

January 2010



GREATER PHILADELPHIA
FOOD SYSTEM STUDY





OUR MISSION

The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals and the public with the common vision of making a great region even greater. Shaping the way we live, work and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment, and enhancing the economy. We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region — leading the way to a better future.

The symbol in our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole, while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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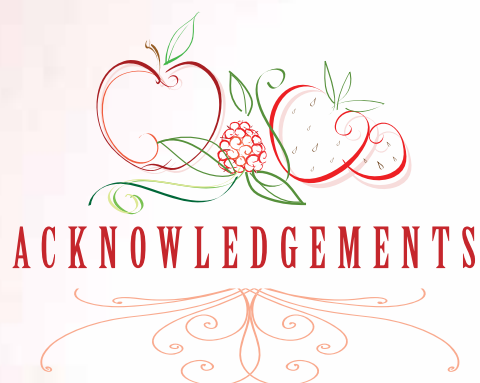
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SHARE Food Program



Communities large and small are fed without anyone truly understanding how the entire global food system moves. Dr. Christian Peters, a former research associate at Cornell University and currently with Tufts University, writes that this illustrates “both the power of the marketplace to meet human demands and the peril of taking its function for granted.”¹

As the metropolitan planning organization for the nine-county Greater Philadelphia region, the Delaware Valley Regional Planning Commission (DVRPC) is envisioning and actively preparing for a

sustainable future amidst energy and climate uncertainties. Increasing energy prices could limit the transport of fresh foods across long distances, and increase the price of food for all consumers. Countries that are primarily agricultural exporters may retain more food products for their domestic markets as urban populations grow and rural populations decrease. Conversely, the trend in Greater Philadelphia has been to rely on agricultural products from farther and farther away, while we are losing viable farmland and a successful agriculture industry. This study is the first stage in DVRPC’s efforts to envision a more sustainable food system for Greater Philadelphia.

Food system planning has recently become a recognized expertise within the planning profession, and more organizations, agencies, businesses, and individuals are appreciating the connections between local farmers, healthy food, and healthy communities.

DVRPC undertook the *Greater Philadelphia Food System Study* to better understand the complicated regional food system that feeds Greater Philadelphia. While the global food system is extraordinarily complicated and affected by geopolitics, free trade, fossil fuel reserves, and climate, DVRPC’s food system study focuses on the agricultural resources, distribution infrastructure, the regional economy, and stakeholders acting within the regional foodshed – the 100-mile radius from a point in Center City Philadelphia.

There are a number of issues facing the Greater Philadelphia food system. Some of those challenges and opportunities that are explored in this study include:

Land use: food system activities take up a significant amount of land, and farmland in metropolitan areas is facing extreme development pressures;

¹ Peters, Christian, 2008. “Foodshed analysis and its relevance to sustainability.” *Renewable Agriculture and Food Systems*: 24(1):1-7.

Contradicting health effects:

America is experiencing rising incidences of both hunger and obesity;

Food access: access to healthy and affordable foods in low-income urban and rural areas is an increasing problem;

Transportation: food, as a high turnover commodity, a good used on a daily basis, is the largest category of freight shipped using our region's highway and road systems. Distribution issues, such as traffic, cost, timeliness, and efficiency, remain top concerns for small and large food producers, local and global companies, alike.

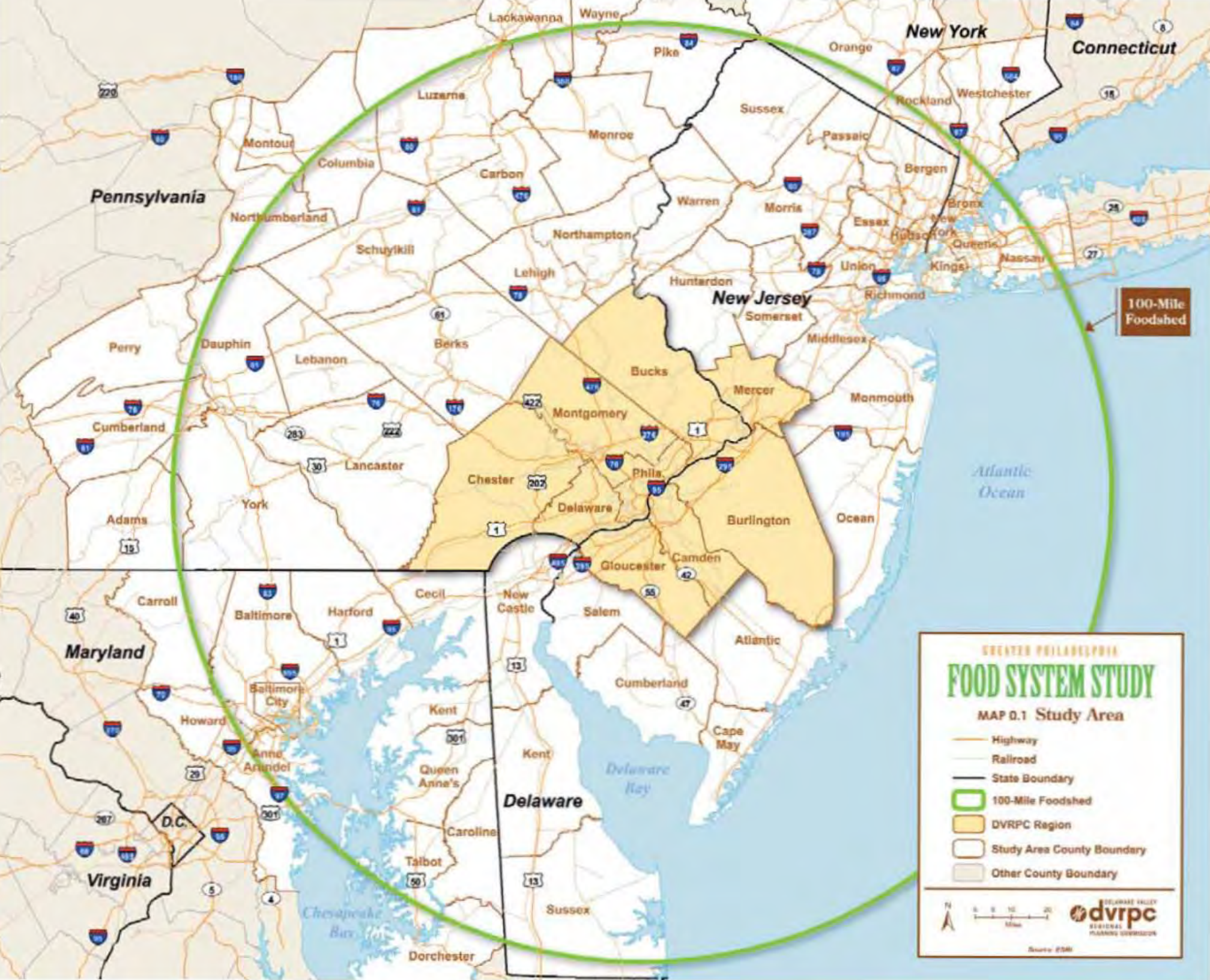
Energy: the food that we eat takes a considerable amount of fossil fuel energy to produce, process, transport, and dispose of, thereby emitting greenhouse gases and creating reliance on a nonrenewable energy source; and

Economic development: the food system represents an important part of the regional economy; food manufacturing can provide much needed low- and moderate-skill jobs; local food production, preparation, and distribution offers entrepreneurial opportunities; and agricultural products are among the nation's strongest and largest exports.

DVRPC's planning area consists of nine counties - Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in southeastern Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties in southern New Jersey. For the purposes of the *Greater Philadelphia Food System Study*, DVRPC's nine-county bistate planning area constitutes the population base, while a 100-mile "foodshed," consisting of 70 counties in five states (Delaware, Maryland, New Jersey, New York, and Pennsylvania), makes up the theoretical production

area of Greater Philadelphia's regional food system. **Map 0.1: Greater Philadelphia Food System Study Area** illustrates the 100-Mile Foodshed and the DVRPC planning area.

Food policy and food system planning are emerging as multi-faceted topics for which there are many experts of varying specialties, other organizations undertaking programs and research projects, and numerous stakeholders, ranging from local farmers to educated consumers, and from elected officials to hunger advocates. Consequently, DVRPC engaged a diverse committee to define the extent of the regional food system and determine the study's scope. Although Greater Philadelphia's residents are fed by a global food system, the committee recommended a 100-mile foodshed as a geographic area in which, perhaps, Greater Philadelphia could source its food. As a result of the committee meetings, this study is organized into five parts:



PART 1: AGRICULTURAL RESOURCES

Parts of New Jersey and Pennsylvania are recognized as having some of the best agricultural soils in the country. Using data from the Census of Agriculture, National Resource Conservation Services, and other sources, this chapter looks at the characteristics of the 100-Mile Foodshed's agriculture industry, which is the supply side of the regional food system.

PART 2: FOOD DISTRIBUTION

The transport of food from a producer to a consumer is a critical part of global, regional, and local food systems. With growing concerns about food safety, homeland security, and carbon emissions, more people want to know the specific routes and modes of food transport and the traceability of food products from the points of production, processing, storage, and retail sales. These tasks are very difficult and cannot be adequately addressed in this study. However, we can create a general picture of how food travels

through the country and to Greater Philadelphia, and we can project trends for the future. DVRPC utilized data compiled by the Federal Highway Administration (FHWA) to create a Greater Philadelphia Food Freight Analysis Framework (Food FAF), which identifies the region's largest trading partners, its competitive advantages, and its exports. Case studies were also completed to track several food items from the point of production to the point of sale.

PART 3: THE FOOD ECONOMY

The 100-Mile Foodshed is rich in agricultural resources and boasts a diversified farming sector. Similarly, Philadelphia, South Jersey, and southeastern Pennsylvania have very vibrant independent restaurant industries and thriving local food establishments, ranging from locally owned supermarkets to a plethora of farmers' markets, serving urban, suburban, and rural communities. This chapter explores both the metropolitan area's demand for food

(of all types) and the food economy's sectors, including food and beverage manufacturing, food wholesaling, food retailers, and food services, among others.

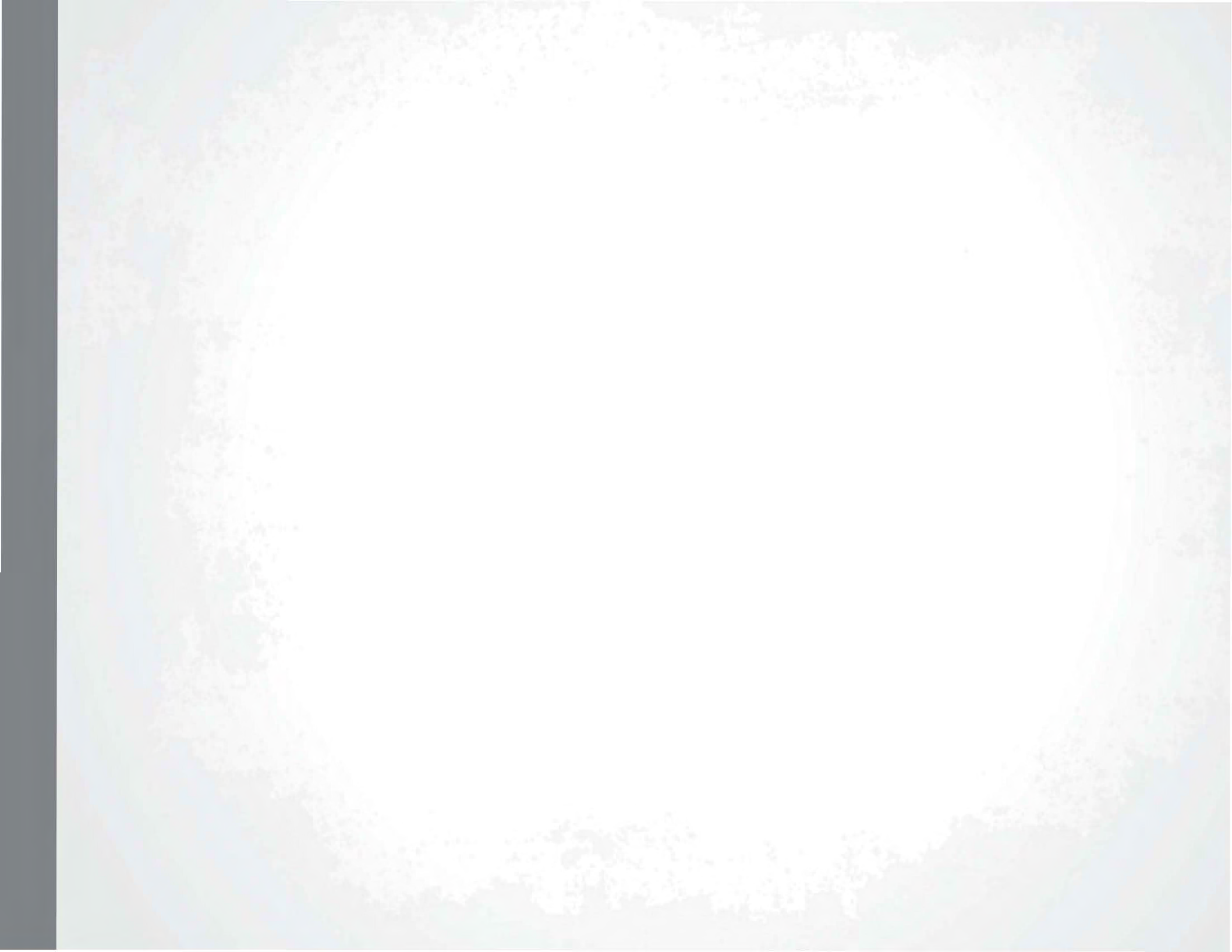
PART 4: FOOD SYSTEM STAKEHOLDER ANALYSIS

A stakeholder analysis is a social research tool that allows an individual or organization to gain more knowledge about a topic very quickly by identifying the key stakeholders, policymakers, and actors in a specific field and geographic area. DVRPC undertook a Stakeholder Analysis to understand "who is doing what where?" within the Greater Philadelphia Food System. By surveying many different people through a variety of methods, DVRPC learned about the food system's complex issues; collected information about other projects, reports, programs, and efforts; identified key actors to interview in person; and detected gaps in research, support services, programs, and nonprofit activities.

The **FINDINGS** chapter ties all the components of the food system together, starting with DVRPC's original impressions gained from the stakeholder analysis to the complicated food distribution system, and from agricultural producers to consumer demand. One of the biggest conclusions that DVRPC draws from the *Greater Philadelphia Food System Study* is how many organizations, individuals, and businesses are active in building a stronger, more equitable, and more sustainable regional food system. Some of these efforts are highlighted in call-out boxes throughout the study, and specifically within the Findings chapter. Lastly, the Findings chapter highlights the need for more food system planning work.

The food system, whether defined as global, regional, or local, poses immensely interesting and confounding planning questions. Food can be viewed through the lenses of homeland security, emergency preparedness and

human services, private industry and business, environmental stewardship, land use, and public utility, among countless other categories. Food is a possible economic development vehicle, and sustainable farming may be the original green job. Food production requires the dedication of land and other natural resources. Food is produced by countless private enterprises, from farmers to retailers, engaged in a free market system, yet it is highly influenced by government interventions, incentives, and disincentives. Food is a necessity as well as a luxury. This study is the first stage in DVRPC's efforts to envision a more sustainable food system for the Greater Philadelphia region.





This chapter looks at the 100-Mile Foodshed's resources needed for the agriculture industry, identifies the differences between agriculture in Greater Philadelphia's foodshed and the nation, and illustrates the threats challenging the future of agriculture in the foodshed. This assessment includes:

Characteristics of the 100-Mile Foodshed

Parts of New Jersey and Pennsylvania are known as having some of the best agricultural soils in the country. The 100-Mile Foodshed has other natural resources, like groundwater, surface water, and temperate climate,

which make it ideal for producing high-quality fruits and vegetables.

Agricultural Land Base

While the 100-Mile Foodshed is densely populated, the area has significant areas of agricultural land.

Farm Characteristics

The 100-Mile Foodshed's farms have been passed down from generation to generation over the last 400 years. These farms are smaller than the average American farm, but produce large amounts of food and other agricultural products.

Agriculture Industry

Not all farmland is used to grow food for people; products from other types of agriculture provide necessary inputs for food production. Because the 100-Mile Foodshed is a densely populated area, rich in natural resources, its agriculture industry will be specialized in slightly different agricultural products as compared to American

agriculture as a whole. DVRPC also profiles different types of agricultural operations to illustrate the diversity of agricultural production within the 100-Mile Foodshed and the complex relationships of the regional food system.

Sustaining Food and Farming

This section identifies farmland preservation efforts and programs established to encourage farm succession and train new farmers.



Farmstead in Lancaster County, Pennsylvania

PHOTO CREDIT: BECKY SWEGER

Tradition of Farming

One reason why the 100-Mile Foodshed retains so much of its agricultural landscape is the Amish and Plain Sect religious communities that have made southeastern Pennsylvania their home and view farming as part of their Christian duty. The first Amish settlers came to Pennsylvania as early as the 1680s, encouraged by the Quakers' tolerance of different religions.

Today, out of 27 states with Amish residents, Pennsylvania has the second highest concentration, with 51,570 people, following Ohio. Unfortunately, due to suburbanization and natural increases in the Amish population, many have had to find nonfarming sources of income or leave Pennsylvania to access affordable farmland.

Sources Professor Linda Aleci, Franklin and Marshall College.

Kraybill, Donald and Steven M. Nolt. *Amish Enterprise: From Plows to Profits*. 2nd ed. The John Hopkins University Press: Baltimore, Maryland, 2004.

Daniels, Thomas. "Farm Follows Function: In Lancaster County, Pennsylvania, Saving Farms Means Keeping a Lid on Growth." *Planning*. January 2000, pp 14-17.

History of Agriculture in the Delaware Valley

Agriculture as both a land use and a way of life dominated the Delaware Valley and its surrounding hinterlands from pre-Colonial times to the mid-20th century. Native Americans fished along the freshwater streams and coastal shores. In the fertile upland soils, villages of Native Americans cultivated small patches of agricultural fields, growing corn, beans, and rice (referred to as the "Three Sisters"). Native Americans gathered fruits and berries, such as blueberries and cranberries, that grew in the wild to supplement their fishing and farming.

As Europeans settled the area, they brought established agricultural practices with them and learned new ones from the Native Americans. The indigenous plants, temperate climate, and rich soils supported a patchwork of small farmsteads in Colonial times. These early farms at

first provided merely sustenance for the settler families, but soon agriculture became a thriving industry, as established farms yielded a surplus of crops and livestock to sell in the nearby settlements. Until the 20th century, farmers used the network of streams and rivers in the Delaware Valley to transport agricultural products—fruits, vegetables, and livestock—by barge or boat from the rural areas to small town centers. From there, products were transported to larger towns and cities. Early on, New Jersey produce was transported to Philadelphia, Baltimore, New York, and Boston.

A surprising amount of information, mostly in the form of farmers' diaries, exists from the Colonial era and provides insight into the Delaware Valley's long agricultural history. However, the only source of detailed, relatively consistent, and time-series data for the American agriculture industry is the US Census of Agriculture, started in 1840.

CENSUS OF AGRICULTURE

The United States Department of Agriculture (USDA) collects a great amount of agricultural data on a regular basis.² These time-series data provide agronomists, farmers, policymakers, planners, and others with facts about the country's ever-changing and diverse agriculture industry. The first Census of Agriculture was conducted in 1840 as part of the decennial population census by the US Department of Commerce's Bureau of the Census. At that time, many Americans lived or worked on farms. In 1997, the USDA took over the collection and administration of the Census of Agriculture. It is synchronized with the US Census Bureau's Economic Census and is conducted on a five-year cycle in the years ending in 2 and 7.

The USDA, through its National Agricultural Statistics Service (NASS) state offices, maintains lists of known farmers throughout the country, based on government lists as well as producer association lists, and other sources. In 2007, the Census Mail List contained 3,194,373 records.³ Each address on the Census Mail List received a detailed census "long form." There are seven regional versions, designed to account for crops most commonly grown within that region, and one national form.

The USDA aims for a 75% response rate in each of the 3,076 counties in the United States reporting one or more agricultural operations.⁴ By the end of June 2008, after several attempts to directly follow up with

nonrespondents by phone and in person, the USDA calculated an 85% response rate. Responses are confidential, and any tabulated data that could identify a respondent is withheld.⁵ Based on several other surveys and data analyses performed regularly by the NASS, missing data in the Census of Agriculture is estimated and the previous census is adjusted, or back-corrected.

In anticipation of each upcoming census, questions are revised or deleted and new questions are added. For example, the 2007 Census asked farmers if they are retired. The census revised its question on certified organic farms and crops and asked more questions about organic practices (as opposed to questions for certified organic operations).

² Most of this chapter is based on data from the USDA's Census of Agriculture. It is noted when data is from another source.

³ The majority of urban gardeners and community gardens are not accounted for in the Census of Agriculture. Some researchers, and specifically Professor Domenic Vitiello of the University of Pennsylvania, are studying whether urban gardeners are using community gardening as a way to supplement their household budget by growing more food and purchasing less food, and / or whether they are selling produce to neighbors and friends. Professor Vitiello's research, while still in data collection, has shown that some gardeners are growing and selling more than \$1,000 worth of produce in a season.

⁴ There are 3,141 counties in the United States, according to the US Census Bureau.

⁵ In instances when data is withheld, it is symbolized with a (D). This entry will appear throughout the data tables within this chapter.



Stolzhus Farm in Lancaster County, Pennsylvania

PHOTO CREDIT: DVRPC

Because the census has changed over time and terms have been redefined, previous data cannot always be compared to more recent data. For example, changes to the definition of “land in farms” now allows for acreage in farmsteads, outbuildings, and wastelands to be included. This redefinition and inclusion of more acreage makes it appear that more land is in production than in previous census years. While the increase of land in production may be a reality in certain counties, like Philadelphia, it may also lead to overcounting in other counties, such as Lancaster, PA.⁶

CHARACTERISTICS OF 100-MILE FOODSHED

The definition of “local” is very subjective. The manager of a farmers' market may define “local” as “the distance a farmer is willing to travel to reach a market.” A vegetable processor may define “local” according to the growing ranges of a variety of vegetables. For the purpose of data collection and aggregation, the Greater Philadelphia Food System Study defines “local” as a 100-mile radius from a point within the central business district of the City of Philadelphia. This radius includes 70 counties in parts of five states—Delaware, Maryland, New Jersey, New York, and Pennsylvania.⁷

The 100-Mile Foodshed has 29,910 square miles (19,142,400 acres) of land area. There are several major cities within the 100-mile study area, including New York City, Philadelphia,

and Baltimore. The US Census reports that in 2003, nearly 31 million (30,954,544) people—10% of the nation’s population—lived within the study area.

The 100-Mile Foodshed has a high population density, with over 1,034 people per square mile. The United States as a whole has a population density of 85 people per square mile.

The population density of the 100-mile radius around Philadelphia makes it one of the densest parts of the United States, second only to the overlapping 100-mile radius around New York City, with 1,083 people per square mile.

See Figure 1.1: Characteristics of the 100-Mile Foodshed for information on land area and population.

⁶ When possible, DVRPC discusses the instance of over reporting or definition changes that may skew a data point in the Census of Agriculture.

⁷ USDA collapses Baltimore City into Baltimore County. Nearly all data tables within this chapter have data entries for 69 counties, rather than 70.

