SUSTAINABLE LONG ISLAND

ADELPHI UNIVERSITY

Long Island's Food System Report Card

- Food Production
- Transformation & Processing
- Distribution, Marketing & Retail
- Food Access & Consumption
- Waste Management
- Cross-cutting Economics

Sustainable Long Island
Adelphi University's Vital Signs
July 2013

Assessing the state of Long Island's Food System

Serving as the platform for subsequent community discussions about policy and program development

ACKNOWLEDGEMENTS

PARTNERSHIPS

The authors would like to acknowledge the Angela and Scott Jaggar Foundation for their continued generosity in supporting projects such as the Long Island Food System Report Card (LIFSRC) and the Food Equity Advisory Committee (FEAC), which strive to improve the regional food system. The Angela and Scott Jaggar Foundation provided a total of $25000 in funding to Sustainable Long Island in support of the development of the LIFSRC and Sustainable Long Island's Food Equity programs.

In addition, this report was made possible by the dedicated efforts of numerous individuals and organizations through their participation in the FEAC and the Vital Signs Advisory Board and their continued commitment to addressing food system issues and equity throughout Long Island.

The Long Island Food System Report Card was developed through a partnership between Sustainable Long Island and Adelphi University's Vital Signs, the research arm of the Center for Health Innovation (CHI). The goal of the LIFSRC is to assess the state of Long Island's food system, focusing on indicators in production; transformation and processing; distribution, marketing and retail; food access and consumption; and waste management. The LIFSRC also examines a separate indicator – food system jobs– across all sectors along the economic domain. The project draws upon a similar document entitled, "Cultivating Resilience: A Food System Blueprint" from the Iowa Food Systems Council as a model for the report.

As part of the project's participatory process, a cross-section of food system stakeholders, including Sustainable Long Island's Food Equity Advisory Committee and Vital Signs Advisory Board, helped to select indicators and provided input on strategies for their assessment. The report card's data inform recommendations for a safe, fair, and sustainable food system and serve as the platform for subsequent community discussions about policy and program development.

Long Island is challenged by disparities in the regional food system and has historically left communities with inadequate access to healthy, affordable food options. As the regional leader in food equity issues, Sustainable Long Island has convened stakeholders from throughout the food system, conducted research and launched projects to address pressing issues, such as youth-staffed farmers' markets and a food access mapping project. A pioneer in the critical analysis of social health disparities, Vital Signs has a track record of offering original community-based, data-driven analysis and policy solutions to address some of the region's most enduring social problems. Both Sustainable Long Island and Vital Signs recognize that equitable access to food is a human right and is best addressed by broad-based community driven strategies.

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EXECUTIVE SUMMARY

FOOD SYSTEM REPORT CARD

The Long Island Food System Report Card (LIFSRC), a joint indicator project between Sustainable Long Island's Food Equity Advisory Committee (FEAC) and Adelphi University's Vital Signs project, takes the first step in looking at the state of our food system. Development of the LIFSRC began in late 2011 and the end product is the result of ongoing stakeholder collaboration. Representatives from across food system sectors have contributed significantly to this report, through the selection of indicators as well as their measurement strategies, and development of recommendations.

The LIFSRC creates a comprehensive baseline profile of the Long Island food system, highlighting indicator trends and needs as well as relationships among sectors of the food system. Data findings then inform recommendations for a safe, fair, and sustainable food system and serve as the platform for subsequent community discussions about policy and program development.

Through this report, we aim to provide all stakeholders with a timely, informative and data-driven document to help generate community dialogue about programs, policies, and research to protect and improve Long Island's food system. Ultimately, we hope that by creating and sharing this report, our region is able to mobilize for change, leading to a wide array of proactive solutions with long-term, tangible benefits to our food system.

There are three primary goals for the LIFSRC:

Create New Knowledge

- Develop collaborative process for designing and interpreting the report card
- Generate a baseline profile of the Long Island food system
- Evaluate sustainability of the Long Island food system
- Highlight trends and pinpoint areas for concern
- Make more explicit relationships among sectors in the food system
- Make recommendations for change based on data/findings

Share New Knowledge

- Distribute data/ report card to stakeholders
- Initiate opportunities for stakeholder dialogue about findings
- Write additional white papers, op-ed pieces etc. based on data findings

Encourage Mobilization of New Knowledge

- Engage stakeholders in new policies and programs to achieve a more sustainable food system
- Support additional research on Long Island food system
- Help to develop new strategies to address food system challenges

Categories by Food System Sectors and Domains

The LIFSRC was structured using best practices from similar reports. In particular, the report employs a matrix as a tool for analysis, placing 11 categories along vertical and horizontal axes, representing the five food system sectors (production, transformation, distribution/marketing/retail, food access/consumption, and waste management) and the three domains of sustainability (economic, environment, and equity), respectively. A cross-cutting category – food system jobs – runs across all sectors overlapping the economic domain.

Identifying and Selecting Indicators for the LIFSRC

Based on an extensive review of the food system literature, we identified an initial set of over 100 different indicators. Stakeholders then helped to narrow them down to the 31 indicators included in this report. Throughout this process, we set out to ensure that the indicators used were reflective of the concerns of a broad spectrum of Long Islanders, measurable and derived from publicly available, reliable sources.

Rating Food System Indicator Trends and Needs

Measuring trends and determining what is needed to address issues found in these trends can be a challenging and subjective process. Evaluators have to assess what the data means for an indicator and extrapolate from it to determine how the indicator trend impacts other issues not being measured.

Rather than providing a ranking system for the indicators (i.e. hierarchical), this report designates whether a trend has moved positively, negatively, or has not experienced significant change over time. These designations do not necessarily reflect directional movement in the data but show whether or not movement is positive or negative for the food system indicator being measured.

- Up arrow (⬆) – trend has moved positively, having increasing or improving effects.
- Down arrow (⬇) – trend has moved negatively, causing decreasing or deteriorating conditions.
- Left-to-Right arrow (⬅➡) – trend is unchanged or steady and impacts or conditions remain the same.

Ratings for indicator needs were driven by consensus among evaluators to determine what actions or activities should be taken to maintain or improve observed trends.

Dark Green – Maintain actions and monitor activities to maintain positive trends.
Green – Long-term actions and minor activities are suggested to increase positive trends.
Yellow – Some actions and activities are needed to reverse stagnant or negative trends.
Orange – Short-term actions and minor-to-major activities are needed to reverse negative trends.
Red – Immediate actions and major activities are needed to reverse negative trends.

Long Island Food System Report Card Ratings with Recommendations

Listed below is a summary of recommendations for building a more sustainable food system. The recommendations were compiled based on input from the FEAC and the Vital Signs Advisory Board. The recommendations were also informed by strategies identified in our literature review of previous academic and policy studies.

Overall Recommendations

1. Infrastructure investment to preserve and grow Long Island's regional food system.
2. Economic diversification in farming to strengthen its role as one of the region's economic engines.
3. Address food accessibility, insecurity and rising costs of food for all Long Islanders.
4. Protect the region's water supply, farmland, and air quality for the long-term environmental viability.
5. Strengthen and expand regional partnerships to promote communication, coordination, collection of information and conducting regular assessments of the food system.

Summary Recommendations by Sector

Production Sector				
Domains	**Categories**	**Indicators**	**Trends**	**Needs**
Economic	Food Produced Locally	Market value and acreage of produce vs. non-produce	↑	
		Farm revenue by crop	↑	
		Farm animals produced	↔	
		Aquaculture and fishery production	↓	
		Farms offering agricultural tourism	↑	
		Farm production expenditures	↓	
Environment	Farms and Preservation	Acreage, number and size of farms	↓	
		Farmland preservation	↓	
Equity	Farm Labor and Farmer Diversity	Farm workers employed by farm labor contracts	↑	
		Farmer and farm operator diversity	↔	

Summary recommendations:

- Improve branding and marketing of locally grown products through the "Grown on LI" campaign.
- Encourage crop diversity to address public health issues and promote economic resiliency.
- Invest in improving water quality and infrastructure to protect local aquaculture and fisheries.
- Support for agritourism as a means for farms to remain economically viable.
- Promote local land use policies that would encourage renewable energy usage on farms as a way to reduce farm expenditures and potentially generate income.
- Update local tax codes to reduce the property tax burden on farms to the statewide level.
- Modernize local zoning codes to further reduce encroachment of residential properties on farmland.
- Set new targets and finance land preservation efforts to reach the goals sought by each county.
- Encourage and train a balanced and skilled work force suitable for smaller farms.
- Expand programs that train and prepare young people to enter the field of farming.
- Explore opportunities to provide incentives to encourage new farmers or farm workers.

Transformation & Processing Sector				
Domains	**Categories**	**Indicators**	**Trends**	**Needs**
Economic	Food Manufacturing	Diversity of food manufacturing by county and type	↓	
		Animal slaughtering and processing	↓	
		Fruit and vegetable preserving and manufacturing	↔	

Summary recommendations:

- Support infrastructure investments in warehousing, processing, and distribution for small-scale producers.
- Invest and support the development of small to mid-sized food production, processing, storage and distribution facilities to expand the value-added agriculture industry.
- Encourage food businesses by developing a network of food hubs and entrepreneurial programs.
- Establish an online portal to support and develop commercial kitchens and food incubators.

Distribution, Marketing & Retail Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Wholesale Market	Food wholesalers	⬇	
Equity	Consumer and Retail Market	Food retailers per 100,000 people	⬅➡	
		Percentage of farms with direct sales	⬆	
		Value of agricultural products sold for human consumption	⬆	

Summary recommendations:

- Increase the number of farmers' markets on Long Island to be on par with the statewide ratio.
- Support public-private investments to attract food wholesale businesses.
- Expand institutional purchasing of local food products and encourage adoption of local procurement policies by public and private entities.
- Promote direct sales of produce at farms as a means of income diversification and further increasing the value of agricultural products.
- Expand community supported agriculture and food box delivery programs to promote accessibility of produce in underserved communities.
- Work with various public and private agencies to identify and expand number of community gardens.
- Explore developing an online marketplace or network to facilitate purchase of Long Island products.

Food Access & Consumption Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Expenditures and Purchasing Power	Average annual food expenditure per consumer unit	⬇	
		Food expenditures, Home vs. Away from Home	⬇	
		Value of SNAP/EBT purchases and access at farmers markets	⬆	
Equity	Food Insecurity and Public Health	Population as food insecure and SNAP eligibility	⬇	
		Percentage of children anemic or underweight	⬅➡	
		Percentage of population that is diabetic	⬇	
		Emergency food programs and pounds of food rescued	⬅➡	
		Adults eating 5+ servings of fruit & vegetables per day	⬅➡	

Summary recommendations:

- Encourage more grocery retailers to offer a variety of affordable, healthy food options.
- Encourage retailers to experiment with pricing strategies that make healthful food more affordable for low-income consumers and potentially create a return on investment.
- Investigate the feasibility of programs, like virtual supermarkets or free supermarket shuttle services to serve Long Islanders without cars or without easy access to grocery stores.
- Encourage customer usage and increase the acceptance of SNAP and EBT at local farmers' markets by subsidizing the technology required and partially matching funds at participating markets.
- Provide farmers with increased tax incentives to partner with food rescue groups in support of farm-to-"community"-table initiatives.
- Promote public gleaming programs as food rescue and feeding initiatives.
- Advocate for increased funding of SNAP and expansion of the pool of eligible families and individuals.
- Encourage hospitals to participate in "adopt-a-farmers'-market" programs to promote healthier eating habits and other public health messages.
- Standardize reporting of emergency food program clients and programs.
- Develop public private partnerships to achieve the Deptartment of Health goal of raising the percentage of adult New Yorkers who eat fruit and vegetables five or more times per day to 33%.

Waste Management Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Waste Alternatives	Composting and alternatives to incineration	NA	
		Recycling as a percentage of municipal solid waste	⬇	
Environment	Negative Impacts and Tracking Waste	Water quality of rivers, lakes, and estuaries	NA	
		Drinking water quality	NA	
		Municipal solid waste transported or incinerated	NA	

Summary recommendations:

- Develop and implement recommendations for community or island-wide food composting systems.
- Reinforce recycling efforts to remove paper, containers, and metal products from the waste stream.
- Increase funding to monitor water quality and mitigation for storm water runoff.
- Support the standardization of waste collection data and dissemination throughout Long Island.

Cross-cutting Economic Indicators				
Domains	Categories	Indicators	Trends	Needs
Economic	Food System Jobs	Wages throughout the food system sectors	⬇	
		Total number of food system jobs	⬅➡	

Summary recommendations:

- Research and explore strategies for strengthening food system jobs; such as developing recommendations for food system businesses to increase their competitiveness and attract a skilled workforce.
- Recommend research to look into existing working conditions, hiring practices and pay for food service employees in all food sectors.
- Enforce and strengthen labor law compliance.
- Advocate for raising the minimum wage for all workers, including tipped workers.
- Fund county training programs for all food system workers, including undocumented workers, that help workers advance to a livable-wage in their segment of the food chain.
- Ensure that local procurement programs for public institutions include labor standards and worker protections and require that all farms and food businesses meet certain labor standards before they receive government loans or subsidies.

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FOOD SYSTEM REPORT CARD

"Agriculture is our wisest pursuit, because it will in the end contribute most to real wealth, good morals, and happiness."
- Letter from Thomas Jefferson to George Washington (1787)

What happens on our farms affects every aspect of our lives. Today, most of the food we consume comes from national and global sources, rather than from local producers. This expansion of the food system can be traced back fifty to seventy-five years ago, when changes in production methods and national agricultural policy encouraged a rapid shift from small-scale farming to large-scale, industrialized agriculture. During the same period, improvements in shipping –specifically refrigerated trucking– facilitated agriculture specialization as well as the long-distance transport of perishable goods to people around the globe. Free trade agreements further opened up markets for the exchange of goods across borders for large farms, although smaller agriculture producers have found it tougher to compete locally with the prices offered by imported foods. As a result of our modern food system, consumers today have access to cheaper and more varied food options year round. American farmers also benefit from export opportunities, keeping many farms competitive and economically viable.

However, the modernization of our food system has not been without difficulties. Like the rest of the nation, Long Island faces a wide-range of food system challenges, many of which have intensified over the last several decades. The region leads the state in agricultural revenue, but Long Island's farms are shrinking in number and size, while the average age of farm operators continues to rise. The current organization of the food system is also highly susceptible to supply chain disruptions, including price spikes caused by severe and atypical weather events. This risk was clearly exposed when Superstorm Sandy hit Long Island in October 2012, preventing people from getting to stores to purchase food while keeping retailers from receiving shipments due to power outages and gasoline shortages.

In addition to its inherent vulnerability, the existing food system also contributes to a range of undesirable economic, environmental and social/health impacts. These include corporate consolidation of the supply chain; ecological hazards like soil erosion, climate change and the dependency on non-renewable energy resources; unsafe working conditions and low wages throughout the food system; and chronic, diet-related health conditions. We also face a growing food insecurity problem, intensified by the Great Recession, as evidenced by the dramatic upsurge in people turning to food banks and federal food programs for assistance feeding their families.

In order to address these issues –and a host of others– we need to take a thoughtful, comprehensive approach to promoting a more sustainable food system. While the terms sustainable or sustainability have been defined and applied differently in research and policy, this report draws on the American Planning Association's (APA) vision of a sustainable food system that "emphasizes, strengthens, and makes visible the interdependent and inseparable relationships between individual sectors of the food system." It also views sustainability as desirable across three domains: Economic, Environment and Equity, ultimately resulting in a food system that is economically robust, environmentally healthy, and socially equitable.

For us, a sustainable food system is a long-term goal, resting on these principles, rather than on a specific and invariable set of practices. Achieving this goal will require a transparent process that carefully balances the competing interests and needs of food system stakeholders in order to maximize benefits for everyone. It also means that we must fully think through the position of local food production within regional, national, and global food networks, finding the scale and degree of interconnection that works best for our region. And, we must focus on improving all food system sectors, from where and how we get our food, to how we manage its disposal.

Long Island's sustainability issues are not beyond our means to address; there are many things that are being done across the country that can be replicated here. Like other states and regions, we need to begin by identifying those issues that are the most pressing. We also need to pinpoint the region's existing assets, like our rich farming and fishing history and our plentiful natural resources, as a base from which to further develop the conditions to support a sustainable food system.

WHAT IS A FOOD SYSTEM?

FOOD SYSTEM REPORT CARD

Food systems have been conceptualized and theorized in a number of different ways.[1] In this report, a "food system" refers to the range of processes –from the production of food to the disposal of waste products– that keep populations fed. It also includes the natural and human resources (or inputs) required to make the system work, as well as the outputs generated at each stage. Moreover, a food system is always understood to operate within a larger social, economic, political, and biophysical context. These broader forces interact with the food system to affect economic, social, and environmental well-being. We define the forces impacting the functioning of the food system as "drivers."

In reality, food system sectors do not operate in isolation but constantly interact with one another. Changes in one sector may affect activities in other sectors. Given the interconnectedness of food system sectors, to the extent possible, this report analyzes trends and patterns within and between food system sectors, in order to create the report card.

For the sake of clarity and simplicity, we divide the food system processes into five distinct sectors: Production; Transformation and Processing; Distribution, Marketing and Retail; Food Access and Consumption; and Waste Management. These sectors may be described as follows:

- The **production** sector involves both the growing and harvesting of food. Activities may include farming, gardening, fishing, hunting and foraging. It also describes how food is grown and by whom.

- The **transformation and processing** sector involves transforming raw food materials (crops and animals) into food products as well as bundling raw food or processed food into marketable products. Activities may include processing and labeling.

- The **distribution, marketing and retail** sector involves moving food products to places where consumers can access or purchase them. Activities include transportation, warehousing and wholesaling.

- The **food access and consumption** sector involves the consumer purchase, acquisition or cultivation of food, as well as the preparation and eating of food. Activities may include buying, gathering, gleaming, growing, accessing food assistance, preparing and eating.

- The **waste management** sector involves the disposal of waste generated throughout the food system process. Activities may include recycling, recovering, reusing, and composting.

In an effort to more fully explore the interactions among food system sectors, this report includes a cross-cutting indicator. This **cross-cutting economics** indicator looks at the impact of the number of jobs and wages in the food system and their potential impact on the food system as a whole.

INTERCONNECTIONS

OF THE FOOD SYSTEM

Food System Resources

Natural and social resources are essential to the food system. Insufficient or diminished resources threaten the food system's ability to function.

- **Natural Resources**: Includes energy, land, air, water, chemical elements, and biological matter.
- **Social Resources**: Includes technological and other skills or knowledge which guides the use of labor throughout the food system sectors. It also includes the economic means to fund the system.

Drivers

The resources needed to make the food system operate productively and efficiently are manipulated and transformed throughout each stage of the food system process. They also interact with ecological and socio-economic environments or drivers.

- **Ecological drivers** include climate variability, water quality and availability, air quality, nutrients, soil quality, and land cover.
- **Socio-economic drivers** include government and economic structures (including policies), social values, cultural traditions, income, education, and demographics.

Ecological and socio-economic environments and drivers vary by location. Long Island's unique ecological and socio-economic environments are the result of our region's mix of topography, climate, land use, history, traditions, government policies, and economic practices.

Outcomes

Food systems generate outcomes that affect environmental, economic, social, and health conditions. These conditions, in turn, interrelate with other parts of the food system.

- **Environmental Outcomes** include the availability and quality of natural resources like soil, water, and air as well as the viability of ecological systems and services.
- **Economic Outcomes** include wages, employment, income, business productivity, and food prices.
- **Social Outcomes** include the quality of working conditions, community engagement and vitality, and food insecurity.
- **Health Outcomes** include chronic diseases related to diet such as diabetes, obesity, and heart disease; physical and mental conditions, such as anemia or depression, related to levels of food security; and food-borne illness related to food safety.

