing	1,204	0
311351	Chocolate and Confectionery Manufacturing from Cacao Beans	679	0
311352	Confectionery Manufacturing from Purchased Chocolate	281	0
311411	Frozen Fruit, Juice, and Vegetable Manufacturing	538	0
311412	Frozen Specialty Food Manufacturing	605	0
311421	Fruit and Vegetable Canning	1,438	1
311422	Specialty Canning	586	0
311423	Dried and Dehydrated Food Manufacturing	289	0

Table E-3. NAICS 31-33: Manufacturing, continued

311511	Fluid Milk Manufacturing	762	0
311512	Creamery Butter Manufacturing	254	0
311513	Cheese Manufacturing	778	2
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing	704	0
311520	Ice Cream and Frozen Dessert Manufacturing	1,419	0
311611	Animal (except Poultry) Slaughtering	2,018	0
311612	Meat Processed from Carcasses	1,191	2
311613	Rendering and Meat Byproduct Processing	248	0
311615	Poultry Processing	572	0
311710	Seafood Product Preparation and Packaging	746	0
311811	Retail Bakeries	19,743	8
311812	Commercial Bakeries	4,714	1
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing	303	0
311821	Cookie and Cracker Manufacturing	739	0
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour	617	0
311830	Tortilla Manufacturing	663	0
311911	Roasted Nuts and Peanut Butter Manufacturing	222	0
311919	Other Snack Food Manufacturing	623	1
311920	Coffee and Tea Manufacturing	868	0
311930	Flavoring Syrup and Concentrate Manufacturing	273	0
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing	496	0
311942	Spice and Extract Manufacturing	957	0
311991	Perishable Prepared Food Manufacturing	368	0
311999	All Other Miscellaneous Food Manufacturing	3,139	2
312111	Soft Drink Manufacturing	2,380	2
312112	Bottled Water Manufacturing	570	0
312113	Ice Manufacturing	523	0
312120	Breweries	1,841	3
312130	Wineries	4,363	15
312140	Distilleries	545	0
333241	Food Product Machinery Manufacturing	1,269	0

Table E-4. NAICS 42: Wholesale Trade

Code	Wholesale Trade	USA	CHQ
42	Total	681,525	19
423440	Other Commercial Equipment Merchant Wholesalers	15,821	0
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers	8,729	0
423830	Industrial Machinery and Equipment Merchant Wholesalers	36,249	0
423850	Service Establishment Equipment and Supplies Merchant Wholesalers	17,503	0
424410	General Line Grocery Merchant Wholesalers	9,190	1
424420	Packaged Frozen Food Merchant Wholesalers	1,281	5
424430	Dairy Product (except Dried or Canned) Merchant Wholesalers	3,469	3
424440	Poultry and Poultry Product Merchant Wholesalers	1,439	0
424450	Confectionery Merchant Wholesalers	2,835	1
424460	Fish and Seafood Merchant Wholesalers	5,734	0
424470	Meat and Meat Product Merchant Wholesalers	3,044	0
424480	Fresh Fruit and Vegetable Merchant Wholesalers	5,925	3
424490	Other Grocery and Related Products Merchant Wholesalers	23,375	2
424510	Grain and Field Bean Merchant Wholesalers	6,292	0
424520	Livestock Merchant Wholesalers	8,906	2
424590	Other Farm Product Raw Material Merchant Wholesalers	6,278	1
424810	Beer and Ale Merchant Wholesalers	2,581	1
424820	Wine and Distilled Alcoholic Beverage Merchant Wholesalers	8,905	0
424910	Farm Supplies Merchant Wholesalers	14,128	0
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	57,853	0

Table E-5. NACIS 56: Food Waste Management

Code	Administrative and Support and Waste Management and Remediation Services	USA	CHQ
56	Total	2,204,591	14
562111	Solid Waste Collection	1,840	0
562119	Other Waste Collection	238	0
562212	Solid Waste Landfill	4,161	0
562219	Other Nonhazardous Waste Treatment and Disposal	4,612	12
562910	Remediation Services	2,490	2
562920	Materials Recovery Facilities	9,739	0
562998	All Other Miscellaneous Waste Management Services	1,221	0



Appendix F.