FIGURE 1.1
Characteristics of the 100-Mile Foodshed

	100-Mile Foodshed	United States	100-Mile Foodshed as part of United States
2003 Population (persons)	30,954,544	299,398,484	10.3%
Total Land Area (sq. miles)	29,910	3,537,438	.8%
Population Density (persons per sq. mile)	1,034	84	N / A
Total Agricultural Lands (sq. miles)	8,123	1,440,774	.6%
Number of Farms	45,673	2,204,792	2.1%
Total Market Value of Agricultural Products Sold	\$6,732,916,000	\$297,220,491,000	2.3%

Source USDA 2009, US Census 2003, DVRPC 2009

Land Use

The land cover of the Greater Philadelphia Food System reflects the area's varied topography, diverse land uses, and agricultural history. The 70 counties within the study area range from very rural counties, like Dorchester, MD, and Wayne, PA,⁸ to very urbanized counties, like New York, NY (Manhattan Borough) and Bronx, NY (Bronx Borough). Some are very

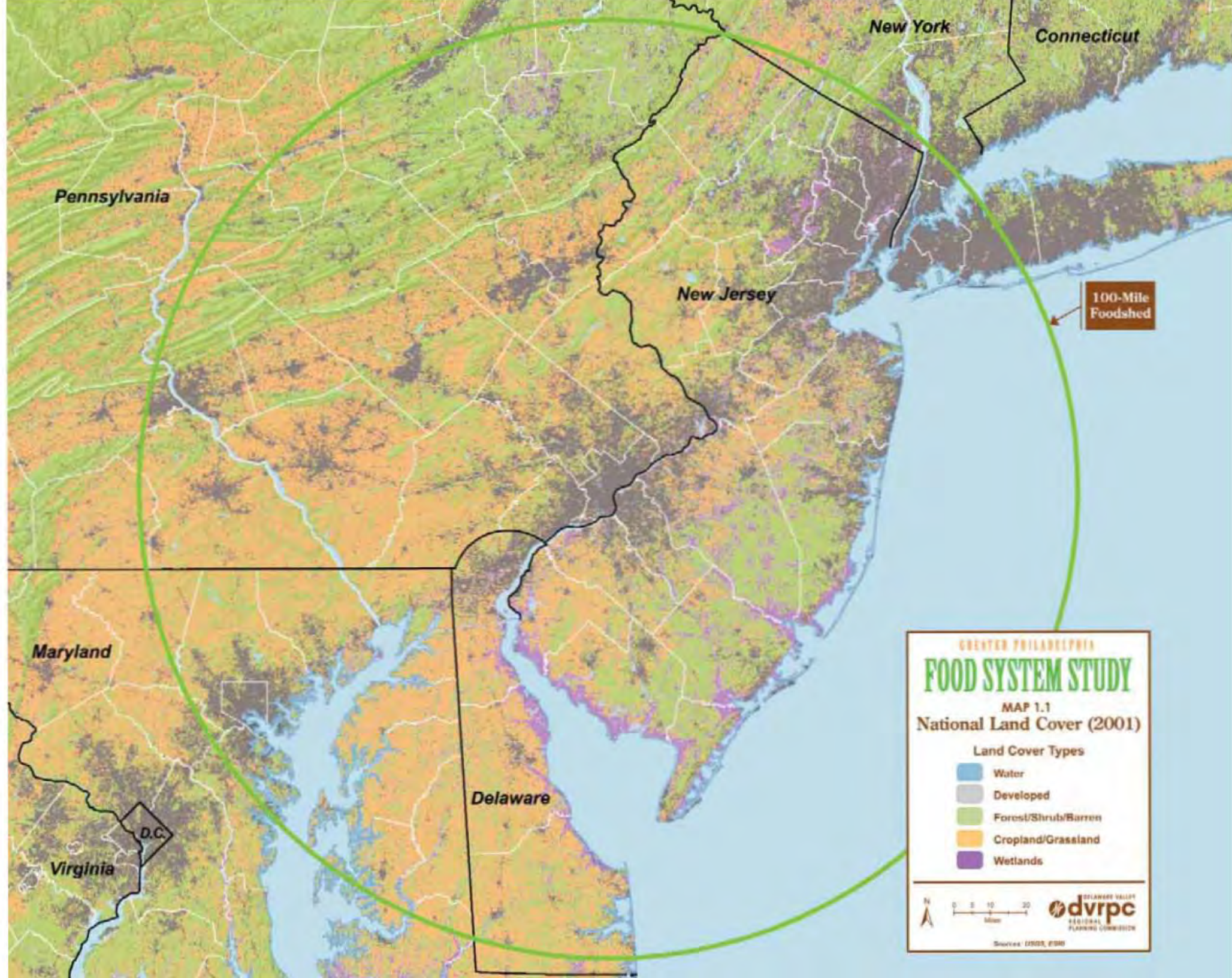
small in land size, like Hudson, NJ (51 square miles), and some are very large, like Lancaster, PA (984 square miles).

In 2001, the most recent year for which we have a consistent land use dataset for the entire study area, the most common type of land cover was forested land, which covered over 39% of the study area that year. According to this dataset, produced by the USDA's Natural Resources Conservation Service,

32% of the 70-county land area was devoted to agricultural use, including grassland, pasture and hay, and cultivated crops. Concentrations of agricultural land are found in Delaware State, the eastern shore of Maryland, and throughout Pennsylvania. As referenced in the previous section, this is slightly different from the 2007 Census of Agriculture, which reports that 27% of the area is agricultural land, which includes farmsteads (family homes, worker housing, and farm buildings). See **Map 1.1: National Land Cover (2001)** for an illustration of the 100-Mile Foodshed's land cover in 2001.

According to the Natural Resources Conservation Service, almost 19% of the 70-county land cover was considered urban development in 2001. Large areas of developed land extend outward along the length of the I-95 corridor, which connects Washington, DC, to Boston. Another 7% of land area was wetlands found along the shorelines of Delaware and New Jersey.

⁸ Wayne is a county in northeastern Pennsylvania, not to be confused with Wayne, a business district and neighborhood located in Radnor Township, Delaware County, PA.



New York

Connecticut

Pennsylvania

New Jersey

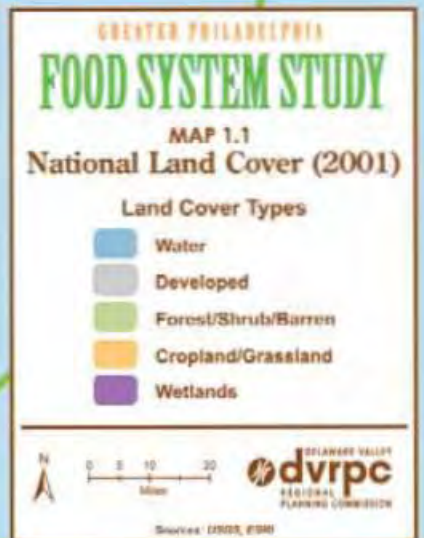
100-Mile Foodshed

Maryland

Delaware

Virginia

D.C.



Agricultural Soils

Soil is the foundation for all land uses and determines how land can be developed. It also defines what type of vegetation is possible and influences agricultural uses. Soil is an essential natural resource for the region to conserve and protect and for a farmer to maintain and improve over time. Greater Philadelphia's 100-Mile Foodshed has some of the most fertile soils in the country, if not the world.

One Chester County open space planner has compared southeastern Pennsylvania's soils to a national treasure on par with the Redwood Forests.⁹ Soil conservation is important to farmers, as it is a resource that cannot be replaced within a human's lifespan and it determines a farm's need for additional inputs. Soil conservation is important to environmentalists, as soil erosion creates environmental problems, such as decreased surface water quality and increased flooding, among other concerns.

The 100-Mile Foodshed's rich agricultural soils are suited to grow a wide variety of crops. Fruits, vegetables, and grains (corn, soy, and wheat) require high-quality agricultural soils, while crops grown for animal feed (pasture, dry hay, haylage, and greenchop) can grow on lower-quality soils. **Map 1.2: Agricultural Soils** depicts the foodshed's soils rated for agricultural use.

Map 1.3: Remaining Agricultural Soils illustrates that the soils that are best for farming are also the soils easiest to develop, as they are usually level, cleared of trees, shrubs, and large rocks, well-drained, and suitable for on-site septic systems, sparing a developer those site preparation costs. Development is one of the largest threats to the 100-Mile Foodshed's agriculture industry because it permanently removes or destroys high-quality agricultural soils.



Cranberry bog in New Jersey's Double Trouble State Park

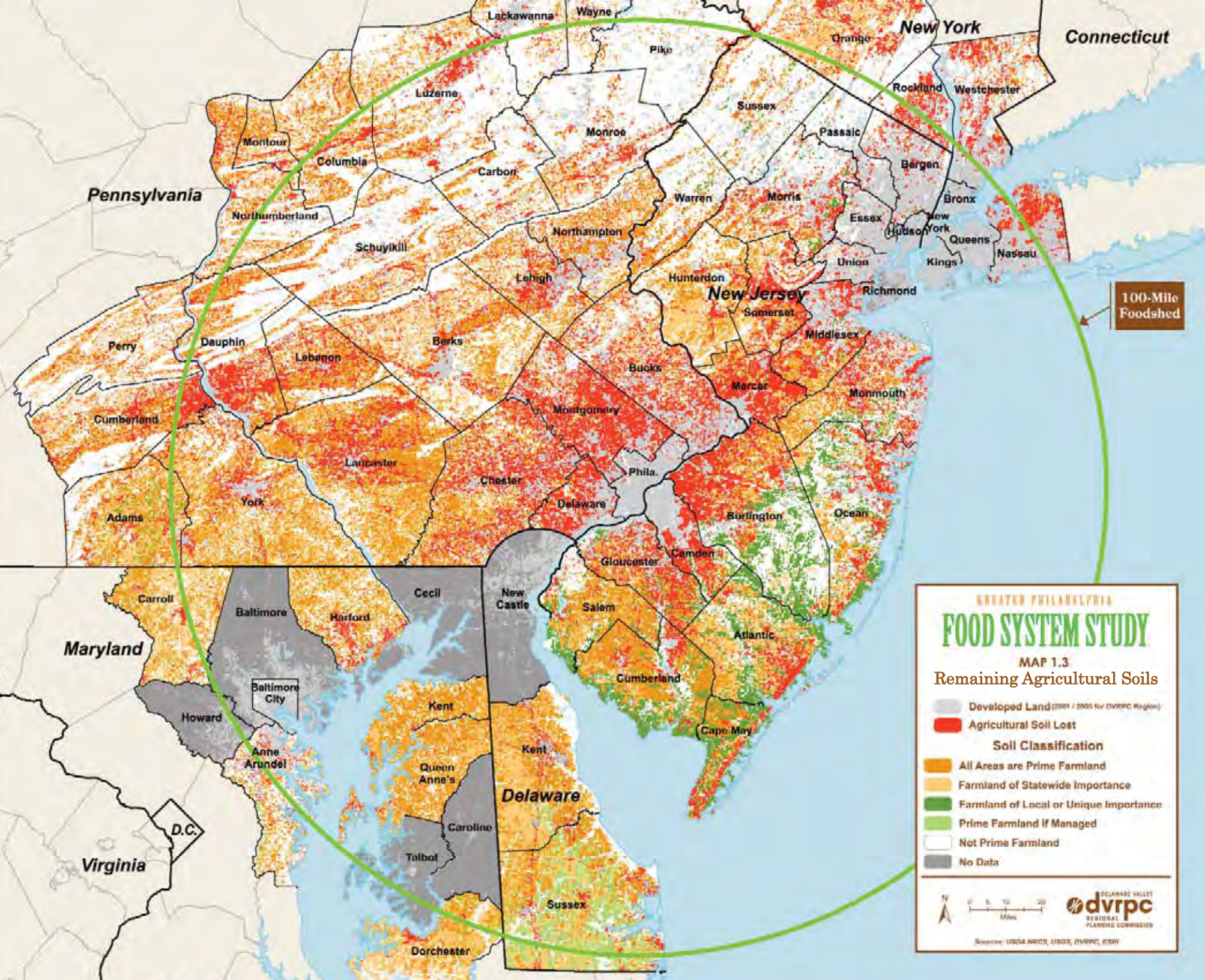
PHOTO CREDIT: SCOTT O'DONNELL PHOTOGRAPHY

Paradise Hill Farm Burlington County, New Jersey

Cranberries and blueberries are examples of high-value regional crops that grow in wet and sandy soil, usually rated as "Farmland of Unique Importance." Paradise Hill Farm is a cranberry and blueberry farm in operation in the New Jersey Pinelands. Mary Ann Thompson's family has operated the farm since the Civil War. Ms. Thompson grows heirloom and modern varieties of cranberries and blueberries. She is dedicated to preserving heirloom varieties, and some of the farm's vines were planted by her great-grandfather. The farm provides educational tours, highlighting the cultural and environmental heritage of the Pinelands.

⁹ Jake Michael, Chester County Open Space Planner, in a presentation on open space protection at the February 7, 2008, meeting of DVRPC's Southeastern Pennsylvania Open Space Coordinating Committee.





As of 2001, about 37% of the foodshed's land area is considered to be important agricultural soils, and an additional 1.4% is considered to be prime farmland if properly managed.

State and national agricultural agencies classify important farmland soils into several categories: Prime Farmland, and Soils of Statewide Importance, Local Importance, and Unique Importance.

Only 16.9% of the foodshed's land area is considered prime farmland. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops.

Another 16.9% of the foodshed's land area is classified as Farmland of Statewide Importance. These soils are close in quality to Prime Farmland and can sustain high yields of crops when correctly managed with favorable conditions.

FIGURE 1.2
Remaining Agricultural Soils

Agricultural Designation	Remaining Agricultural Soils*	% of Total Land Area
Prime farmland	3,225,824	16.9%
Farmland of local importance	22,209	0.1%
Farmland of statewide importance	3,228,660	16.9%
Farmland of unique importance	578,072	3.0%
Prime farmland, if drained	74,664	0.4%
Prime farmland, if irrigated	177,283	0.9%
Prime farmland, if protected from flooding	18,297	0.1%
100-Mile Total Land Area**	19,136,640	100%

*Based on 2005 DVRPC Land Use data for 9 counties and 2001 NRCS Land Cover data for remaining 61 counties

**Agricultural values not available for New Castle in Delaware; Cecil, Baltimore, Howard, Caroline, and Talbot in Maryland; Bronx, Queens, Kings, and Richmond in New York; and Hudson in New Jersey.

Source NRCS 2005, DVRPC 2009

Only 3.1% of the study area's total land is considered Farmland of Unique Importance or Local Importance. These soils can support the production of high-value regional crops, like horticultural crops, or indigenous foods, like strawberries, cranberries, and blueberries.

Growing Season

Much like soils and rainfall, the 100-Mile Foodshed's growing season largely impacts the agriculture industry. The 100-Mile Foodshed is located about halfway between the Equator and the North Pole, resulting in a highly variable climate, with wet, dry, hot, and cold weather patterns. There are great differences in climate, from the

Pocono Mountains, with its cooler temperatures and increased winter precipitation, to Cape May, with its hotter summer days. Generally, the southeast portion of the foodshed, consisting of southern New Jersey and Delaware, has more “freeze-free” days than the northwest portion, which includes northwest New Jersey and northeastern Pennsylvania. Many fruits and vegetable crops need nighttime temperatures above 45°F to grow and optimum daytime temperatures between 75° and 85°F to bear flowers or fruit.¹⁰

While it seems that food production in the 100-Mile Foodshed is limited by its growing season, it has a relatively long season, sometimes stretching from March to mid-November in southern areas and from mid-April to mid-September in most other areas.

Agricultural researchers, extension agents, and farmers are experimenting with season extension within the 100-Mile Foodshed. As farmers sell more

products directly to consumers or have contracts with retailers and other buyers, it is important to maintain those relationships throughout the year by extending the growing season to 10 to 12 months of the year. Techniques for extending the growing season can range from permanent greenhouses to semipermanent high tunnels, from plastic crop covers to mulch.

The National Center for Appropriate Technologies (NCAT) identifies the benefits and disadvantages to season extension. Benefits of year-round production include the retention of old customers and access to new customers, year-round income, and year-round employment for farm workers. Some disadvantages include limited breaks in the yearly work schedule for farmers, additional management, increased production costs, and, depending on what technique is chosen, increased use of fossil fuels and / or plastic waste.¹¹

Recently, unheated high tunnels have grown in popularity in the 100-Mile Foodshed. High tunnels, also called hoop houses, have been used over the last 200 years in Europe and are widely used in Asia and the Middle East today. A high tunnel is an arched frame covered with clear plastic designed to collect and store solar heat. Crops are typically grown in the ground with drip irrigation.

An average tunnel allows a grower to plant about three weeks earlier in the spring and extend the growing season for about a month in the fall.

Greenhouses, which can result in year-round production, are usually heated through electricity or natural gas heating. Many greenhouses are heated passively through solar power, and a few greenhouses are heated through alternative energy, like biofuels or recycled methane gas.

Extension agents throughout the 100-Mile Foodshed have reported an increased interest in and use of season

¹⁰ Orzolok, Michael. “Season Extension: New Techniques and Covers for Extending the Growing Season.”

¹¹ National Center for Appropriate Technologies. “Season Extension for Market Growers.” <http://attra.ncat.org/attra-pub/seasonext.html>. Accessed 1 July 2009.

extension. Lancaster Farm Fresh Cooperative, a farmer cooperative that specializes in wholesale trade and community-supported agriculture, has many growers who extend their growing season to meet demand for local produce in the early spring and fall.



Tomatoes growing in greenhouse at Greensgrow Farm in Philadelphia

PHOTO CREDIT: BECKY SWEGER

Climate Change and Food

Global, national, and local food systems are very dependent on fossil fuels, from manufacturing nitrogen fertilizers to

operating machinery, and from transporting food products to cooking food at home. All of these actions currently rely on fossil fuels and produce greenhouse gas emissions. Carbon dioxide, nitrous oxide, and methane are all greenhouse gases (sometimes referred to as GHG) that contribute to climate change.

Processing and home preparation are the biggest users of energy; however, production is arguably the most dependent on fossil fuels and one of the biggest sources of greenhouse gas emissions. Despite the popularity of the term “food miles,” and concern over the energy required to transport food around the globe, transportation is not necessarily the biggest source of emissions within the food system. In addition, it should be noted that some modes of transport are more energy efficient, and thus lower in emissions, than others. Water transport is the most efficient per unit, followed by rail, then truck, then air freight.¹² However, it is important to note that water transport

uses a lower-quality fuel, often referred to as “bunker fuel,” which generates more pollution, and specifically particulate matter, than other types of fuel.

Within agricultural production, there are several ways that greenhouse gases are emitted. First, deforestation, or clearing forestland for agricultural purposes, releases carbon stored in plants. Second, most fertilizers are made from nitrogen, and the application of fertilizer onto cropland causes the release of nitrous oxide. Third, cattle, goats, and sheep release methane as part of their natural digestion. Fourth, intensive farming and grazing leads to soil erosion and degradation, which may release carbon previously stored in the soil. Finally, the mechanization of on-farm machinery and the use of packaged inputs like seeds and pesticides have increased agriculture’s dependence on fossil fuel. Some experts believe the national food system uses approximately 7.3 calories of energy (mostly in the form of fossil fuels) to produce, manufacture, package, store, and deliver each calorie of food energy.¹³

¹² Brodt, Sonja, Erica Chernoh and Gail Feenstra. “Assessment of Energy Use and Greenhouse Gas Emissions in the Food System: A Literature Review.” UC Davis Agricultural Sustainability Initiative. November 2007.

¹³ Heingberg, Richard and Michael Bomford. *The Food & Farming Transition: Toward a Post Carbon Food System*. The Post Carbon Institute, Spring 2009.

Globally, agriculture accounts for 13.5% of greenhouse gas emissions annually, slightly higher than transportation (at 13.1%), and land use changes more broadly account for more than 30% of all greenhouse gas emissions. However, according to DVRPC's Regional Greenhouse Gas Emissions Inventory, which was completed in 2009 using 2005 data, the agricultural sector accounts for only 7.6% of emissions nationally and only 0.5% of all emissions in the DVRPC nine-county region.¹⁴ Of the emissions attributed to agriculture in the DVRPC region, the majority were from agricultural soils (runoff from manure, fertilizer, and plant residues), followed by manure management (nitrous oxide), and methane emitted by livestock. Agriculture's smaller regional share of emissions can be attributed to the smaller proportion of agricultural land within the region as compared to the nation, and the small proportion of ranching or intensive livestock production within the region.

While the food system is contributing to climate change, agriculture is also

detrimentally impacted by climate change through increased flood events, droughts, hurricanes, forest fires, and an overall loss of biodiversity. Some sources such as the Union of Concerned Scientists (UCS) have stated that Pennsylvania's climate may be more similar to present-day Georgia by the year 2070. Continuing changes to temperature, rainfall, and the increased amount of CO₂ in the atmosphere could positively and negatively affect Pennsylvania's agriculture industry. On the positive side, moderate increases in temperature and a longer growing season could increase yields of corn and soybeans. However, the negative impacts could outweigh moderate benefits. With increased temperature and periods of extreme weather, Pennsylvania, and other Mid-Atlantic states, will experience an increase in pests, pathogens, and weeds. Hotter summers and lower rainfall could require that more crops be irrigated. High-value fruits, such as grapes and certain varieties of apples, may produce lower yields and battle increased pests as they lose the beneficial "chilling effect" of a cooler winter.¹⁵

UCS also calculates that the dairy industry, a particularly significant agricultural sector within Greater Philadelphia's 100-Mile Foodshed, could decline by as much as 20% in Pennsylvania during the summer months given the highest-emissions scenario.¹⁶

Farmers are among the most adaptable and innovative business operators. However, climate change will produce economic uncertainty, and small and large operators alike will have to invest in transitioning their operations. UCS suggests that a diminished agricultural economy in rural areas may accelerate the conversion of farmland to development.

To highlight the impacts of global warming, the Arbor Day Foundation released a new plant Hardiness Zone map in 2006, updating the map released by the USDA in 1990. Based on state weather data, the 2006 map shows that significant portions of many states have already shifted from one zone to another warmer zone.

¹⁴ Graff, Robert. Regional Greenhouse Gas Emissions Inventory. Delaware Valley Regional Planning Commission. March 2009.

¹⁵ Union of Concerned Scientists. Climate Change in Pennsylvania: Impacts and Solutions for the Keystone State. October 2008.

¹⁶ Frumhoff, et al. "Confronting Climate Change in the US Northeast: science, impacts and solutions." Union of Concerned Scientists. July 2007.

Most of New Jersey, Delaware, Maryland, and southeastern Pennsylvania fall within Zone 7, which has an annual low temperature ranging from 10°F to 0°F.

See **Figure 1.3: 2006 Hardiness Zones for the 100-Mile Foodshed.**¹⁷

Some local food and organic advocates such as the Rodale Institute have shown that sustainable production practices like low till, generating alternative energy on a farm, seed saving, and planting cover crops help combat climate change by reducing emissions and sequestering carbon. In the larger food system, some people suggest that making direct connections between producers and consumers, retrofitting waste management to compost food scraps, and local preferential purchasing policies for institutions and large wholesale buyers will reduce greenhouse gas emissions and create other environmental benefits.

FIGURE 1.3
2006 Hardiness Zones for the 100-Mile Foodshed



Source National Arbor Day Foundation 2006, DVRPC 2009, ESRI 2009

¹⁷ Arbor Day Foundation. www.arborday.org/media/zones.cfm. Accessed 22 May 2009.

Water Resources

Farm productivity and viability rely upon access to water from either precipitation or irrigation. Most of the 100-Mile Foodshed's farmers rely on precipitation. The average precipitation rates for the five states range from 42 inches a year in New York to 47 inches a year in New Jersey.¹⁸ In addition to its high rate of precipitation, the 100-Mile Foodshed has many surface and groundwater resources that can be used to irrigate cropland.

There are several ways to irrigate a farm. A farm pond may be dug to capture surface water from the surrounding area. Another method is to withdraw water from a stream. Drilling one or more wells and pumping from groundwater is a more costly, but frequently used, method. Farmers can use large sprinklers or drip irrigation systems to irrigate fields. Drip irrigation provides nearly constant water to plants' roots and is considered

to be the most efficient way to irrigate land since it reduces evaporation and seepage.

Some of the largest farms in the 100-Mile Foodshed's suburbanizing counties are nurseries, horticulture operations and sod farms, and vegetable farms, all of which usually require irrigation in addition to precipitation. However, only 12% of the foodshed's farms reported irrigating, and only 8% of all cropland was irrigated in 2007. Most irrigated acres were located in large nursery- and vegetable-producing counties, such as Sussex and Kent in Delaware, Caroline and Dorchester in Maryland, and Cumberland and Salem in New Jersey.

Cranberry production, a very specialized type of agriculture, requires direct access to surface water. A common method of harvesting cranberries is to flood a dry cranberry bed with fresh water, drive a harvester through the bog, removing the

cranberries from their vines, and collect the cranberries that float to the top. Many cranberry farms are a thousand acres or more because the operation needs significant amounts of land to secure significant water rights.