Food System Scales and Tiers

Food systems operate and interact at different geographic scales, ranging from global to local and are nested within one another (Figure 1). For example, beyond the Long Island food system, there is a regional system including other parts of New York, New Jersey, Connecticut, and Pennsylvania, as well as national and international systems.

We can also think about food systems in terms of how they are organized, specifically the nature of the relationship between producers and consumers. Represented as a series of concentric circles or tiers, the relationships range from personal production of food (Tier 1), where the producer is the consumer, to global and anonymous (Tier 5), where the supply chain is very long and the consumer has no relationship with the producer (Figure 2). In between these two extremes are an assortment of food businesses, varying in size and in their interactions with customers and partners.

When certain tiers (or scales) overpower others, food systems may become unbalanced. Of particular concern to Long Island is the quantity of food that is imported from the national and global scale and the susceptibility to supply chain disturbances, including fluctuating commodity prices (oil and electricity) and price surges related to climate conditions. We also harm our local air quality as a result of burning fossil fuels through the shipment of products to the region, particularly through truck transportation.

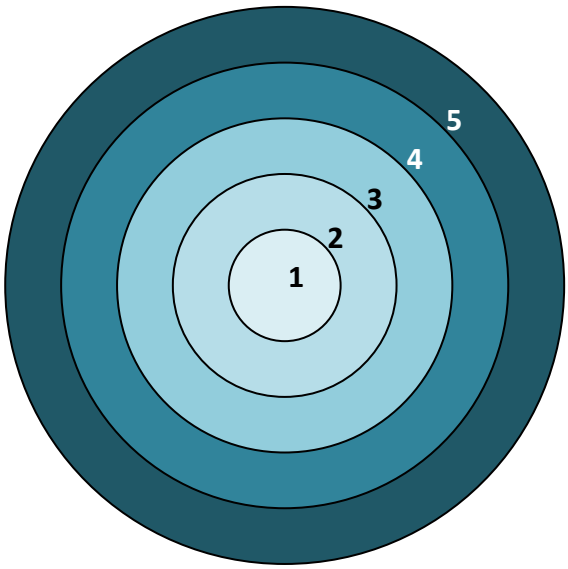
In order to achieve greater balance, we need to build up our local and regional food system tiers, focusing on producer and consumer interactions, as well as strategic partnerships among industries. This will help to increase the type of food available across tiers; improve food system resiliency by more equally distributing risk; and generate collaboration and entrepreneurship to sustain a healthy food system.

Figure 1: Food System Scales

Impacts

Within a health context, there are impacts or outcomes resulting from current food systems. These are interconnected to the functionality, efficiency, and policies of food systems.

- Human Health includes the physiological status and the presence of diseases such as obesity, diabetes, cardiovascular disease and cancer of a population resulting from the availability, quality, quantity, and safety of the food supply.
- Economic Health includes wages, employment, household income, and business activity. It also includes the circulation of monetary wealth within communities.
- Ecological Health includes the environmental integrity of natural resources such as soil, water, biodiversity, air and fossil fuel usage and the restorative capacity to carry out nature's services.
- Social Health or fairness is a measure of social justice and engagement and assures no person or thing is exploited; workers earn a living wage, work in safe conditions, and are offered equal opportunities to advance while low to moderate income families are able to afford fresh, nutritious meals.



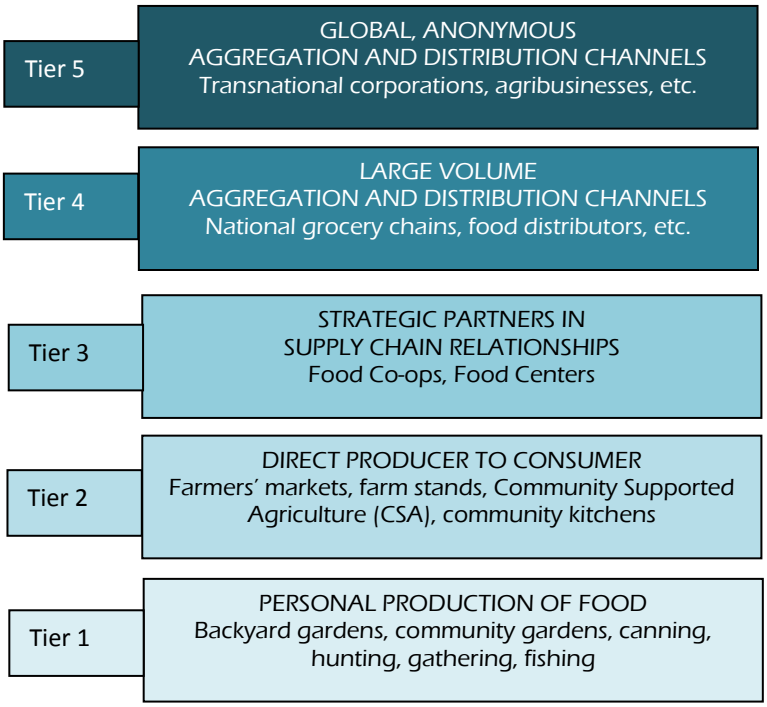


Figure 2: Consumers and Producer Relationships
Source: Center for Integrated Agricultural Systems, University of Wisconsin

CHALLENEGES

TO LONG ISLAND'S FOOD SYSTEM

Long Island is a region with a rich food culture, reflected in its long history of farming and fishing, its ever-growing mix of national cultures and foodstuffs, and its bourgeoning local food movement. It is also an important contributor to the state's food economy. Yet, the food system is not as robust as it could be, given the range of resources and assets available to us. Challenges to the food system exist at every level and are broad-based. Because of this complexity, we categorize these challenges according to the core principles of a sustainable food system: *environmentally healthy, economically robust, and socially equitable*. Each principle addresses challenges across food system sectors.

We present these challenges with the understanding that their size and range may appear overwhelming, but are not insurmountable. We need to create a thoughtful, proactive, and integrated approach to act in the region's best interest and demand the political imagination and willpower to move us out of today's complacency into tomorrow's more sustainable future.

Challenges to an environmentally healthy food system

Risks to the environment exist at each stage of the food system, from production to waste management, harming air and water quality, reducing the amount of arable land, and negatively impacting environmental and personal health. In addition, the overreliance on non-renewable energy sources, dependence on nitrogen-rich fertilizers, widespread use of pesticides and herbicides, fresh water extraction, and suburban sprawl continue to negatively impact our ecosystem. Examples of our impaired ecosystem include poor surface and ground water quality; air pollution; dwindling farmland and protected open space; greater susceptibility to climate change; and threats to plant and animal life. It is essential to mitigate these negative environmental impacts to ensure the long-term success of agriculture on Long Island and protect public health.

Challenges to an economically robust food system

There are many economic challenges across the food system that impact stakeholders and the wider regional economy. Pre-existing issues such as rising food prices, stagnant or low wages, unemployment, and a rising, higher cost of living have been aggravated by the recent recession, contributing to economic stagnation. Meanwhile, the high costs of agricultural inputs, property taxes and utility fees are making it increasingly difficult for farmers to maintain operations and earn their livelihoods. The food system is also hindered by the lack of well-developed and well-funded food manufacturing and distribution infrastructure. While ambitious projects like Agriculture Enterprise Park in Calverton begin to address such gaps, more investment is needed to increase capacity and offset declines in the number of food processing and wholesale facilities. Finally, the lack of higher skilled jobs in the food industry that would pay livable wages not only impacts personal finances, but drags down the overall economy, through decreased consumer demand and spending.

Challenges to a socially equitable food system

Lower-income and middle-class Long Islanders encounter multiple barriers to accessing nutritious and affordable food in their communities. These barriers include an insufficient number of local food retailers, an inadequate public transportation system to reach these retailers, and the high price of grocery items, particularly healthy food options. For those without access to nutritious food, diet may be compromised and the risk increases for a range of diet-related health conditions such as diabetes, hypertensions, and anemia. In addition, unsafe work conditions, unfair labor practices, and lack of health benefits negatively impact many in the food manufacturing and service sectors as well as farm workers, particularly in lower-wage positions.

System transparency is also an issue: Consumers often do not have adequate information about what is in their food as well as how their food was produced, transformed, distributed, or marketed. Finally, process inequities are inherent in the food system. For example, decision-making about food system practices and regulations often take place without input from farmers, workers, and consumers who would benefit from a more participatory system of governance.

Methods

The purpose of the LIFSRC is to identify and measure the sustainability of Long Island's food system in order to encourage dialogue, research, and policies to promote economic development, environmental health, and social equity. The study uses 11 main categories to group 31 indicators across food system sectors. Toward this end, the LIFSRC creates a baseline profile of the Long Island food system, highlighting indicator trends and needs as well as relationships among sectors of the food system. Data findings then inform recommendations for a safe, fair, and sustainable food system and serve as the platform for subsequent community discussions about policy and program development.

Throughout this report, we aim to provide all stakeholders with a timely, informative and data-driven document to help generate community dialogue about programs, policies, and research to protect and improve Long Island's food system. Ultimately, we hope that by creating and sharing this report, our region is able to mobilize for change, leading to a wide array of proactive solutions with long-term, tangible benefits to our food system.

Indicator Identification and Selection

Based on an extensive review of the food system literature, the stakeholders identified an initial set of over 100 different indicators who helped to narrow them down to the indicators included in this report. Throughout this process, we set out to ensure that the indicators used were reflective of the concerns of a broad spectrum of Long Islanders, measurable and derived from publicly available, reliable sources. These sources include federal, state and county governments, national, regional and local non-profit organizations, and national research and academic institutions.

The selection of all the indicators reflects consideration of the following criteria:

- Reliability: consistently measures same phenomena over repeated observations.
- Validity: measures the phenomena it states it is measuring.
- Sensitivity to changing phenomena: measurement detects small changes in occurrence.
- Timeliness: data are current and/or conform to some established time period.
- Regularity: data are collected routinely at some specified interval.
- Longitudinally: data are collected at different points in time for the same population.
- Public availability: data are easily accessible and understandable.
- Geographic specificity: data are bounded geographically.

Data Analysis

To the extent possible, each indicator was assessed through geographic comparisons with national and state data. Analysis focused on trends over time, comparing an indicator's most recent year with a fixed first year in a longitudinal time series (a process referred to as baseline benchmarking). Whenever possible, relationships between data findings in one food system sector or domain were contrasted and/or linked with findings in another.

MATRIX CATEGORIES

SECTORS AND DOMAINS

Food Sectors	Domains		
	Economic	Environment	Equity
Production	Food Produced Locally	Farms and Preservation	Farm Labor and Farmer Diversity
Transformation & Processing	Food Manufacturing		
Distribution, Marketing & Retail	Wholesale Market		Consumer and Retail Market
Food Access & Consumption	Expenditures and Purchasing Power		Food Insecurity and Public Health
Waste Management	Waste Alternatives	Negative Impacts and Tracking Waste	
Cross-cutting Indicator	Food System Jobs		

Production Sector

- Food Produced Locally – describes the economic value of Long Island's agriculture and aquaculture, fisheries, alternative revenue sources for farms through agricultural tourism, and the impact of production expenses on locally produced food.
- Farms and Preservation – highlights trends in the acreage, number and size of farms, and tracks how successful county-led preservation efforts have been.
- Farm Labor and Farmer Diversity – describes what crops are raised and how much is dedicated for food as well as the impact of different farm labor employment methods on food production.

Transformation & Processing Sector

- Food Manufacturing – describes how manufacturing diversity affects the local economy.

Distribution, Marketing & Retail Sector

- Wholesale Market – describes the availability and accessibility of various food types through local retail and wholesale outlets.
- Consumer and Retail Market – highlights the number of farms and the market value of direct sales for those farms that provide direct sales of their products.

Food Access and Consumption Sector

- Expenditures and Purchasing Power – tracks how much consumers are spending on food, where food expenditures are occurring, and the value of SNAP sales at farmers' markets.
- Food Insecurity and Public Health – describes the percentage of the population that is food insecure and/or enrolled in SNAP/Food Stamps as well as the numbers accessing emergency food services.
- Additionally, this indicator looks at the prevalence of specific diet-related health conditions.

Waste Management Sector

- Waste Alternatives as Economic Generators – looks at the impact of composting and recycling on reducing municipal solid waste.
- Negative Impacts and Tracking Waste – examines the environmental effects of waste on our water supply as well as the effects of municipal solid waste on air and soil.

Cross-cutting Economic Category

- Food System Jobs – looks at the number of jobs across the food system as well as employee wages, examining the impact of jobs in one sector throughout all sectors and on the long-term viability of employment around food.

Data Challenges

Indicator projects like the LIFSRC typically use quantitative, secondary data to assess local conditions. Quantitative data are often referred to as "objective," meaning they provide measurements that are impartial or unbiased. However, no data or research can be completely free from subjective influences. Indicators and data, even the absence of data, reflect the choices and concerns of those collecting information at a particular point in time. This does not diminish the significance of studies like the LIFSRC but offers a context to frame and inform our understanding of data findings.

The use of secondary data in the LIFSRC also presented a variety of method-related challenges. In addition to the absence of data, in some cases, there were also definitional and temporal issues, given the wide array of data sources (government databases; grassroots and not-for-profit data; national, state and local research studies) and the scope of food system issues being explored. These included:

- Different definitions of phenomena or operational definitions, e.g. food retailers.
- Different cycles of data collection (e.g. annual), and different starting points for longitudinal data.
- Data gathered for only one point in time.

In some cases, the lack of robust data, particularly at the local or regional level, posed difficulties for analysis. For example, data on the Waste Management sector was extremely limited; hindering attempts to determine long-term trends. Such limitation points to the need for enhanced efforts (by the counties or other organizations) to regularly collect detailed, systematic information on all food system sectors.

Rating Food System Indicator Trends and Needs

Measuring trends and determining what is needed to address issues found in these trends can be a challenging and subjective process. Evaluators have to assess what the data means for an indicator and extrapolate from it to determine how the indicator trend impacts other issues not being measured.

Rather than providing a ranking system for the indicators (i.e. hierarchical), this report designates whether a trend has moved positively, negatively, or has not experienced significant change over time. These designations do not necessarily reflect directional movement in the data but show whether or not trends is positive or negative for the food system indicator being measured.

- Up arrow (⬆) – trend has moved positively, having increasing or improving effects.
- Down arrow (⬇) – trend has moved negatively, causing decreasing or deteriorating conditions.
- Left-to-Right arrow (⬅➡) – trend is unchanged or steady and impacts or conditions remain the same.

Ratings for indicator needs were driven by consensus among evaluators to determine what actions or activities should be taken to maintain or improve observed trends.

Dark Green – Maintain actions and monitor activities to maintain positive trends.
Green – Long-term actions and minor activities are suggested to increase positive trends.
Yellow – Some actions and activities are needed to reverse stagnant or negative trends.
Orange – Short-term actions and minor-to-major activities are needed to reverse negative trends.
Red – Immediate actions and major activities are needed to reverse negative trends.

Recommendations

Recommendations for approaches to build a more sustainable food system appear at the end of this report. The recommendations were compiled based on input from the FEAC and the Vital Signs Advisory Board. The recommendations were also informed by strategies identified in our literature review of previous academic and policy studies. Over time, we hope to build on this initial work and expand the LIFSRC to include additional data, indicators, and to further develop recommendations.

REPORT CARD

ASSESSING LONG ISLAND'S FOOD SYSTEM

Domains	Categories	Indicators	Trends	Needs
Production Sector				
Economic	Food Produced Locally	Market value and acreage of produce vs. non-produce	↑	
		Farm revenue by crop	↑	
		Farm animals produced	↔	
		Aquaculture and fishery production	↓	
		Farms offering agricultural tourism	↑	
		Farm production expenditures	↓	
Environment	Farms and Preservation	Acreage, number and size of farms	↓	
		Farmland preservation	↓	
Equity	Farm Labor and Farmer Diversity	Farm workers employed by farm labor contracts	↑	
		Farmer and farm operator diversity	↔	
Transformation & Processing Sector				
Economic	Food Manufacturing	Diversity of food manufacturing by county and type	↓	
		Animal slaughtering and processing	↓	
		Fruit and vegetable preserving and manufacturing	↔	
Distribution, Marketing & Retail Sector				
Economic	Wholesale Market	Food wholesalers	↓	
Equity	Consumer and Retail Market	Food retailers per 100,000 people	↔	
		Percentage of farms with direct sales	↑	
		Value of agricultural products sold for human consumption	↑	
Food Access & Consumption Sector				
Economic	Expenditures and Purchasing Power	Average annual food expenditure per consumer unit	↓	
		Food expenditures, Home vs. Away from Home	↓	
		Value of SNAP/EBT purchases and access at farmers' markets	↑	
Equity	Food Insecurity and Public Health	Population as food insecure and SNAP eligibility	↓	
		Percentage of children anemic or underweight	↔	
		Percentage of population that is diabetic	↓	
		Emergency food programs and pounds of food rescued	↔	
		Adults eating 5+ servings of fruit and vegetables per day	↔	
Waste Management Sector				
Economic	Waste Alternatives	Composting and alternatives to incineration	NA	
		Recycling as a percentage of municipal solid waste	↓	
Environment	Negative Impacts and Tracking Waste	Water quality of rivers, lakes, and estuaries	NA	
		Drinking water quality	NA	
		Municipal solid waste transported or incinerated	NA	
Cross-cutting Economic Indicators				
Economic	Food System Jobs	Wages throughout the food system sectors	↓	
		Total number of food system jobs	↔	

RATING INDICATORS

INDIVIDUAL FOOD SYSTEM SECTORS

The following section looks at the individual food system sectors and provides a detailed analysis of the categories and indicators used for assessment. Additional charts and graphics are included in the report to provide a visual representation of the sub-indicator being measured so that trends can be observed.

Production Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Food Produced Locally	Market value and acreage of produce vs. non-produce	↑	
		Farm revenue by crop	↑	
		Farm animals produced	↔	
		Aquaculture and fishery production	↓	
		Farms offering agricultural tourism	↑	
		Farm production expenditures	↓	
Environment	Farms and Preservation	Acreage, number and size of farms	↓	
		Farmland preservation	↓	
Equity	Farm Labor and Farmer Diversity	Farm workers employed by farm labor contracts	↑	
		Farmer and farm operator diversity	↔	

Food Produced Locally

Indicator Background

Long Island has a long and rich history of farming and agriculture, dating back more than 300 years when the area was first settled. Agricultural products grown on Long Island over the years include fresh vegetables and fruit, seafood, poultry, and a variety of horticultural products. The region is also strong in niche agricultural markets such as ducks, wine, sod, and fruit and vegetables for both local and non-local markets. Today, more than 35,690 acres are in production on Long Island, growing more than 100 different crops.[2]

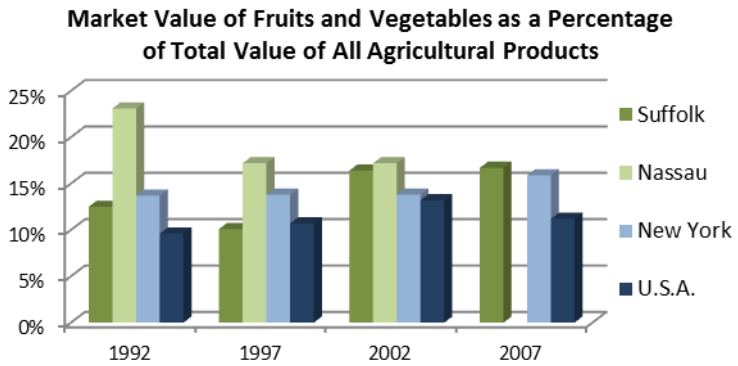
Agriculture and fishing are important components of the Long Island economy. More than 6,000 people work in agriculture and fishing related industries, which total more than $240 million in cash receipts.[3] While Nassau and Suffolk both have long agricultural histories, the vast majority of farming now takes place in Suffolk County, which leads the state in agricultural revenue. Suffolk County also ranks first statewide in terms of nursery, greenhouse, floriculture, pumpkin and sod production and aquaculture.