Additional Data

Tables F-1 to F-15: Associated with figures in Chapter 2

Tables F-16 to F-18: Additional data related to federal guidelines in Chapter 2

Tables F-19 to F-22: Associated with figures in Chapter 3

Table F-1. Decennial Population Change, 1980- 2010 (Associated with Figure 2.2)

Year	No.	% Change
1980	146,925	
1990	141,895	-3.54
2000	139,750	-1.53
2010	134,905	-3.59
Total	563,475	8.18

Data Source: American Community Survey, 2012 5-year Estimates

Table F-2. Population Distribution by Sex and Age, Chautauqua County and New York (associated with Figure 2.3)

Age Group	Chautauqua Couty		New York State	
	No.	%	No.	%
Children Under 18	29,333	21.8	4,316,920	22.2
Millenials (18-34)	29,176	21.7	4,651,370	24
Middle Aged (35-64)	53,676	39.9	7,789,201	40.2
Seniors (65+)	22,414	16.7	2,640,634	13.6
Total	134.599	100	19.398.125	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-3. Expanded Population Distribution by Sex and Age, Chautauqua County (Associated with Figure 2.4)

Age	All Residents		Females		Males	
	No.	%	No.	%	No.	%
Under 5	7,470	5.5	3,687	2.7	3,783	2.8
5 to 9	7,867	5.8	3,866	2.9	4,001	3.0
10 to 14	8,498	6.3	4,065	3.0	4,433	3.3
15 to 17	5,498	4.1	2,695	2.0	2,803	2.1
18 to 24	15,291	11.4	7,453	5.5	7,838	5.8
25 to 34	13,885	10.3	6,902	5.1	6,983	5.2
35 to 44	15,591	11.6	7,853	5.8	7,738	5.7
45 to 54	20,091	14.9	10,012	7.4	10,079	7.5
55 to 64	17,994	13.4	8,989	6.7	9,005	6.7
65 to 74	11,221	8.3	5,920	4.4	5,301	3.9
75 to 84	7,776	5.8	4,487	3.3	3,289	2.4
85 and Over	3,417	2.5	2,383	1.8	1,034	0.8
Total	134,599	100	68,312	50.8	66,287	49.2

Data Source: American Community Survey, 2012 5-year Estimates

Table F-4. Expanded Population Distribution by Sex and Age, New York State (Associated with Figure 2.5)

Age	All Residents		Females		Males	
	No.	%	No.	%	No.	%
Under 5	1,159,763	6.0	566,465	2.9	593,298	3.1
5 to 9	1,157,647	5.9	568,639	2.9	589,008	3.0
10 to 14	1,212,044	6.2	589,999	3.0	622,045	3.2
15 to 17	787,466	4.1	384,187	2.0	403,279	2.1
18 to 24	1,979,223	10.2	975,587	5.0	1,003,636	5.2
25 to 34	2,672,147	13.8	1,353,699	7.0	1,318,448	6.8
35 to 44	2,619,534	13.5	1,336,027	6.9	1,283,507	6.6
45 to 54	2,858,807	14.8	1,470,759	7.6	1,388,048	7.2
55 to 64	2,310,860	12.0	1,215,782	6.3	1,095,078	5.7
65 to 74	1,378,799	7.1	758,957	3.9	619,842	3.2
75 to 84	870,606	4.5	518,038	2.7	352,568	1.8
85 and Over	391,229	2.0	268,111	1.4	123,118	0.6
Total	19,398,125	100	10,006,250	51.6	9,391,875	48.4

Data Source: American Community Survey, 2012 5-year Estimates

Table F-5. Educational Attainment Among Residents of Chautauqua County and New York State (Associated with Figure 2.6)

	Chautauqua County		New York	
	No.	%	No.	%
Less than High School	14,335	13.6	2,272,224	15.1
High School Graduate (includes equivalency)	35,889	34.1	4,084,477	27.1
Some College or Associate's Degree	35,572	33.8	4,140,878	27.5
Bachelor's Degree	11,220	10.7	2,703,864	17.9
Graduate Degree or Higher	8,250	7.8	1,879,762	12.5
Total	105,266	100	15,081,205	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-6. Employed Civilian Population 16 Years and Older by Employment Sector (Associated with Figure 2.7)

	Chautauqua County		New York State	
	No.	%	No.	%
Private Sector	35,330	59.6	5,778,087	63.7
Public Sector	11,780	19.9	1,500,457	16.5
Self-Employed	5,355	9.0	880,435	9.7
Private Non-Profit	6,817	11.5	904,663	10.0
Unpaid Family Workers	36	0.1	9,720	0.1
Total	59,318	100	9,073,362	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-7. Hispanic Population by Race (Associated with Figure 2.8)