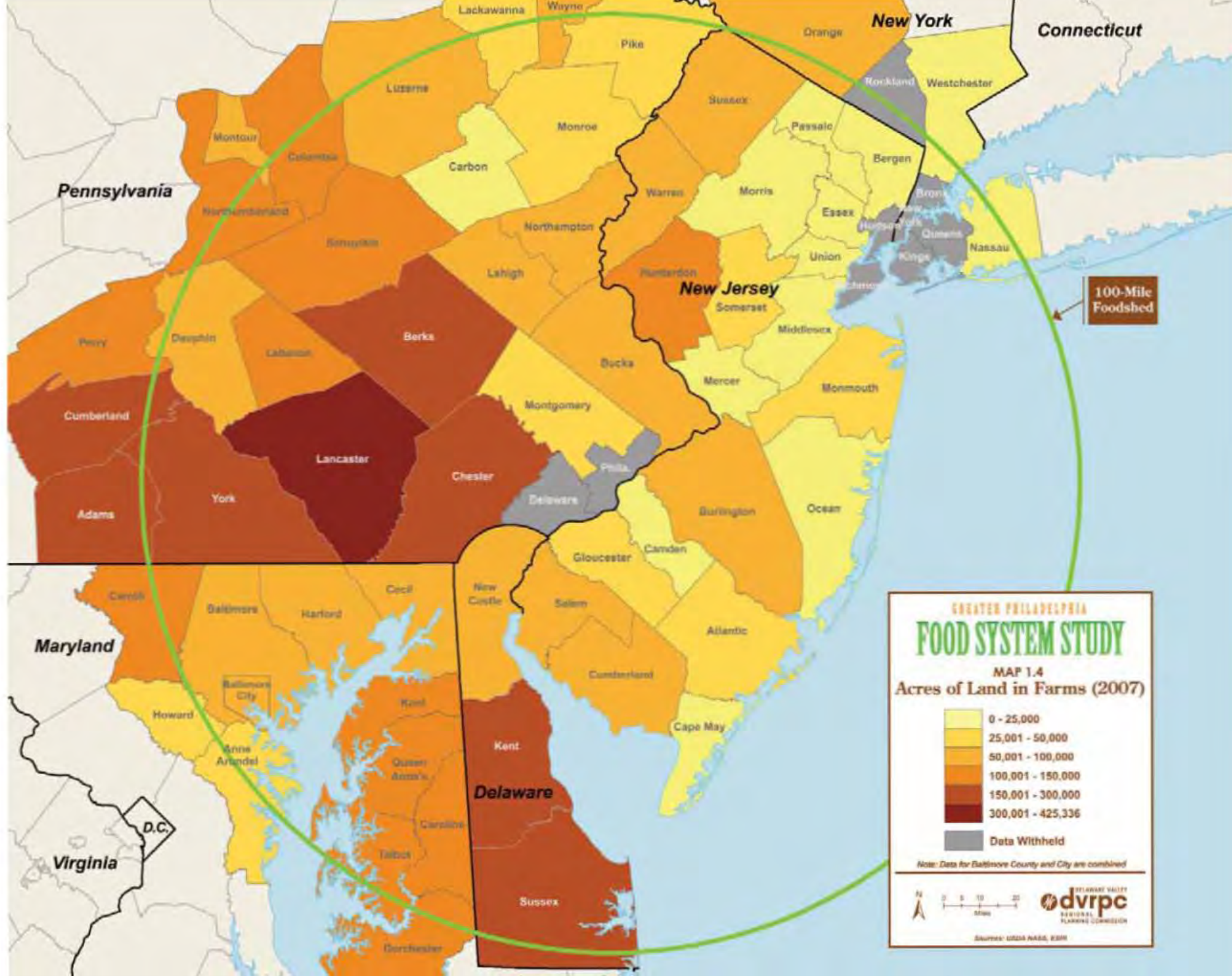
AGRICULTURAL LAND BASE

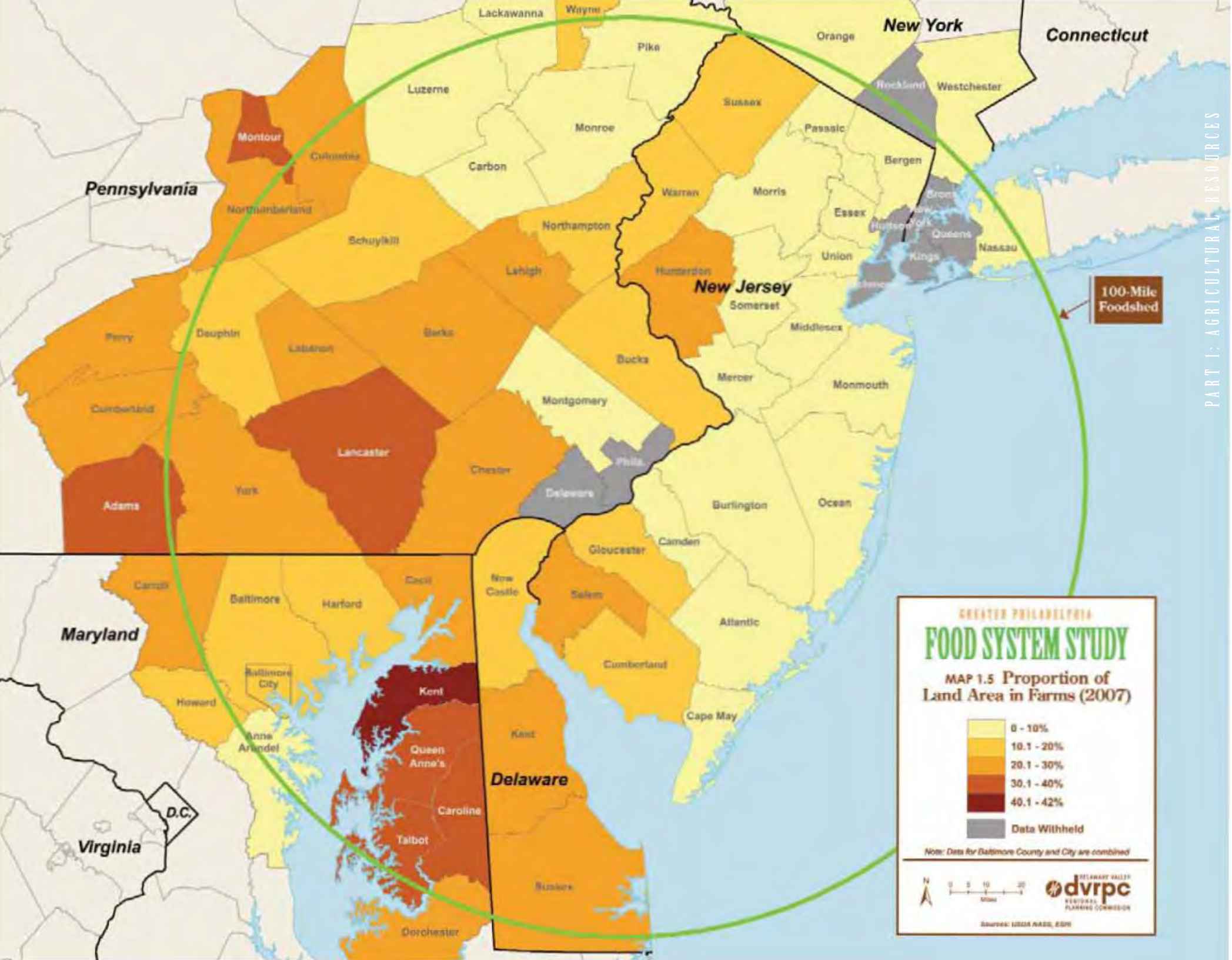
According to the USDA 2007 Census of Agriculture, the 100-Mile Foodshed has 5,198,753 acres of "land in farms," or land related to agricultural productions (i.e., cropland, pastureland, orchards, and land under farm buildings).

See **Map 1.4: Acres of Land in Farms (2007)**, which illustrates which counties have the most farmland.

Farm acreage and farming in the 100-Mile Foodshed and throughout the United States changed dramatically during the second half of the 20th century. Over half (58%) of the agricultural land in the 100-Mile Foodshed was lost between 1910 and 2007.

¹⁸ National Oceanic and Atmospheric Administration (NOAA), Earth System Research Laboratory, www.cdc.noaa.gov/cgi-bin/data/timeseries/timeseries1.pl. Accessed 27 April 2009.





The USDA defines land in farms as “agricultural land used for crops, pasture, or grazing... [and] woodland and wasteland not actually under cultivation or used for pasture or grazing.” The USDA states that large acreages of woodland or wasteland held for nonagricultural purposes are deleted from individual reports during the editing process.

Changes to the definition “land in farms” may have led to an artificial increase in total farmland acreages for some counties within the 100-Mile Foodshed. See the Summary section at the end of this chapter for more analysis on the importance of definitions.

Source USDA. 2007 Census of Agriculture: Appendix B: General Explanation and Census of Agriculture Report Form. Released February 2009.

Most of that decline occurred between 1950 and 1969, when an average of 143,000 acres were lost every year.¹⁹ This time period coincides with the rise of auto-dependent suburban tract developments, like Levittown in Nassau County, New York. The rate of decline has slowed since 1969; however, the 100-Mile Foodshed continued to lose over 21,000 acres of farmland each year from 1987 to 2007.

Despite the 100-Mile Foodshed being a heavily urbanized area with overlapping major metropolitan areas, far-reaching highway infrastructure, and extensive public transportation services, the study area has a large amount of farmland. Large areas of agriculture are concentrated in several geographic areas:

- Maryland’s Eastern Shore – Caroline, Kent, Queen Anne’s, and Talbot counties;

- Lower Delaware Estuary – Kent, New Castle, and Sussex counties in Delaware; and Cumberland and Salem counties in New Jersey; and

- Pennsylvania’s Farm Belt – Adams, Berks, Chester, Cumberland, Lancaster, Lebanon, and York counties.

In comparing the 1987 Census of Agriculture to the 2007 Census county by county, some interesting trends emerge. Seventeen counties within the 100-Mile Foodshed have seen an increase in agricultural land over the last 20 years. Thirteen counties reported significant increases (greater than 5%) in farmland, including Perry, Pike, Northumberland, Schuylkill, and Lancaster counties in Pennsylvania. These increases in agricultural land probably have more to do with changes in the definition of “land in farms” and the USDA’s concerted efforts to reach more farmers, including those farmers operating “retirement farms,” farms of

¹⁹ The Eco Trends Project. www.ecotrends.info/EcoTrends/. Accessed 27 April 2009.

various sizes, and farmers from diverse ethnic backgrounds. For example, land cover data in Lancaster County depicts only 54% of the land area in agricultural use, as compared to the USDA's report that 67.5% of the county is considered "land in farms."²⁰

The majority of counties (44) report a loss of farmland in the last 20 years. Wayne, PA, Sussex, DE, Orange, NY, Kent, DE, and New Castle, DE, reported the largest losses of farmland. These counties are either exurbs of large metropolitan areas or are located near smaller urbanizing areas like Scranton in Pennsylvania or Wilmington in Delaware. For seven counties, there is either no reported farmland or the amount of census survey respondents is too small to disclose the data.

FIGURE 1.4
Detailed Types of Farmland in the 100-Mile Foodshed

Detailed Types of Farmland	2002 (Acres)	2007 (Acres)	% Change (2002 to 2007)	Absolute Change (2002 to 2007)
Harvested cropland	3,259,174	3,193,783	-2.0%	-65,391
Other cropland (idle, summer fallow, failures)	264,798	252,286	-4.7%	-12,512
Cropland used only for pasture	265,226	190,833	-28.0%	-74,393
Permanent pastureland	259,908	339,732	30.7%	79,824
Woodland not pastured	623,879	681,248	9.2%	57,369
Woodland pastured	80,587	47,582	-41.0%	-33,005
Land in farmsteads, buildings, etc.	319,112	312,735	-2.0%	-6,377

Source: USDA 2009, DVRPC 2009

Types of Farmland

The USDA's Census of Agriculture categorizes farmland into four broad and overlapping types: cropland, pastureland, woodland, and other uses, such as farmsteads, buildings, and wastelands (on-farm dumps, manure lagoons, spray fields, etc.). The 100-Mile Foodshed, which is characteristic of the larger Mid-Atlantic region, has much more cropland (73%) than any other type of farmland, while the

United States as a whole has almost equal amounts of pastureland and cropland. Seven percent is pastureland, 14% is woodland, and 6% is for other uses. Comparatively, the nation's farmland comprises 45% cropland, 44% pastureland, 8% woodland, and 3% for other uses.

As mentioned before, the USDA's broad categories overlap one another. Both cropland and woodland, if level, can be used as pastureland.

²⁰ Lancaster County Planning Commission. Greenscapes: The Green Infrastructure Element. Pg. 20. Draft completed November 2008.

The USDA defines a farm as “any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year.”

The definition of a farm has changed nine times since 1850. The current definition was first used in the 1974 Census.

Some experts suggest that the USDA’s definition is too broad, and that the United States has at least one-third less farms than reported in the Census of Agriculture.

Source USDA. 2007 Census of Agriculture: United States Summary and State Data. Volume 1, Part 51. Released February 2009.

In 2007, about 11% of all farmland in the 100-Mile Foodshed was used for pasture. Since the Census of Agriculture is a survey, individual operators determine how to classify their land, based on USDA definitions, on the reporting form.

Figure 1.4: Detailed Types of Farmland in the 100-Mile Foodshed compares data from the 2002 Census of Agriculture to the 2007 Census. Notably, the amount of “permanent pastureland” and “woodland not pastured” significantly increased by 31% and 9%, respectively, between 2002 and 2007.

These large increases in permanent pastureland and woodland may indicate that many farmers are retiring and transitioning their land to less intensive uses. Anecdotally, DVRPC learned of older farmers replanting cropland with tree saplings, which conserves soil, as no family members were interested in

farming. The large decrease in harvested cropland and cropland used only for pasture may also indicate land lost to development.

FARM CHARACTERISTICS

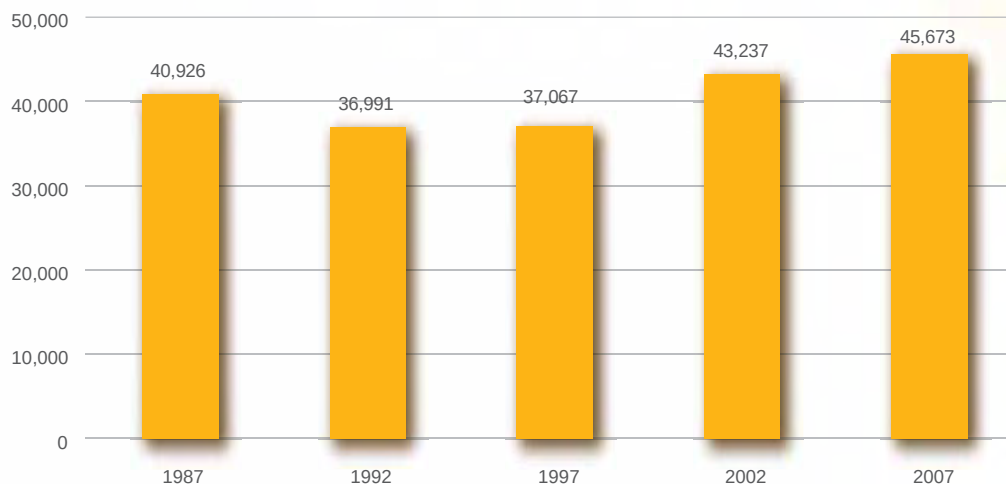
In the last century, two significant changes occurred in agriculture: the increased practice of mechanized harvesting and government price supports. These two changes encouraged farm operators to increase the size of their farms to gain economic efficiencies and reduce the amount of farm labor needed. These changes also created an incentive to plant large acreages of field crops, such as grains, corn, and hay, while decreasing acreage for more labor-intensive crops like vegetables and fruits. Field crops became more profitable due to these changes, which also led to agricultural production being concentrated in fewer and larger farms.

In 1935, the United States had 6.8 million farms. Today, there are 2.2 million farms. However, during this time, the average farm size nearly tripled, so that the overall decrease in farmland acreage was relatively small. In 1935, the average farm size was 155 acres. Today, the average size is 418 acres, with the majority of farms far below the average.²¹

In contrast, the 100-Mile Foodshed has recently experienced an increase in the total land in farms, but a decrease in the average size of farms. In 2007, the 100-Mile Foodshed had 45,673 farms, an increase of 5.6% over the 2002 Census of Agriculture, and an increase of 12% from the 1987 Census. **Figure 1.5: Change in the Number of Farms in the 100-Mile Foodshed** illustrates this steady increase.

During the same time period, the average size of the foodshed's farms decreased from 137 acres in 1987 to

FIGURE 1.5
Change of the Number of Farms in the 100-Mile Foodshed



Source USDA 2009, US Census 2003, DVRPC 2009

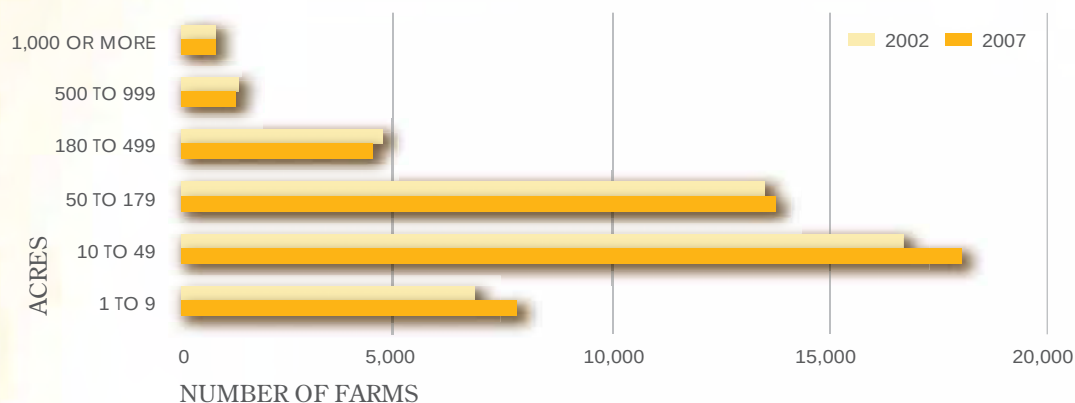
114 acres in 2007. The increase in the number of farms and decrease in average farm size suggests that farms are getting smaller through subdivision by sale, inheritance, or retirement. It also suggests that there are more “lifestyle” or hobby farms in the 100-Mile Foodshed. More people are living on large lots of five to 20 acres and maintain a preferential farmland tax assessment by operating small-scale

agricultural activities. **Figure 1.6: Farms by Size in the 100-Mile Foodshed** illustrates the distribution of farms by size.

Over 16% of the 100-Mile Foodshed's farms are smaller than 10 acres, and that number continues to increase. The smallest category of farms (one to nine acres in size) increased by 15% between 2002 and 2007, while the largest

²¹ Economic Research Service, USDA. Structure and Finances of US Farms: 2005 Family Farm Report. 2005.

FIGURE 1.6
Farms by Size in the 100-Mile Foodshed



Source: USDA 2009, DVRPC 2009

category of farms (1,000 or more acres in size) decreased by 2%. These large farms are more often owned by corporations rather than families and may be large-scale poultry operations found in southern Delaware and the Eastern Shore of Maryland. Similarly, the number of farms in the category of 180 to 499 acres in size decreased by 5%. These farms are most likely family-owned dairy and livestock farms. However, the smaller-scale production farms that we more often

associate with traditional family farms, ranging from 10 acres to 179 acres in size, increased by 5%. These small- to medium-scale row crop (such as corn and soybeans) farms, vegetable farms, dairies, and orchards make up the majority (69%) of the foodshed's farms.

Tenure and Ownership of Farms

Most (74%) of the 100-Mile Foodshed's principal farm operators have lived on

or operated their farms for more than 10 years. Farming traditions have persisted within Greater Philadelphia's landscape of urban development. Southern New Jersey has long-established farmers, specializing in vegetable growing and row crops, while Chester, Lancaster, and York counties in Pennsylvania have entire social and religious communities that are devoted to agricultural production.

The average tenure of a principal operator on a farm ranges from 10 years in Philadelphia to 28 years in Richmond County (Staten Island), New York. The 2007 Census of Agriculture can attest to the resurgence of urban and periurban agriculture. Farmers with the least number of years on a farm, representing the newest farmers, are likely to be found in Lancaster, Philadelphia, and Delaware counties in Pennsylvania; and Queens, Bronx,

and Kings (Brooklyn) counties in New York. See **Appendix A: Agricultural Resources Data Tables** for more detailed information for each county regarding principal operators.

Farms have generally remained under family ownership. About 86% of all of the foodshed's farms are owned by a family or individual; 5% are owned by a family-held corporation; about 7% are owned by a partnership; 1% are owned by another type of organization, such as an estate, trust, or institution; and 1% are owned by a corporation. The amount of land in acres, compared to the number of farms, is slightly different, with families and individuals owning 67% of all the farmland in the foodshed, family corporations owning 14% of all farmland, partnerships owning 16%, other organizations owning 1%, and corporations owning 1%. See **Figure 1.7: Farm Ownership by Type**.

FIGURE 1.7
Farm Ownership by Type

Ownership by Type		2002	2007	% Change
Family or Individual	Farms	37,452	38,808	3.6%
	Acres	2,849,508	3,092,442	8.5%
Family-held corporation	Farms	1,966	2,408	22.5%
	Acres	359,941	647,350	79.8%
Partnership	Farms	2,546	2,929	15.0%
	Acres	743,793	752,700	1.2%
Other (cooperative, estate, trust, institution)	Farms	263	427	62.4%
	Acres*	45,808	59,580	30.1%
Corporations	Farms	281	382	35.9%
	Acres*	29,805	59,718	100.4%

*Due to small sample size, many counties could not report total acreage for land owned by "other" or corporations. These acreage numbers are conservative estimates.

Source NRCS 2009, DVRPC 2009

Estimated Value of Land and Buildings

The estimated market value of land is determined by its development potential (derived through zoning) and its expected returns on its agricultural activity. Because land is a finite resource, land values are based on potential use, not just potential

farming activity. When urban development encroaches upon farmland, the value of remaining farmland increases. This, in turn, makes it more difficult for new and aspiring farmers to purchase land and increases the costs of farming as property taxes, labor costs, and other transaction and opportunity costs increase.

According to the 2007 Census of Agriculture, the average per-acre value of land and buildings within the 100-Mile Foodshed is \$8,380, compared to the national average per-acre value of \$1,892. Within the 100-Mile Foodshed, the value per acre varies widely, from a low of \$1,664 in Pike County, PA, to a high of \$133,263 in Union County, NJ. The five counties with the highest market value per acre—Union, Essex, and Bergen counties in New Jersey; and Richmond and Nassau counties in New York—are all in the New York metropolitan area. See **Appendix A: Agricultural Resources Data Tables** for the details of each county. Another way to look at the rising costs of owning a farm or gaining access to a farm as a new farmer is the average value per farm. The average farm in the 100-Mile Foodshed was valued at \$953,897 in 2007, while the average farm in the United States was valued at \$791,138. As mentioned previously, the average size of a 100-Mile Foodshed farm is 114 acres, while the average

American farm is 418 acres. The top five counties with the highest value per average farm are Westchester, NY, New Castle, DE, Talbot, MD, Nassau, NY, and Kent, DE, ranging from \$2,557,300 in value per farm to \$2,091,272. These are a mix of suburban and rural counties. High land and residential real estate values may explain why the suburban counties of Westchester and Nassau have the highest per-farm values. New Castle and Kent in Delaware and Talbot in Maryland have a significant number of poultry producers, and poultry producers tend to have farms with large and expensive poultry houses.

Throughout the nation, farm real estate values have increased over a long period of time, and have dramatically increased between 2002 and 2007. This increase coincides with the national rise in the value of residential real estate, which peaked in 2006 and has been followed by a steep and dramatic decline in recent years.

The National Association of Realtors still claims that a house doubles in value every 10 years despite the current housing bubble crash.²²

AGRICULTURE INDUSTRY

The 100-Mile Foodshed's agriculture industry can be evaluated with several indices, including the "total market value of products sold," "farms by sales," "total amount of commodities produced," "number of farms producing different types of commodities," "farm-related income," and "farm-related expenses."

Market Value of Products Sold

Since 1987, the value of crop and livestock in the 100-Mile Foodshed increased by 118%. Between 2002 and 2007, the value of production increased 48%. See **Figure 1.8: Market Value of Products Sold**. Several factors have contributed to this increase. Corn, soybean, and grain, primarily grown in

²² National Association of Realtors. "Housing Market Facts." www.housingmarketfacts.com. Accessed 5 May 2009.

the Greater Philadelphia food system for animal feed, have increased in value due to the anticipated production of biofuels. Extreme droughts in other regions, states, and countries have also increased prices. Additionally, the United States as a whole is experiencing more demand from other countries, including developing countries, for specific agricultural products.

The 100-Mile Foodshed's top commodities in 2007 were:

- Poultry and eggs (29% of total market value of production in 2007);
- Greenhouse, nursery, and floriculture products (22%);
- Milk and other dairy products (17%);
- Grains, oilseeds, dry beans, and dry peas (11%); and
- Vegetables, melons, potatoes, and sweet potatoes (6%).