New York State is home to world class fishing for a wide variety of cold water, warm water and saltwater fish species, with the largest fishing trades historically occurring on the East End of Long Island. While oyster, commercial fishing and the bay scallop industries were once booming business, challenges from pollution, overfishing, and competition have plagued the industry over the past decades. Harmful algal blooms known as Brown Tides as well as state and federal regulations designed to provide for improved conservation and management of fisheries have limited commercial fishing activities in recent years. Despite this, the Long Island Sound and other waters serve as breeding, nesting, and nursery areas for a variety of plant and animal life, contributing an estimated $5.5 billion per year to the regional economy from boating, commercial and sport fishing and sight-seeing.[4]

This indicator examines the economic health of the food production sector, while considering how effectively the region is leveraging agritourism (and other niche/direct markets) in order to attract more business to the area. By increasing the dollars spent on local food, we can benefit from a multiplier effect that stimulates our wider economy and generates greater wealth, income and jobs. Data for this indicator come from the United States Department of Agriculture (USDA) Census of Agriculture, the National Marine Fisheries Service and the USDA Fruit Report.

Market value and acreage of produce vs. non-produce

The percentage of agricultural revenue from fruit and vegetable production is informative for two reasons. First, changes in the percentage suggest either an increase or decrease in the scale of fruit and vegetable farming. Growing more produce locally potentially lessens our dependency on imports from other markets, especially if fruits and vegetables are sold directly to consumers or distributed at local retailers. Second, marketed effectively, Long Island fruits and vegetables are attractive export commodities or ecotourism draws, generating profit for agricultural producers and the wider economy as well as strengthening regional identity around food.



Source: United States Department of Agriculture, NASS Census of Agriculture
Notes: Market value of fruits and vegetables for Nassau not disclosed in 2007. Fruits and vegetables include vegetables, melons, potatoes, sweet potatoes, fruits, tree nuts and berries.

Based on data from the U.S. Census of Agriculture, the market value of produce as a percentage of total agricultural revenue increased in Suffolk County from 1992 to 2007. The market value of fruits and vegetables, which was 12.5% of total agricultural revenue in 1992, rose to 16.7% in 2007. Total agricultural revenue for Suffolk County was $242,933,000 in 2007, with approximately $40,560,000 from sales of fruits and vegetables.

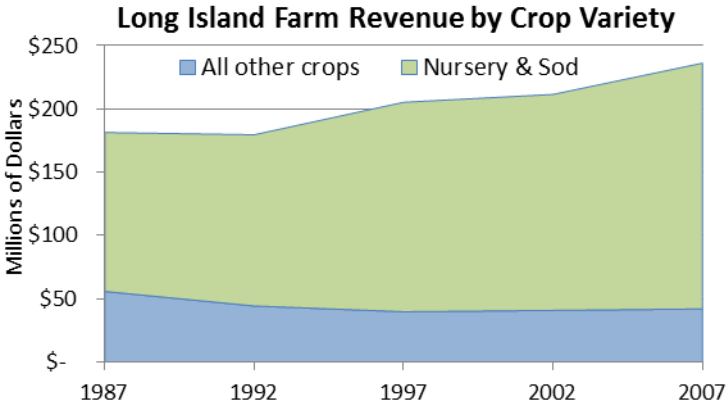
The increase in the percentage of fruit and vegetable market value corresponds with a gain in the percentage of acres used for growing produce in Suffolk County. From 1992-2007, the proportion of farmland acres used for fruit and vegetable production climbed from 22.6% to 28.6%.[5]

In Nassau, the market value of produce as a percentage of total agricultural revenue decreased from 1992 to 2002, falling from 23.1% to 16.7%. No data were available for Nassau County in 2007. Total agricultural revenue for Nassau was $8,251,000 in 2002, with a market value of $591,000 for fruits and vegetables. Total agricultural revenue was $15,799,000 in 2007.

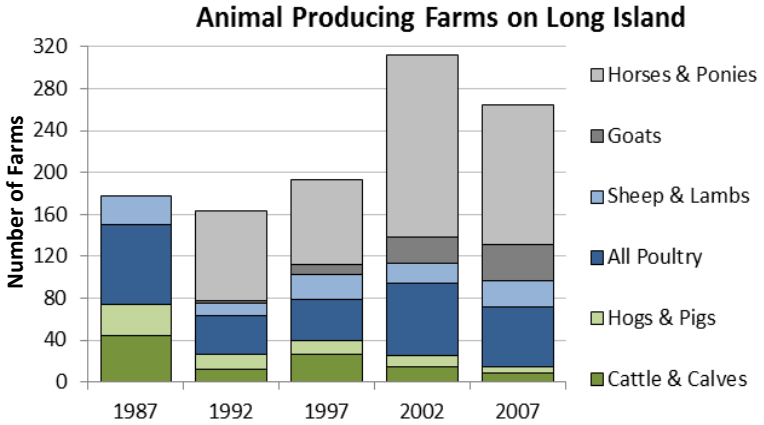
Due to lack of data on acres in orchards, it was impossible to determine longitudinal changes in the percentage of farmland acres in Nassau County growing produce.

Farm revenue by crop

A unique combination of climate and topography allows Long Island farmers to harvest a broad array of crops, with nursery yields, such as floriculture and sod, dominating production. With the exception of pine trees, grains, and hay, all other crops produced on Long Island show a positive trend. From 1987 to 2007, the inflation-adjusted value for vegetables, melons, potatoes, and sweet potatoes increased 12%, while the value for fruit, tree nuts, and berries increased by almost 171% island-wide. Nursery crops such as floriculture and sod increased over 54% during the same time period and were valued at approximately $194,305,000 in 2007. The value of nursery crops produced in 2007 was significant to Long Island's agricultural industry, representing more than 50% of the revenue from nursery crops value produced in the state, up from over 40% in 1987.



Source: United States Department of Agriculture, NASS Census of Agriculture. Values are adjusted for inflation to 2007 dollars.



Source: United States Department of Agriculture, NASS Census of Agriculture.

Farm animals produced

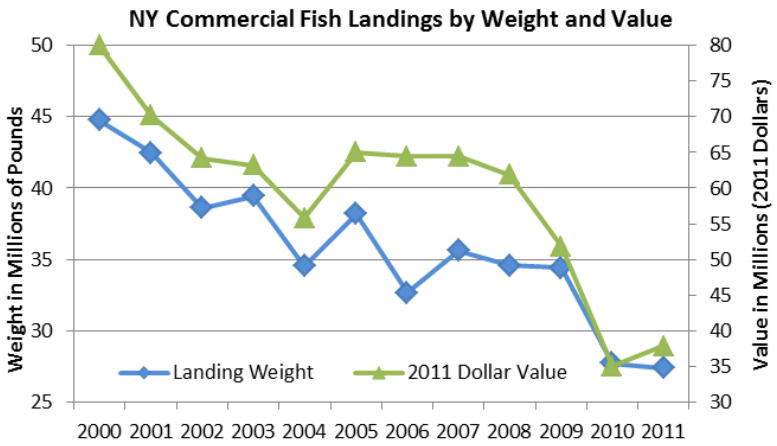
Animal production has been an important component of farming on Long Island, including duck and poultry farming. Dating back to the 1850s, Suffolk County was a leading producer of ducks. Throughout the 20th Century, duck farming on Long Island abounded, peaking in the 1940s-1960s when the region produced approximately two-thirds of the duck consumed in the nation, and making the industry as vital to the state economy as commercial fishing.[6] However, the growth in duck farms eventually resulted in coastal water pollution and an increase in regulations which, along with rising property values and suburbanization, shut down much of the industry. In 2010, only two duck farms remained on Long Island, yet Suffolk County still leads the state in duck production, producing roughly 10% of the nation's duck meat.[7] In 2007, Suffolk County ranked fifth in New York State in poultry.

Other farm animal production on Long Island is mixed, with some animal production appearing to be phased out in preference of others. From 1987 to 2007, the number of farms producing cattle and calves decreased by nearly 91%, with only one farm in Nassau and seven farms in Suffolk remaining in 2007. During the same timeframe, the number of farms producing hogs and pigs dropped by nearly 78%, with one farm in Nassau and six farms in Suffolk remaining. Poultry farms shrank by over 52%, leaving six farms in Nassau and 51 farms in Suffolk. The number of farms producing sheep and lambs remained relatively flat during the same time period, with one farm in Nassau and 24 farms in Suffolk. In the same timeframe, the number of farms raising horses and ponies increased by nearly 156%, rising to 26 farms in Nassau and 108 farms in Suffolk, while the number of farms producing goats skyrocketed in 2007 to more than 11 times the number in 1992, with five farms in Nassau and 29 farms in Suffolk.

Aquaculture and fishery production

In addition to standard agricultural products, Long Island also benefits from a sizeable aquaculture industry. The market value of Long Island's aquaculture (fish farms, crustaceans, mollusks, and aquatic plants, in general) appears to have remained steady for the most part, showing only a 1.4% decline between 2002 and 2007 sales. However, after adjusting for inflation, the market value of Long Island's aquaculture actually declined by 14.5%. The 2007 market value reported by the US Census of Agriculture was for Suffolk County only, and was recorded at over $7.6 million.

Commercial fishing remains an important driver of our local economy. In 2010, New York State ocean fisheries landed almost 28 million pounds of fin fish, shellfish and crustaceans with a value of $35 million. Approximately 99% of New York State landings took place in Nassau and Suffolk Counties, with the greatest weight and dollar value landed in Montauk. Even as Long Island contributes significantly to New York's fishing/seafood industries, the last ten years show an overall negative trend in landings, with dollar values falling 44.3% and weight falling 38% from 2000 to 2011.

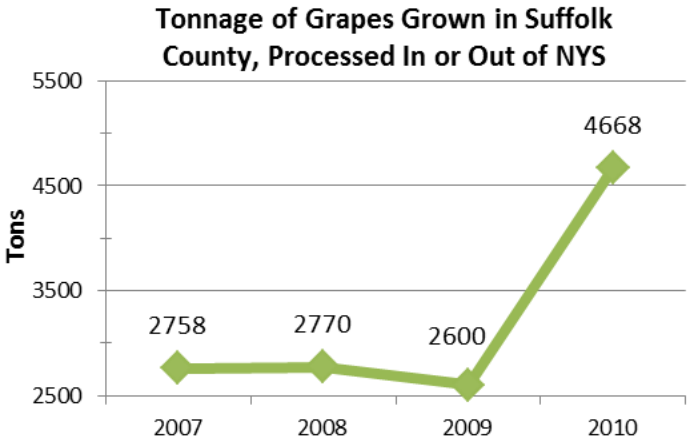


Source: National Marine Fisheries Service, NOAA

It should be noted that an initiative headed by Cornell Cooperative Extension to expand bay scallop restoration efforts, included in the Long Island Regional Economic Development Council's (LIREDC) plan for the region, received funding through Empire State Development and Governor Cuomo in 2012.

Farms offering agricultural tourism

Agricultural tourism or agritourism includes a range of farm-based activities, like tours, roadside stands, wineries, u-pick activities, and pumpkin patches, conducted for the enjoyment and education of visitors. Agricultural tourism provides farm operators with opportunities for diversification and profit, promotes economic development and helps educate the public about the important contributions of agriculture to the region's economy and quality of life. In addition, agritourism may enhance the appeal of and demand for local products, foster regional marketing efforts and create value-added and direct-marketing opportunities to stimulate economic activity and spread the benefits to various communities in the region.



Source: United States Department of Agriculture, NASS Fruit Report

Data on agritourism were first collected in 2002. At that time, Nassau County had only one farm that promoted agricultural tourism, while Suffolk County had ten. The value of agritourism was not reported for Nassau County in 2002, but for Suffolk agritourism produced approximately $18,000 in economic benefit. By 2007 no farms in Nassau County engaged in agritourism, but the number of farms in Suffolk County offering agritourism had more than tripled to 32 farms, generating over $798,000 for the region.

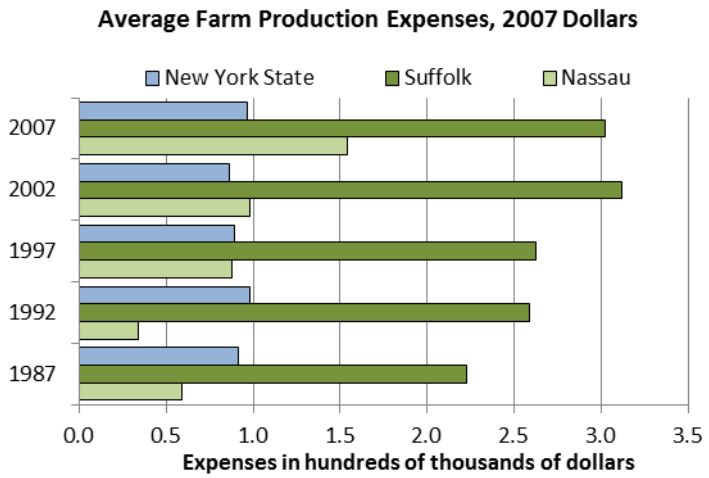
Wineries are among the most prominent agritourism ventures on Long Island, attracting 1.2 million visitors annually. Suffolk County ranks third in the state in grape production and has seen significant growth in recent years, producing 4,668 tons of grapes in 2010.

Farm production expenditures

There are a wide variety of expenditures involved in farm production. For the purposes of this indicator, the expenses that are being examined fall into one of three categories: those with a potential environmental impact, utilities and property taxes, and the cost for new or replacement seeds, plants, trees, and vines. Other significant expenses that factor into farm business and profitability include capital expenses such as equipment, and wages.

Expenditures with potential environmental impacts include fertilizers used for replenishing nutrients in soils, chemicals used as pesticides, herbicides and fungicides to control pests and weeds, and petroleum products such as gasoline, fuels or oils to power farm equipment. The cost of fertilizers for Long Island farms, when adjusted for inflation in 2007 dollars, decreased by 11.7% between 1987 and 2007. The cost for chemicals, in 2007 dollars, also fell by 11.1% in the same timeframe.

Two expenses that have risen dramatically and impacted farms in Nassau County are property taxes and utility costs. After adjusting for inflation, utility costs rose 548% between 1987 and 2007. Property taxes on farms reached their highest point in 1997, when they increased 538% from 1987 rates. Since then, taxes have declined somewhat, but are still more than double the 1987 rate. From 1987-2007, prices for fuels and gasoline increased 97% for Nassau farms, while the cost of new seeds, plants, trees, and vines rose by over 363%.



Source: United States Department of Agriculture, NASS Census of Agriculture

In Suffolk County, property taxes increased by 118.7% between 1987 and 2007, while utility costs rose by over 225% in the same time period. Gasoline and fuel expenditures rose by over 208% from 1987 to 2007, but by far the largest expenditure increase was for seeds, plants, trees, and vines, which soared over 312% in the same period. Fertilizer and chemical expenditures grew at nearly the same rate, 63.2% and 62.8% respectively, between 1987 and 2007.

Farms and Preservation

Indicator Background

From 1982 to 2007, the United States converted more than 14 million acres of prime farmland to development. While the rate of conversion has slowed in recent years, 4 million acres were lost between 2002 and 2007. On Long Island, the increased value of land for development has also resulted in a decline in farmland. In response, local counties, towns, and not-for-profits have spearheaded a range of conservation initiatives to preserve undeveloped land both for farming and open space. Retaining active farmland is a vital part of keeping agriculture economically viable on Long Island.

The Nassau County Environmental Bond Acts of 2004 and 2006 calls for the preservation of 400 acres of open space, some of which is farmland. To date, the $150 million program has preserved more than 230 acres of open space both inside and outside of the County's Special Groundwater Protection Area (SGPA), including several farms, a few of which are being cultivated.[8] Organizations like the Nassau Land Trust and The Nature Conservancy partner with Nassau County to preserve farmland, such as the Crossroads Farm at Grossman's. A 10-year action plan developed by Long Island's "Last Stand," a coalition of environmental, civic and business associations, calls for renewed commitment to save the most significant remaining open spaces and farmland and to restore and protect harbors, bays and public parklands.[9]

This indicator looks at the current number of farms and acreage of active farmland. It also tracks the extent of farmland preservation efforts. Data for this indicator comes from the US Census of Agriculture.

Acreage, number, and size of farms over time

Long Island's farmlands have changed dramatically over time as the area has transformed from a largely rural to a primarily suburban setting. In 1920, Long Island had a total of 3,441 farms, with 71% located in Suffolk County. By 1950, at the start of the post-war suburban development boom, the number of farms stood at 2,805, with 88% located in Suffolk County. By 2007, 644 farms were left in the region (with 91% in Suffolk), a decline of 81% since 1920. In terms of farmland, the acreage distribution by county is similarly stark. In 2007, just 3.6% of Long Island's 35,692 acres of farmland were located in Nassau County.

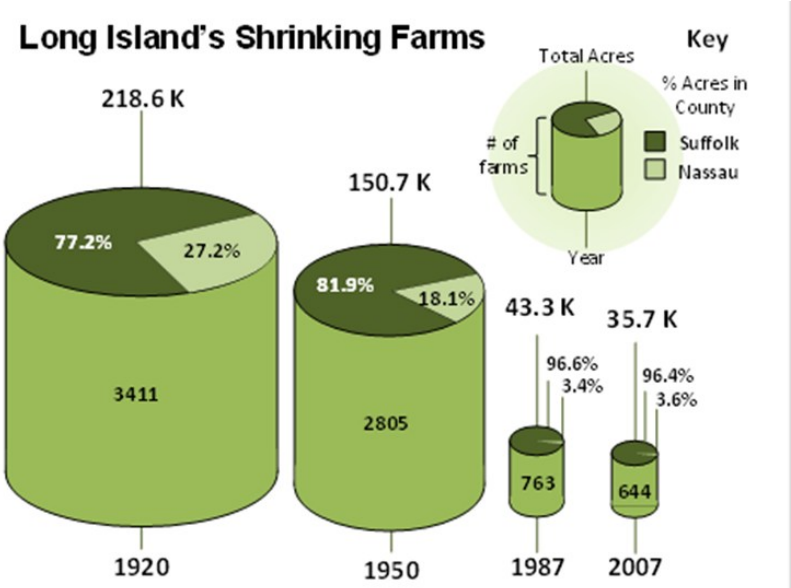
As the number of farms has decreased, so too has their size. Farms smaller than 50 acres in size represent over 75% of all farms left on Long Island with more than 55% of farms smaller than 10 acres. In 2007, the median size for farms in Suffolk County was 14 acres, while the median size in Nassau County was only 6 acres; farmland acreage in both counties was significantly less than the New York State median farm size of 95 acres.

Farmland preservation

Preserving Long Island's farmland has been an uphill battle for conservationists. Issues such as changing zoning regulations, current land use policies, financing, and conflicts with new residential developments have resulted in less farmland being preserved over the last decade than originally anticipated. Suffolk County engages in numerous programs to acquire and preserve land and open space, including a farmland preservation program. Suffolk County was the first county in the nation to implement a purchase of development rights (PDR) program to preserve farmland (1974).[10] In the Suffolk County Farmland PDR program, a landowner transfers or sells the development rights of his/her land for any use, other than agriculture, to the County while maintaining private ownership of the land. This transaction guarantees that the property will be used for only agricultural practices or open space in perpetuity. Other eastern Towns, including Brookhaven, Riverhead, Southampton, and nonprofit organizations are also actively involved in farmland and other types of preservation. Preserving farmland is important as it reduces susceptibility to development pressures and enables farmers and farm owners to continue to operate their farms without worrying about selling the land.