	Chautauqua County		New York State	
	No.	%	No.	%
White Alone	125,574	93.3	12,756,269	65.4
Black or African American Alone	3,161	2.3	3,033,052	15.6
Two or More races	2,284	1.7	525,129	2.7
Some Other Race Alone	1,868	1.4	1,632,383	8.4
Asian Alone	894	0.7	1,465,733	7.5
American Indian and Alaska Native Alone	699	0.5	70,910	0.4
Native Hawaiian and Other Pacific Islander Alone	119	0.1	6,897	0
Total	134,599	100	19,490,373	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-8. Hispanic Population by Race (Associated with Figure 2.9)

	No.	%
White Alone	5,500	66.6
Some Other Race Alone	1,761	21.3
Two or More Races	613	7.4
Black or African American Alone	336	4.1
American Indian and Alaska Native Alone	47	0.6
Total	8,257	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-9. Languages Spoken at Home by Individuals Ages 5 and Older (Associated with Figure 2.10)

	No.	%
Only English	117,519	92.4
Spanish	5,544	4.4
Other Languages	4,066	3.2
Total	127,129	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-10. Per Capita Income by Race (Associated with Figure 2.11)

	Estimate (\$)	No. Residents	%
White Alone	22,500	125,574	93.3
Black or African American Alone	11,896	3,161	2.3
Two or More Races	6,103	2,284	1.7
Some Other Race Alone	11,473	1,868	1.4
Asian Alone	22,043	894	0.7
American Indian and Alaska Native Alone	8,460	699	0.5
Native Hawaiian and Other Pacific Islander Alone	21,071	119	0.09
Total	21,742	134,599	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-11. Vehicle Availability Among Households (Associated with Figure 2.12)

Vehicle Ownership	Chautauqua		New York State	
	No.	%	No.	%
No Vehicle Available	6,051	11.0	2,122,503	29.4
1 Vehicle Available	20,819	37.9	2,349,993	32.6
2 Vehicles Available	20,172	36.7	1,914,302	26.6
3 Vehicles Available	5,967	10.9	590,479	8.2
4 or More Vehicles Available	1,941	3.5	232,818	3.2
Total	54,950	100	7,210,095	100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-12. Households with Persons with Disability, Children, and/or Seniors Present (Associated with Figure 2.15)

	Chautauqua County		New York		United States	
	No.	%	No.	%	No.	%
Disabled	15,115	27.5	1,626,434	22.5	28,133,487	24.4
Under 18	15,689	28.6	2,319,186	32.1	38,324,455	33.3
Seniors	21,453	39.0	2,568,889	35.5	39,237,811	34.1

Data Source: American Community Survey, 2012 5-year Estimates

Table F-13. Composition of SNAP-recipient Households (Associated with Figure 2.16)

	Chautauqua County		New York		United States	
	No.	%	No.	%	No.	%
Disabled	4,169	7.6	442,088	6.1	5,874,268	5.1
Under 18	4,351	7.9	461,044	6.4	7,400,263	6.4
Seniors	2,185	4	346,647	4.8	3,351,607	2.9

Data Source: American Community Survey, 2012 5-year Estimates

Table F-14. Percent of Households by Race that Receive SNAP Benefits (Associated with Figures 2.17 and 2.18)

	Households		% Households	
	Total	Receiving SNAP	Receiving SNAP By Race	Receiving SNAP By All Households
White	52,798	7,774	14.7	89.8
Black/African American	755	290	38.4	3.3
Two or more races	532	288	54.1	3.3
Some other race	373	210	56.3	2.4
American Indian and Alaska Native	270	85	31.5	1.0
Asian	216	11	5.1	0.1
Native Hawaiian and other Pacific Islander	6	0	0	0
Total	54,950	8,658		100

Data Source: American Community Survey, 2012 5-year Estimates

Table F-15. Health Behaviors and Outcomes Related to Diet (Associated with Figure 2.19)

	Chautauqua County		New York State	
	No.	%	No.	%
Obesity Among Adults	28,107	32.1	3,527,077	24.6
Adults Consuming One or More Sugary Drinks Daily	28,171	30.5	3,402,766	24.7
Adults Consuming Fast Food Three or more times per week	6,493	7.3	817,815	5.9

Data Source: New York State Department of Health, 2013-2014

Table F-16. Federal Income Limits for SNAP Eligibility

Household size	Monthly Income limit (\$)	Annual income limit (\$)
1	1,287	15,444
2	1,736	20,832
3	2,184	26,208
4	2,633	31,596
5	3081	36972
6	3530	42360
7	3980	47760
8	4430	53160
Each additional member	451	5,412+

Data Source: USDA Food and Nutrition Service, 2016

Table F-17. Federal Household Poverty Thresholds

The income levels that determine the classification of a household's poverty status.