This indicates that Greater Philadelphia's agricultural area specializes in high-value products that can be grown on smaller farms

FIGURE 1.8
Market Value of Products Sold

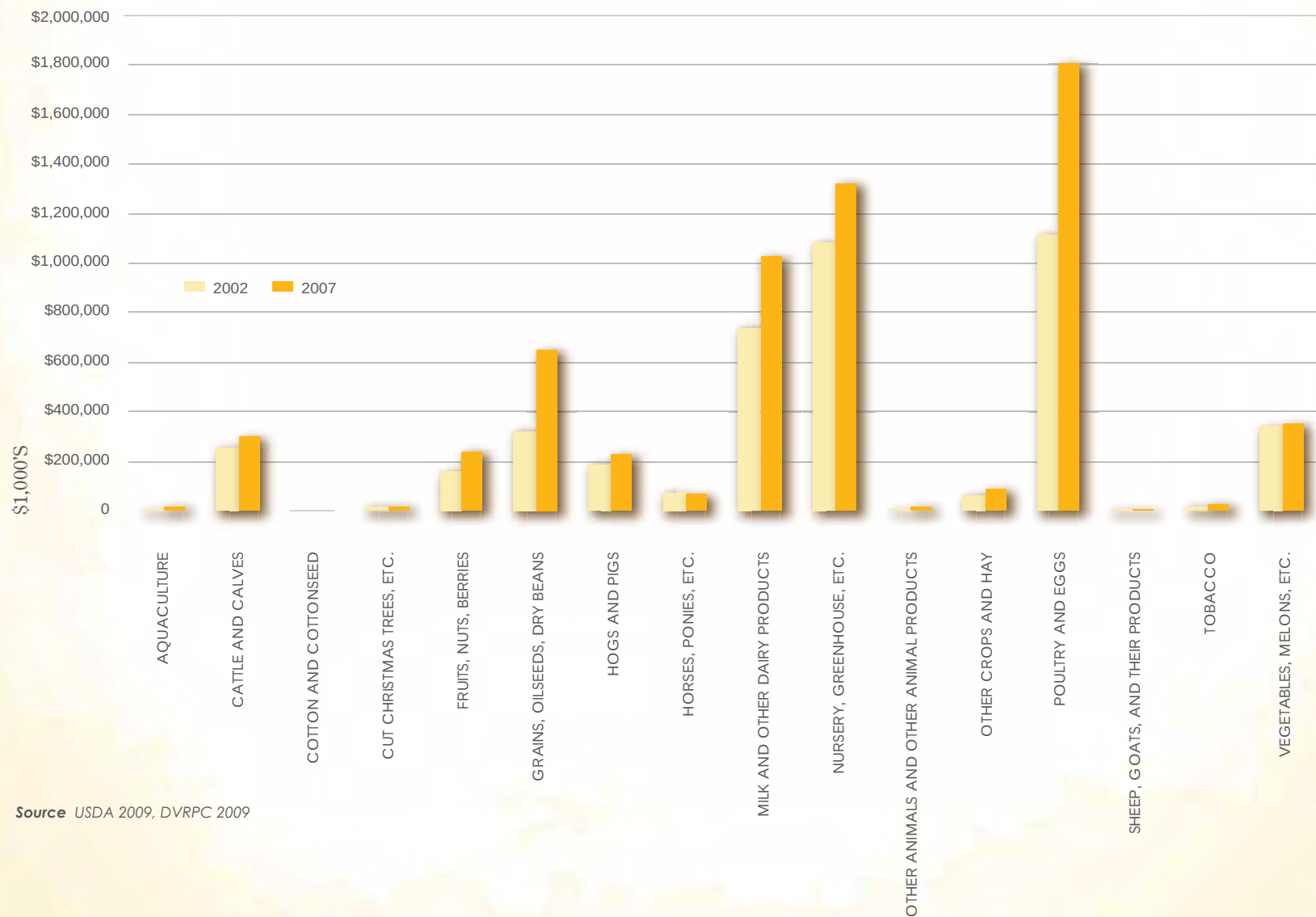
	1987	1992	1997	2002	2007
100-Mile Foodshed	\$3,560,149,000	\$4,151,775,000	\$4,538,841,000	\$4,698,799,000	\$6,732,916,000
Average per 100-Mile Farm	\$86,989	\$112,237	\$122,449	\$108,675	\$147,415
United States	\$136,048,516,000	\$162,608,334,000	\$196,864,649,000	\$200,646,355,000	\$297,220,491,000
Average per United States Farm	\$65,164	\$84,458	\$102,970	\$94,245	\$134,806

Source USDA 2009, DVRPC 2009

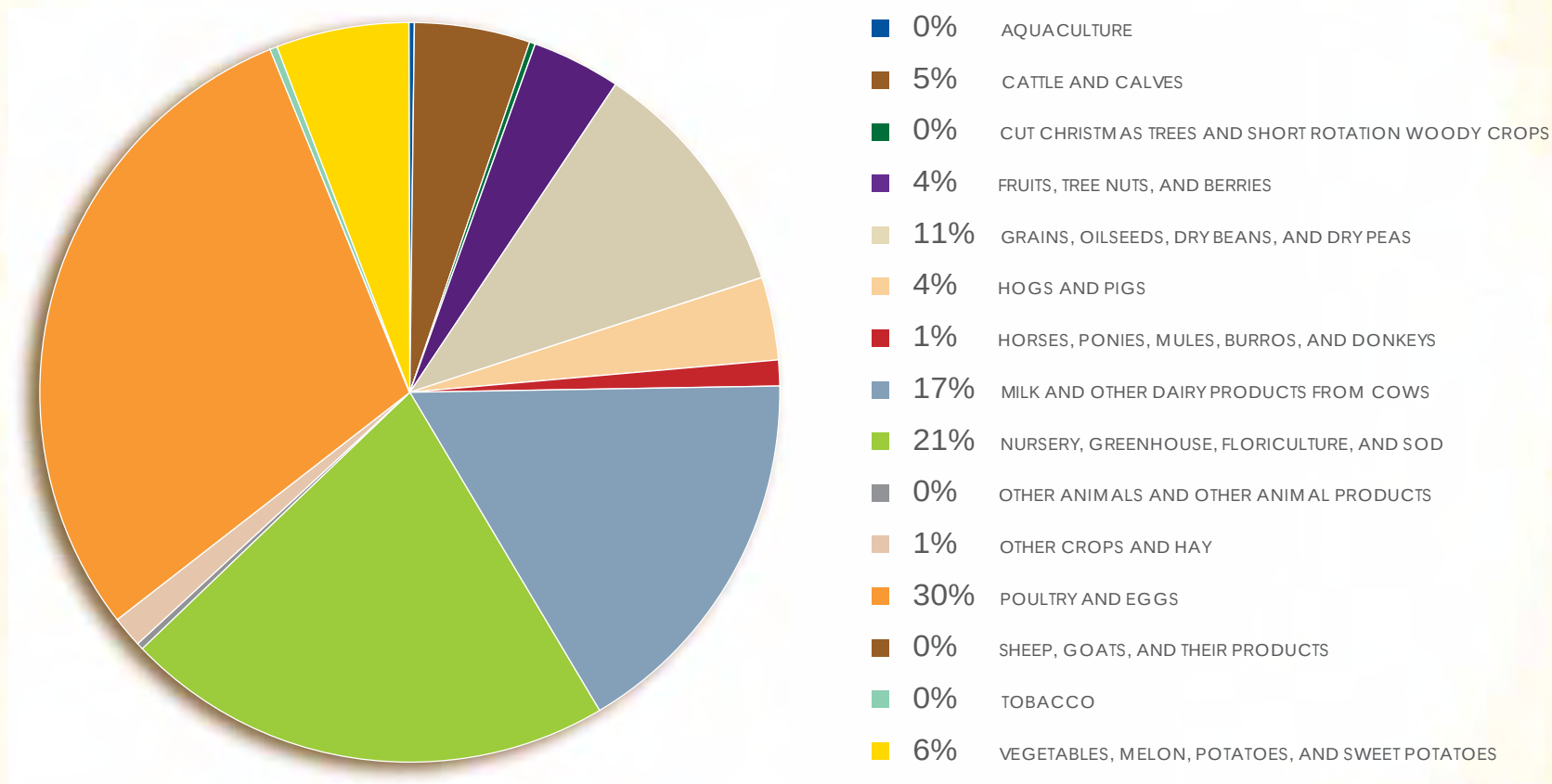
(i.e., vegetables), close to suburban markets (nursery crops), and raised on smaller livestock farms (poultry and eggs). **Figure 1.9: Value of Sales by Commodity Group in the 100-Mile Foodshed** illustrates this specialization. Some commodities, such as poultry and eggs, and milk and other dairy products, are generally raised closer to urban markets. Anecdotal research reports that dairy products tend to travel shorter distances (under

500 miles) from producers to markets than other commodities.

The United States agriculture industry concentrates on slightly different products than the 100-Mile Foodshed. In 2007, 26% of the total market value of products sold was derived from grain production, 21% from cattle and calves, 12% from poultry and eggs, 6% from fruits, tree nuts, and berries, and 6% from hogs and pigs. Some of these

FIGURE 1.9**Value of Sales by Commodity Group in the 100-Mile Foodshed**

Source: USDA 2009, DVRPC 2009

FIGURE 1.10**Proportion of Commodities Produced by Sales Within the 100-Mile Foodshed (2007)**

Source USDA 2009, DVRPC 2009

Pietro Mushrooms
Chester County, Pennsylvania

In 1967, Peter Alonzo and his son started Pietro Mushrooms in only four growing houses in Kennett Square, Pennsylvania. Today, the farming operation has 54 growing rooms and the family plans to expand using more efficient technology.

Mushroom growing is a unique type of agriculture and requires supplies and inputs from a variety of sources, including other types of farmers. Mushrooms are fungi that naturally grow on a dark and wet forest floor. To simulate dark and wet conditions, the Alonzos purchase manure, straw, and hay from horse breeding and boarding operations, field crop farmers, and other types of farmers in Chester and other nearby counties.

At the end of the 10- to 12-week growing process, the waste, known as “spent substrate,” is sent back to the field crop farmers to use as fertilizer. This closed-loop system is not only efficient for production; it also cultivates a community of support between the various types of farmers in Chester County.

commodities, such as grains and cattle, require more land and use less fertile soils.

When comparing the 100-Mile Foodshed to the United States, it is important to note that the foodshed has only 0.6% of the country’s agricultural lands, about 2% of the country’s farms, and produces about 2% of the country’s market value of agricultural products. The 100-Mile Foodshed produces, by market value, 8% of the country’s nursery products, 5% of poultry and eggs, 5% of Christmas trees, 3% of horses, and 3% of milk and dairy products. This suggests two slightly different things: 1) the 100-Mile Foodshed farms are producing more of these commodities on less land, generating slightly higher sales, or 2) this Mid-Atlantic region has a higher cost of living, which by association increases agricultural product sales.

Ten counties within the 100-Mile Foodshed produce 60% of the entire 70-county foodshed’s market value. Three foodshed counties—Lancaster, PA, Sussex, DE, and Chester, PA—are within the top 50 of all 3,076 United States counties reporting agricultural operations. See **Appendix A: Agricultural Resources Data Tables** for more detailed information for each county on the market value of products sold. It is also important to note that the commodity group nursery, greenhouse, floriculture, and sod also includes mushroom production, thus increasing that commodity group. According to the Chester County Agricultural Development Council, over 30% of the country’s mushroom production occurs in Chester County.

Fifty-seven percent (57%) of the 100-Mile Foodshed’s total market value is from sales of livestock, poultry, and their products, compared to 48% in the United States as a whole.

Farms by Value of Sales

Most farms (78%) in the United States gross less than \$50,000 a year in sales. In the 100-Mile Foodshed, farms gross slightly more in sales per farm than the national average. See **Figure 1.11: Average Sales per Farm** for an illustration of the difference. The 100-Mile Foodshed has slightly more farms, proportionally, that generate gross sales of \$100,000 or more than in the United States generally. About 14% of all the 100-Mile Foodshed's farms reported gross sales between \$100,000 and \$499,999 in 2007, as compared to 11% of all US farms. These farms typically represent successful family farms. About 7% of all foodshed farms and 5% of US farms reported sales of \$500,000 or more. These farms may be extremely large family farms and corporate farms. See **Figure 1.12: Farms by Value of Sales in the 100-Mile Foodshed**. A number (31) of foodshed counties have average sales per farm well above \$100,000. Sussex, DE, Dorchester, MD, Richmond, NY, Caroline, MD, and Chester, PA are among the top foodshed counties with average sales per farm of over \$300,000 each.

FIGURE 1.11
Average Sales per Farm

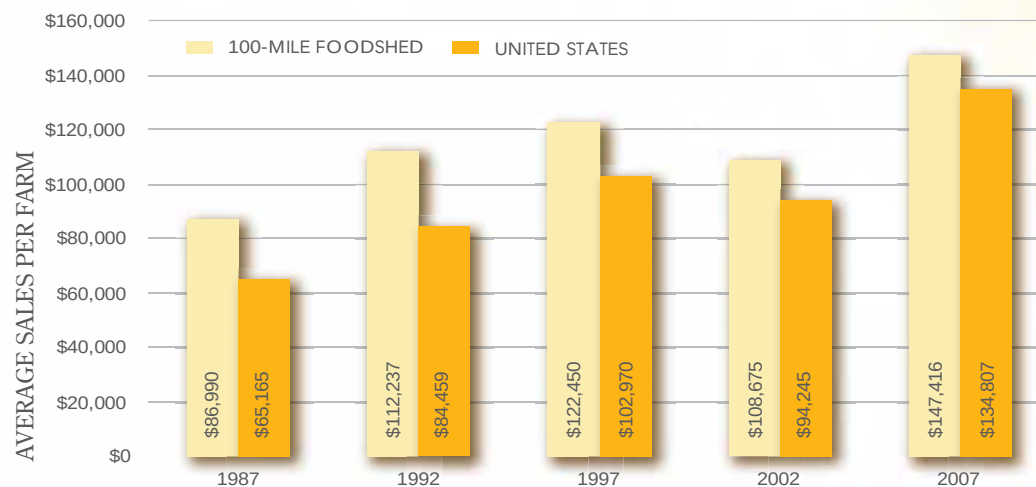
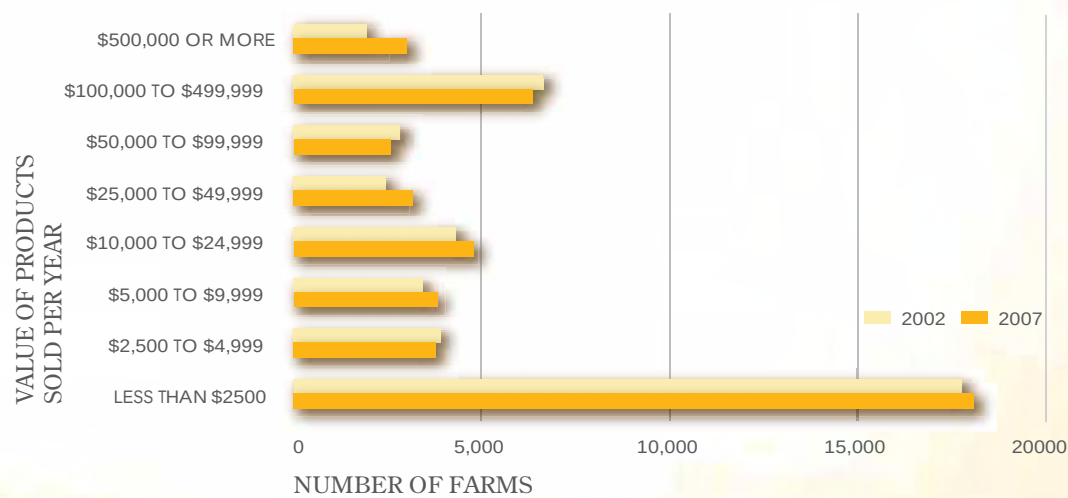


FIGURE 1.12
Farms by Value of Sales in the 100-Mile Foodshed



Source USDA 2009, DVRPC 2009

Commodities Produced

As mentioned before, the 100-Mile Foodshed specializes in higher-value products that can be grown on medium to small farms close to metropolitan areas. While Lancaster County, PA, is the top producer for most commodities, including milk and dairy products, as well as hogs and pigs, different counties specialize in different commodities. **Map 1.6: Top Commodity by Production Value (2007)** illustrates the top-grossing commodity group for each county within the 100-Mile Foodshed.

The top commodity by value may not be the top commodity by acreage.

Map 1.7: Top Crops by Acreage (2007) illustrates this difference.

Certain commodities, like oilseed and grains, are low-value commodities that require a significant amount of acreage—they are high-weight, low-value commodities, as described in

Part 2: Food Distribution. By acreage, 44 of 70 counties have a large portion of farmland devoted to grain for animal feed (corn for grain, corn for silage, and forage). Some farmers who raise livestock reported that animal feed was their largest expense and therefore tried to grow as much as possible on their own farms.

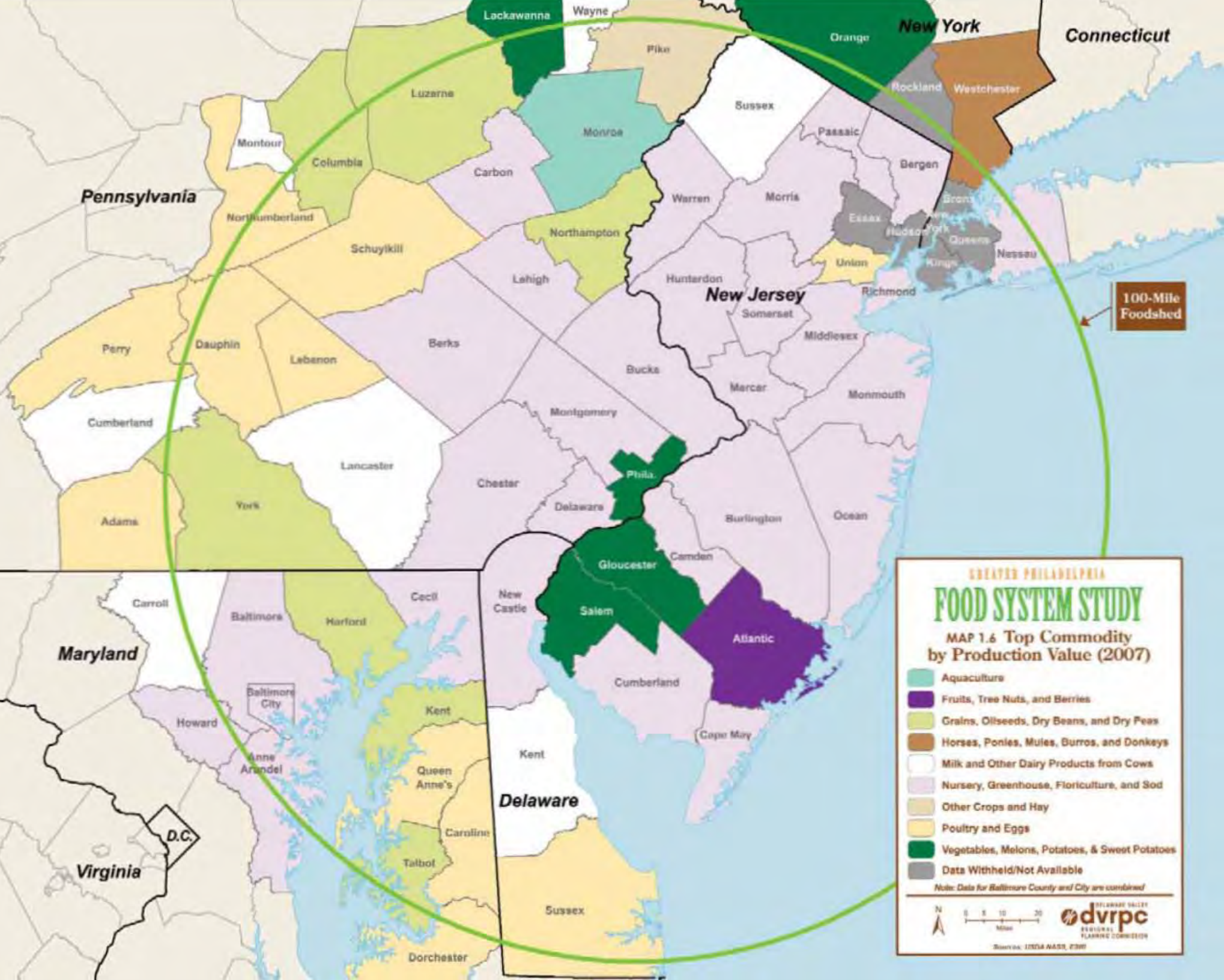
The USDA also categorizes farms by North American Industrial Classification System (NAICS) codes. While many farms grow and sell different agricultural products falling into several NAICS codes, farms only report themselves within one NAICS code, usually the code with the highest sales. Although we cannot see how diversified a given farm may be, we can see how diversified the 100-Mile Foodshed is.

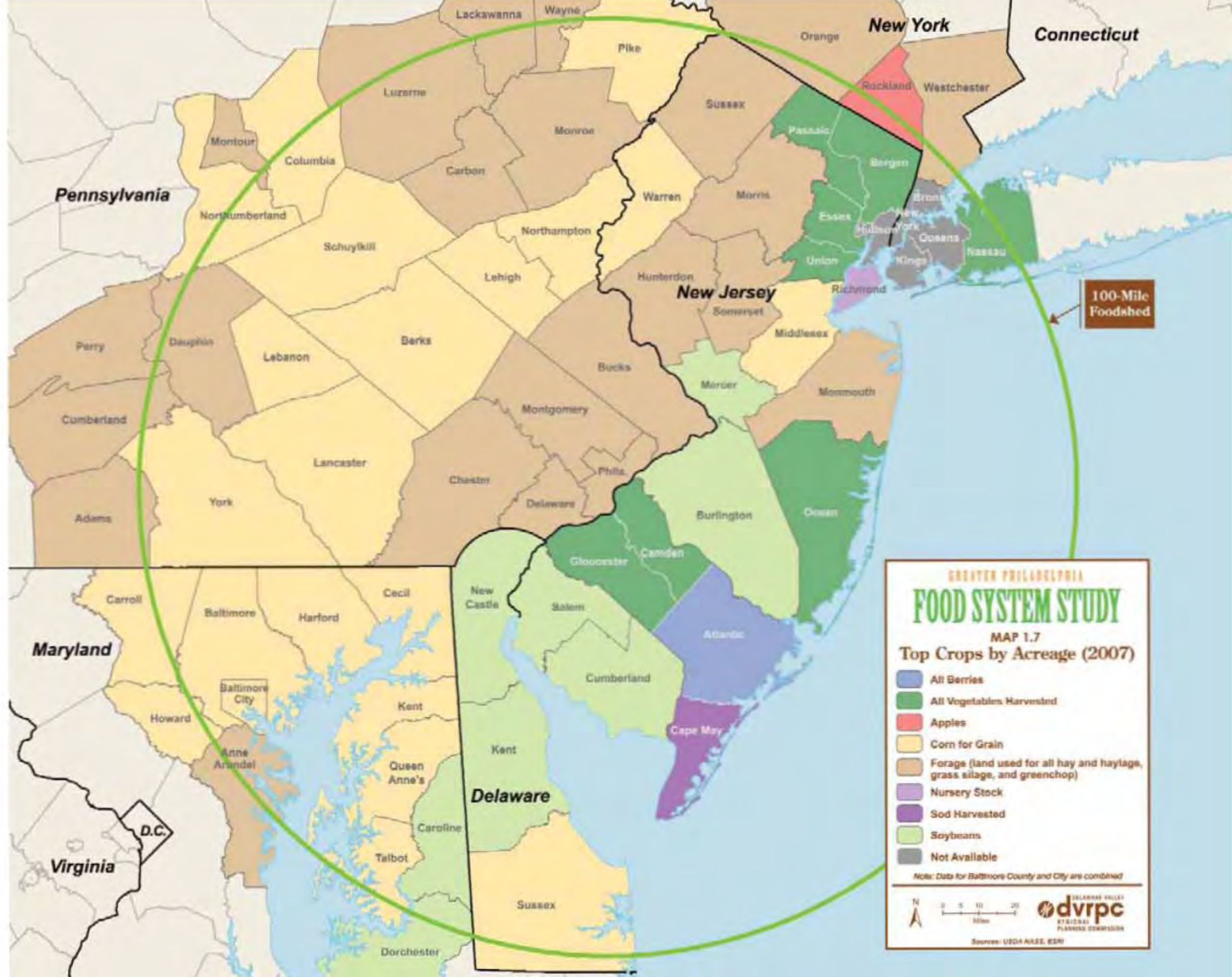
When looking at farms by a NAICS code, one can see that the 100-Mile Foodshed has more oilseed and grain

farms (5,875) than fruit and vegetable farms (4,241). There are even more farms that specialize in animal aquaculture and other animal production (7,104) than there are fruit and vegetable farms. Farmers in Greater Philadelphia's 100-Mile Foodshed, the rest of the United States, and all over the world have produced crops for nonfood purposes (i.e., fiber and fuel) for many centuries. Additionally, a significant proportion²³ of farmland throughout the United States raises crops for animal feed and forage, which are indirectly consumed by the general population when we eat meat, eggs, or other animal products. See **Figure 1.13: 100-Mile Foodshed Farms by NAICS Code**, which tabulates by NAICS code all 45,673 farms in the 100-Mile Foodshed.

As more people have become concerned with and interested in alternative energy, and specifically renewable energy from biofuels, more agricultural

²³ Based on the 2007 Census of Agriculture, between 55 and 80% of the country's land in farms may be used as pastureland or grow field crops for animal forage. While the 100-Mile Foodshed has more land proportionally devoted to fruit and vegetable production, a large amount of land grows animal feed for livestock raised within the foodshed.





land around the world has been put into nonfood production. While this transition from food to nonfood production has changed the agriculture industry in the Midwest, the great majority of farms in the 100-Mile Foodshed do not grow substantial amounts of crops for biofuel production. However, this could change if oilseeds and grains now grown for animal feed or human consumption are more valuable for biofuel production. Recently, academic research points out the perils of growing crops for biofuel production. According to Jason Hill of the University of Minnesota, America's current corn and soybean production would meet only 12% of the country's gasoline demand.²⁴ Increased production of crops for biofuels would require the clearing of forestland or conversion of less suitable land, releasing more carbon emissions currently sequestered in woody plants and soils.²⁵

FIGURE 1.13
100-Mile Foodshed Farms by NAICS Code

NAICS 4-Digit Code	Number of Farms	Proportion of Foodshed Farms
Oilseed and grain farming (1111)	5,875	12.9%
Vegetable and melon farming (1112)	2,323	5.1%
Fruit and tree nut farming (1113)	1,918	4.2%
Greenhouse, nursery, and floriculture production (1114)	4,388	9.6%
Other crop farming (1119)	9,904	21.7%
Beef cattle ranching and farming (112111)	3,822	8.4%
Cattle feedlots (112112)	830	1.8%
Dairy cattle and milk production (11212)	3,921	8.6%
Hog and pig farming (1122)	637	1.4%
Poultry and egg production (1123)	3,000	6.6%
Sheep and goat farming (1124)	1,951	4.3%
Animal aquaculture and other animal production (1125,1129)	7,104	15.6%
100-Mile Total	45,673	100%

Source USDA 2009, DVRPC 2009

Lancaster County, with 5,462 farms, boasts the most farms in nearly every category. York County is second, with 2,370 farms. A ranking and explanation of each NAICS code follows:

- **“Other crop farming”** constitutes one-fifth (21.7%) of the 100-Mile Foodshed's farms. Lancaster, PA has over 674 “other crop” farms, followed by York, PA with 510 farms. Other crop farming is defined by NAICS as “establishments primarily engaged in (1) growing crops such as tobacco, cotton, sugarcane, hay, sugarbeets,

²⁴ Hill, Jason, et al. “Environmental, economic, and energetic costs and benefits of biodiesel and ethanol biofuels.” Proceedings of the National Academy of Sciences. Published July 25, 2006. www.ele.arizona.edu/papers/PNAS%20Biofuels%207_06.pdf. Accessed 7 July 2009.