Suffolk County also maintains an agricultural district program - a tax abatement program to relieve active farm areas of property tax burdens for short 8-year cycles, which also affords farms protection under New York State "right-to-farm" laws.[11] Sprawling development continues to put pressure on farmland, particularly as Suffolk County's population grows.

As stipulated by the Suffolk County Agricultural Protection Plan of 1996, the County sought to protect a minimum of 20,000 acres by 2012. As the plan noted, fiscal and temporal challenges to meeting the stated goals were great, but the plan did recommend at the time that at least another 10,000 acres should be preserved. As of 2012, approximately 10,400 acres or 52% of the target goal had been successfully protected, with the vast majority of land preserved located on the East End. The Town of Riverhead has seen the largest share of the County's preservation efforts, accounting for over 56% of all farmland preserved. As farmland diminishes, it becomes harder to protect and preserve; thus as time goes on it becomes more difficult, and more expensive, to achieve the stated goals. In August 2012, Suffolk County was awarded a grant by the New York State Department of Agriculture and Markets to update the County's Agriculture Protection Plan.



Source: United States Department of Agriculture, NASS Census of Agriculture

Nassau County began its farmland preservation efforts in 2004 with a targeted goal of preserving 400 acres by 2016. As of 2010, the County had been able to preserve approximately 300 acres, representing almost 75% of its goal. Over 75% of the farmland preserved was in the Town of Oyster Bay, which is the least urbanized of the three towns and two cities that comprise the County.

Farm Labor and Farmer Diversity

Indicator Background

The composition of farm laborers and operators can provide insight into fairness and diversity in farming as well as the long-term viability of agriculture. Many Long Island farmers, like their national counterparts, rely on migrant workers as a source of labor. However, concerns exist about workplace safety, language barriers, and job insecurity for migrant workers.

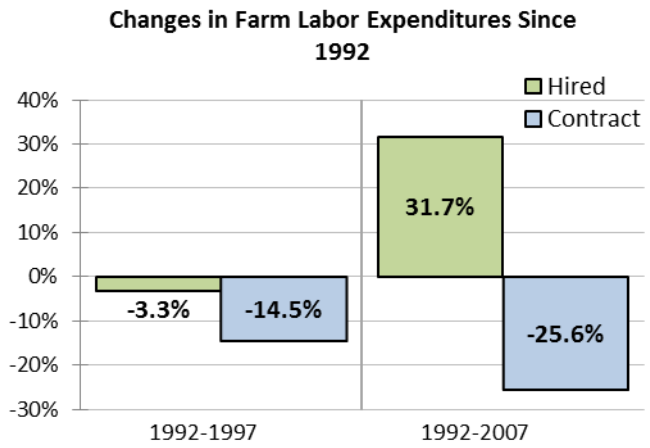
In keeping with national trends, Long Island's farmers are aging. The long-term success of our agricultural system depends on bringing in younger, newer farmers, who are typically more diverse in terms of sex and race/ethnicity. These operators can help to revitalize farming at the same time they better reflect and represent the growing diversity of our region.

This indicator looks at expenditures in hired and contract labor as a proxy for fair wages and working conditions. It also examines trends in farm operator diversity, by sex, age and race/ethnicity. Data for this indicator comes from the USDA Census of Agriculture.

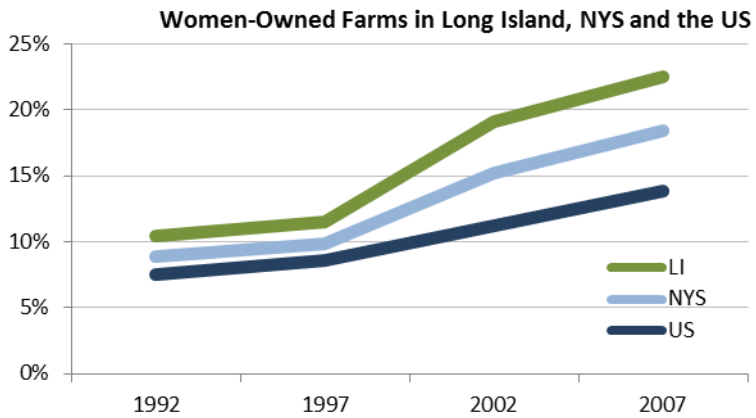
Farm workers employed by farm labor contracts

Some farmworkers are hired to work on farms through middle-men, often called farm labor contractors, who provide a range of services, including transporting, hiring and supervising farmworkers. Even though federal law makes farm operators using contractors jointly responsible for complying with employment standards, operators sometimes use contractors as a way to outsource labor issues and avoid responsibility for fair working conditions and wages.

On Long Island, farms are largely reliant on direct hires rather than on employees obtained through labor contractors. Between 1992 and 1997, overall expenditures for both hired and contracted labor declined. This corresponds with an overall decrease in the number of farms on Long Island. When adjusted for inflation, expenditures for hired labor increased by 31.7% between 1997 and 2007. In the same time period, expenditures for contracted labor decreased by 25.6%. As of 2007, expenditures for hired labor represented 98% of the $68.5 million spent on the labor force on Long Island's farms.



Source: United States Department of Agriculture, NASS Census of Agriculture

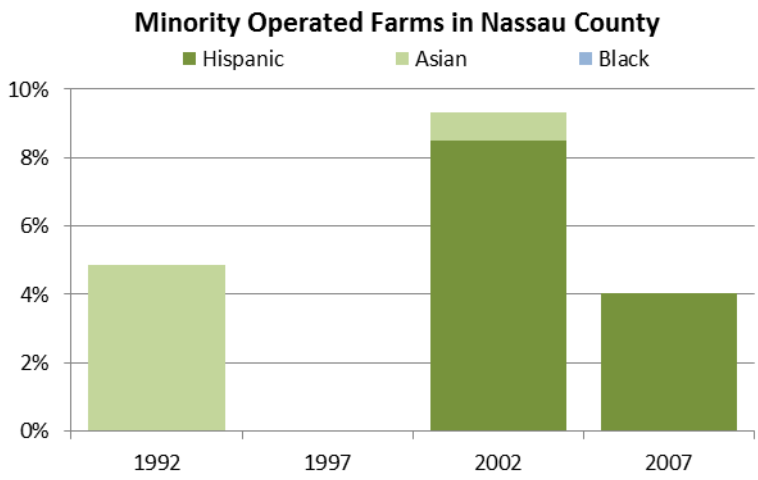


Source: United States Department of Agriculture, NASS Census of Agriculture

Farmer and farm operator diversity

Nationally, a growing number of farms are being operated by women. On Long Island, women historically have operated farms at higher rates than they have in either New York State or the US, although the number of female farm operators has significantly increased in recent years. The number of farms operated by women on Long Island more than doubled between 1992 and 2007, reaching over 22.5% of farms. In contrast 18.4% of farms in the state and 13.9% of farms nationwide were operated by women in 2007. As of 2007, Nassau County had the highest percentage of women-operated farms of the two counties –over one third– slightly more than double the number in 1992.

However, this doubling in the number of women-operated farms in Nassau County did not occur until after 2002, when the percentage was just under 15.4%. Unlike Nassau, the growth of women- operated farms in Suffolk County has been more gradual, representing less than 21.4% of all farms in the county in 2007.

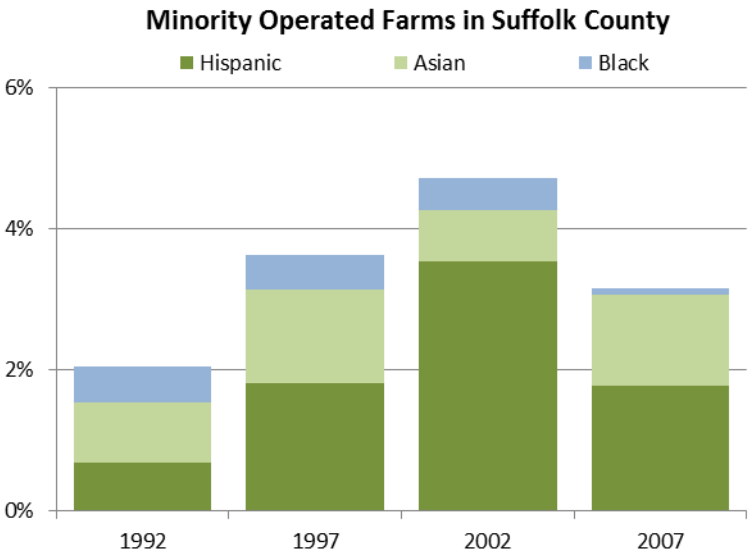


Source: United States Department of Agriculture, NASS Census of Agriculture

Nationwide, fewer young people are choosing farming as a career than in the past. This trend is also occurring statewide and on Long Island. While the average age of farmers decreased between 1997 and 2002, it began to increase in 2007, although at a much slower pace than at the state or national level. The average age of farmers nationwide increased 3.1 years to 57.1 years old between the years 1997 and 2007. In the same timeframe, the average age of farmers in New York State rose 3.3 years to 56.5 years. In Suffolk County, the average age rose 1.1 years to 55.2 years old while in Nassau County, the average age rose 0.6 years to 55.1 years old.

Long Island farm operators are more racially/ethnically diverse than operators in other areas of New York State, although New York has proportionately fewer farms operated by African Americans and Hispanics than do farms nationwide.

In 2007, the percentage of farms operated by people of Hispanic origin in Nassau County was over 4%, more than six times the state rate and almost double the national rate. However, in Suffolk County, Hispanic-operated farms represented 1.78% of all farms, or roughly double the state rate, but less than the national rate. There were no Asian-operated farms in Nassau County, but Asian-operated farms in Suffolk County represented 1.28% of all farms, more than five times the state percentage and more than double the national percentage. The only race/ethnic group that did not exceed the state or national rates in either county was African Americans, who did not operate any farms in Nassau County and operated just 0.1% of farms in Suffolk County, only slightly larger than the state and national's rates.



Source: United States Department of Agriculture, NASS Census of Agriculture

Transformation & Processing Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Food Manufacturing	Diversity of food manufacturing by county and type	⬇	
		Animal slaughtering and processing	⬇	
		Fruit and vegetable preserving and manufacturing	⬅➡	

Food Manufacturing

Indicator Background

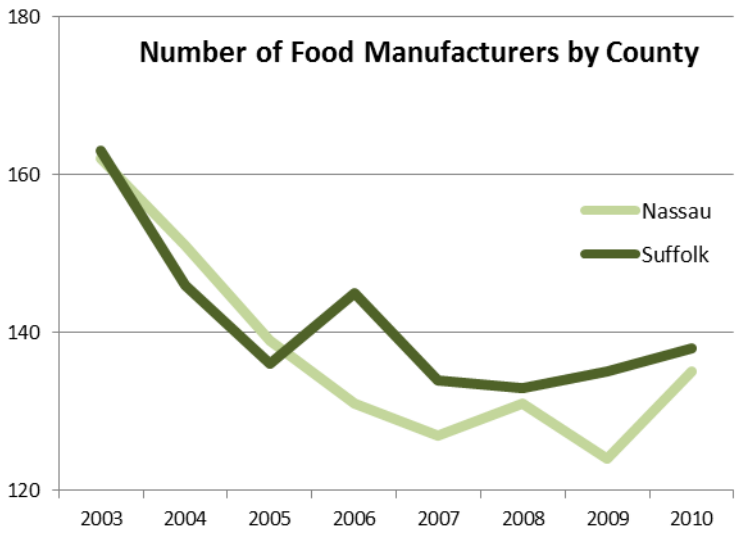
Food transformation or processing involves converting raw agricultural, animal, seafood, or other food sources into products as well as labeling and packaging them for market. A strong processing infrastructure is important to developing the local food economy because it keeps this critical part of the supply chain in the community, generating greater revenue and more jobs. It also increases the likelihood that consumers will be able to access and consume locally produced food.

This indicator examines trends in the size and scale of individual manufacturing categories, as well as manufacturing overall. It also pulls out two categories –animal slaughtering and processing and fruit and vegetable preserving and manufacturing– for closer analysis. Data for this indictor come from the U.S. Census, County Business Patterns, 2010.

Diversity of food manufacturing by county and type

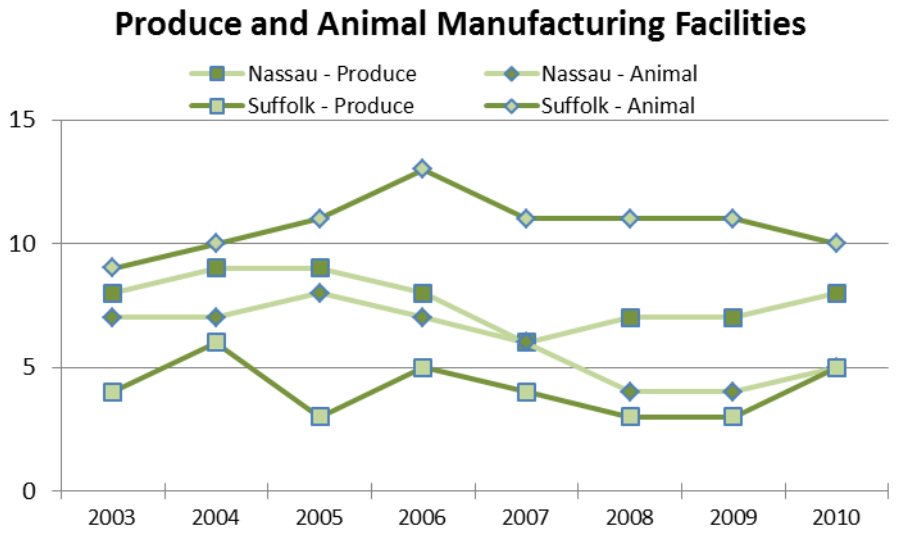
Since 2003, both Nassau and Suffolk Counties have seen some decline in their overall food manufacturing, with some sectors seeing larger declines than others. The number of food manufacturers overall decreased 16.7% percent in Nassau from 2003 to 2010, while the number of food manufacturers overall fell 15.3% in Suffolk County during the same time period. From 2007 to 2010, the number of food manufacturers in Nassau increased by 6.3% while in Suffolk County, it rose 3%. Between 2009 and 2010, the number of manufacturers rose by 8.9% in Nassau and 2.2% in Suffolk, respectively. While this points to a positive trend, the number of food manufacturing establishments throughout Long Island was still lower in 2010 than it was in 2003.

Of all food manufacturing categories, the bakery and tortilla manufacturing category experienced the largest decline in both counties, dropping 23.4% in Nassau and 17% in Suffolk between 2003 and 2010. Interestingly, most of the falloff in bakery and tortilla manufacturing occurred between 2003 and 2007, when manufacturing throughout the other categories had either leveled off or improved. Despite this, bakery and tortilla manufacturing still represents approximately 70% of all the food manufacturing facilities on Long Island.



Source: U.S. Census, County Business Patterns

Only seafood and other manufacturing facilities have seen increases in the number of facilities on Long Island, while the remaining six food manufacturing categories have either remained flat or have declined slightly. The number of seafood manufacturing facilities doubled from 2003 to 2010, with all of the new facilities located in Nassau County. Animal food and dairy products saw the largest decline in the number of facilities between 2003 and 2010, falling 25% and 27.3%, respectively.



Source: U.S. Census, County Business Patterns

Fruit and vegetable preserving and manufacturing

The number of fruit and vegetable preserving and manufacturing facilities rose and fell several times between 2003 and 2010, but ultimately grew slightly more than 8% overall during this time period. This growth may be related to the increase in production of produce that was reported earlier in this report. Still, fruit and vegetable manufacturing is one of only three categories of food manufacturing that has shown an increase in the number of facilities on Long Island.

Animal slaughtering and processing

After seeing a slight increase between 2003 and 2006, the number of animal slaughtering and processing facilities dropped by 25% on Long Island in 2008. From 2008 to 2010, the number of these establishments remained flat. This may be a consequence of an indicator trend reported earlier that showed huge declines in the number of farm animals produced.

Distribution, Marketing & Retail Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Wholesale Market	Food wholesalers	⬇	
Equity	Consumer and Retail Market	Food retailers per 100,000 people	⬅➡	
		Percentage of farms with direct sales	⬆	
		Value of agricultural products sold for human consumption	⬆	

Wholesale Market

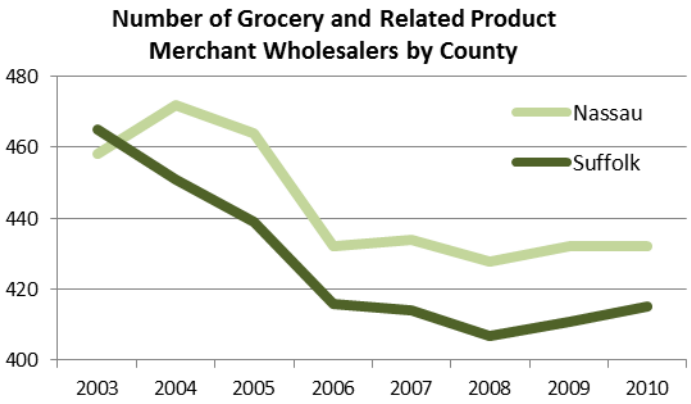
Indicator Background

Food wholesaling involves the storing, assembling, marketing, and transport of food to retailers, food service operators, other wholesalers, and additional types of businesses. Wholesalers typically buy items in bulk from producers or manufacturers and distribute them to retailers for a service fee. Wholesale channels allow retailers and other food-businesses to purchase products at a cost that is less than they would pay dealing with producers/manufacturers directly. The presence of a strong regional wholesale market increases the likelihood that food produced in an area is distributed, sold and consumed locally.

This indicator tracks the number of food wholesalers on Long Island over time. Data for this indicator come from the U.S. Census, County Business Patterns, 2010.

Food wholesalers

Between 2003 and 2010, the number of food wholesalers decreased in Nassau and Suffolk Counties. Over these eight years, Suffolk County lost 10.8% of food wholesale companies, with the largest declines in the poultry, packaged frozen foods, and fish and seafood sectors. In Nassau County, the number of food wholesale companies fell 5.7% over the same period, with the largest declines in the same sectors as Suffolk County.



Source: U.S. Census, County Business Patterns

The drop in the number of establishments was most dramatic during 2006-2008, just as the recession was getting underway. Since then, all sectors have either leveled off or shown a slight increase in number as industries continue to come back to Long Island.

Consumer and Retail Market

Indicator Background

Consumers acquire their food from a number of sources, including directly from farmers, roadside stands, Community Supported Agriculture (CSAs) programs or farmers' markets, as well as from intermediary retailers, such as supermarkets, convenience stores and restaurants. Over the past twenty years, major changes have occurred in the retail food market, as nontraditional grocery retailers, like warehouse clubs and drugstores, have increased their share of sales. At the same time, direct sales from food producers (farmers) to consumers have also increased, rising 104.7% from 1997 to 2007 in the U.S.

Within the consumer/retail market, not all individuals have equal access to safe, affordable and nutritious food. Barriers to food access vary and may include price, personal mobility and geographic distance from retailers. One way to measure possible geographic access challenges involves the ratio between population size and the number of stores in an area. A negative change in the ratio may indicate an increase in access barriers, with more people having to travel greater distances to acquire food.

This indicator examines consumer access to food by assessing rates of grocery stores, convenience stores and supercenters per population over time. It also looks at access and market trends by tracking changes in the number of farms selling directly to consumers as well as the value of agricultural products sold for human consumption. Data for this indicator come from the U.S. Census of Agriculture and Food Environment Atlas.