Size of Household Unit	Weighted Average Thresholds (\$)
One person (unrelated individual)	11,720
Under 65 years	11,945
65 years and over	11,011
Two people	14,937
Householder under 65 years	15,450
Householder 65 years and over	13,892
Three people	18,284
Four people	23,492
Five people	27,827
Six people	31,471
Seven people	35,743
Eight people	39,688
Nine people or more	47,297

Data Source: American Community Survey, 2012 5-year Estimates

Table F-18.1 Ratio of Residents' Income to Poverty Level

Reflects status of individual's ratio of income compared to the poverty level.

	Chautauqua County		New York State	
	No.	%	No.	%
Poor or struggling	51,005	39.7	5,970,762	31.6
Doing ok	77,541	0.6	12,915,163	0.7
Total	128,546	40.3	18,885,925	32.3

Data Source: American Community Survey, 2012 5-year Estimates

Table F-18.2 Supplementary Table

Under 1.00 (Doing Poorly)
1.00 to 1.99 (Struggling)
Under 2.00 (Poor or struggling)
2.00 and Over (Doing ok)

Data Source: American Community Survey metadata

Table F-19. Agricultural Land by Type of Use, 2012 (Associated with Figure 3.2)

Land Use Type	Acres	Number of Operations	Avg. Acres per Operation	%
Cropland	129,467	1,333	97.1	54.7
Pastureland Excluding Cropland and Woodland	25,186	781	32.2	10.6
Pastureland Excluding Woodland with Any Irrigation on Operation	883	24	36.8	0.4
Pastureland Excluding Cropland and Woodland	26,069	805	32.4	11.0
Woodland Excluding Pastured Land	56,515	923	61.2	23.9
Pastured Woodland	4,070	203	20.0	1.7
Other Agricultural Land In Operation Not Used as Cropland, Pastureland, and Woodland	21,308	1,226	17.4	9.0
All Agricultural Land	236,546	1515	156.1	100

Data Source: 2012 US Census of Agriculture

Table F-20.1 Agricultural Farmland by Type of Treatment, 2012 (Associated with Figure 3.6)

Treatment Method	Area (acres)	%
Fungicides	18,013	8.3
Herbicides	53,641	24.7
Insecticides (excluding nematicides)	28,081	12.9
Insecticides	4,535	2.1
Other	6,229	2.9
Fertilizer (Manure)	38,580	17.8
Fertilizer	67,967	31.3
Total Treated Agricultural Land	217,046	100

Data Source: 2012 U.S. Census of Agriculture

Table F-20.2 Agricultural Farmland by Type of Treatment, 2012 (Associated with Figure 3.6)

Treatment Method	Area (acres)	%
Fungicides	18,013	7.6
Herbicides	53,641	22.7
Insecticides (excluding nematicides)	28,081	11.9
Insecticides	4,535	1.9
Other	6,229	2.6
Fertilizer (Manure)	38,580	16.3
Fertilizer	67,967	28.7
Untreated Ag Land	19,500	8.2
Total Agricultural Land	236,546	100

Data Source: 2012 U.S. Census of Agriculture

Table F-21. Percent of Farms Operated and Age of Operators, 2012 (Associated with Figure 3.7)

Age	% of Farm Operators
< 25	0.3
25 - 34	5.1
35 - 44	13.7
45 - 54	23.8
55 - 59	16.2
60 - 64	13.3
65 - 69	10.8
> 70	16.8
Total	100

Data Source: 2012 U.S. Census of Agriculture

Table F-22. Change in Land Area in Grape Production Over Time (Associated with Figure 3.8)

Year	Number of Acres
1974	18,868
1982	19,166
1992	17,446
2002	19,349
2012	20,557

Data sources: US Agricultural Census (2002-2012), US Census of Agriculture Historical Archive (1974 - 1992)



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