²⁵ Sugarcane appears to be the most economically viable and energy-efficient crop for biofuel production. Most domestic sugarcane production occurs in Hawaii, Florida, and Louisiana. The Mid-Atlantic and Northeast states do not have a suitable climate for sugarcane production.

peanuts, agave, herbs and spices, and hay and grass seeds, or (2) growing a combination of the valid crops with no one crop or family of crops accounting for one-half of the establishment's agricultural production." Crops not included in this category are oilseeds, grains, vegetables and melons, fruits, tree nuts, greenhouse, nursery, and floriculture products.

- Fifteen percent of the foodshed's farms are engaged in "**aquaculture and other animal production**," which includes the raising of bees, horses and other equine, and rabbits and other fur-bearing animals. Again, Lancaster and York counties have the most farms within this category, with 497 and 425 farms, respectively.
- The third-most prevalent type of farm is "**oilseed and grain farms**," with 12.9% of all farms within this category. Again, Lancaster and York counties have the most of this type, with 544 and 444 farms, respectively.
- Almost 10% of the foodshed's farms specialize in "**greenhouse, nursery, and floriculture production**." This category of farms is not solely floriculture and horticultural production. It also includes mushroom production and large-scale production of fruits and vegetables in greenhouses. Monmouth and Hunterdon counties, both in New Jersey, have the most of this type of

farm, with 270 and 239 farms, respectively. Chester County is the top-producing county for mushrooms, which are grown in warehouses under controlled conditions. Chester County has 194 farms within this NAICS category.

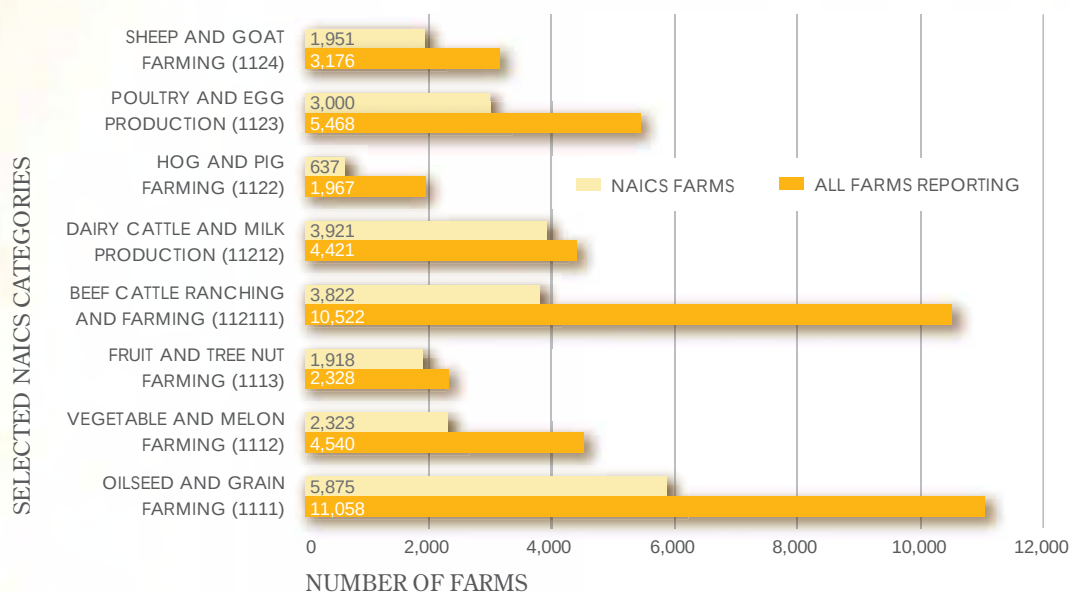
- Nearly one-third of all of Lancaster County's farms specialize in "**dairy cattle and milk production**." However, only 8.6% of the foodshed's farms are dairy farms. Chester County, PA, is second in the number of dairy farms, with 271 farms.
- Closely related to dairy farms are "**beef cattle ranches and farms**" (which are categorized separately from cattle feedlots). Again, Lancaster and York counties have the most of this type of farm, with 504 and 260 farms, respectively.
- Sussex, DE, has the most "**poultry and egg production**" farms, with 620 farms, followed by Lancaster, PA, with 401 farms.
- Five percent of the foodshed's farms are "**vegetable and melon**" farms. Again, Lancaster, PA, has the most farms, with 234, followed by Cumberland, NJ, with 96.
- The ninth-most prevalent type of agricultural production is "**sheep and goat farming**." Nearly 2,000 (1,951) farms specialize in this.

Hunterdon, NJ, has the most, with 178 farms, followed by Lancaster, PA, with 160.

- Four percent of the foodshed's farms are "**fruit and tree nut**" farms. Adams, PA, has 144 such farms, followed by Burlington, PA, with 118 farms.
- Less than 2% of the foodshed's farms are considered "**cattle feedlots**." The USDA defines this NAICS code as "establishments primarily engaged in feeding cattle for fattening." Lancaster and York, PA, have the most, with 219 and 60 operations, respectively.
- About 1% of the foodshed's farms are categorized as "**hog and pig**" farms. Lancaster, PA, has 174 farms, followed by Berks, PA, with 41 farms.

As mentioned above, farms must report only one NAICS category. However, many farms within the 100-Mile Foodshed operate several different types of farming and animal husbandry. For example, the 2007 Census reported that 1,967 farms sold over 2.8 million pigs and hogs, but only 637 farms are categorized by NAICS code as pig and hog farms.

FIGURE 1.14
NAICS Comparison



Source USDA 2009, DVRPC 2009

See **Figure 1.14: NAICS Comparison** for a comparison between farms reported under a NAICS code and all farms reporting sales within NAICS codes.

Additionally, over one-third of all farms in the foodshed are considered “other crop farming” or “animal aquaculture and other animal production.”

This suggests a highly diversified agriculture industry.

Fruit and Vegetable Production

Much of the local food discussion centers on the production, distribution, sale, and consumption of fruits and vegetables. Fruit and vegetable

Beechwood Orchards ***Adams County, Pennsylvania***

Started in 1978, Beechwood Orchards is a 200-acre farm operated by Dave Garretson in the Adams County “Fruit Belt.” Originally, the orchard sold fruit to processors in large volumes. However, processors consolidated, left the area, or stopped buying locally, especially as cheaper imports crowded the market.

Mr. Garretson started selling his apples, peaches, plums, pears, cherries, and berries at farmers' markets, restaurants, and retail stores in the Greater Philadelphia area. His children have decided to continue working in the family business, and the Garretson family has plans to enlarge its operation.

producers of various sizes and different agricultural practices tend to engage in direct marketing more than any other type of producer, and therefore may be the most visible producers in the local food marketplace. However, these farmers make up only 9.3% of the 100-Mile Foodshed's farms, based on NAICS code, and only 15% of all farms reporting fruit and vegetable production. About 157,000 acres of vegetables were harvested in 2007.

Between 2002 and 2007, the foodshed lost about 1,000 acres of vegetable production. However, those farmers remaining in vegetable production are changing what they grow, perhaps in response to increased interest in and opportunities for direct marketing. Some farmers interviewed for this study reported that they change what they plant based on what garnered a high price in the wholesale or direct markets the year before. **Figure 1.15: Selected Vegetable Production**

illustrates this. By acreage, only two types of vegetables increased modestly in production: snap beans and watermelons. Green lima beans declined by nearly 6,000 acres. Sweet corn also declined by close to 6,000 acres, but remains the most popular vegetable in production, comprising 21.1% of all acres harvested in 2007.

The category of "all other vegetables" grew from 12,088 acres in 2002 to 28,930 acres in 2007. This "catchall" category is reported by farmers for vegetable varieties that do not have a specific code on the 2007 Census data form. The 139% increase in harvested acres suggests that vegetable growers in the 100-Mile Foodshed are planting more varieties of different vegetables. This trend is also found throughout the rest of the country, as more farms experiment with direct marketing and / or are operated by people from diverse ethnic groups and different culinary traditions.

Less detailed information is available for fruit growing. In 2007, 2,328 farms reported 37,238 acres of "land in orchards." USDA defines this category as including "bearing age and nonbearing age fruit trees, citrus or other groves, vineyards, and nut trees of all ages."

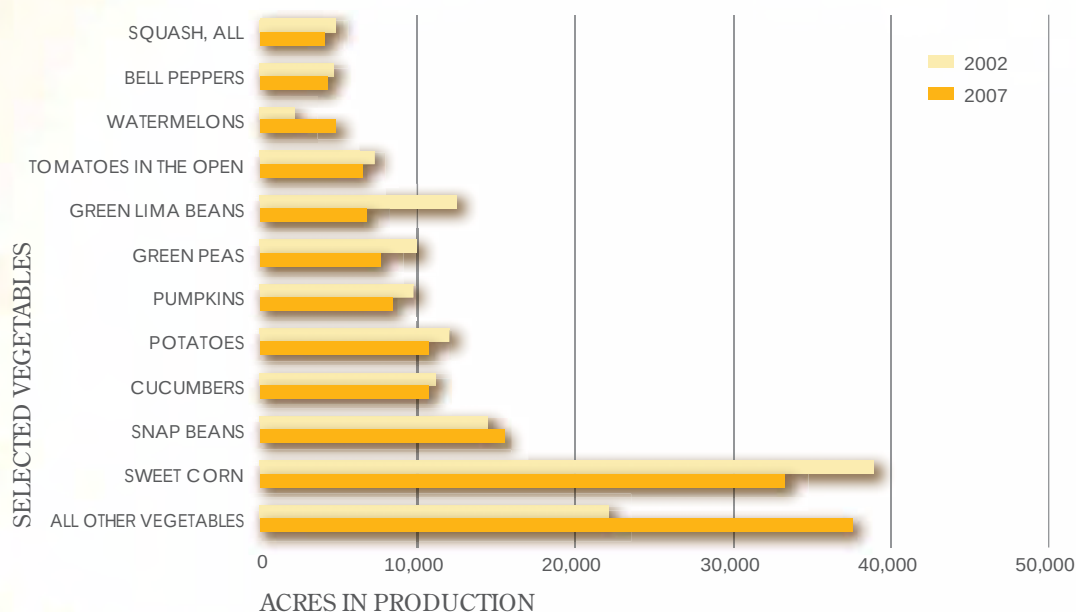
Over half (52.3%) of all orchard land is in nonbearing and bearing apple trees. Peaches account for 26.9% of all orchard lands. Grapes, which have increased in popularity over the last 20 years as many growers have become winemakers, account for 650 farms and 2,638 acres of vines. Over 1,500 acres bear fruit, while another 440 acres are nonbearing.



Peach Orchard in New Jersey

PHOTO CREDIT: BLUE COLTHARP

FIGURE 1.15
Selected Vegetable Production



Source USDA 2009, DVRPC 2009

Fruit growing is different from vegetable farming in a number of ways. Fruits typically grow on trees, which can take between three and five years to produce fruit. Depending on the variety, climate, and care, a fruit tree can have a short lifespan of only 10 to 20 years.²⁶ Some varieties of

grape vines can live up to 100 years, but most have a much shorter life span. Therefore, fruit growing requires time, land, planning, and patience. Much like vegetables, fruit can be damaged by poor weather, such as storms, drought, and frost.

Dusty Lane Farm **Salem County, New Jersey**

Dusty Lane Farm is a 1,400-acre diversified vegetable and grain farm that grows primarily for processing. Mike Brooks, at the age of 27, is an eighth-generation farmer. He created a partnership with his parents.

The Brooks determine their planting seasons and processing contracts based on their own capacity and economic feasibility, with four full-time employees, including themselves, and one part-time employee. In the summer of 2008, they sold their white potatoes to processors, such as Herr's and Hanover Foods, for chips, and to repackers to bag and sell to supermarkets. Some of their tomatoes are canned by a local repacker and distributed statewide with a "Jersey Fresh" label. Their spinach and peas are sold to a flash freezer / distributor. Local feed mill companies purchase their corn, soybeans, and wheat.

Additionally, the Brooks family has preserved 1,000 acres to keep farmland for their family's future generations of farmers. And Mike has diversified the vegetable farming operation by starting a new trucking company, MNB Transport, which distributes the farm's produce to its wholesale buyers.

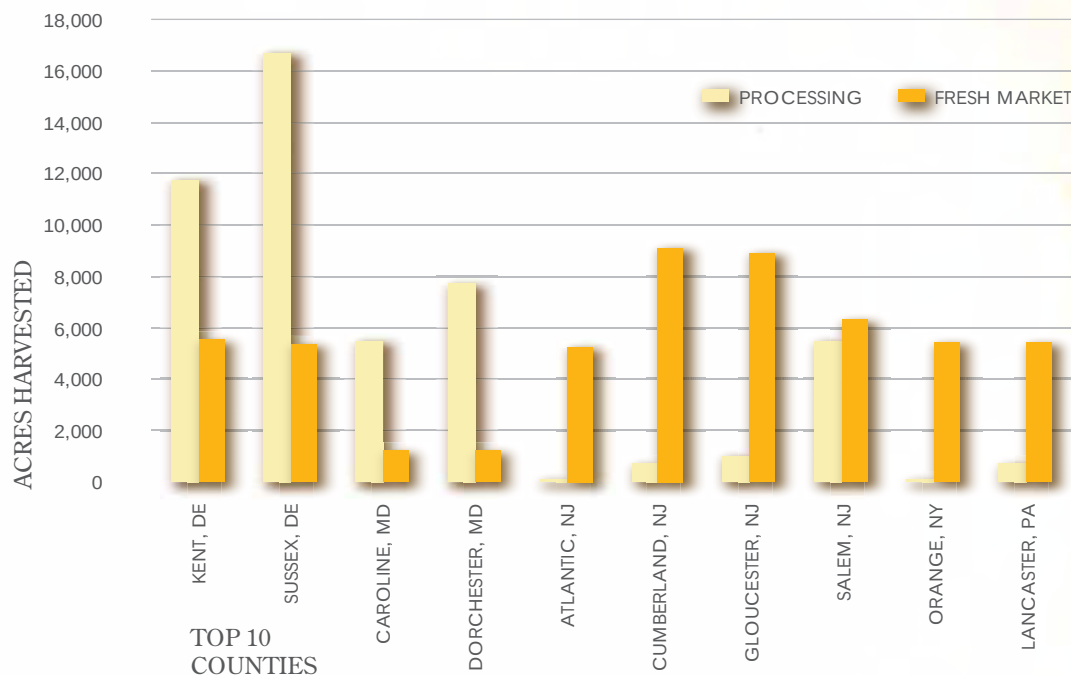
The Brooks family farm is an example of a local farm maintaining multiple business relationships and sales channels to bring its products to market, and supplementing its income with other farm-related activities.

²⁶ Terhune Orchards. "About the Farm." www.terhuneorchards.com/our_crops.html. Accessed 22 May 2009.

The Mid-Atlantic States, most of which are within Plant Hardiness Zones 6 and 7, grow a great variety of fruits and vegetables, rivaling larger agricultural states like Washington, Oregon, Virginia, North Carolina, South Carolina, and Georgia. See **Appendix A: Agricultural Resources Data Tables** for details regarding the variety of fruits and vegetables that are grown within the 100-Mile Foodshed.

While the foodshed grows a lot of fruits and vegetables, and interest in direct marketing from both the consumer and the producer is increasing, many vegetables are grown specifically for processing rather than for “fresh market” and are not meant for immediate sale to a consumer. For example, carrots grown for processing look very different from carrots grown for the fresh market. Green beans grown for processing have a much shorter life span (oftentimes less than 24 hours) than green beans grown for fresh market, which can stay fresh for two to four weeks.

FIGURE 1.16
Vegetables for Fresh Market and Processing



Source USDA 2009, DVRPC 2009

The top 10 vegetable-producing counties that grow for both processing and fresh market are shown in **Figure 1.16: Vegetables for Fresh Market and Processing**. Those counties farther away from the Philadelphia and New York metropolitan areas grow considerably more for processors, such as Birds Eye or Campbell’s Soups—two food

manufacturers that buy from Mid-Atlantic farmers. Counties closer to urban areas, even smaller areas like Atlantic City, NJ, and Wilmington, DE, grow considerably more for the fresh market. Fresh market vegetables may end up at a farmers’ market or may be sold to a produce wholesaler, who may then sell to a supermarket chain.

Contract Growing

Many family farms raise livestock or grow crops under a contract with a larger company or corporation. This can prove problematic for a farmer because he or she does not set the prices and is usually paid below market price for a specific commodity. It also can be beneficial, as both producer and contractor share the risk and expense. The USDA does not consider as production contracts growers operating under “marketing contracts, future contracts, forward contracts, or other contracts based strictly on price,” or growing for a cooperative. Therefore, we still have an incomplete view of how many producers within the 100-Mile Foodshed are contract growers.

Contract growing is reported for several categories of livestock and crops. First is “custom-fed cattle shipped directly for slaughter.” Additionally, cattle not

shipped directly for slaughter are considered in the category “other cattle, livestock, poultry, or aquaculture.”

Over 5,358 farms in the 100-Mile Foodshed raise cattle for beef. Only 233 farms in the foodshed raise cattle under a contract. Because the number of farms is low, exact numbers of animals are not released for each county. However, Lancaster and Berks, PA, had the most farms selling beef cattle in 2007. In 2007, 1.7% of Lancaster County’s beef cattle (the number of animals sold within calendar year 2007) and 3.5% of Berks County’s were “custom-fed cattle shipped directly for slaughter.” In 2007, 2.2% of Lancaster County’s beef cattle farms and 4.9% of Berks County’s sold livestock produced under contract and falling in the category “other cattle, livestock, poultry, or aquaculture.” This suggests that beef cattle are still raised by “independent growers,” although many of those growers likely have established

contracts with large slaughterhouses or wholesalers. Farms raising “broilers and other meat-type chickens” under contract are a very different story.

Poultry raised under contract indicates that farmers raise the chickens and ship them directly to a slaughterhouse or processor. Large-scale processors, like Purdue or Tyson, usually deliver the baby chicks, mandate in what type of building the chickens should be raised, provide the feed, and transport the chickens from farm to processor. Sussex, DE, Lancaster, PA, Caroline, MD, Dorchester, MD, and Kent, DE, are the five largest poultry counties by number of broilers sold in 2007. Nearly 100% of all of the chickens sold in Sussex, Lancaster, and Kent counties, and 100% of all chickens sold in Caroline and Dorchester counties, were produced under contract. These poultry operations most likely represent “factory farms.”

Allen Family Foods
Sussex County, Delaware

Conventional poultry production is an intensive farming practice where broilers (meat chickens) and egg-laying hens are raised in high-density, indoor facilities under controlled conditions. To increase cost efficiency, large-scale poultry operations are often vertically integrated, where a single company controls multiple stages of production from hatching to feeding to packaging for the consumer. Allen Family Foods, a company located in Seaford, Sussex County, ranks 15th in the nation's largest broiler producers. Primarily family run since the Allen family started as a small hatchery in 1919, the company is now in its third generation of management and packages about 12 million pounds of finished poultry products per week.

Sources

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 "How the Broiler Chicken Industry Works."
www.dpichicken.com/index.cfm?content=news&subcontent=details&id=205. Accessed 7 July 2009.
 Allen Family Foods.
www.allenfamilyfoods.com/corp/welcome.html.
 Accessed 8 July 2009.

Large-scale contract poultry production is a relatively recent development in the food industry. Up until the 1950s, chickens were raised on most farms and in some backyards throughout the country. Starting in the 1980s, poultry production became concentrated on fewer farms in the eastern half of the United States, and those farms worked directly with an "integrator," or processor. Contract poultry production is primarily located in the southeastern and Delta states, followed by Pennsylvania and the Delmarva Peninsula. Some researchers believe that raising poultry may be particularly attractive to farmers in the south because of lower-priced land, less-productive soils, and warmer climates, as poultry can be particularly vulnerable to extreme changes in temperature. Additionally, many poultry farms in the South are newer than the independent poultry farms in the Northeast and Midwest, and were specifically started as contract growers.²⁷

However, the number of farms producing eggs under contract is significantly different from farms raising chickens for meat. Lancaster, PA, Hunterdon, NJ, York, PA, Berks, PA, and Chester, PA, are the top five counties in number of farms raising "layers" chickens. Only 5% of Lancaster and Berks counties' egg-producing farms produce under contract. None of Hunterdon County's 258 egg-producing farms produce under contract. Still, many large-scale farmers, while technically independent, may have established wholesale contracts with large corporations.

About 60% of all the foodshed's hogs and pigs sold in 2007 were produced under contract, but only 13.1% of farms raising hogs and pigs were under contract. Again, Lancaster, PA, is the top producer, with 39.8% of its hog farms and 70.8% of all hogs and pigs raised under contract.

²⁷Perry, Janet, et al. "Broiler Farms' Organization, Management, and Performance."
 USDA Economic Research Service. Agriculture Information Bulletin No. 48, March 1999.

Similarly, Lebanon, PA is the second top producer, and has 21.2% of its hog farms and 57.3% of all hogs and pigs raised under contract. This suggests that contract growers are generally concentrated animal feeding operations (CAFOs), which usually create more detrimental environmental impacts than farms with fewer animals on proportionally more land.

Less information is available regarding contract “vegetable, melons, and potatoes” growers. The Census of Agriculture does not ask how many acres are under contract. The top 10 vegetable growing counties by total acreage, are Sussex and Kent in Delaware; Salem, Gloucester, Atlantic, and Cumberland in New Jersey; Dorchester and Caroline in Maryland; Lancaster in Pennsylvania; and Orange in New York. However, only five of the 10 counties report vegetable contract growing. About 34% of Sussex County’s vegetable farmers, 27% of Kent’s

farmers, less than 10% of Dorchester’s farmers, 8% of Caroline’s farmers, and less than 3% of Salem’s farmers are under contract. Similar to livestock production, these farmers probably operate larger farms and may deal directly with large food companies like Campbell’s Soups or Birds’ Eye, or work directly with subcontractor processors, sometimes referred to as repackers.

Sustainable and Certified Organic Producers

Local food is not synonymous with sustainable or organic production, although it is often viewed as such. However, many local producers produce sustainably or are certified organic.²⁸ According to the 2007 Census of Agriculture, 698 farms, or 1.5% of all of the 100-Mile Foodshed’s farms, report organic production as defined by the National Organic Standards. While National Organic Standards are

Landisdale Farm Lebanon County, PA

Landisdale Farm has been a certified organic farm since 1998. Owned and operated by the Landis family, this farm raises a wide variety of organic vegetables and grass-fed beef. They sell their produce and meat through their 200-member CSA, to restaurants, retail stores, and directly to consumers at local farmers' markets, such as the Clark Park Farmers' Market in Philadelphia.

²⁸ More research is needed to determine how many sustainable producers and humane producers are operating in the Greater Philadelphia Food System.

used for certification, not all farms reporting organic production are certified organic.²⁹ See **Map 1.8: Certified Organic Producers** for the location of some of these producers.

Many farmers have transitioned over to organic or sustainable production because organic and sustainable products can be sold at a higher market price. Consumer research proves that consumers are willing to pay more for an environmentally sensitive or sustainable products.