Food retailers per 100,000 people

Trends in the number of retail food stores per 1,000 county residents vary by county as well as by types of stores. From 2007-2009, the number of grocery stores[12] per 1,000 people rose 1.7% in Nassau and fell 1.6% in Suffolk. As of 2009, Nassau had .42 grocery stores per 1,000 people and Suffolk had .34. The ratio of convenience stores to 1,000 people increased in both counties over the same time period, up 3.9% in Nassau and 10% in Suffolk. As of 2009, Nassau had .29 convenience stores per 1,000 residents and Suffolk had .34.

Growth in the number of supercenter stores per 1,000 residents was slightly negative in Nassau (-.32%) and Suffolk (-.44%) between 2007 and 2009. As of 2009, both Nassau and Suffolk had .01 supercenter stores per 1,000 residents. This development runs counter to trends at the national level.

As of 2011, the number of farmers' markets per 1,000 persons was lower in Nassau (.001) and Suffolk (.001) than statewide (.003). As reliable data for previous years are unavailable at the county level, it is impossible at this time to determine any trends for this indicator.

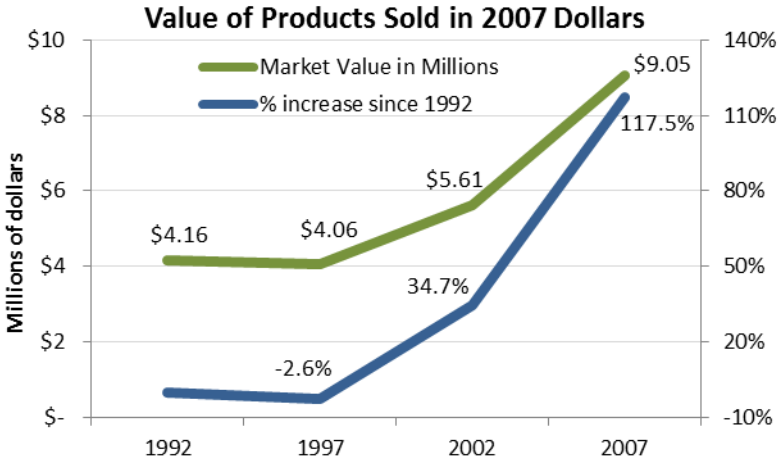
Percentage of farms with direct sales

This indicator represents the value of agricultural products produced and sold directly to consumers from retail establishments like roadside stands, farmers' markets, and pick-your-own sites. The benefits of direct sales are that farmers can generally sell their products for more than wholesale prices, while customers can purchase them at or below general retail prices.

Since data were first collected in 1992, the number of farms with direct sales has decreased in Nassau County while it has increased in Suffolk County. From 1992 to 2007, the percentage of farms in Nassau with direct sales declined from 12.9% to less than 8.5%. In Suffolk County, the percentage of farms with direct sales increased from 15.84% in 1992 to almost 19% in 2007. However, the percentage of farms in Suffolk County offering direct sales declined by 0.1% from 2002 to 2007, reflecting a small fall from the record high.

Value of agricultural products sold for human consumption

Since 1992, the value of direct sales of products for human consumption has decreased in Nassau while it has increased in Suffolk. As of 2007, only five farms or roughly 8.5% of farms in Nassau County reported direct sales, down from eight farms in 1992. The last year data were disclosed for the value of products sold directly for human consumption in Nassau County was 1997, with a reported value of $154,000. In Suffolk County, 111 farms or nearly 19% of farms in the County reported direct sales of products for human consumption in 2007, up from 93 farms in 1992 and the market value of products sold was reported at over $9 million.



Source: United States Department of Agriculture, NASS Census of Agriculture

Food Access & Consumption Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Expenditures and Purchasing Power	Average annual food expenditure per consumer unit	↓	
		Food expenditures, Home vs. Away from Home	↓	
		Value of SNAP/EBT purchases and access at farmers markets	↑	
Equity	Food Insecurity and Public Health	Population as food insecure and SNAP eligibility	↓	
		Percentage of children anemic or underweight	↔	
		Percentage of population that is diabetic	↓	
		Emergency food programs and pounds of food rescued	↔	
		Adults eating 5+ servings of fruit & vegetables per day	↔	

Expenditures and Purchasing Power

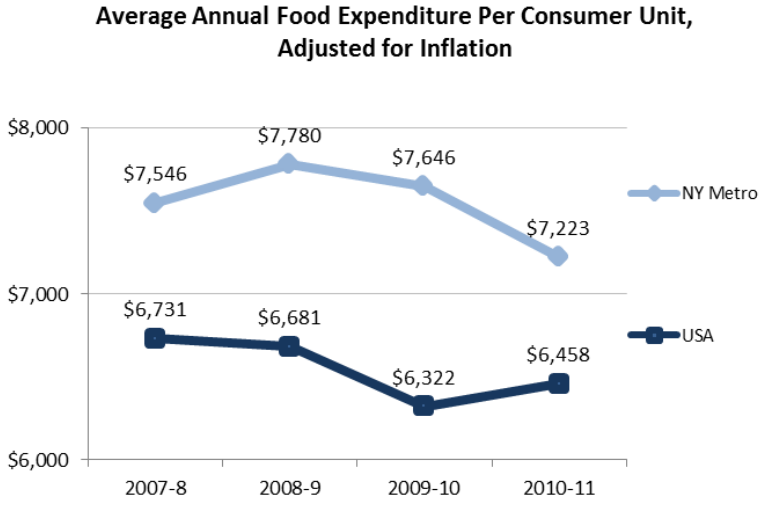
Indicator Background

Expenditure patterns are important because they reflect fiscal well-being for consumers as well as the greater economy. The Great Recession and the continued economic downturn have significantly impacted household purchasing power, as incomes have stagnated or declined and prices, for some items like food, have risen. Due to economic pressures, households may cut back on the amount spent on food. This shift has particular significance for lower-income households, who spend a greater percentage of their income on food and may be forced to make difficult budgetary tradeoffs in order to eat. Households may also need to reduce expenditures on all or certain food products in order to meet other monthly expenses, putting members at increased risk for food insecurity.

This indicator tracks consumer spending on food over time to show trends in purchasing power. It also explores patterns in Supplemental Nutrition Assistance Program (SNAP) sales at farmers markets. Data for this indicator come from the Bureau of Labor Statistics, Consumer Expenditure Survey and the Farmers' Market Federation of New York.

Average annual food expenditure per consumer unit

According to the Consumer Expenditure Survey, average annual food expenditures per household residents in the New York Metro Area, which includes Long Island, declined slightly, just 0.6%, between 2007 to 2008 and 2010 to 2011.



Source: Bureau of Labor Statistics, Consumer Expenditure Survey
Consumer Unit equals 2.5 people in all years except 2009-2010 when it is 2.6.

However, when adjusting for inflation, average annual household expenditures on food in the New York Metro region fell 2.3% from $7,546 in 2007 to 2008 to $7,371 in 2010 to 2011. This drop is smaller than the decline in expenditure nationally over the same time period (4.1%). By contrast, annual food price inflation, as measured by the Consumer Price Index, rose 5.5% in 2008, 1.8% in 2009 and 0.8% in 2010. For 2007 to 2008, New York Metro food expenditures made up roughly 12% of all annual household expenses. This rose to 13% in 2008 to 2009, at the height of the recession, and remained at this level through 2010 to 2011.

Food expenditures, Home vs. Away from Home

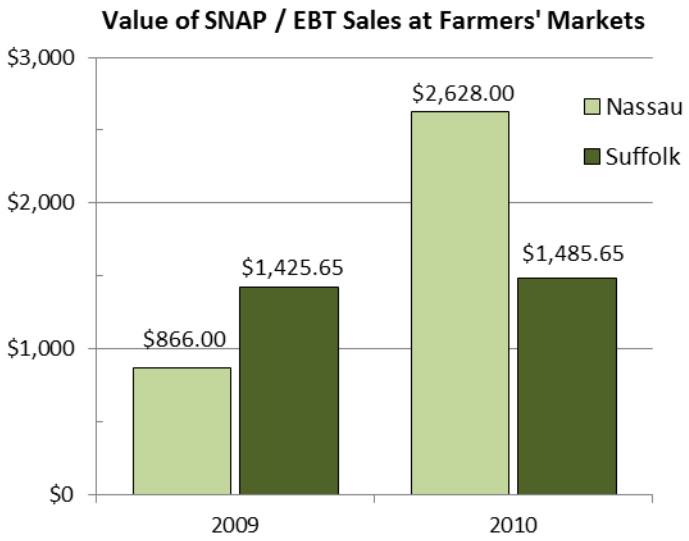
The amount spent on food at home and away from home per household has changed over the course of the economic downturn. Households are cutting back on the number of meals eaten out at restaurants and other venues while increasing food bought at the grocery store to eat at home.[13]

Whereas a household in the New York Metropolitan region spent an average of 53% of their food budget on groceries in 2007 to 2008, it spent 57% in 2010 to 2011. This percentage was smaller than the percentage spent on groceries per household at the national level in 2010 to 2011 (59.4%). The proportion of the food budget spent on certain food groups has also changed slightly. Compared to 2007 to 2008, households in 2010 to 2011 spent a greater percentage of their food budget on fruits, vegetables and meat. However, they spent less on dairy. Expenditures for staples like bread and cereal remained stable.

Value of SNAP/EBT purchases and access at farmers markets

Farmers markets are increasingly important consumer sources for locally gown, healthful food. However, several barriers, including product prices, make markets less accessible to lower-income eaters.

To address this issue, a growing number of farmers markets are accepting Supplemental Nutrition Assistance Program (SNAP) benefits as payment for food. Typically, farmers' markets use a central point of sale Electronic Benefits Transfer (EBT) terminal to process preloaded benefit cards and sell scrip to customers to use throughout the market. On Long Island, growth in farmers' market revenue varies by county. In Nassau County, value from SNAP sales increased 203.5% between 2009 and 2010, from $866 to $2,628. The increase in SNAP sales was less dramatic in Suffolk County, which has historically had higher SNAP/EBT redemption rates than Nassau County, rising just 4.2% from $1,425 in 2009 to $1,485 in 2010. In 2009, Suffolk County accounted for nearly 62% of total SNAP/EBT redemptions at farmers' markets on Long Island, but in 2010, it made up just 36% of all redemptions with Nassau's sales exceeding Suffolk's by nearly two-thirds. These numbers comprise a very small portion of the $26.5 million in SNAP benefits distributed to recipients each month. SNAP dollars remain a virtually untapped source for revenue which could potentially help farmers markets grow and vendors prosper.



Source: Farmers' Market Federation of New York

Food Insecurity and Public Health

Indicator Background

For a food system to be sustainable, it must meet the food needs of its entire population. Food needs vary, depending on cultural conditions and the make-up of a local population. However, there are basic guidelines to the "right to food" which have been articulated by international bodies, like the United Nations. In sum, the right to food is respected when food is available (from the land or in shops), economically and physically accessible and adequate in terms of nutrition, safety and cultural relevancy. When these conditions are present, they create an environment in which people are empowered to feed themselves in dignity and without worry. In addition, they contribute to health, which may be conceived as a complete state of physical, emotional and social well-being.

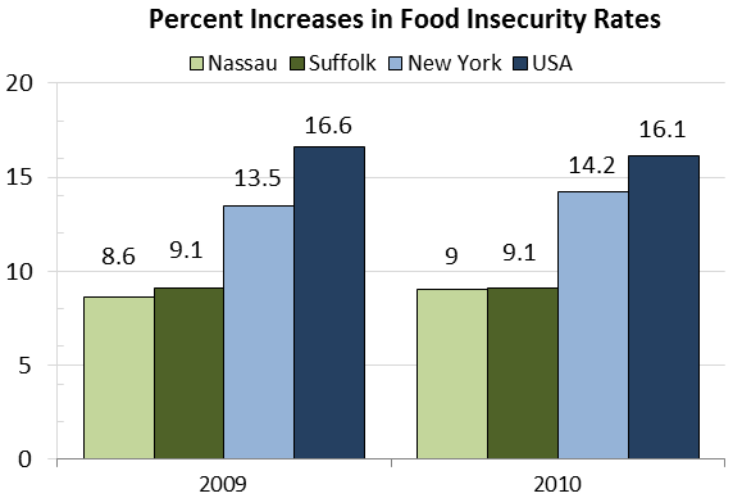
Much research suggests that overall poorer physical health is associated with low-income/food insecure Americans, although the complex pathways by which this occurs are not fully understood (but stress/poor mental health is thought to play a significant role).[14] Another factor includes inconsistency in diet, including irregular access to produce and grains, resulting in greater risk for diabetes, heart conditions and other ailments.

This indicator tracks degrees of food insecurity, dietary patterns, as well as health impacts, potentially related to nutrition. In so doing, it monitors changes in food-related behavior and health outcomes, in the context of the current economic downturn. Data for this indicator come from a range of sources including the New York State Office of Temporary and Disability Assistance, the not-for-profit Feeding America, the 2010 U.S. Census, and the Centers for Disease Control (CDC).

Population as food insecure and SNAP enrollment

The federal government defines food insecurity as "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways." Food insecurity typically increases during times of economic hardship. Other conditions that also contribute to food insecurity are high housing costs, low wages, underemployment and unemployment, conditions which are found throughout Long Island. When household resources are not able to cover the cost of living, many people must make a decision between paying housing or other costs and buying (enough) food.

A recent study by Feeding America's "Map the Meal Gap, 2011," which measures the distance between household food budgets and the actual cost of meeting nutrition needs, suggests that food insecurity continues to slowly rise throughout Long Island. From 2009 to 2010, the percentage of the population that was considered food insecure in Nassau County rose to 9.0% of the population, whereas in Suffolk County it remained flat at 9.1%, representing roughly 254,000 people in total for 2010. Food insecurity rates for children were higher than rates for adults in 2010, when 13.6% of children in Nassau and 15.1% of children in Suffolk experienced food insecurity.



Source: Feeding America, "Map the Meal Gap"

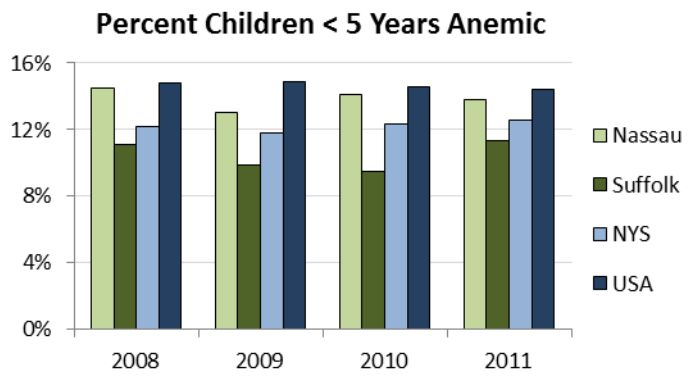
Feeding America further identified food insecurity across the income spectrum, noting that approximately 61% of the region's food insecure households make above 185% of the federal poverty level or more than $40,348 for a family of four, approximately double the national average.

Another measure is to assess food insecurity involves tracking the number of people enrolled in the Supplemental Nutrition Assistance Program (SNAP). Under SNAP, the federal government provides eligible low-income households an electronic benefit card they can use to buy food at authorized food markets. The number of people receiving SNAP in an area highlights economic need and also shows how successfully people are accessing food assistance programs. Eligibility for SNAP is based on a range of financial and non-financial factors, including immigration status, age and household composition. In terms of income, households must not earn more than 130% of the federal poverty line (FPL) in gross income or 100% of the federal poverty line in net income in order to qualify for the program.[15]

On Long Island, SNAP enrollment has increased dramatically in recent years. Between October 2008 and October 2011, SNAP enrollment rose 116% in Nassau and 168% in Suffolk. Today, approximately 181,704 people on Long Island receive SNAP benefits. This growth in enrollment on Long Island mirrors state and national trends.

Percentage of children anemic or underweight

Food insecurity puts children at greater risk for risk for dietary deficits and under-nutrition, which can potentially impact physical health, cognitive development and the ability to concentrate and learn at school. Two common measures of nutritional status are anemia and underweight.

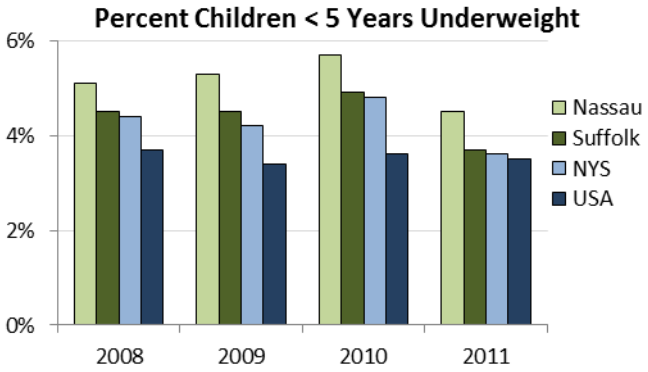


Source: CDC. Note: Based on 1998 CDC MMWR, "Recommendations to Prevent and Control Iron Deficiency in the United States" altitude adjusted, children 6 months of age and older included in the analysis. Includes low Hb, low Hct and low Hb/Hct.

Anemia is a condition which results from a lack of enough red blood cells to carry the required amount of oxygen to body tissues. Anemia is an indicator of iron deficiency in children, the most common micronutrient deficiency. Underweight is also known as wasting or thinness and may be a sign of malnutrition.

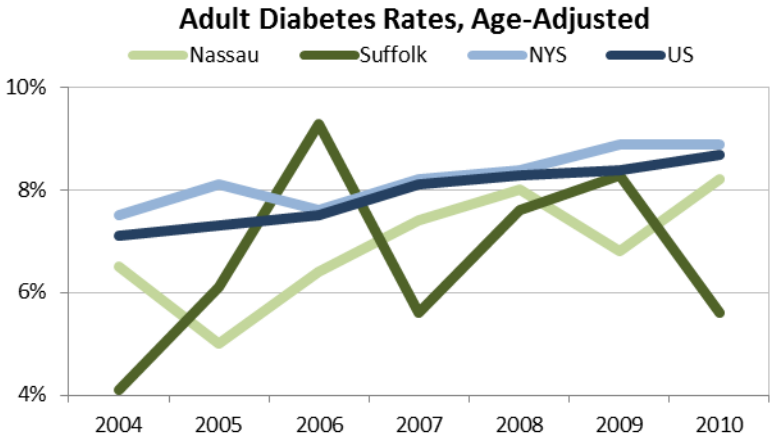
The CDC's Pediatric Nutrition Surveillance System (PedNSS) provides trend-related data on nutrition-related indicators for children enrolled in federal child health and nutrition programs. In New York, PedNSS data are drawn from infants and children participating in the Special Supplemental Program for Women, Infants and Children.

From 2008-2011, the percentage of children with anemia declined from 14.5% to 13.8% in Nassau and increased from 11.1% to 11.3% in Suffolk; however, there was a significant degree of fluctuation in percentages during these years. In 2011, the percentage of children with anemia was greater in Nassau (13.8%) than at the state level (12.6%); In Suffolk, it was smaller (11.3%) than at the state level. Rates of anemia were lower in both Nassau and Suffolk than nationally.



Source: CDC. Note: Based on 2000 CDC growth chart percentiles for children 2 years of age and older; underweight is defined as BMI-for-age < 5th percentile.

From 2008-2011, underweight percentages declined from 5.1% to 4.5% in Nassau; however, the rate increased from 2008 to 2010, making the drop in 2011 difficult to interpret, as it may be a single year outlier in an overall negative trend. In Suffolk, rates also decreased, from 4.5% in 2008 to 3.7% in 2011. Both Nassau and Suffolk had higher percentages of children underweight for all years compared to New York and the nation.



Source: BRFSS, CDC

<u>Percentage of population that is diabetic</u>

Diabetes is caused by the inability of the body to metabolize glucose, resulting in high blood glucose levels. There are four types of diabetes: Type 1 diabetes, Type 2 diabetes, gestational diabetes, and diabetes secondary to other conditions. Type 2 is the most common form of diabetes and is more prevalent in African Americans, Latinos, Native Americans, Asian Americans, and the elderly. Unlike Type 1 diabetes, which is the result of genetics and autoimmune condition, type 2 diabetes can be prevented and managed through diet and exercise.