Sustainable growing practices at Fernbrook Farm in Bordentown, New Jersey

PHOTO CREDIT: DVRPC

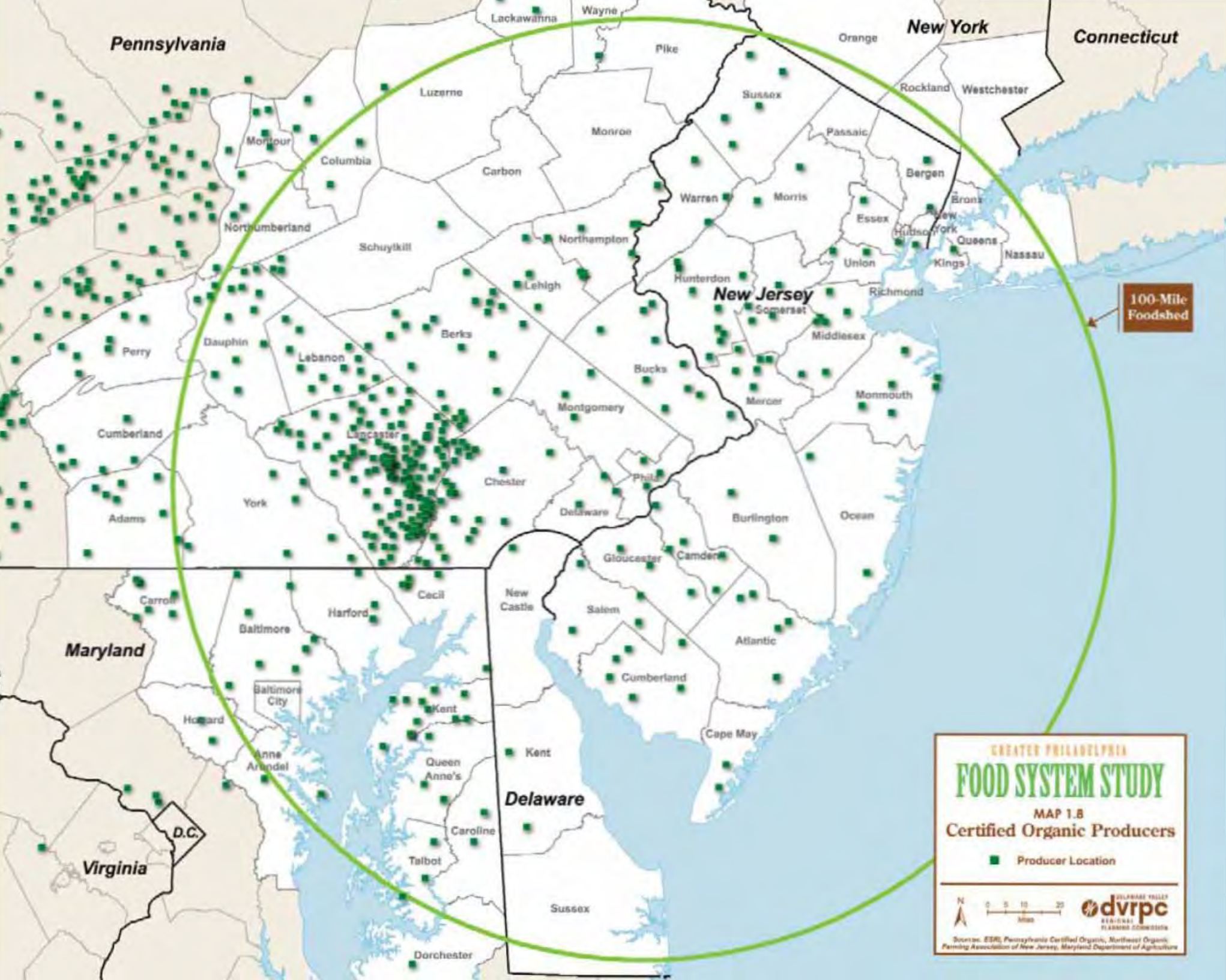
The 2007 Census of Agriculture reports that less than 1% of agricultural sales are of organic products, including all crops, livestock, and animal products. In 2007, 636 organic foodshed farms sold nearly \$40 million worth of agricultural products. In the United States, 18,211 organic farms sold \$1.7 billion.

Organic producers gross lower total sales than the average farmer (of all types). The average 100-Mile Foodshed farmer (organic and conventional producers) grossed \$147,416 in 2007, while the average American farmer grossed \$134,807. The average 100-Mile Foodshed organic farmer grossed \$62,850 in 2007, while the average American organic farmer grossed \$93,850. Sustainable and organic producers attest that environmentally sensitive practices require fewer inputs, such as chemicals, fertilizers, and soil conditioners; therefore, they

can earn less and still remain profitable. Additionally, sustainable and organic producers are generally operating smaller farms without mechanized harvesting, which may generate fewer expenses.

In the United States, 20,437 farms reported as organic farms. The USDA is following up the 2007 Census with an Organic Production Survey. This survey will ask more detailed questions about: types of crops and livestock that are raised; what sustainable production practices, such as integrated pest management, cover crops, and conservation tillage, are employed; production expenses; marketing channels, such as wholesale or direct; and value-added processing. This survey, due to be released in 2010, will present a clearer picture of organic and sustainable agriculture in the United States and in Greater Philadelphia's food system.

²⁹ The National Organic Standards Board is administered by the USDA. More information is available at www.ams.usda.gov/nop/.





Intergenerational farmers at Beechwood Orchard in Adams County, Pennsylvania

PHOTO CREDIT: BEECHWOOD ORCHARD

Operator Characteristics

Experts estimate that as much as half of all the country's farmland will change hands in the next 10 to 15 years.³⁰ Many factors influence a farm's transition from one operator or owner to the next. Those factors include inheritance tax laws, land prices, viability of the farming industry, education and training programs, financing, and retirement planning. Federal, state, regional, and municipal policy and programs can address some of these factors to encourage farming to remain in and around Greater

Philadelphia. Understanding the characteristics and needs of the principal operators of the 45,000 farms in the 100-Mile Foodshed is imperative when thinking about public policy changes.

As farmers age, a new generation will be needed to take over management of the farms. According to the 2007 Census of Agriculture, the average age of the principal operators of the 100-Mile Foodshed farms was 55.2, while the average age of an American farmer was 57.1. However, linking ownership of a farm to the age of operators skews the average age of the American farmer. Many farm operations rely on the younger generation within a family to operate the farm, but the elder farmer retains ownership of the farm.

The counties of Lancaster, PA, Philadelphia, PA, Lebanon, PA, Kent, DE, and Chester, PA, have the youngest principal operators on average, while Union, NJ, Rockland, NY, Richmond (Staten Island), NY, Kent, MD, and Anne

Arundel, MD, have the oldest principal operators. The counties with younger principal operators tend to have more total farmers and more full-time farmers, while three of the counties with older principal operators have less than 50 farms in total. This suggests that counties with more active agriculture communities may attract, support, and nurture new farmers through informal social and family structures or more formal new-farmer programs.

The USDA reports that farming is becoming more of a lifestyle than a primary profession. Slightly less than one-half (49.2%) of the 100-Mile Foodshed's 45,673 principal farmers list farming as their primary occupation. Similarly, 65% report working "off the farm." However, only 38% report holding a full-time job off the farm. Nationally, operators on farms with sales over \$250,000 are less likely to work off the farm.³¹

³⁰ American Farmland Trust, "Farming on the Edge Report," www.farmland.org/resources/fote/default.asp. Accessed 5 May 2009.

³¹ National Agricultural Statistics Service.

While the principal operators of farms are still overwhelmingly male, there are increasingly more female operators. In 2007, 16.6% of all 100-Mile Foodshed farms were operated by a woman, compared to just 13.9% in the United States. As a comparison, the National Women's Business Council reported that in 2002, 30.4% of all privately held firms were owned by women, and an additional 18% were equally owned.³² This increase in female principal farm operators suggests that more women are becoming interested in farming, but it also may signify that a widow is now the principal operator, as women tend to live five to eight years longer than men.³³ Additionally, more women may be considered the principal operator if the spouse is now working full time off the farm to secure higher pay or health benefits.

Of the 17 principal operators in Philadelphia County, 10 (58.8%) were women. Nassau, NY, Westchester, NY,

Ocean, NJ, and Anne Arundel, MD, also report that more than one-quarter of their principal operators are women. Comparatively, the counties with the fewest principal women operators proportionally are Talbot, MD, Lancaster, PA, Lebanon, PA, Schuylkill, PA, Dorchester, MD, and Northumberland, PA. Five of these six counties have more total farmers than all of the before-mentioned counties. Lancaster, PA, has more female principal farmers in number (397) than all of the other counties.

See **Appendix A: Agricultural Resources Data Tables** to see comparisons by counties on average age, principal occupation, and sex.

In the 2007 Census of Agriculture, the USDA asked a new question to farmers regarding their retirement. In the 100-Mile Foodshed, 7,615 farmers, on 496,173 acres, reported that they were retired or living on a "retirement farm."



A member of the national organization Women, Food, and Agriculture Network (WAFN)

PHOTO CREDIT: MARK ANDREW BOYER, ORGANICNATION.TV

Pennsylvania Women's Agricultural Working Group (PA-WAgN)

PA-WAgN is a membership organization created by the PSU Cooperative Extension, PASA, Rodale, and others to provide networking opportunities and practical workshops and training on topics ranging from production to business planning for women in agriculture.

Source

<http://wagn.cas.psu.edu/>

³² National Women's Business Council. "Fact Sheet, July 2007." www.nwbc.gov/ResearchPublications/documents/KeyFactsWBOandtheirEnterprises.pdf. Accessed 14 May 2009.

³³ Hitti, Miranda. "US Life Expectancy Best Ever, Says CDC." WebMD HealthNews. www.webmd.com/news/20050228/us-life-expectancy-best-ever-says-cdc. Accessed 14 May 2009.

This represents 16.6% of all of the foodshed's farmers and 9.5% of the foodshed's land in farms. Similarly, 20.7% of the country's farmers, on 9.7% of the country's land in farms, report that they are either retired or living on a retirement farm. However, the USDA defines a "retirement farm" as a farm that produces less than \$250,000 worth of agricultural sales. A principal operator may report being retired and still list farming as his or her primary occupation, or a retirement farm may be functionally operated by another family member or farm manager.

Farm Income

In 2007, the 100-Mile Foodshed sold \$6.7 billion in agricultural products and incurred \$5.6 billion in production expenses. Between 2002 and 2007, income from sales increased by 43.3%, while production expenses increased at the same rate, by 43.7%. Average sales per farm increased by only 35.6%, suggesting that there are fewer farms remaining profitable. For farms to stay profitable, many farmers may look for other sources of income. **Figure 1.17: Farm Income and Expenses**

FIGURE 1.17
Farm Income and Expenses

		2002	2007	% Change
Market Value of Products Sold	All 100-Mile Foodshed Farms	\$4,699,188,000	\$6,732,916,000	43.3%
	Average per 100-Mile Farm	\$108,684	\$147,415	35.6%
	All US Farms	\$200,646,355,000	\$297,220,491,000	48.1%
	Average per US Farm	\$94,245	\$134,807	43.0%
Production Expenses	All 100-Mile Foodshed Farms	\$3,919,634,000	\$5,631,053,000	43.7%
	Average per 100-Mile Farm	\$90,654	\$123,290	36.0%
	All US Farms	\$173,199,216,000	\$241,113,666,000	39.2%
	Average per US Farm	\$81,362	\$109,359	34.4%
Government Payments Received	All 100-Mile Foodshed Farms	\$69,508,000	\$71,391,000	2.7%
	Average per 100-Mile Farm*	\$8,925	\$5,973	-33.1%
	All US Farms	\$6,545,678,000	\$7,983,922,000	22.0%
	Average per US Farm*	\$9,251	\$9,523	2.9%
Farm-Related Income	All 100-Mile Foodshed Farms	\$139,728,000	\$284,107,000	103.3%
	Average per 100-Mile Farm	\$10,140	\$17,959	77.1%
	All US Farms	\$5,859,226,000	\$10,489,874,000	79.0%
	Average per US Farm	\$9,421	\$15,133	60.6%
Net Cash Income	All 100-Mile Foodshed Farms	\$988,790,000	\$1,457,361,000	47.4%
	Average per 100-Mile Farm	\$21,649	\$31,908	47.4%
	All US Farms	\$40,514,055,000	\$74,581,098,000	84.1%
	Average per US Farm	\$19,032	\$33,827	77.7%

*Net Cash Income is calculated as follows: **Market Value of Products Sold – Production Expenses + Government Payments Received + Farm-Related Income = New Cash Income**

Source USDA 2009, DVRPC 2009

calculates the net cash income for the aggregated 70-county area as compared to the United States. The top five most profitable counties include Richmond (Staten Island), NY, Sussex, DE, Nassau, NY, Dorchester, MD, and Atlantic, NJ. For this study, profitability is calculated as net cash income. Five counties report a loss for 2007, including Philadelphia, PA, Howard, MD, Montgomery, PA, Pike, PA, and Monroe, PA.

Although not reported on the county level, the 2007 Census of Agriculture asked operators to report how much of their household income is generated from farming. Nearly 80% of all American farmers report that less than half of their household income is generated from farming; however, about 50% of principal operators report being full-time farmers. This difference illustrates that many farming families rely on a spouse to take a full-time job for medical benefits or, less frequently, retirement benefits. It also illustrates that many full-time farmers work

second jobs during the winter or growing seasons.

Farmers all over the country, and especially in Greater Philadelphia's 100-Mile Foodshed, are looking to other sources of farm-related income to increase their profitability.

Farm-related sources of income include agritourism and recreational services, crop and livestock insurance payments, dividends or payments from a cooperative, or other agricultural services, such as planning, plowing, spraying, animal boarding, or animal breeding (excluding horse breeding). Farm-related sources of income can include "off-farm" income, but they must be related to the agriculture industry. Income from farm-related activities doubled between 2002 and 2007 within the Greater Philadelphia food system. While income derived from agritourism is the fastest growing source of income for farmers in the 100-Mile Foodshed, it only makes up about 9% of all farm-related sources of income. See **Figure 1.18: Sources of**

Farm-Related Income for the 100-Mile Foodshed for a visual breakdown of farmers' farm-related income, which does not include the sale of agricultural products.

By far the largest category of farm-related income is "other farm-related income sources." USDA defines this broad category as income derived from animal boarding, animal breeding (excluding horse breeding), state fuel tax refunds, farm-generated energy, and other income sources not explicitly mentioned.

Excluding Philadelphia, which has a number of nonprofit and educational farms, the counties reporting a loss in farm-related income may have more lifestyle farms than production farms. The counties with the most profitable farms on average range from large production counties like Sussex, Delaware, to urban counties like Richmond, New York, to those with more farms specializing in direct marketing, like Atlantic, New Jersey, and Nassau, New York.

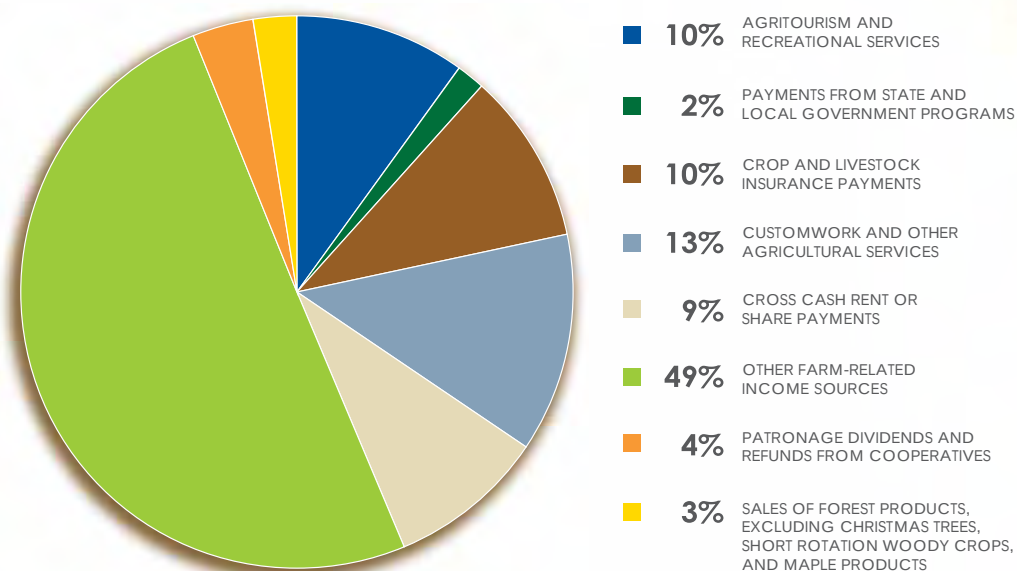
Fernbrook Farms **Burlington County, New Jersey**

Fernbrook Farms is a diversified farming operation with a variety of on-farm revenue sources. The property is a third-generation farm on preserved land. For-profit enterprises such as a wholesale nursery, a bed and breakfast, and a Community Supported Agriculture (CSA) program supplement the nonprofit education center, which operates farm-to-school outreach, nutrition workshops, and summer camps for youth.

In the 2008 growing season, the CSA provided shares to 160 members from six acres of on-farm production and supplements from other farms for things like sweet corn. Leftovers went to Farmers Against Hunger or local pig farmers. The Farm-to-School programs run by the education center are expanding and staff coordinate some parts of the statewide Farm to School Network. There are plans to expand on-farm production to include eggs and grass-fed meat and to recruit more members to the CSA.

FIGURE 1.18

Sources of Farm-Related Income for the 100-Mile Foodshed

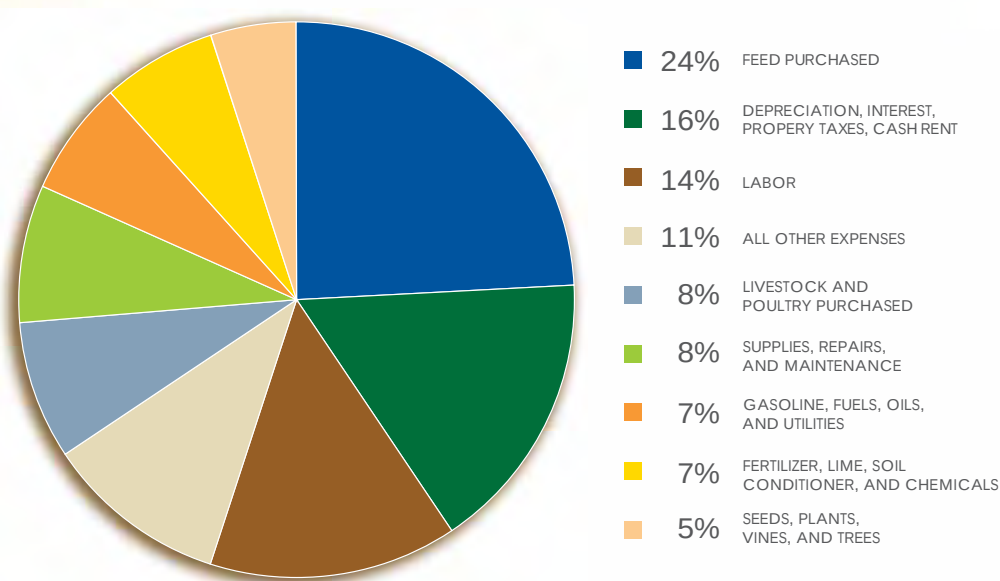


Source: USDA 2009, DVRPC 2009

Also of interest is who is benefiting from federal payments. Between 2002 and 2007, 53% more farms in the 100-Mile Foodshed received government payments (7,788 farms in 2002 compared to 11,951 farms in 2007), but the total amount of payments only increased by 2.7%, meaning that

average payments per farm decreased by 33.1%. For the United States as a whole, government payments increased by 22%, but 18% more farms participated (707,564 farms in 2002 compared to 838,383 farms in 2007). The predominantly agricultural counties of Sussex, DE, Lancaster, PA,

FIGURE 1.19
Production Expenses for the 100-Mile Foodshed



Source USDA 2009, DVRPC 2009

Queen Anne's, MD, Kent, DE, and Berks, PA, all within the Chesapeake Bay watershed, have the most farms enrolled and received the most government payments within the 100-Mile Foodshed. The suburbanized and urbanized counties of Philadelphia, PA, Pike, PA, Westchester, NY, Bergen, NJ,

and Passaic, NJ, had the fewest farms receiving government payments.³⁴

Farm Expenses

Throughout DVRPC's surveying effort in the summer of 2008, stakeholders reported that it was getting more and

more expensive to remain in farming because of numerous issues, including the high cost of land and property taxes, expensive labor, and increasing energy oil prices, which also affect the cost of fertilizers and other supplies.

According to the 2007 US Census of Agriculture, American farmers spent about 18.8% of their total expenses on feed for animals, 14.5% on livestock and poultry purchases, 8.4% on hired farm labor, 7.7% on depreciation of farm equipment and buildings, and 6.9% on fertilizers and soil conditioners. Farmers within the 100-Mile Foodshed spent 24% of their total expenses on feed for animals, a combined 16% on depreciation, interest, property taxes, and rent, 14% on hired labor, 8.1% on livestock and poultry purchases, and 7.9% on supplies, maintenance, and repairs. The slight difference in expenses illustrates that Greater Philadelphia

³⁴ Ten of the 70 counties do not have any farms receiving any government payments.

practices different types of agriculture compared to the United States as a whole and signifies that the foodshed has proportionally more dairy and poultry farms with specific building and land requirements, and more fruit and vegetable farms requiring more hands-on labor.

Between 2002 and 2007, production expenses in total increased by 39.2% for all American farmers, and 43.4% for farmers within the 100-Mile Foodshed. The foodshed's farmers reported the biggest increases in gas and fuel (85.8% increase), cash rent for land and buildings (54%), feed for animals (52.7%), livestock purchases (50.3%), and fertilizer and soil conditioners (50.1%). Farmers throughout the United States reported the biggest increases in gas and fuel (93.4%), fertilizer and soil conditioners (85.7%), feed for animals (54.9%), seeds and plants (54.5%), and

cash rent for land and buildings (46.7%). In short, nearly everything increased more than the standard inflation rate for the US dollar. Between 2002 and 2007, the standard inflation rate was 18.4%, meaning that \$1 in 2002 was worth \$0.82 in 2007, and \$1 in 2007 was worth \$1.18 in 2002.³⁵

Direct Sales

Direct sales, sometimes referred to as direct marketing, is one way that producers get their products to a market. Direct sales can also yield more income to a producer, eliminating third-party distributors. As evidenced by popular media and the increase in Community Supported Agriculture operations and farmers' markets, a significant segment of American consumers is increasingly interested in purchasing food directly from the producer.

It is important to note that direct sales, while increasing 54.6% between 2002 and 2007, only constitute 1.4% of all agricultural sales in the 100-Mile Foodshed. Within the United States, direct sales make up less than 1% (0.4%) of total agricultural sales. Northeast and Mid-Atlantic states sell proportionally more directly to the customer than other larger agricultural states. In many instances, farmers do not rely solely on one method or channel for distribution, like direct sales. Like any other business, most farmers diversify distribution channels and may sell to distributors, directly to a retail outlet or an institution, at a farmers' market, at auctions, through a website, or at a farmstand or on-farm store. Direct marketing usually appeals to a small- to medium-sized farm located near suburban or urban markets.

³⁵ Based on Consumer Price Index conversion factors, available from the Congressional Budget Office and the President's Office of Management and Budget.

Farmers' markets, where farmers can sell directly to the public, have grown tremendously in popularity in recent years. In the 100-Mile Foodshed, there are about 500 farmers' markets. As of the end of the 2008 growing season, New York, NY (Manhattan), had the greatest number of farmers' markets, with 40, followed by Philadelphia, PA, with 35, Kings, NY (Brooklyn), with 33, Westchester, NY, with 26, and Bronx, NY, with 24. Within Greater Philadelphia, there were 92 farmers' markets. Montgomery, PA, had nine, Camden, NJ, had eight, and Bucks, PA, had seven.

Similarly, Community Supported Agriculture (CSA) operations, another form of direct sales, have also grown in popularity in the last decade.

According to various sources, there are 119 CSAs in the 70-county area.³⁶

Comparatively, the counties with the highest value of direct sales are Lancaster, PA, Orange, NY, Bucks, PA, York, PA, and Hunterdon, NJ; and the counties with the highest proportion of all agricultural sales coming from direct sales are Mercer, NJ, Monroe, PA, Morris, NJ, Carbon, PA, and Westchester, NY. See **Figure 1.20: Comparing Direct Sales by Top Counties** for a comparison of the top five foodshed counties by total sales, proportional sales, biggest increases in direct sales, and biggest decreases in direct sales.

According to the 2007 Census of Agriculture, Pennsylvania and New Jersey rank very high nationally

The USDA refers to direct sales as “agricultural products sold directly to individuals for human consumption” and defines it as the value of products sold from “roadside stands, farmers' markets, and pick-your-own sites.” Nonedible products, such as flowers, wool, or plants, are excluded. Additionally, sales from vertically integrated operations that do their own processing and marketing are also excluded.

Source USDA. 2007 Census of Agriculture: United States Summary and State Data. Volume 1, Part 51. Released February 2009.

³⁶ The 2007 Census of Agriculture also details CSAs, but there is some controversy over the results. Some experts think that the Census overreports the number of CSAs for a given county or state. For this study, DVRPC aggregated the self-reported listings from several sources, including the NJ Department of Agriculture's Jersey Fresh and www.visitnjfarms.com, the Pennsylvania Association of Sustainable Agriculture's (PASA) www.buylocalpa.org, Fair Food's www.localfoodphilly.org, Local Harvest, and the Robyn Van En Center at Wilson College.

in direct sales and income derived from agritourism activities.

Pennsylvania is third in the country after California and New York in the total value of direct agricultural sales. The per capita (by total state population) spending on agricultural products sold directly to consumers equaled \$6.10 in Pennsylvania, \$3.47 in New Jersey, and \$4.05 in Delaware. The national average per capita spending on direct agricultural sales was \$4.02. The state with the highest per capita spending on direct agricultural sales was Vermont, with \$36.80, followed by Oregon, with \$15.04 per capita.

Agritourism

There are a variety of direct marketing and agritourism activities located within Greater Philadelphia's 100-Mile Foodshed, including farm stores, farm tours, Christmas tree farms, educational activities, horse

FIGURE 1.20

Comparing Direct Sales by Top Counties

Direct Sales	State / County	2007
Most Direct Sales in 2007	Pennsylvania / Lancaster	\$9,220,000
	New York / Orange	\$5,424,000
	Pennsylvania / Bucks	\$4,963,000
	Pennsylvania / York	\$4,010,000
	New Jersey / Hunterdon	\$3,315,000
Biggest Increase in Direct Sales (2002 to 2007)	New Jersey / Atlantic	989.0%
	Pennsylvania / Carbon	762.3%
	Maryland / Caroline	383.4%
	New Jersey / Mercer	372.4%
	Pennsylvania / Monroe	304.5%
Direct Sales as Part of Total Agricultural Sales	New Jersey / Mercer	17.4%
	Pennsylvania / Monroe	15.0%
	New Jersey / Morris	11.4%
	Pennsylvania / Carbon	11.0%
	New York / Westchester	10.0%
Biggest Decrease in Direct Sales (2002 to 2007)	Maryland / Howard	-13.2%
	Pennsylvania / Dauphin	-27.3%
	New Jersey / Cape May	-41.3%
	Delaware / New Castle	-51.7%
	New Jersey / Burlington	-70.4%

Source USDA 2009, DVRPC 2009

activities, farm stays, garden or corn mazes, fruit festivals, Halloween activities, tractor or hay rides, hiking, museums, pick-your-own produce (U-pick), wagon or carriage rides, wineries, and petting zoos. Within the

70 counties of the 100-Mile Foodshed, there are at least 1,546 farms that participate in one or more of these activities.

The counties with the greatest number of farms participating in on-farm direct sales or agritourism are Lancaster, PA (115 farms), Sussex, DE (70), Berks, PA (67), Burlington, NJ (64), Monmouth, NJ (63), Hunterdon, NJ (62), and Sussex, NJ (59). After farmstands, the most common agritourism activity in the 100-Mile Foodshed is pick-your-own operations, of which there are at least 403 in the foodshed. There are also at least 1,221 on-farm stores and roadside stands, 272 Christmas tree farms, 205 farms that offer tours, and 167 farms that offer tractor or hay rides.

See **Map 1.9: Direct Marketing and Agritourism Activities (2008)**.

Farmers' Markets

Farmers' markets provide easily accessible venues for agricultural producers to sell directly to consumers. As of 2009, the DVRPC nine-county region had 81 farmers' markets, according to the USDA and

local organizations. Although the USDA's National Survey of Farmers' Market Managers reports a slower growth of markets between 2006 and 2008 compared to the previous 10 years, the increasing number of these direct sales outlets visually represents the growing local food movement.

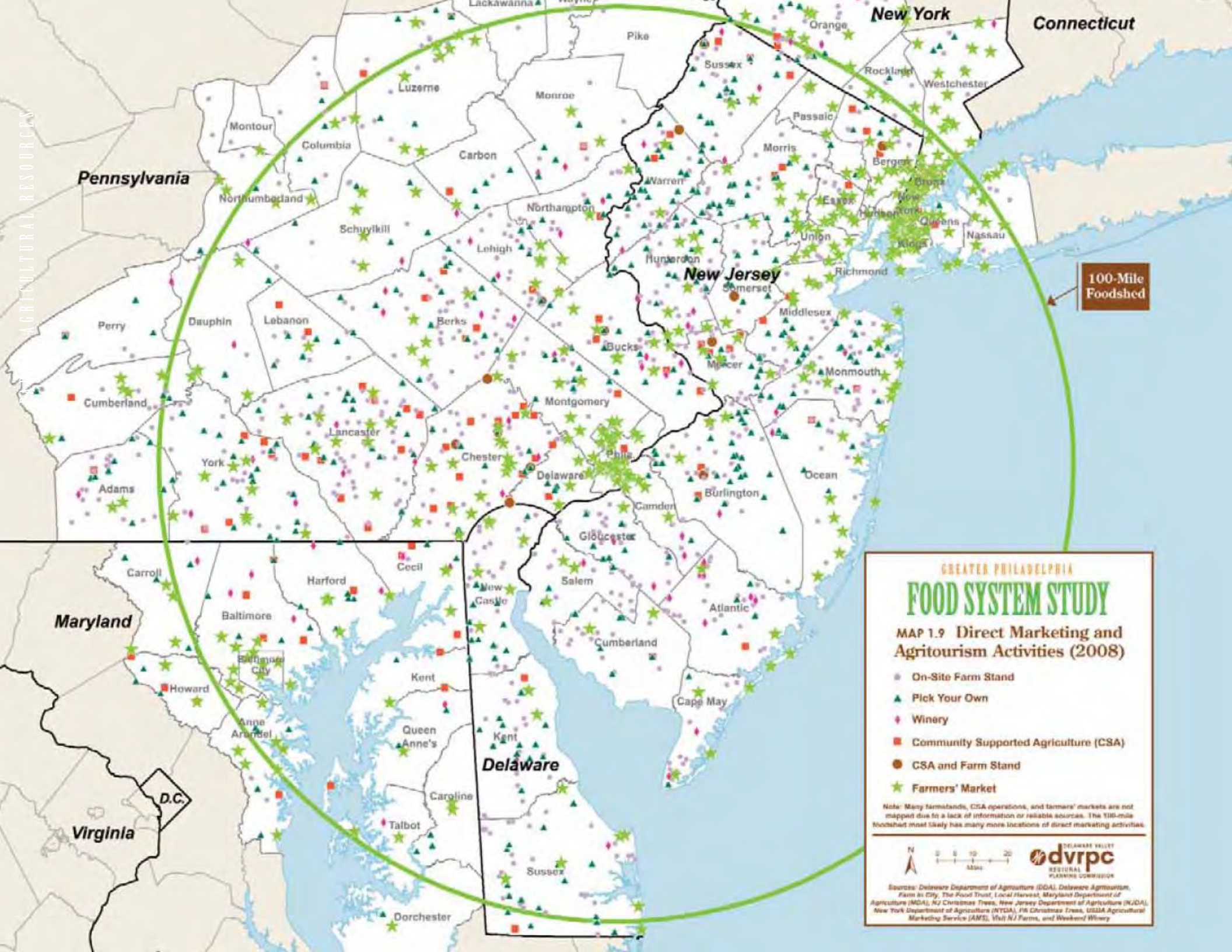
The USDA's Agricultural Marketing Service conducts various studies on farmers' markets to better understand the costs and benefits of participating in farmers' markets and to identify and evaluate support programs for direct marketing. Recent surveys conducted by USDA have tracked changes in many variables, including what products are offered at markets, the primary motivators for consumers to patronize a farmers' market, the operational challenges facing both producers and market managers, and successful markets' logistical and organizational practices.

Fruitwood Orchards Gloucester and Salem counties, New Jersey

Throughout this study, DVRPC has heard that more and more farmers are turning to direct marketing as a way to increase sales or stay in business. Some farmers also make value-added products from their harvest, such as fresh-baked pies, cheeses, and fruit preserves. Fruitwood Orchards in Elk Township, New Jersey, is one example of a farm that changed its business model to specialize in direct sales and value-added products.

Owned and operated by the Wright Family for almost 60 years, Fruitwood Orchards grows apples, peaches, cherries, and strawberries, among other fruits and vegetables, on 110 acres. The family began raising honey bees to help pollinate their fruit trees, and started a separate honey-producing and pollination business.

Fruitwood Orchards specializes in direct sales, using several different marketing channels, from an on-farm stand to a mail- and internet-order business, from operating a pick-your-own operation to participating in nine farmers' markets in southern New Jersey and southeastern Pennsylvania.



100-Mile Foodshed

GREATER PHILADELPHIA
FOOD SYSTEM STUDY

MAP 1.9 Direct Marketing and Agritourism Activities (2008)

- On-Site Farm Stand
- ▲ Pick Your Own
- ◆ Winery
- Community Supported Agriculture (CSA)
- CSA and Farm Stand
- ★ Farmers' Market

Note: Many farmstands, CSA operations, and farmers' markets are not mapped due to a lack of information or reliable sources. The 100-mile foodshed most likely has many more locations of direct marketing activities.



Sources: Delaware Department of Agriculture (DDA), Delaware Agritourism Farm to City, The Food Trust, Local Harvest, Maryland Department of Agriculture (MDA), NJ Christmas Trees, New Jersey Department of Agriculture (NJDA), New York Department of Agriculture (NYDA), 1% Christmas Trees, USDA Agricultural Marketing Service (AMS), Visit NJ Farms, and Weekend Winery

The most recent iteration of the USDA's National Survey of Farmers' Market Managers revealed that year-round markets with paid managers, rather than those run by volunteers, are the most successful. Also, markets that are at least five years old were found to yield more sales per month and more sales per producer than new markets, which could suggest customer loyalty and support, or that established markets are in the best and most obvious locations.

Advertising, publicity, and local food promotion were the most common challenging issues facing Mid-Atlantic managers and therefore for which they felt they needed the most assistance. The research also showed that in the Mid-Atlantic region, an average of 60.8% of customers traveled five miles or less to get to a farmers' market, and only 5.2% traveled more than 20 miles. In addition to these findings, marketers expressed interest in more

marketing data and demographics to analyze customer preferences and to find effective ways to target customers.

The USDA administers this survey every two years and uses the findings to inform the department's technical assistance programs and grant opportunities.

SUSTAINING FOOD AND FARMING

In addition to soil suitability, climate, and water resources, the agriculture industry needs other resources in order to thrive, be successful, and feed local populations and people around the world. Some of the resources are economic and entrepreneurial, while others are institutional support systems. One of the most important resources for future generations of farmers is affordable land that is protected from development—preserved farmland.

Buy Fresh Buy Local Campaign

The national Buy Fresh Buy Local marketing campaign was created in 2003 by the FoodRoutes Network to support local producers and encourage a greater appreciation for regional food, unique flavors, and seasonality. Participating businesses make a commitment to the program by featuring local food.

In Pennsylvania, the Buy Fresh Buy Local campaign is coordinated by the Pennsylvania Association for Sustainable Agriculture (PASA), with nine county and regional chapters organized by an alliance of organizations and agencies across the Commonwealth. Fair Food, an organization started by White Dog Community Enterprises, organizes Buy Fresh Buy Local Greater Philadelphia. The program continues to grow nationwide, currently promoted by 73 chapters in 24 states across the country.

To complement the consumer-targeted Buy Fresh Buy Local program, PASA has launched the Good Food Neighborhood, a web-based marketing program created for the local food eaters to show their support for local producers and network socially with other “local foodies.” Together, these two programs and other similar initiatives work to increase support for the local food movement in Greater Philadelphia.

Other Resources Necessary for the Agriculture industry

The agriculture industry, like any industry, has economic requirements in order to be successful. As agriculture has declined in prominence in the 100-Mile Foodshed, so too have agricultural support businesses. Farmers in suburbanized counties, such as Camden County, New Jersey, report traveling to neighboring counties to sell produce to wholesalers. Many farmers in southern New Jersey purchase farm equipment from companies in Lancaster County, PA. Other farmers specializing in organic production report that it is hard to find an organic grain buyer or seller. Agricultural support businesses are evaluated in more detail in **Part 3: The Food Economy**. However, there is a multitude of other agricultural support services and resources that are not captured in traditional

economic sources. Other resources include labor, training and education programs, and financing.

Labor

The 100-Mile Foodshed's farms have labor needs that range from low-skill seasonal workers to highly skilled consultants. Different types of agriculture require different labor pools. Livestock operations need access to veterinarians and animal husbandry consultants. Fruit and vegetable farms need seasonal labor to pick produce. Field crop farms need seasonal labor to help with harvesting. And as more farms are interested in direct sales, some farmers are finding that they need sales staff to secure retail contracts, fulfill orders, or sell at farmers' markets. Farm laborers are paid a minimum wage (\$7.25 as of July 2009) or paid "by piece" in New Jersey and Maryland. Delaware, Pennsylvania, and New York have slightly different minimum wage

regulations. Securing trained labor, providing labor housing, and ensuring equitable and fair pay can be a struggle for many farmers throughout the United States and within the 100-Mile Foodshed. According to the 2007 Census of Agriculture, about 23% of foodshed farms hired farm workers and reported over \$800 million in payroll. While the number of farms hiring labor and the number of workers employed continues to decline each year, the total payroll continues to increase each year.

Financing

Securing financing for a farming operation is in many ways like securing financing for any small business. In other ways it is not at all similar. Farm Credit is a nationwide system started by Congress in 1916 to provide capital to agricultural operations. Groups of farmers across the country formed the organization as a cooperative business, lending money

to each other, as they found traditional banks to be less interested in making loans. To borrow money, a farm has to become an owner in the cooperative, which enlarges the financing pool and allows them to receive interest earnings. There are different levels of eligibility for lending, ranging from producers to basic processors, from marketers to farm-related businesses.

The 100-Mile Foodshed is served by Mid-Atlantic Farm Credit, AgChoice Farm Credit, and First Pioneer. Loans cover traditional activities like real estate purchases, equipment and operating expenses, and working capital. The Farm Credit industry is introducing more innovative programs that will serve young and beginning farmers and small and minority farmers. The credit agencies also offer training and education on financial management.

Training

Many state agencies and nonprofit organizations are committed to

providing farmers with technical assistance and training people interested in farming. Some training resources are provided by the USDA and national nonprofit organizations like the National Center for Appropriate Technologies.

Land grant universities have a long history and duty to take academic research and translate findings for pragmatic applications. The 100-Mile Foodshed is served by the Penn State Cooperative Extension, the Rutgers Cooperative Extension, the University of Delaware Cooperative Extension, the Cornell Cooperative Extension, and the Maryland Cooperative Extension. While not a land grant university, Delaware Valley College awards degrees in agriculture and other related fields, and is broadening its community outreach and research centers to engage the agricultural community in and around the Bucks County campus.

Calkins Creamery Wayne County, Pennsylvania

The Bryant family has operated the 240-acre Highland Farm in Honesdale since 1871. In late 2008, the farm was preserved through the Wayne County Agricultural Land Preservation Program, providing the landowners with capital to pay off debts, invest in improvements, or save for future expenses.

Jay and Emily, younger members of the Bryant family, constructed the Calkins Creamery onsite in 2006 “with the hope of sustaining the farm for future generations.” The creamery produces farmstead cheeses using mostly raw milk from the herd of 80 registered Holstein cows.

Preserved Farmland

As development pressure increases, the need to preserve farmland also increases. Development pressure often increases the value of land. Conversely, farmers need access to less expensive land because agriculture is land intensive, has slim margins for profitability, and prices fluctuate according to domestic and international markets. In the Mid-Atlantic, farmland is particularly well suited for land development, as it is usually cleared and level, has access to groundwater, and is relatively close to metropolitan employment centers.

Farmland preservation originated as a growth management technique in the 1960s as state and local governments saw an explosion of suburban development. Farmland preservation, and protection of other types of open space, is an investment made today for

the continued use in the future.³⁷

Both New Jersey and Pennsylvania are models for state farmland preservation programs. New Jersey's program is one of the oldest in the country, started in 1985, while Pennsylvania's program has protected the most acres of any state-level program.³⁸

Farmland can be permanently protected through a variety of means. A landowner can sell or donate a development easement—the right to develop land for nonagricultural purposes—to a government or a nonprofit land trust. This is the most common farmland preservation technique. Development rights of the land can be transferred to another piece of land, increasing its development potential. This is referred to as “Transfer of Development Rights,” or TDR. A landowner can restrict the development potential of land through “deed restriction.” Farmland can also be

purchased outright through a fee-simple sale. This approach is sometimes used when a landowner wishes to retire but has no heirs to continue farming or does not want to go through the process of selling to another farmer.

Reducing the land's development potential should reduce its resale value, theoretically making it more affordable for farming in the future. While so much farmland is preserved, farmers, especially new or young farmers, have expressed frustration in gaining access to preserved farmland, in addition to unpreserved farmland. In New Jersey, specifically, the sale price of a preserved farm can be nearly as high as the sale price of a farm with development potential. Some people consider this good for a farmer who needs to maintain financial equity in his or her farm, while other people consider this bad for a new farmer looking to access land in an expensive and suburbanizing area.

³⁷ Gustanski, Julie Ann. *Protecting the Land: Conservation Easements Past, Present, and Future*. Washington, DC: Island Press, 2000. p. 10.

³⁸ Commonwealth of Pennsylvania, Department of Agriculture. “About Farmland Preservation.” www.agriculture.state.pa.us/agriculture/cwp/view.asp?q=128859. Accessed 5 May 2009.

According to the most recent data available for each county, 732,661 acres of farmland are permanently protected through a publicly funded program (state, county, or municipal). This represents 3.8% of the total land area of the foodshed, and only 14% of farmland as reported in the USDA's 2007 Census of Agriculture.

Land trusts also preserve a significant amount of farmland, although there is no consistent or widely available data source for the 70-county region. In 2008, DVRPC completed a data collection and analysis project covering 22 counties for the William Penn Foundation. This project entailed collecting data on preserved farmland and lands owned or leased by land trusts, among other types of protected open space. Within the 22-county area, land trusts have preserved 451,777 acres of land. However, this land is not all farmland. Land trusts have preserved historic resources, nature preserves, recreational areas, water source protection lands, trails, and other significant areas of natural resources.

A number of nonprofit land trusts and local governments in the 100-Mile Foodshed are exploring the possibility of leasing preserved or publicly owned land to farmers. A few such initiatives include:

- Philadelphia's Fairmount Park Commission and Recreation Department owns, leases, or maintains three farms within the city limits, including Fox Chase Farm, Manatawna Farm, and the Saul Agricultural High School. The department is exploring how to make more land available for commercial urban farmers.
- The Philadelphia Water Department is exploring urban farms as a beneficial land use that captures stormwater runoff.
- In the spring of 2009, the Philadelphia Redevelopment Authority (RDA) issued a Request for Qualifications, seeking individuals and organizations to propose agricultural uses for vacant land within the city on a short-term lease. This is referred to as interim land use, or land banking. However, it is uncertain that the RDA will be following up on the submissions. Instead, it may pursue interim land use leases with established urban farmers.

- Chester, Lehigh, and Montgomery counties in Pennsylvania and Burlington County in New Jersey operate demonstration / education farms on publicly owned land.
- Heritage Conservancy, based in Bucks County, PA, and the Willistown Conservation Trust, based in Chester County, PA, are actively looking for farmers to farm preserved land.
- The New Jersey Conservation Foundation is undertaking a feasibility study to determine if large-scale greenhouse production can occur on vacant land in urban areas. This would help to retain prime farmland in rural areas by not constructing buildings on top of rich and productive soil.
- Greener Partners, based in Delaware County, PA, is a nonprofit organization whose sole mission is to establish teaching gardens and sustainable farms on public or underutilized land.

It should be noted that land easements or deed restrictions can preclude preserved land—specifically, conserved land occupied by a landowner, nature preserves, and some public parks—from being farmed.



*Farmland in Cumberland County,
New Jersey*

PHOTO CREDIT: DVRPC

Greater Philadelphia's Agricultural Land Needs

In a densely populated area like Greater Philadelphia, not all food can be local. Simply put, population demand exceeds the agricultural supply from within the 100-Mile Foodshed. A quick land consumption analysis can provide an initial basis to discuss Greater Philadelphia's agricultural land needs.

Using conservative estimates of agricultural land required for a

complete diet, as derived by Christian Peters at Cornell University, Greater Philadelphia's population requires over 6.8 million acres of agricultural land.³⁹

Threats and Challenges to Local Agriculture

DVRPC's long-range plan, *Connections: The Regional Plan for a Sustainable Future*, outlines a strategy for recentralization based on the land use, transportation, environmental, and economic competitiveness benefits associated with such a development pattern. The global food system will most likely go through recentralization as well, and more of the world's urbanizing populations will need to be fed by agricultural resources that are close by, rather than exporting agricultural products. Conversely, Greater Philadelphia and the rest of the United States are relying on agricultural resources farther and

farther away, while we are losing irreplaceable agricultural lands to urban development. Between 1990 and 2005, the DVRPC region lost over 126,000 acres of agricultural land.

In addition to sprawling development and farmland loss, there are other threats that are challenging Greater Philadelphia's foodshed and its agriculture, including competition for water, competition between different types and scales of agriculture, increased interest in and necessity for biofuel production, uncertainty of climate change and increasingly severe weather events, and increasing energy prices. Much like any other businesspeople, farmers need to prepare for transitioning their farms to a new generation of farmers, whether they are family members or other interested parties.

³⁹ Peters, Christian. "Testing a complete-diet model for estimating the land resource requirements of food consumption and agricultural carrying capacity: The New York State example." *Renewable Agriculture and Food Systems*: 22(2): 145-153. 2007.

FIGURE 1.21**Greater Philadelphia's Agricultural Land Needs**

DEMAND				SUPPLY		DEFICIT	
DVRPC REGION 2005 POPULATION (PERSONS)		TOTAL AGRICULTURAL LAND NEEDS PER CAPITA (ACRES)*	TOTAL AGRICULTURAL LAND NEEDS FOR GREATER PHILADELPHIA (ACRES)	DVRPC REGION 2007 TOTAL CROPLAND AND PASTURELAND (ACRES)**		(ACRES)	
5,519,051	X	1.23	=	6,788,433	379,481	-6,408,952	

DEMAND				SUPPLY		DEFICIT	
100-MILE FOODSHED 2003 POPULATION (PERSONS)		TOTAL AGRICULTURAL LAND NEEDS PER CAPITA (ACRES)*	TOTAL AGRICULTURAL LAND NEEDS FOR THE 100-MILE FOODSHED (ACRES)	100-MILE FOODSHED 2007 TOTAL CROPLAND AND PASTURELAND (ACRES)**		(ACRES)	
30,954,544	X	1.23	=	38,074,089	4,127,348	-33,946,741	

*Assumes a diet that meets recommended total caloric value of 2,000 calories per person, and includes about nine ounces of cooked meat and eggs and 91 grams of fat.

**Excludes "woodland not pastured" and "land in farmsteads, buildings, etc."

Source USDA 2009, DVRPC 2009

SUMMARY

While the USDA Census of Agriculture provides a detailed view of America's agricultural industry and helps draw conclusions about Greater Philadelphia's 100-Mile Foodshed, a lot of information is still missing. For instance, we can only assume that the 100-Mile Foodshed has proportionally more smaller-scale and more diversified farms as compared to the United States. And we can only assume that

smaller scale and more diversified agriculture suggests more sustainable producers (which includes Certified Organic producers, producers that practice Integrated Pest Management and other sustainable and humane production methods). Because the census maintains survey respondents' confidentiality, we cannot parse out the data to understand the different farm and farmer characteristics associated with a type of agriculture (i.e., organic producers are younger than

conventional producers, nationally). Additionally, we do not know how much food that is produced within the 100-Mile Foodshed is sold to and consumed by Greater Philadelphia's population.

DVRPC's analysis of the 100-Mile Foodshed's agricultural resources reveals changes in the agriculture industry over the last five to 20 years, but it is very difficult to attribute causes to the changes. For instance:

The Importance of Definitions

The USDA's Census of Agriculture is the only comprehensive data source for information on the US agriculture industry. Data is drawn from actual farmers who respond to surveys. This means that data analyses are dependent on self-identifying and self-reporting, which can lead to underreporting, overreporting, and misinformation.

Over the years, the USDA has refined its surveying process and definitions. In 1997, the USDA reconfigured the Census of Agriculture and incorporated the use of the North American Industry Classification System (NAICS) and included Christmas tree growers and maple syrup producers in its definition of agricultural producers, increasing the number of farms and land in farms as compared to previous years. The USDA also adjusts data to address nonresponse rate and changes results of past censuses. While these modifications aim to increase the accuracy of the survey and create a comprehensive view of the US agriculture industry, comparisons between years may lead to misinterpretations of changes in data.

Statistics also vary between different data sources based on definitions used to classify farms and farmland. The USDA considers a farm as any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year. The New Jersey Farmland Assessment Act requires minimum revenue of \$500 and minimum size of five acres to qualify as a farm. This distinction can lead to discrepancies within similar categories. When comparing Cumberland County, New Jersey, data for the 2007 tax year, the county calculated the total land used for agriculture as 85,703 acres, while the Census of Agriculture reported only 69,489 acres as land in farms. Additionally, New Jersey farmland assessment allows woodland to qualify as farmland, if it is under a forest management plan and produces \$500 worth of products. The Census of Agriculture only includes woodland if it is part of a farm, so large tracts of woodland are often excluded.

- The 100-Mile Foodshed yields higher average sales per farm than the national average. Does that mean that the 100-Mile Foodshed has better soils, or sells higher priced products, or can charge more in an urban area?
- More 100-Mile Foodshed farms are receiving government payments, mostly through NRCS conservation programs, but the farms are receiving less, on average, while other regions are receiving more. Do the 100-Mile Foodshed farms undertake farming practices that are excluded from USDA programs? When will we see the reforms of the 2008 Farm Bill?
- If Greater Philadelphia demands more food than the 100-Mile Foodshed can supply, what food commodities are we under-producing? What are we over-producing? How many calories are imported?

While this is not a comprehensive list of the Census of Agriculture's shortcomings, it is important to understand that as the Census of Agriculture is refined and redefined to better capture the intricacies of American agriculture, changes in definition can lead to misinterpretation of the data, and suggest that the

100-Mile Foodshed has more farmers or more food producers than we actually do. See **The Importance of**

Definitions.