On Long Island, the age-adjusted adult diabetes rate has increased in both Nassau and Suffolk. From 2004-2010 the rate rose 26.2% in Nassau and 36.6% in Suffolk, although rates varied during the intervening years. As of 2010, the adult diabetes rate was 8.2% in Nassau and 5.6% in Suffolk. Rates in both counties were lower than the state or national level.

Emergency food program and pounds of food rescued

Once every three to four years, the two largest emergency food organizations on Long Island –Long Island Cares and Island Harvest– participate as network members in a hunger survey conducted by the national not-for-profit, Feeding America. Based on data from Hunger in America 2010, more than 280,000 Long Islanders received emergency hunger-relief services from Island Harvest and Long Island Cares through soup kitchens, food pantries and other sources, an increase of 21% in the number of clients since the Hunger in America 2006 report.

In terms of demographics, the study found that 63% of clients seeking emergency food assistance were members of households living below the federal poverty line, with 48% of households having at least one employed adult. Children made up 39% of the members of households served by Island Harvest and Long Island Cares. Approximately 4% of the members in client households were elderly.

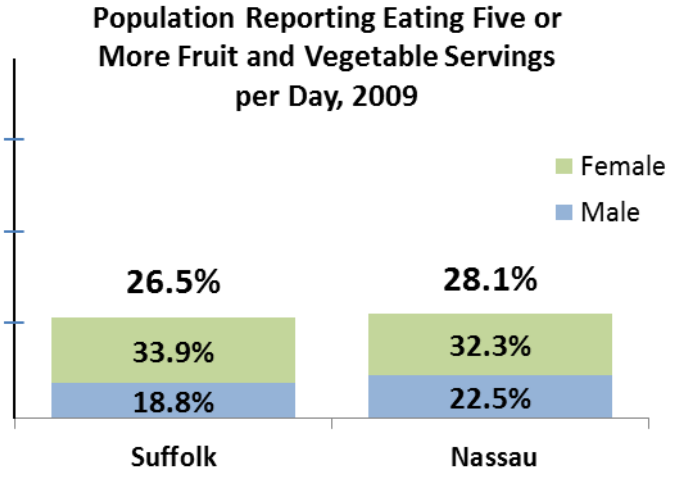
While these data are instructive, Hunger in America does not look at client demand and demographics at sites which are not members of the Feeding America network. As a result, data are missing from small non-affiliated agencies as well as larger organizations, like the soup kitchen "Interfaith Nutrition Network" (The INN). Consequently, the numbers of emergency food clients on Long Island are likely undercounted.

While the primary aim of emergency food organizations is to address food insecurity, many also engage in food rescue to achieve this goal. In our region, Island Harvest operates according to this model, collecting surplus food from a range of area businesses –restaurants, food retailers, distributors and manufacturers– that would otherwise be disposed of as municipal waste, lessening the impact on the environment.

A review of program data indicates that the pounds of food collected and distributed by Island Harvest have grown over time. In 2006, Island Harvest reported that it had rescued over 7 million pounds of food on Long Island. By 2010, the organization reported collecting and distributing over 8 million pounds of unused food. Other local organizations engaged in food rescue include Rock and Wrap It Up and Food Not Bombs.

Adults eating 5+ servings of fruit & vegetables per day

Diets with higher intakes of vegetables and fruits have been associated with a variety of health benefits, including decreased risk for heart disease, diabetes and some types of cancers. With this in mind, the USDA's Food Guide Pyramid recommends 2-4 servings of fruit and 3-5 servings of vegetables each day or a minimum of 5 or more servings daily.[16]



Source: BRFSS, CDC

On Long Island, patterns of fruit and vegetable consumption vary by county. Between 2003 and 2009, the percentage of adults who reported consuming five or more servings of fruits or vegetables per day increased 15.8% in Nassau and decreased 7.3% in Suffolk. Consumption rates increased at the state and national level during the same time period. As of 2009, 27.1% of Nassau adults and 28% of Suffolk adults ate five or more servings of fruits and vegetables per day, a proportion greater than at the state or national levels.

In terms of gender, women reported eating more daily servings of fruits and vegetables than men in both counties in 2009. The data also show a relationship between higher education levels and increased fruit and vegetable consumption (although education may be acting as a proxy for income level). In Suffolk County, 30.9% of individuals with a college degree ate five servings of fruits and vegetables per day compared to 19% of individuals with a high school degree or less. Results in Suffolk County were even starker, with 33.1% of college graduates eating five serving per day versus 15.9% of individual with a high school degree or less.

Waste Management Sector				
Domains	Categories	Indicators	Trends	Needs
Economic	Waste Alternatives	Composting and alternatives to incineration	NA	
		Recycling as a percentage of municipal solid waste	⬇	
Environ-ment	Negative Impacts and Tracking Waste	Water quality of rivers, lakes, and estuaries	NA	
		Drinking water quality	NA	
		Municipal solid waste transported or incinerated	NA	

Waste Alternatives

Indicator Background

Composting and recycling are environmentally and economically advantageous alternatives to traditional waste disposal means like incineration/landfills.

Composting involves the decomposing and recycling of organic matter (e.g. yard trimmings, food wastes, manures) into a substance that can be used to fertilize and condition soil. In addition to its ecological benefits, like soil enrichment and clean-up, composting is financially beneficial for consumers, farmers and the wider economy. Composting yields economic returns by reducing the need for pesticides and fertilizers, creating a market for local compost producers and eliminating landfill disposal costs.

Recycling is the process of collecting, sorting, and turning solid waste into new products. Like composting, recycling offers environmental benefits by increasing energy efficiency, diminishing greenhouse gas emissions and preserving natural resources. From an economic standpoint, recycling minimizes energy and disposal costs.

This indicator explores rates of composting and recycling for Long Island municipalities. Data for this indicator come from *Recycling on Long Island 2009 – A Report on Municipal Programs in Nassau and Suffolk Counties* produced by the Waste Reduction and Management Institute at Stony Brook University.

Composting and alternatives to landfills/incineration

The report considers a number of indicators, including composting activities in 13 of the 15 municipalities on Long Island in tonnage collected and in pounds generated per person per day by municipality. The report does not specify composting rates for the Town of Riverhead or the City of Long Beach. In addition, it does not indicate any trends and previous reports did not specifically capture composting rates.

Composting Rates on Long Island - 2009				
Municipality	Tons	Ranking	PPD*	Ranking
Hempstead	66,602	1	0.52	10
Islip	48,695	2	0.79	7
Brookhaven	45,748	3	0.51	11
Southampton	26,310	4	2.4	1
Smithtown	25,617	5	1.17	5
Babylon	23,956	6	0.6	8
Huntington	21,245	7	0.57	9
North Hempstead	16,576	8	0.4	12
Southold	8,527	9	2.02	2
Oyster Bay	6,018	10	0.11	13
East Hampton	5,523	11	1.39	4
Glen Cove	5,018	12	0.99	6
Shelter Island	807	13	1.74	3
Riverhead	0	14	0.0	14
Long Beach	0	15	0.0	15
*PPD- Pounds Per Person Per Day				

Source: The Waste Reduction and Management Institute,

In general, East End towns had higher rates of composting activities. Only five of the thirteen municipalities recorded composting rates in excess of one pound per person per day in 2009, with the Town of South Hampton ranked highest at 2.4 pounds/person/day and 4th in annual tons collected at 26,310 tons per year. The Town of Hempstead reported the highest amount of composting generated at 66,602 tons annually, despite ranking only 10th in amount collected per person per day (0.52 pounds per person per day). The Town of Oyster Bay had one of the lowest composting rates on Long Island, ranking 13th in pounds per person per day reported (0.11 pounds) and collecting only 6,018 tons annually, a tenth of what is generated in Hempstead, ranking 10th overall in tonnage collected.

Negative Impacts and Tracking Waste

Indicator Background

Each food system sector may have negative impacts on water, soil, and air quality, affecting personal health and the food supply. Contaminants such as nitrates and fertilizers used on farms and lawns combined with stormwater runoff, hazardous material spillage, leaching from landfills and saltwater intrusion can affect arable land, air quality and the amount of available potable water. Regarding water quality, water authorities on Long Island are sometimes required to take wells off-line into order to address these contamination problems. Ecological hazards, like the use of non-renewable energy, continue as food is processed, distributed and prepared for consumption while waste disposal strategies, present its own environmental challenges.

This category's indicators examine the effects of food system byproducts on the environment, by assessing water quality and solid waste transportation/incineration, but also stress the need for better data collection methods to truly know the impact waste has on the local food supply. Data for this category comes from *Recycling on Long Island 2009 – A Report on Municipal Programs in Nassau and Suffolk Counties*, the Suffolk County Water Authority and the Bureau of Watershed Assessment and Management, New York State Department of Environmental Conservation.

Water quality of rivers, lakes, and estuaries

The Atlantic Ocean and the Long Island Sound Basin experience considerable stress, due to a combination of factors including the surrounding land's early settlement, urban setting population density, and aging infrastructure. Among the sources that contribute to water quality issues in the basin are: "Municipal and industrial discharges, urban storm runoff, combined and separate sewer overflows, contaminated sediments, oil and hazardous material spills, nonpoint source runoff from a variety of activities, landfill leachate, dredge spoil disposal, ground/surface/saltwater intrusion, and thermal discharges." Of all these sources, urban/stormwater runoff, which transports pollutants to basin waters, has the greatest degree of impact on Long Island's rivers and streams, with the second greatest degree of impact on Long Island's lakes and ponds. State assessments of basin waters found that 35% of rivers, 8% of lakes, and 37% of estuaries were "poor" quality.

Water Quality in the Atlantic Ocean/Long Island Watershed - 2011					
Type	Size	Un-assessed	Good	Satisfactory	Poor
Rivers	522 miles	41%	17%	13%	30%
Lakes	6,728 acres	45%	1%	46%	8%
Estuaries	905,934 acres	0%	12%	52%	37%

Source: Bureau of Watershed Assessment and Management, NYS DEC

Drinking water quality

Great strides have been taken to protect the drinking water quality throughout Long Island. However, because of the various agencies that monitor the water supply and the lack of consistency in reporting, it is difficult to examine trends or conditions that may affect quality.

One dataset that is readily available is from the Suffolk County Water Authority. Based on its Source Water Assessment Program (SWAP) created by the federal Safe Drinking Water Act of 1996, Suffolk County published a report in 2012 to evaluate existing and potential threats to the quality of its public drinking water as prescribed by the New York State Department of Health.

It is important to note that the report only indicates the potential for contamination, reported as susceptibility to contamination, and not actual contamination levels based on the presence of contaminants above ground in source water recharge areas, which have the potential to reach down into the aquifers and enter through with water through well screens. If well water supply is found to be contaminated, Suffolk County withdraws that well from service to ensure that drinking water standards are met. It is also important to note that the numbers reported represent the percentage of wells tested and not the actual number of wells with a particular contamination level.

Municipal solid waste transported or incinerated

According to Stony Brook's Waste Reduction and Management Institute, almost 1.4 million tons or 59% of municipal waste was disposed of through incineration on Long Island in 2009, with another 385,000 tons or 17% of municipal waste transported out of both Nassau and Suffolk Counties. The Town of Oyster Bay transported the most waste of any municipality on Long Island, shipping over 142,000 tons of waste in 2009. The Town of Hempstead lead in both the amount of waste that was incinerated (over 544,000 tons) and recycled (nearly 160,000 tons) on Long Island. It is important to note that as per the report, no two municipalities capture or report municipal solid waste in the same manner, making it difficult to make direct comparisons and requiring the original study to use broad, general terms to identify and categorize municipal solid waste.

Cross-cutting Economic Indicators				
Domains	Categories	Indicators	Trends	Needs
Economic	Food System Jobs	Wages throughout the food system sectors	⬇	
		Total number of food system jobs	⬅➡	

Food System Jobs

Indicator Background

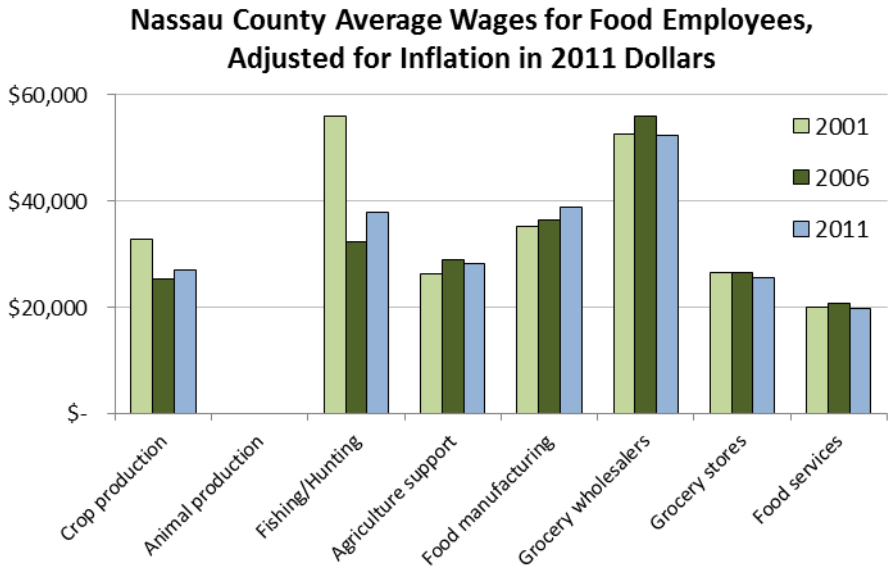
A sustainable food system ensures fair work practices, respect for employees and competitive wages across all sectors of the food system. Providing livable wages, workplace rights and protections benefits not just workers, but impacts the wider economy and the health and safety of the greater community.

Currently, there are approximately 20 million Americans working in the U.S. food system. While there are some higher paying jobs in the food system, many workers, especially those at the bottom of the supply chain, receive less pay than employees in other industries. In many food system jobs, workplace conditions are dangerous. For example, meat packing is one of the most hazardous jobs in the U.S., with more than 10% of workers experiencing job-related illness and injury, twice the rate for all manufacturing jobs. While wages are not perfect proxies for workplace policies and standards, they are generally representative, and may be associated with safety of work practices, availability of benefits or rest/break procedures.

This indicator explores wages throughout the food system as well as the growth in the number and percentage of food system job compared to jobs in all sectors of the economy. Data for this indicator come from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Wages throughout the food system sectors

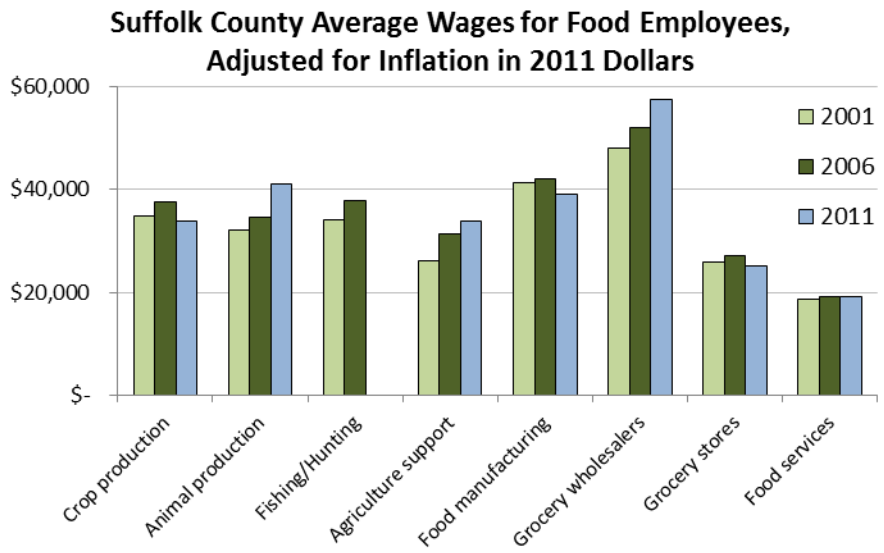
Average wages for food industry employees have not kept pace with average wages for employees in all industries as a whole over the last decade as well as since the Great Recession. While the average salary for employees in all industries combined was $48,403 in 2011, many food system jobs, especially those at the bottom of the supply chain, were well below this figure.



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages
Note: Data are based on 8 categories from the North American Industry Classification System (NAICS): Crop production (NAICS 111), Animal production (112), Fishing/hunting (114), Agricultural support (115), Food manufacturing (311), Grocery Wholesale (4244), Grocery Stores (4451) and Food services and drinking places (722).

Between 2001 and 2011, average wages for food sector employees in Nassau County rose 13.8%, before adjusting for inflation, while average wages for employees in all sectors rose by 30.3%. During the same time period, average wages for food sector employees in Suffolk County rose by 9.8% before adjusting for inflation, while average wages of employees in all sectors rose by 34.8%.

Yet, even as food industry wages increased, their purchasing power for employees actually diminished between 2001 and 2011. In Nassau County, the purchasing power for food sector employees decreased by 10.4%, while the purchasing power for employees in all sectors rose by 2.6%. Likewise in Suffolk County, the purchasing power for food sector employees decreased by 13.5%, while the purchasing power for employees in all sectors rose by 6.1%.

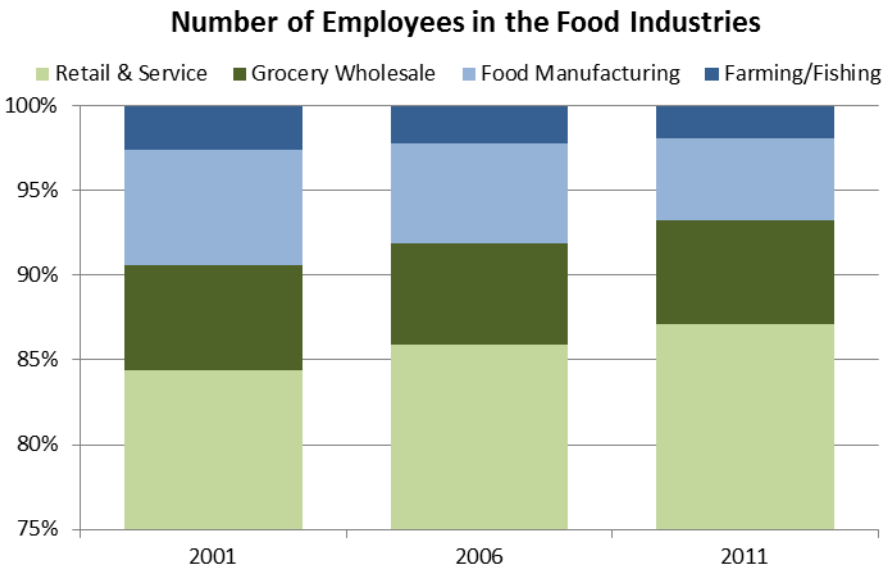


Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages
Note: Data are based on 8 categories from the North American Industry Classification System (NAICS): Crop production (NAICS 111), Animal production (112), Fishing/hunting 114), Agricultural support (115), Food manufacturing (311), Grocery Wholesale (4244), Grocery Stores (4451) and Food services and drinking places (722).

Wages vary among food industry sectors. After adjusting for inflation, a few have seen an increase in average wages for employees over the past 10 or so years, including food manufacturing (+10.3%); however, wages have remained flat since the Great Recession began. Annual wages for employees in most of the remaining categories either stagnated or fell slightly since 2001 (grocery wholesaler employees, crop production and food services employees) or decreased significantly. For example, workers in food and beverage stores experienced a 7% loss overall in wages between 2001 and 2011, with the biggest drop (-12.9%) occurring between 2005 and 2011.

Total number of food system jobs

On Long Island, growth in the number of food system jobs has greatly outpaced growth in the number of jobs in all industries. Between 2001 and 2011, the number of employees in food system jobs in Nassau County increased 14.7%, whereas the number of jobs in all sectors decreased by 0.5%. In Suffolk County, the number of employees in food system jobs increased 23.8%, while the number of jobs in all sectors increased only 5.4%.



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages
Note: Farming/Fishing is derived from NAICS codes 111, 112, 114, and 115. Food manufacturing is derived from NAICS code 311. Grocery Wholesale is derived from NAICS code 4244. Retail and Service is derived from NAICS codes 4451, 4452, and 722.

It should be noted that during this time period most of the increase in jobs was in the retail and service industries, while manufacturing and agricultural jobs decreased significantly. In Nassau County, agricultural jobs decreased 23.5% while in Suffolk County they decreased 16.3%. Manufacturing jobs in Suffolk County fell 29.4%, while manufacturing jobs in Nassau County increased 14.5%.

RECOMMENDATIONS

For Improving the Food System (OVERALL)

The LIFSRC divides recommendations for improving the food system into two groups, overall recommendations and specific recommendations by sector. This report proposes five overall recommendations to improve the food system, which are:

1. Infrastructure investment – Private and public investment is needed to reinvigorate Long Island's food system. Whether the investment is in rebuilding of commercial fisheries and docks, encouraging manufacturing in the development of food centers, or providing additional ways to get locally-produced food to local consumers, a concerted effort is needed to preserve and grow the regional food system.
2. Economic diversification for farming – The economic diversification of farms is a critical element in preserving remaining farmland and to reduce the dependency on importing food. Whether by encouraging direct sales, promoting agro-tourism, or allowing renewable energy production on farms, diversification will greatly assist in keeping farming as a viable component in the regional economic engine.
3. Address accessibility to food and costs – While food prices continue to rise, so does the number of individuals who are dependent on public or not-for-profit social services for their daily food needs. More should be done to promote time and cost-effective ways to acquire foods, given Long Island's high cost of living (especially monthly housing costs) and limited public transportation system. This includes continued outreach efforts to enroll eligible individuals in federal food assistance programs and advocacy for an increase in monthly SNAP benefits as well as changes in eligibility rules to allow more low-income households to join the program. Other strategies include developing new Community Supported Agricultural (CSA) programs, expanding the number of farmers' markets that accept SNAP/EBT, and working with local retailers and wholesalers to encourage the consumption of locally grown products. Creating more outlets to purchase fresh, locally-grown products helps to reduce transportation costs for both the farmer and consumer and potentially lower food prices. Farmers' markets, CSA and similar programs also help to lower prices by eliminating middlemen and allow farmers' to generally sell their products below retail prices.
4. Protection of the environment – The protection of the regions' water supply, farmland, and air quality is necessary for the long-term viability of the food system on Long Island. Remediation of the water supply and correcting issues that lead to poor water quality, controlling the amount of municipal waste generated and expanding recycling and composting initiatives, and reducing the consumption of fossil fuels for the production and distribution of food are a few ways to we can begin to protect these precious resources.
5. Strengthen and expand regional partnerships to promote communication, coordination, collection of information and conducting regular assessments of the food system.
    A. The information would include the development of a web portal for food system information and resources and analysis of food system policies and regulations that inhibit or support a healthy food system along with recommendations for improvement.
    B. The assessments would include periodic updates of the Long Island Food System Report Card, evaluations of food system policies and regulations, and recommendations for creating a healthier and more sustainable regional food system.
    C. Strategic partnerships would include Sustainable Long Island's Food Equity Advisory Committee, the New York State Council on Food Policy, the Governor's Office, New York State Department of Agriculture and Markets, the New York State Department of Health, the Suffolk County Food Policy Council, and other government and civic groups.

RECOMMENDATIONS

For Improving the Food System (SPECIFIC)

Based on the findings of the LIFSRC, there are sectors of the food system that need to be improved while there are others that must continue to be supported to ensure a stable system. Below are specific recommendations for what policy makers, farmers, employers, food advocacy groups, and others can do to ensure a sustainable and thriving food system.

Production Sector

As a regional and state leader in farming, it is important to promote the production and consumption of locally grown products to avoid an overdependence on importing foods and the volatility in prices as a result of this dependency. There is the additional benefit of reducing negative environmental impacts from the burning of fossil fuels if more food can be obtained from local sources. Specific recommendations are:

- Improve branding of Long Island produce by creating demand. Promoting the benefits associated with locally-grown products can ensure that Long Island remains a regional agricultural leader. Campaigns such as "Grown on LI," the marketing campaign by the Long Island Farm Bureau to promote regional pride, should be expanded into regional markets, promoting Long Island products and establishing a known identity and brand, including its produce, wine, poultry, fish, and more.
- Identify financing initiatives for small to mid-size farms to encourage crop diversity and promote long-term economic viability. Developing incentives to encourage farms to diversify their crops provides greater accessibility to produce that can improve public health while helping to make them less vulnerable to negative impacts of unanticipated events that impact crop production. Additionally, a wider variety of products will likely improve competitiveness of Long Island farms and may increase appeal to markets outside the New York region.
- Protect aquaculture and fishery production by developing incentives to encourage investment in improving water quality and infrastructure. Improved water quality will help to protect fisheries, scallop farms, and other aquaculture and promote a stable market for these products. Likewise, infrastructure improvements and modernization will promote Long Island as a major hub for fishing and sustainability.
- Promote agricultural tourism through increased marketing and outreach as a means to stabilize Long Island's agricultural economy. Tripling tourism in Suffolk County between 2002 and 2007 has increased the amount of revenue generated from these activities by more than 44 times the pre-2002 rate. Agricultural tourism allows farms to diversify their incomes and can help slow down the rate of the number of farms disappearing, especially with escalating production costs and rising land prices. Possible agritourism activities include:
    - A. Encourage the diversity of agricultural operations by allowing agricultural tourism on preserved farmland. Agricultural tourism is minimally invasive, enhances agricultural awareness amongst the population at-large, creates jobs, and improves the economic viability of the agricultural industry by creating an additional revenue stream.
    - B. Cultivate tourists, in addition to crops, by providing lodging, meals, and outdoor activities to tourists on farms. Activities may include pick-your-own programs, tours, mazes, hiking, biking, fishing, wagon/hay rides, demonstrations, and picnic sites. Some farms in Switzerland provide opportunities for tourists to help out with farm chores.[17]
    - C. Develop or enhance a network of farms, wineries, and other businesses that participate in agritourism, encouraging tourists to travel from site to site via a network of nature trails, bike paths, or scheduled farm activities. This could be done, for example, by integrating farms into wine tour programs or other ecotourism activities.
    - D. Work with state and local tourism advocates to develop agritourism promotional programs.

- Taking steps to lower farm production expenditures. Average farm expenditures in Suffolk County are triple those for the rest of the state, and are almost double for farms in Nassau County. Costs of farm inputs such as fuel, utilities, machinery, labor, and fertilizer are generally rising faster than revenues, making it especially difficult for small and mid-sized family farms to operate. Specific recommendations that can make farming more economically viable are:
    A. Promote the use of renewable energy on farms to reduce reliance on traditional energy sources, helping to lower their utility costs. Potentially, farmers can export excess energy produced on their farms as a means of generating additional income.
    B. Governments should explore options for decreasing the tax burden and by updating local zoning requirements, greatly assisting in stabilizing Long Island's farms. For example, Suffolk County administers the State's Agricultural District program locally, which relieves active farms from property tax burdens for eight-year cycles. Agricultural District programs can be promoted to ensure farms are able to take advantage of this tax break.

Considering how much farmland has already been lost to development, more must be done to protect the remaining farmland on Long Island. Continued loss of farmland can lead to higher food prices, environmental degradation, and a shrinking economy for the region. The longer it takes to preserve farmland, the more intensely pressures to develop will weigh on farms and farmland. Specific recommendations are:

- Reconsider local planning policies to adjust to the reality of fewer and smaller farms. Zoning efforts should be considered to stop the encroachment of residential developments and create "buffer zones" around existing farms, making them more cost effective to operate and protecting the interests of farmers and residents.
- Set new targets to increase financing for land preservation and the rate of land acquisition. For example, Suffolk County was unable to meet its goal of protecting the remaining 9,400 acres of productive farmland by 2012. Preservation stakeholders and local governments should work together to identify specific actions, develop a new timeline and implement financial mechanisms to meet this goal. Strategies to achieve this may include:
    A. Collaboration between state and local governments to identify financial incentives for preservation or increase Long Island's share of funding for land preservation and management;
    B. Ensure the continuation of programs such as Farmland Purchase of Development Rights and Agricultural Districts.
- Although little farmland remains in Nassau County, there are tools and resources to protect farmland, such as conservation easements and land preservation through the County's Environmental Bond Act. Nassau stakeholders should renew their commitment to farm protection to ensure that farms do not altogether disappear by raising awareness about and strengthening these tools. Together, state and local governments and other stakeholders should develop and implement an action plan to protect remaining farmland land to preserve farming viability, including setting new preservation or protection targets; identifying or committing financial resources; and establishing a trust fund or working closely with organizations like the Nassau Land Trust and The Nature Conservancy to acquire, preserve, restore, and manage critical lands. The farmland preservation action plan should build on recommendations in the 10-year action plan supported by Long Island's "Last Stand" coalition, including a commitment to protecting 10,000 agricultural acres.

As the median age of farmers across the country and on Long Island increases, it is important to foster new generations of younger farmers and farm operators who will bring new energy to the industry and sustain farming into the future. Providing opportunities for young people from a variety of backgrounds and cultures to learn the skills and business practices needed to run successful farms will strengthen the agricultural economy, enhancing long-term viability of farms and increasing farm-based employment opportunities. Specific recommendations are:

- Introduce young people to farming concepts by expanding community garden programs locally, engaging these individuals about the importance of agriculture and how it affects their communities through interactive and educational programs.
- Encourage a balanced and skilled farm workforce. To ensure that agriculture remains an industry for future generations, more needs to be done to train and employ skilled labor and farm operators. Providing opportunities for individuals to make a decent living by working on farms to support themselves and their families can assist in the preservation and growth of the farming industry.
- Expand programs that train and prepare young people to enter the field of farming. Programs such as the Long Island Farm Bureau's Young Farmer & Rancher Program are important in sustaining and growing Long Island's agricultural industry by providing critical training to 18-35 year-olds interested in farming. Additionally, careers in farming can be promoted in primary and secondary schools to teach children the importance of farming to society. This and other similar programs should be expanded, perhaps in collaboration with educational institutions such as Cornell Cooperative Extension, to attract more students and teach critical skills such as farm business planning and management. In New York City, for example, Cornell Cooperative Extension of NYC and GrowNYC launched the New Farmer Development Project in 2000 to identify, train and educate the next generation of regional farmers, keeping farmland in production and strengthening the agricultural economy and community.
- Explore opportunities to provide incentives to encourage new farmers or farm workers, such as creating a regional or statewide agriculture and farm worker job creation tax credit for small and mid-sized farms that hire one or more new workers.

Transformation and Processing Sector

Food processing and manufacturing have diminished significantly on Long Island, yet these businesses are critical to getting local products into the marketplace. Small and mid-size farms may not have sufficient capital or space to own vehicles, refrigeration equipment, commercial kitchens, processing facilities, or warehouse space, and may lack resources needed to develop distribution routes or networks with regional buyers and customers. The Long Island Regional Economic Development Council has supported investment in projects such as the "Agri-Park" in Calverton, bay scallop restoration at Orient Harbor, and infrastructure improvements at Montauk commercial fisheries as ways to develop food manufacturing on Long Island. The USDA is committed to food hubs because they offer infrastructure support to producers and strengthen regional food systems. Steps should be taken to encourage development of additional transformation, processing, and distribution facilities on Long Island. Specific recommendations to address this are:

- Infrastructure investments to support warehousing, processing, and distribution of Long Island products. Facilities such as food hubs offer a combination of production, packaging, distribution, and marketing services, making it possible for small-scale producers to gain entry into new and additional markets that would be difficult if not impossible to access on their own. Government agencies and private entities should develop incentives, tax credits, or other funding mechanisms to encourage development of such facilities.
- Invest and support the development of small to mid-sized food production, processing, storage and distribution facilities to expand the value-added agriculture industry. Facilities that accommodate storage, packaging, and processing of local products will enable food entrepreneurs to grow their businesses through developing value-added products and transforming produce into ready-for-market packages. Support can take the form of financial incentives to businesses, public/private partnerships, food safety and technical trainings, and small business development assistance for entrepreneurs.

- Encourage food businesses by developing a network of incubators and entrepreneurial programs. These programs can include commercial kitchens, processing facilities, and retail components in which producers can develop and test new products. Such facilities foster innovation by reducing the risk in launching start-up business ventures, providing shared space to producers at affordable, short-term rental rates; eliminating the need for major capital investments. Offering incentives for development of such facilities, particularly in underserved or economically disadvantaged communities should be considered as a strategy to revitalize the local economy, spurring job creation and business development. One example is the Agriculture Consumer Science Center in Calverton, owned and operated by Stony Brook University, a state-of-the-art shared processing center for farmers and food entrepreneurs.[23]
- Explore and establish an online portal to assist with and develop commercial kitchens and food incubators to facilitate value-added food processing and sales.

Distribution, Marketing & Retail Sector

Traditionally, food grown on Long Island is shipped to major distribution centers such as the Hunts Point Market in NYC only to make a return trip to communities throughout Long Island before reaching consumers. Strengthening local distribution networks can help to decrease the time it takes for food to reach consumers. In addition, reducing the need for truck travel would help to reduce air pollution and vehicle congestion from truck traffic, reduce the likely of food spoilage, and strengthen the local economy by bringing new jobs to the region. Specific recommendations to address this are:

- Increase the number of farmers' markets on Long Island to be on par with the statewide ratio. The number of farmer's markets relative to population in the region is less than half that of the state. New markets in existing downtown or other high pedestrian traffic areas will create opportunities for getting local produce and other products to customers in new markets, creating new points of access. At the same time, farmers' markets potentially help to promote healthier eating, revitalize local neighborhoods, and boost the regional economy. Food system advocates should consider developing a plan or setting a goal for matching the statewide ratio of farmers' markets to population.
- Support public-private investments to attract food wholesale businesses. Projects like food hubs and the previously mentioned Agri-Park in Calverton will assist in reaching markets that require handing, storage and transportation standards. The ability to process, store, and transport locally grown produce will enable both merchant and retail wholesale businesses to thrive, making more Long Island food products available to retail and institutional customers. Sectors that should be considered for potential additional investments that can take advantage of Long Island's natural assets are the fresh and frozen produce and fish markets. Working with local Industrial Development Agencies (IDA) in creating the right economic climate can make such projects feasible, helping to rebuild the region's food wholesale industry.
- Expand and incentivize institutional purchasing of Long Island food products. Encourage adoption of local procurement policies by public and private entities, including schools, hospitals, corporations, colleges and universities, and long-term care facilities to make more Long Island products available to residents. Explore and consider developing an online system to facilitate local institutional purchasing. Consider developing and adopting policies that set targets for local food purchasing by public institutions.

Another way to strengthen the local economy and stabilize the region's farming industry is to improve the "farm-to-table" concept, which in turn makes the region less dependent on importing food and the environmental and economic consequences associated with this dependency. Farm-to-table initiatives can improve access to locally grown foods by making them more widely available at direct-market retail locations, as well as through specialized programs like Community Supported Agriculture (CSA) networks, and in restaurants. Specific recommendations to expand access to locally grown products through farm-to-table activities include:

- Promote direct sales at farms as a means of income diversification and increasing the value of agricultural products. Farmers can yield slightly higher prices than wholesale prices through direct sales, reducing the amount of produce loss to spoilage during transportation and increasing their bottom line. Direct sales ventures may include roadside stands, pick-your-own sites, and on-site retail markets.
- Expand CSA and food box delivery programs. Several organizations and farms, including Hamlet Organic Garden (HOG) on Long Island currently run CSA programs, in which farms partner with community groups before the growing season begins. Members purchase a share of produce from farms, generally paying up-front for the season to help support planting, farming, and harvest activities and relieving the farm of the burden of finding commitments and guaranteeing some income for the season. In exchange for their payment, members receive regular deliveries (often weekly or bi-weekly) of items available from the farm. In a CSA, customers and farms share the risks of farming (crop failure, disease, weather) and the benefits (farm fresh crops, new products and recipes) allowing the farm to continue production. A "fresh food box" delivery program is similar to a CSA, but allows more flexibility by allowing consumers to make weekly purchases rather than upfront purchases by season. Customers, often in underserved communities, purchase fresh, seasonal, locally-grown produce in pre-packed boxes on a weekly basis and may be able to utilize EBT in addition to cash, credit, or debit card, making it a more affordable option for many families.
- Work with local governments, educational institutions, and nonprofits to inventory and assess land suitable for community food production, such as community and school gardens. Guidelines should be developed to help participants understand safe gardening practices, and sample ordinances should be developed for consideration by municipalities and agencies for developing these community gardens.
- Explore developing an online marketplace or network to facilitate the purchase of Long Island products. The Arkansas Local Food Network (ALFN) is a membership organization that facilitates weekly ordering of locally-grown produce (and other local products) from multiple participating farms, allowing customers to choose what they want when they want.[18] Items are subject to availability and farms estimate on a weekly basis what they will have and customers pick up their orders at a single pick-up point. Minimal membership fees are charged to cover site maintenance and coordination.

Food Access and Consumption Sector

Given the cost of living on Long Island, food access issues are particularly important. On average, consumers in the region spend more for food and other monthly necessities, particularly housing, than consumers in other areas of the country. As a result, many people lack the adequate income to purchase healthier food options. Specific recommendations to improve food access are:

- Promote an increase in the number of grocery retailers that offer a variety of affordable, healthy food options. In addition to establishing farmers' markets and other local-centric food markets, Long Island food system stakeholders should explore and develop incentives to increase the number of grocery stores and supermarkets in underserved areas as well as the availability of fruit and vegetables in grocery and convenience stores. Analysis indicates that such retail interventions are more likely to be successful when they involve three critical components: Local food advocacy groups, state or federal start-up funds, and community development financial institutions.[19] The New York Healthy Food Healthy Communities program, which provides financing for retail projects in underserved communities, is a key resource for efforts to increase access to food locally, but these efforts should also involve local collaborations that facilitate community buy-in and market entry for potential retailers.
- Encourage customer usage and increase the acceptance of SNAP and Electronic Benefits Transfer (EBT) at local farmers' markets. More than $5 billion in SNAP benefits were made available to New Yorkers in FY2012, yet less than 1% of that was spent at farmers' markets.[20] Just over half of the farmers' markets on Long Island accept SNAP/EBT. A coordinated effort to reach individuals utilizing federal nutrition assistance programs and to encourage them to use SNAP at farmers' markets may help them to access healthy, locally grown produce, and provide income to participating farms.

A. Expand the use of the wireless EBT program. Food system stakeholders should work with the Farmers' Market Federation of New York and other entities to promote the New York State Wireless EBT Program by fully subsidizing wireless EBT terminals for market managers, farm stands, and mobile markets.
B. Implement a broad-reaching, outreach campaign aimed at SNAP recipients and farmers' markets. Education should teach recipients about where they can use their benefits and the benefits of spending SNAP dollars at farmers' markets (e.g., produce at farmers' markets is often days fresher than what is available at local supermarkets, tasting better and lasting longer in your refrigerator; SNAP can be used to purchase seeds and seedling plants, giving customers the ability to grow their own herbs and vegetables if they wish).

- Explore and develop programs to increase the use of SNAP/EBT at farmers' markets by providing financial incentives, in the form of partial matches or "bonuses" to customers using EBT. Programs such as Bounty Bucks in Boston, MA, Health Bucks in New York City, and the FreshConnect program at select markets throughout New York state, provide coupons that match purchases made at farmers' markets using EBT: dollar for dollar in Bounty Bucks, or $2 for every $5 spent in the case of Health Bucks and FreshConnect. Long Island food system stakeholders should develop an equivalent program for Nassau and Suffolk Counties or work to expand the FreshConnect EBT matching coupons to all farmers' markets throughout the state.
- Investigate the feasibility of programs to serve Long Islanders without cars or without easy access to grocery stores. Initiatives like the Virtual Supermarket Project in Baltimore allow consumers to place grocery orders online at local libraries and then pick items up the next day free of delivery charge. Other localities, like Charleston, have instituted free supermarket shuttle services, transporting consumer to and from shops. These and other programs would be especially beneficial to those with limited mobility, like seniors and/or a dependence on public transportation.

Food insecurity is a growing concern on Long Island, especially because so many are ineligible for any federal assistance yet struggle to put food on the table relying on hunger relief programs for their supplemental and sometimes primary means of obtaining food. Food insecurity also contributes to a range of negative physical and mental health outcomes and widens disparities in health that already exist for economically disadvantaged Long Islanders. Some recommendations for addressing this issue are:

- Support farm-to-"community"-table initiatives. Provide farmers with increased tax incentives to partner with food rescue groups who would collect and redistribute food to community and civic groups that serve the hungry, soup kitchens, and food pantries.
- Promote gleaming programs as volunteer and civic service opportunities, inviting faith-based groups, schools, businesses and other entities to supplement ongoing hunger relief efforts. Food gathered by volunteers would be distributed to local food banks, pantries and soup kitchens. In addition, teaching those with limited work experience farming skills provides an opportunity for these individuals to learn a trade, develop skills to help them integrate into the workforce while providing for some of their basic food needs.
- Encourage retailers, in partnership with the county, a university or a not-for profit, to experiment with pricing strategies that make healthful food more affordable for low-income consumers, many of whom would like to purchase nutritious food but are unable to do so because of high prices. Recent research suggests that price reduction strategies, which promote specific foods by lowering their cost, may help alter dietary behavior.[21]
- Advocate for continued and expanded funding of SNAP; additional outreach to increase enrollment of eligible participants, and expansion of the pool of eligible families and individuals. SNAP is the largest program in the domestic hunger safety net and an important source of nutrition assistance for low-income individuals and families. However, SNAP eligibility is tied to the federal poverty line, which does not take regional variations in cost of living into account. As a result, many people in areas with a high cost of living, like Long Island, live in economic hardship but remain ineligible for federal food nutrition assistance. Expanding the pool of eligible participants would ensure that thousands of local families who struggle to feed themselves receive much needed financial support and may be better able to access fresh, healthy food options.

- Advocate for the continued funding and expansion of eligible families and individuals in other food assistance programs. Programs such as Women, Infants, and Children's (WIC) subsidized school breakfasts and lunches, and summer meal programs are a few other ways of providing meals to vulnerable populations, particularly children. Free universal, in-class breakfast has been adopted in many school districts and offers a way for low-income children to eat a meal with their peers, avoiding stigma, increasing access and counteracting hunger which can interfere with successful learning.
- Standardize and improve the reporting of emergency food program clients and programs. Without a central method to evaluate the number and demographics of clients served, client needs and satisfaction, amount of food collected, types of food distributed, and the number of programs that are operating, it is difficult to assess the effectiveness of these programs and to determine what issues need to be addressed.
- Encourage hospitals to "adopt-a-farmers'-market" to provide perinatal and nutrition information to mothers and children on-site to address childhood anemia and issues associated with being underweight. Focusing efforts at locations where decisions are being made that can affect long term health should be part of future prevention initiatives. Adopting or sponsoring a farmers' market will help to strengthen the markets' presence at hospital locations, expanding its client base and providing medical facilities opportunities to educate customers and promote public health.
- Developing public-private partnerships to expand outreach at achieving the New York State Department of Health goal of raising the percentage of adult New Yorkers who consume fruit and vegetables five or more times per day to 33%.[22] Local health departments, food advocacy groups, medical facilities, farmers and retailers should partner to distribute information about the benefits of eating healthier at locations where people are obtaining their food to help reach this goal.

Waste Management

Too often waste is something that is taken for granted. Promoting alternatives to waste (e.g. recycling or composting) as economic generators for municipalities can not only help to reduce the amount of waste generated, but may also have a positive impact on our environmental and food system. Compost generated from food waste can be an excellent source of fertilizer for personal, community, and school gardens, increasing production. Promoting the composting of food waste and packaging also diverts material from the waste stream, reducing the amount of municipal waste taken to landfills or incinerators. Some recommendations for addressing this are:

- Food system stakeholders should develop and implement recommendations for community or Island-wide food composting systems, including using compostable or recyclable food packaging and setting targets for increasing food waste composting by weight or volume.
- Reinforce recycling efforts to remove paper, containers, and metal products from the waste stream. Recycling rates have been decreasing steadily on long Island for the past decade as per the Waste Reduction and Management Institute. Evidence has shown that implementing some form of a "Pay-As-You-Throw" system Island-wide, where recyclable waste is free, dramatically reduces waste and increases recycling in areas that have implemented it. To detract the carting of waste to cheaper locations, towns should agree to a standard price for waste collection fees.
- Increase funding to monitor water quality and mitigation for storm water runoff. New York State Department of Environmental Conservation (DEC) should partner with local municipalities to better report its findings and make it readily available and transparent to the public. Additionally, municipalities can partner with DEC and interested parties to better mitigate issues, such as storm water runoff, which affects water quality through guidelines, codes or policies that encourage use or adoption of green infrastructure or Low-Impact Development techniques (e.g., bioswales, permeable or porous surfaces, stormwater collection, etc.).
- Support the standardization of waste collection data and dissemination. As no two municipalities in the region report waste collection in the same way, any data obtained is a rough estimate at best. However, great efforts have taken place to provide this data to the public in a meaningful way. County and local governments need to collaborate on how to report this data in a thorough and consistent manner so that efforts to control waste are better monitored and acted upon.

Cross-cutting Economic Indicator - Food System Jobs

As mentioned under the section for locally-grown foods, more can be done to encourage a diverse, balanced and skilled workforce throughout the food system. The growth of jobs in the food sector has dramatically increased compared to other industries, but wages have actually declined and are generally lower than those in other industries, and often do not come with benefits. Depressed wages in the food sector in a region with a high cost of living is a recipe for economic instability. Some recommendations to address this are:

- Research and explore strategies for strengthening food system jobs. Develop recommendations for food system businesses to increase their competitiveness and attract a skilled workforce by providing opportunities for individuals to make a decent living and support themselves and their families, improving overall economic stability of employees and fostering growth of the industry. This is especially important in the retail and service industries, which have some of the lowest reported wages of any jobs in the food industry. Cutting-edge food service businesses offer competitive wages and benefits that meet the needs of today's workforce.
- Enforce and strengthen labor law compliance. Using regulatory devices such as food safety and liquor licenses to ensure that employers are complying responsibly is one means to address this issue. Penalties should also be increased for employers who violate labor laws, especially through misappropriation of employee wages and tips, which reduces employee take-home pay and the amount of money paid in taxes.
- Advocate for raising the minimum wage for all workers, including tipped workers. Increasing the minimum wage would improve wages, reduce poverty, and help food system workers transition off public assistance programs.
- Fund county training programs for all food system workers, including undocumented workers. Training programs should offer career pathways that would enable workers to make a livable-wage in their segment of the food chain.
- Ensure that local procurement programs for (public) institutions include labor standards and worker protections, such as health care benefits and occupational safety. In addition, legislation should require that all farms and food businesses meet certain labor standards before they receive government loans or subsidies.

APPENDIX A

About the Contributors

Sustainable Long Island

Sustainable Long Island is a regional nonprofit whose mission is to promote economic development, environmental health, and social equity for all Long Islanders, now and for generations to come. Sustainable Long Island is a catalyst and facilitator for sustainable development. We cultivate the conditions, identify resources and provide tools to advance sustainability on Long Island.

Over the last 50 years, our communities were built and have matured without adequate planning, leaving an aftermath of suburban sprawl, fragmented transportation systems, depleting natural resources, segregated neighborhoods and schools, and deteriorating downtowns. To address these needs, Sustainable Long Island advances sustainable development; community and regional planning that integrate current and future needs for economic growth, environmental health, and social equity. For more information about Sustainable Long Island and the organization's work, visit http://sustainableli.org.

Food Equity Advisory Committee

Sustainable Long Island's Food Equity Advisory Committee (FEAC) was created to increase dialogue around our food system and to bring multiple sectors of the food system together to address food equity on a regional level. The FEAC looks at policies and programs to increase access to fresh, healthy food across Long Island and is comprised of a diverse set of stakeholders from many levels of the food system.

The FEAC has regularly discussed issues such as the lack of access to fresh, healthy food options and barriers to access, including transportation and distribution systems, and recognizes that food equity requires community-driven, viable, long-term solutions to map out a comprehensive course of action.

Adelphi University

Adelphi is a world class, modern university with excellent and highly relevant programs where students prepare for lives of active citizenship and professional careers. Through its schools and programs—The College of Arts and Sciences, Derner Institute of Advanced Psychological Studies, Honors College, Ruth S. Ammon School of Education, University College, Robert B. Willumstad School of Business, College of Nursing and Public Health and the School of Social Work—the co-educational university offers undergraduate and graduate degrees as well as professional and educational programs for adults. Adelphi University currently enrolls nearly 8,000 students from 43 states and 45 foreign countries. With its main campus in Garden City and centers in Manhattan, Hauppauge, and Poughkeepsie, the University, chartered in 1896, maintains a commitment to liberal studies in tandem with rigorous professional preparation and active citizenship.

Adelphi University's Center for Health Innovation

The Center for Health Innovation (CHI) brings together many professional and academic backgrounds to create and foster practitioner-focused, interdisciplinary academic programming, healthcare research, community partnerships and leadership—all with the goal of meeting current and emergent healthcare needs. CHI is a progressive collaboration of schools and disciplines within Adelphi University. It establishes a single point of reference for all healthcare programs and services, thereby creating a collective identity, increasing efficiency, and expanding Adelphi's regional influence in healthcare. Interdisciplinary groups monitor our programs, and their work is supported through consultation with the Faculty Senate Academic Affairs Committee. For more information about CHI, visit adelphi.edu/chi.

Adelphi University's Vital Signs

Vital Signs is a multiphase project that systematically identifies, tracks, and analyzes the social health of populations and communities in Nassau and Suffolk counties on Long Island. Initiated by Adelphi University President Robert A. Scott in 2004, it has the primary objective of developing a centralized resource to help inform policy and service provision and reduce social health disparities. As a campus-community partnership, Vital Signs reflects Adelphi's ongoing commitment as an "engaged university" and is affiliated with the Institute for Social Research and Community Engagement.

Adelphi University's Institute for Social Research and Community Engagement (iSoRCE)

iSoRCE generates actionable knowledge through collaborative social research and uses that knowledge to better understand and address Long Island's critical and enduring social issues. Rather than developing top -down solutions for social problems, iSoRCE incorporates community questions, priorities, and perspectives into the investigatory process. iSoRCE then works with community partners to explore and take action on findings. iSoRCE is part of the Center for Health Innovation at Adelphi University.

APPENDIX B

Food Equity Advisory Committee Members

This report is made possible by the dedicated efforts of numerous individuals and various organizations for their participation in the FEAC and their continued commitment in addressing farming issues and food equity throughout Long Island.

- Central Islip Youth Enrichment Services
- Adelphi University Institute for Social Research and Community Engagement
- Bayshore Unified Free School District/Long Island School Nutrition Directors Association
- Community Gardens Coordinator, Department of Family Medicine Stony Brook University
- Cornell Cooperative Extension of Suffolk, Nutrition/Wellness - Family Health & Wellness
- SUNY Stony Brook Department of Family Medicine
- Health & Welfare Council of Long Island
- Heifer International / Hobbs Community Farm
- Hempstead Rebirth
- iEatGreen
- Island Harvest
- Long Island Cares
- Long Island Council of Churches
- Long Island Farm Bureau
- Nassau & Peconic Land Trusts
- Nassau Soil Water Conservation District
- New York State Department of Health
- New York State Department of Agriculture & Markets
- Roosevelt Community Revitalization Group
- Slow Food Huntington
- Suffolk County United Veterans/Greater Bellport Coalition
- SUNY Old Westbury
- Sustainability Institute at Molloy College
- Town of Hempstead Council District 1- Hon. Dorothy Goosby
- USDA Natural Resources Conservation Service

APPENDIX C

Resources

Center for Integrated Agricultural Systems, University of Wisconsin, http://www.cias.wisc.edu
Centers for Disease Control, Behavioral Risk Factor Surveillance System (BRFSS), http://www.cdc.gov/brfss
Centers for Disease Control, Pediatric Nutrition Surveillance System (PedNSS), http://www.cdc.gov/pednss
Cornell Cooperative Extension of Suffolk, "Suffolk County Farmers Markets, 2012," http://ccesuffolk.org/farmers-markets-373/
Farmers Market Federation of New York, http://www.nyfarmersmarket.com/resources/resources-for-farmers-markets/ebt.html
Feeding America, Map the Meal Gap, 2011 http://feedingamerica.org/hunger-in-america/hunger-studies/map-the-meal-gap.aspx#
Island Harvest, http://www.islandharvest.org/intro.aspx
Long Island Cares, http://www.licares.org
Long Island Farm Bureau, http://www.lifb.com
Long Island Regional Economic Development Council, http://regionalcouncils.ny.gov/content/long-island
The New York Health Foods & Healthy Communities fund, http://esd.ny.gov/BusinessPrograms/HealthyFoodHealthyCommunities.html.
New York State Department of Agriculture and Markets, "Specialty Crop Block Grant Program," http://www.agriculture.ny.gov/AP/slide/SpecialtyCrop.html
New York State Department of Environmental Conservation, Bureau of Watershed Assessment and Management, http://www.dec.ny.gov/about/1149.html
New York State Office of Temporary and Disability Assistance, http://otda.ny.gov
Stony Brook University, School of Marine and Atmospheric Sciences, Waste Reduction and Management Institute, http://www.somas.stonybrook.edu/institutes/wrmi.html
Suffolk County Department of Planning, http://www.suffolkcountyny.gov/Departments/Planning/Divisions.aspx
Suffolk County Water Authority, http://www.scwa.com
Tagtow A., Roberts S., "Cultivating Resilience: A Food System Blueprint that Advances the Health of Iowans, Farms and Communities," February 2011, http://iowafoodsystemscouncil.org/cultivating-resilience
US Bureau of Labor Statistics, Consumer Expenditure Survey, http://www.bls.gov/cex
US Bureau of Labor Statistics, Quarterly Census of Employment and Wages, http://www.bls.gov/cew
US Census, County Business Patterns, 2011, http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl
US Department of Agriculture, Agricultural Marketing Service (AMS). "Farmers Markets and Local Food Marketing: Food Hubs: Building Stronger Infrastructure for Small and Mid-Size Producers," http://www.ams.usda.gov/AMSv1.0/FoodHubs
US Department of Agriculture, National Agricultural Statistics Service, Census of Agriculture, http://www.agcensus.usda.gov/index.php
US Department of Agriculture Agricultural Marketing Service, "Specialty Crop Block Grant Program," http://www.ams.usda.gov/AMSv1.0/scbgp
US National Oceanic and Atmospheric Administration, National Marine Fisheries Service, http://www.nmfs.noaa.gov

APPENDIX D

Notes

[1]Soabl, J. *A conceptual model of the food and nutrition system*. Soc Sci Med. 1998 Oct ;47(7):853-63.
[2]Long Island Farm Bureau, http://www.lifb.com/Portals/1/history-of-agriculture.pdf
[3]The Long Island Regional Economic Development Council (2011). *Long Island's Future Economy: A Strategic Economic Development plan for the Long island Region.*
[4]US EPA National Estuary Program (2005), http://nepis.epa.gov/Adobe/PDF/P1002OT7.pdf.
[5]This percentage was determined by combining the number of acres in orchards and vegetables harvested and dividing it by the total number of farmland acres.
[6]Suffolk County Department of Planning, http://www.suffolkcountyny.gov/Portals/0/planning/EnvPlanning/LIDuckHistory/Main_Report.pdf
[7]Keep It On Long Island, http://www.kioli.org/longisland/infamous/duck-farming/
[8]Nassau County: Healthy Nassau. $150 million Environmental Program Bond Act, retrieved from http://www.nassaucountyny.gov/healthynassau/land/eba.html
[9]The Nature Conservancy: New York, Long Island's Last Stand, retrieved from http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newyork/explore/long-island-long-islands-last-stand.xml
[10]Suffolk County Department of Planning, http://www.suffolkcountyny.gov/Departments/Planning/Divisions/OpenSpaceandFarmland/FarmlandPreservation.aspx
[11]*Ibid*
[12]According to the Census: Grocery stores include establishments generally known as supermarkets and smaller grocery stores primarily engaged in retailing a general line of food, such as canned and frozen foods; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry. Included in this industry is delicatessen-type of establishments primarily engaged in retailing a general line of food.
[13]As defined by the Consumer Expenditure Survey, food at home includes all expenditures for food at grocery stores (or other food stores). Food away from home includes spending on food at eating and drinking establishments, as well as at hotels, recreational sites, and schools. See: http://www.bls.gov/cex/csxgloss.htm
[14]Biros, M.H., Hoffman, P.L. & Resch, K. (2005). The prevalence and perceived health consequences of hunger in emergency department patient populations. *Academic Emergency medicine*, 12: 310–317; Stuff, J., Casey, P. Szeto, K., et al. (2003). Household food insecurity is associated with health status.. *Journal of nutrition,* 134: 2330–233; Vozoris, N.T. & Tarasuk, V.S. (2003). Household food insufficiency is associated with poorer health. *Journal of nutrition*, 133: 120–126.
[15]In New York, there is more income flexibility in percentage of gross income for households in which there are disabled or senior members or where child care costs exist.
[16]The USDA sets a serving size for fruit or vegetables as equal to about one-half cup. Greens like spinach and lettuce have a serving size of one full cup. One serving of sliced fruit is equal to one-half cup; however a single piece of fruit, such as an apple or an orange, counts as one serving. The decision was based on the portion sizes that people typically eat, ease of use and nutritional content of fruits and vegetables.
[17]Agritourism: Cultivating Tourists on the Farm. Washington State University Extension. Retrieved from http://cru.cahe.wsu.edu/CEPublications/eb2020/eb2020.pdf
[18]Arkansas Local Food Network, http://littlerock.locallygrown.net/
[19]Fife, John. (2012). Bringing Supermarkets into Food Deserts: An Analysis of Retail Intervention Policies. Retrieved from SSRN: http://ssrn.com/abstract=2197864 or http://dx.doi.org/10.2139/ssrn.2197864
[20]According to the Farmers' Market Federation of New York, roughly $1.6 million in SNAP benefits were used at farmers' markets in 2010.
[21]Dong D, Lin BH. Fruit and Vegetable Consumption by Low-income Americans: Would a Price Reduction Make a Difference? 2009. Economic Research Report No. (ERR-70).
[22]New York State Department of Health, Bureau of Chronic Disease Evaluation and Research http://www.health.ny.gov/statistics/brfss/reports/docs/1202_brfss_fruit_and_vegetable_consumption.pdf
[23]An example of an agriculture business incubator model currently on Long Island is the Agriculture Consumer Science Center at Calverton owned and operated by Stony Brook University http://www.stonybrook.edu/calverton/AgricultureConsumerScienceCenter/index.html

NOTES

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