Despite the numerable unanswered questions, the Census of Agriculture, supplemented with stakeholder interviews and other research, provides the following findings:

- While many people lament the 100-Mile Foodshed's short growing season, local producers take advantage of the temperature climate, reliable rainfall, fertile soils, and groundwater resources and are employing season extension techniques. These natural resources, combined with adaptable agricultural practices, are obvious competitive advantages and will become more important as other geographic areas grapple with water shortages, diminishing soil fertility, and the increased costs of fossil fuels.
- Greater Philadelphia's 100-Mile Foodshed is the second most densely populated area in the United States, second only to the overlapping 100-Mile Foodshed of New York City. However, the area retains about 27% of its land area in agriculture, thanks to land preservation and a history and culture of farming and food.
- The population density also makes land more expensive. All but one county has higher farmland values than the national average value of \$1,892 per acre. The 100-Mile Foodshed's land is, on average, 342% more expensive.
- Because of the 400-year old Colonial history and culture of farming, 100-Mile Foodshed farms are three times smaller than the average American farm.
- While income from agricultural sales increased by 43.4% between 2002 and 2007 in the 100-Mile Foodshed, production expenses increased at the same rate, by 43.7%. Profitable farmers are working with slim margins.
- Even though the 100-Mile Foodshed is densely populated and only 27% of the land area is devoted to agriculture, a surprisingly high proportion of land is used to raise livestock.
- Nearly one-half (46.7%) of all 100-Mile Foodshed farms report raising livestock primarily (by NAICS). Another 12.9% of farms report primarily growing oil and grains, often used to feed livestock. This is surprising because livestock requires more land, and land is in short supply in a densely populated area.
- Direct sales are low, accounting for only 1.4% of all agricultural sales in the 100-Mile Foodshed. This suggests that most local food is getting to market through conventional distribution channels, like produce wholesalers, meat processors, and other food processors. Those counties farther away from the Philadelphia and New York metropolitan areas grow considerably more fruits and vegetables for local processors, such as Birds Eye or Campbell's Soups.

Analyzing the 100-Mile Foodshed provides DVRPC with more information about the larger Greater Philadelphia Food System. While it appears that food grown in the 100-Mile Foodshed is getting to market, that market may be in Philadelphia, or any number of other metropolitan areas, including New York City and Washington, DC. While farmers are finding markets for their agricultural products, they may not be making enough money in sales to remain profitable, given increasing production costs such as labor, fuel, and packaging. A handful of farmers have

found ways to remain profitable by changing business models, such as selling more product directly to consumers and retailers, or producing high-end niche products like artisanal cheese and local honey.

These producers, while meeting a market need, are not the majority of producers, nor are they numerous enough to sustain a thriving agricultural industry, with support services, that produces large amounts of food for nearby populations. **Part 1: Agricultural Resources** illustrates just how fragile Greater Philadelphia's 100-Mile Foodshed is. While food is currently easily procured and transported from other areas, we may need to rely on food resources closer to population centers in the near future. However, because the foodshed's agricultural resources are threatened by sprawling populations and accompanying land development,

and decreasing farm profitability and cheap food prices, we may not have the rich and productive foodshed when we need it most.



PART 2

Food Distribution



When asked what information stakeholders would like to know about Greater Philadelphia's food system during the surveying effort summarized in **Part 4: Food System Stakeholders Analysis**, stakeholders had two common questions: 1) how much food that is produced within the region is consumed within the region, and 2) how far does food travel from farm to table or from producer to consumer?

Answering those two questions is extremely difficult, if not impossible. To provide some insight and partial answers, DVRPC utilized data compiled by the Federal Highway Administration (FHWA) to create a Food Freight Analysis Framework (FAF) for Greater Philadelphia. While a Food FAF cannot calculate exact food miles, it captures how much food is leaving the region, and therefore suggests how much food that is produced within the region is consumed within the region. The Food FAF is another way to identify the region's trading partners and its manufacturing and retail clusters.

To complement the data-driven Food FAF, DVRPC conducted several supply chain case studies to better understand how far food travels from producers around the world and within the Greater Philadelphia food system to consumers.

GREATER PHILADELPHIA'S DISTRIBUTION NETWORK

The Greater Philadelphia region boasts a strong transportation infrastructure system that is not very congested compared to other metropolitan areas like New York or Washington, DC. Greater Philadelphia has seven interstate highways: I-76, I-276, I-476 (part of the Pennsylvania Turnpike), I-95, I-195, I-295, and the New Jersey Turnpike (which is I-95 through northern New Jersey).

Greater Philadelphia's port activity is centered along the Delaware River and hosts 33 active port facilities in six counties. The regional ports tend to specialize in niche cargo, such as steel, paper, and fresh produce. However, the majority of tonnage moving along the Delaware River is crude petroleum destined for one of several major refineries in the region.

Because of the nature of food travel, this study does not include a modal breakdown of food movements associated with Greater Philadelphia. A sampling of outbound domestic movements showed that 99% of food-related tonnage was shipped by truck. In the domestic supply chain, products that are high turnover, like perishable food, almost always travel by truck.

Despite roadway congestion, trucks still carry goods more quickly and reliably from origin to destination than any other mode. Rail is primarily used to carry heavy cargo over long distances. There are examples of food-related products traveling by rail, like the Tropicana Juice train that runs from Florida to Northern New Jersey. Because fresh food is perishable and needs to be refrigerated, trucks will most likely remain the preferred mode for the food industry.

THE FOOD FREIGHT ANALYSIS FRAMEWORK

The Freight Analysis Framework (FAF) is a massive data integration process undertaken by the FHWA to create a nationwide freight database.⁴⁰

Originally, the FAF was developed to ascertain the increasing pressure that freight puts on the nation's infrastructure. This pressure can be viewed both positively and negatively. Freight brings Americans access to the global marketplace and an availability of goods. The nation's interaction with the global economy creates economic benefits in terms of industrial profits and specialized labor. However, the movement of freight can create increased congestion and extreme wear-and-tear. On highways, for example, one loaded truck can cause the same amount of damage to a segment of road as 10,000 cars.⁴¹

The FAF is a forecast tool, estimating increases or decreases in freight movements by different types of commodities and modes of travel. This chapter presents data in three specific years: 2002, 2010, and 2035. The FAF database defines Greater Philadelphia as 10 counties: Philadelphia, Bucks, Montgomery, Chester, and Delaware counties in Pennsylvania, and Burlington, Camden, Gloucester, Salem, and Cumberland counties in New Jersey. Greater Philadelphia, as defined by the 10 counties, has a population of 5,357,004.⁴² This is somewhat smaller than the DVRPC nine-county region's population of 5,519,051 people, which includes Mercer County, but not Salem or Cumberland counties.

The Food FAF evaluates the type, value, and weight of food commodities that are traded between the 10-county

⁴⁰ For full details and technical documentation on the FAF, visit the FHWA website at http://ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm. Information on DVRPC's use of the FAF is included in Appendix B.

⁴¹ Comparisons of fully loaded trucks to passenger cars range from one truck causing as much damage as 5,000 to 10,000 passenger vehicles. Such estimates can be attributed to the Transportation Research Board (TRB).

⁴² According to US Census July 2007 estimates.

Greater Philadelphia area, the 100-Mile Foodshed,⁴³ the rest of the United States (domestic movements), and the world (international movements). See **Map 2.1: Food Freight Analysis Framework 100-Mile Foodshed** for the geographic area that includes the 100-Mile Foodshed. The FAF geographic area, much larger than the 70 counties within the 100-Mile Foodshed, must be used because the FAF database aggregates data by these larger metropolitan divisions instead of by individual counties.

FAF Strengths and Challenges

As a planning tool, the FAF allows freight data to be aggregated over various geographic areas so that

federal, state, and local governments can better understand the flow of cargo from one region or state to another and can forecast growth in shipments.⁴⁴

The FAF is a useful tool in that it aggregates an immense amount of data collected by various government agencies and measures freight movements throughout the United States and identifies domestic and international trading partners.

As the findings of the FAF are detailed and the trends highlighted in this section, it is important to look at the challenges and shortcomings of the database.

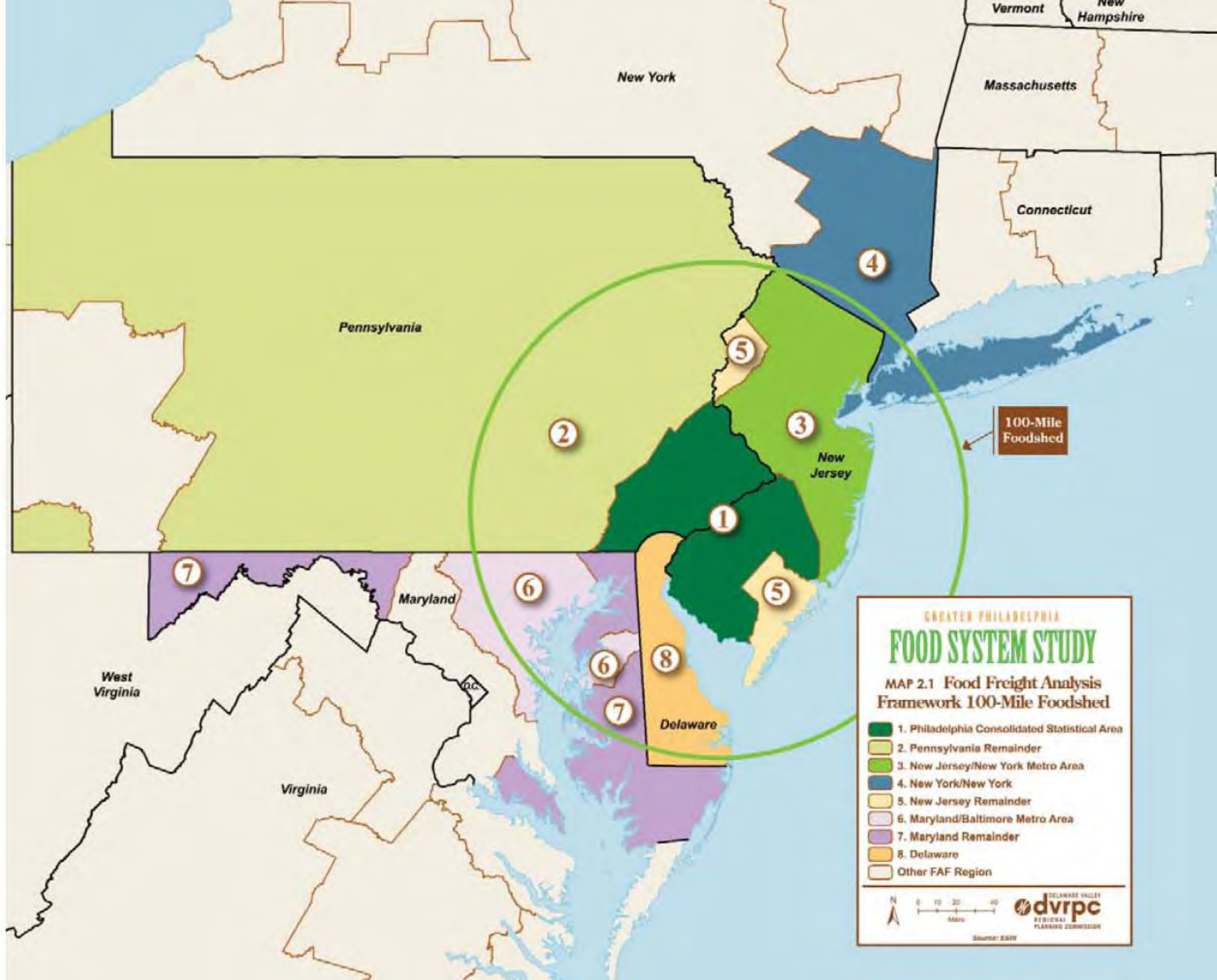
99% of all food shipments are by truck, as opposed to other modes of transportation, such as rail or air.

Greater Philadelphia's ports have longer and more flexible gate hours than some ports in New York City. At NYC ports, there are only five hours a day that a ship can start unloading and a truck can be loaded. After gate hours close, the boat must sit at the dock and "sweat." In contracts, Greater Philadelphia's ports in southeastern Pennsylvania and southern New Jersey are open 19 hours a day, unloading ships and loading trucks.

- Philadelphia Regional Port Authority

⁴³ Because the FAF database aggregates and estimates data on a large geographic area roughly based on metropolitan statistical areas, the 100-Mile Foodshed consists of a significantly larger area than the often-referenced 70-county foodshed.

⁴⁴ It is important to note that forecasts based on 2002 data will not take into account any drastic changes in the US transportation system or major world events. The forecasts are simply using economic and population data to project movements onto the current transportation network.



- Because the forecasts are first based on national controls, aggregation down to the metropolitan level loses some accuracy. This, however, is true for any statistical database—the larger the region or sample size, the more reliable the numbers derived from a statistical sampling.
- The geographic areas used in the FAF are not ideal or consistent with other US surveying and data collecting initiatives. County-level data is not available in the FAF. This is especially problematic when evaluating data for the 100-Mile Foodshed. Therefore, the Food FAF uses a significantly larger geographic area as indicative of the 100-Mile Foodshed study area.
- No through movements are included. For example, a movement from Washington, DC, to New York City may pass through Greater Philadelphia, but would be unaccounted for in the FAF.
- Because the base year is 2002, forecasts cannot account for the recent increase in food and fuel prices, the popularity of biofuels, or the growing popularity of the local food movement.
- Weight and value of commodities may be double counted. A finished product that moves into the Philadelphia region and is warehoused and then distributed to a retailer is counted as both an inbound movement and a

within region movement, thus double counting the product. Similarly, raw products that go into a processing center and come out as finished products are counted twice—as the raw product and as a fraction of the finished product.

- The FAF database and its original data sources do not account for unregulated freight. A shipment of avocados coming from Mexico crosses the United States border and must be unloaded to an American truck or packaged by an American company. If this freight has a final destination in Greater Philadelphia, the shipment will be counted as a domestic *inbound* movement, not an international import.
- It is important to note that the FAF is designed to quantify movements, not consumption. For example, 40 million tons of foods are moving into, *within*, and out of Greater Philadelphia. However, that same region consumes about three million tons of food. See **Part 3: The Food Economy** for more information on food consumption and retail.

Commodities in the Food FAF

There are 43 commodity codes within the FAF database that correlate with the Standard Classification of

Transported Goods used by Bureau of Transportation Statistics and the US Census Bureau. Of the 43 classifications, there are eight commodities that are associated with the food industry. For the purposes of this study, the eight commodities and their movements constitute the Food FAF. The categories are: (1) live animals and fish; (2) cereal grains; (3) other agricultural products; (4) animal feed; (5) meat and seafood; (6) milled grain products; (7) other foodstuffs; and (8) alcoholic beverages. Detailed descriptions of what are contained in each of these commodity classifications, and the base year and forecasted values, are found in the Food FAF Commodity Summaries in **Appendix C: Food Commodity Summaries**.

Type of Movements

The Food FAF refers to three different types of movements:

- *Within Region* (or intraregion) movements are those that originate and are destined for inside Greater Philadelphia.

- *Inbound* movements are movements originating outside Greater Philadelphia that are destined for Greater Philadelphia. In the Food FAF, inbound movements can be described as originating in the 100-Mile Foodshed, as Other Domestic Sources, or as International Sources.
- *Outbound* movements are movements originating in Greater Philadelphia and destined for a location outside of Greater Philadelphia. As with inbound movements, the analysis will describe these movements as destined for the 100-Mile Foodshed, as Other Domestic Destinations, or as International Destinations.

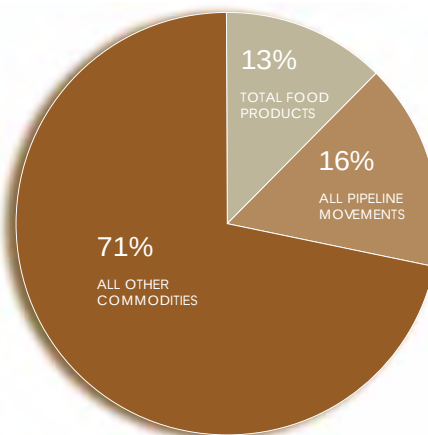
Greater Philadelphia's Freight Flow

The freight system carries many different types of consumer items and raw materials. Food-related commodities make up just a percentage of total freight movements. It is important to understand how food, as a commodity, is projected to grow compared to all other types of commodities, because freight rates can change, affecting the price of food for the consumer. This section describes how food fits into Philadelphia's freight system and into the nation's comprehensive freight system.

In Greater Philadelphia, food movements of all different types (*within, outbound, and inbound*, from both domestic and international sources) constituted 40 million tons in 2002. Food represents 13% of total freight movements. At the national level, 16% of the total weight of all movements can be associated with food in 2002. This slight difference in percentages is most likely due to the amount of cereal grains produced in the Midwest's "grain-belt" states.

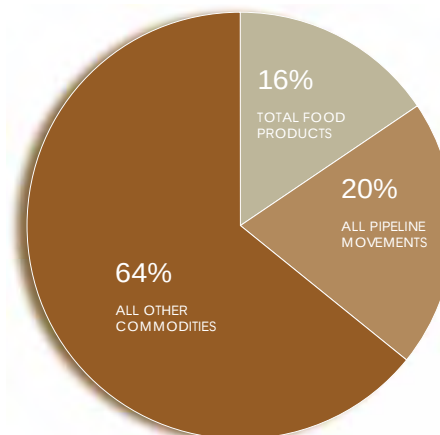
The 2035 forecasted data for Greater Philadelphia predicts a large increase (46%) of movements associated with food products. The total movements of food-related goods in terms of weight are forecasted to grow from 40 million tons to 58 million tons. All other commodities, not including pipeline shipments, are projected to increase by only 25%. On the national level, the movement of food-related products is anticipated to increase by 94%.

FIGURE 2.1
Total Freight Movements Associated with Greater Philadelphia by Weight (2002)



Source FHWA 2007, DVRPC 2009

FIGURE 2.2
Total Freight Movements for the United States by Weight (2002)

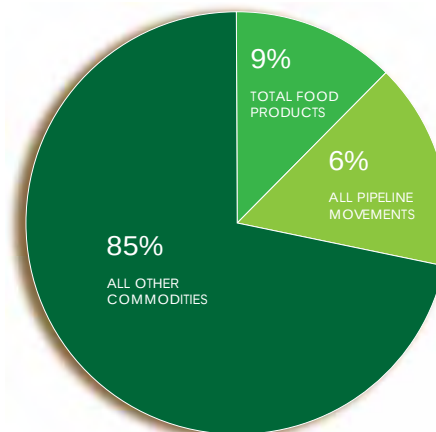


Source FHWA 2007, DVRPC 2009

Similarly, all other commodities for the nation are projected to grow at a rate of 93%. This difference between Greater Philadelphia and national growth is likely due to high population growth in other parts of the country, compared to modest growth in Greater Philadelphia. The DVRPC nine-county region is forecasted to grow by 14% from 2000 to 2035.

Another way to evaluate freight movements is by value. Food freight has a smaller share of the total value of freight movements than it does of the total weight of freight movements. In terms of value, Philadelphia's freight system is estimated to have carried slightly over \$29 billion worth of food products, which is only 9% of the total freight movements. This trend holds true for the national totals as well. Nationally, food freight makes up 10% of the total value of freight movements, including food from domestic and international sources.

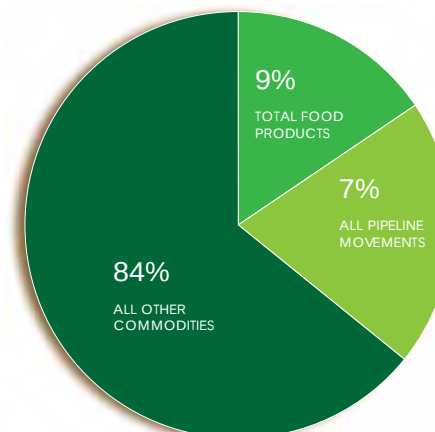
FIGURE 2.3
Total Freight Movements Associated with Greater Philadelphia by Value (2002)



Source FHWA 2007, DVRPC 2009

Nationally, the value of food-related movements is projected to grow at a much sharper rate (93%) than for Greater Philadelphia (40%) by 2035. However, the value of all other commodities nationwide is projected to skyrocket, with a 217% growth rate, while only growing by 93% in weight. It is interesting to note that both the value and weight of food-related movements are projected to grow at

FIGURE 2.4
Total Freight Movements for the United States by Value (2002)



Source FHWA 2007, DVRPC 2009

similar rates, while the value of all other commodities is scheduled to grow significantly faster than the weight. In other words, the nation is expected to demand, and possibly produce, more low-weight / high-value products, such as pharmaceuticals, electronics, and medical equipment, rather than high-weight / low-value products, such as coal.

This relatively low forecast for increased value of food movements, as compared to other types of commodities, also reveals that the FAF database cannot account for the recent increases in food prices and the economic downturn, as its base year is 2002. See **Part 3: The Food Economy** for an explanation of the Consumer Price Index and the increase of the price of food. In 2008, while the Consumer Price Index for all items began to fall as consumers spent less, prices for food and beverages continued to rise and demand remained relatively constant.

GREATER PHILADELPHIA'S FOOD MOVEMENTS

In 2002, more food moved *inbound* to the region than moved *within* or *outbound*. Roughly 16 million tons of food, across all eight commodity classifications, was moved into the



Bananas piled high at Reading Terminal Market, Philadelphia

PHOTO CREDIT: JIM AUCHINLECK

region, and roughly 14 million tons moved *within* the region. About eight million tons of food left Greater Philadelphia in 2002. Greater Philadelphia is predominantly a consumption-based region, as is the majority of the northeast United States. The population of 5.5 million people is too large to subsist on the food being produced locally (See **Part**

1 and **Part 3** for the 100-Mile Foodshed's agricultural production and Greater Philadelphia's food consumption). The necessity for additional food to meet basic needs, seasonality, and weather, combined with modern society's desire and demand for fresh and exotic foods year-round, increases the amount of inbound food destined for Greater Philadelphia.

As seen in **Figure 2.5: Types of Food Movements**, *inbound*

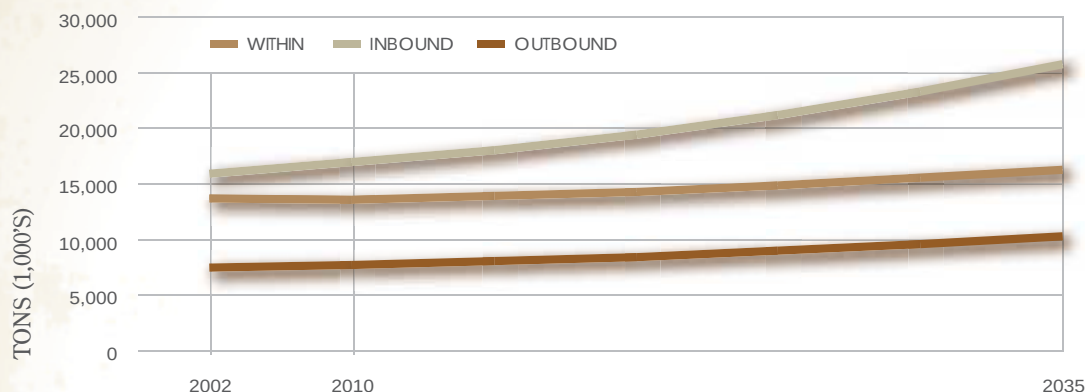
movements are projected to grow the most through 2035. This trend is evident throughout seven of the eight food commodities⁴⁵ detailed below.

Both within movements and outbound movements have relatively modest growth rates of about 30%.

Meanwhile, inbound has a projected growth rate of 61% through the year 2035.

⁴⁵ Commodity Category (8) Alcoholic Beverages is the outlier.

FIGURE 2.5
Types of Food Movements



Source FHWA 2007, DVRPC 2009

Food Origins

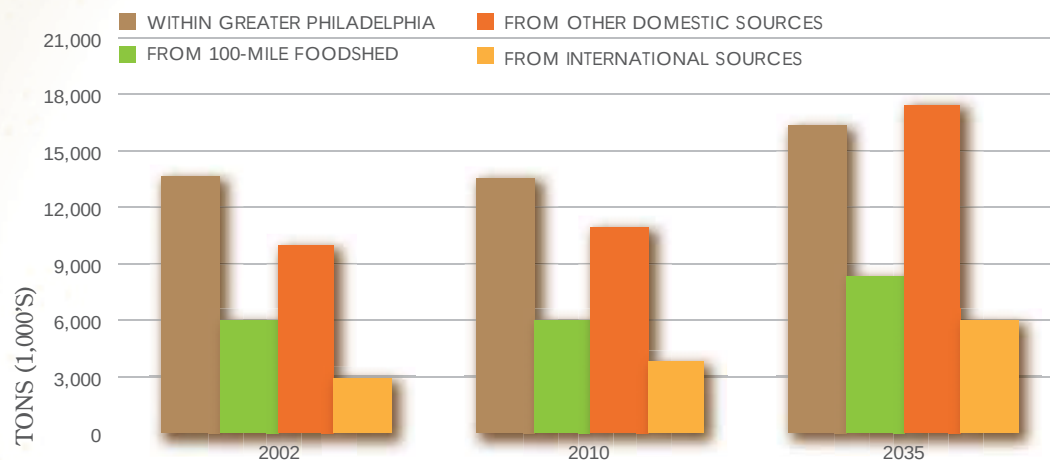
In the last few years, people have become more and more interested in where their food originates. Some people are concerned about contamination issues or want to support their local food producers. Others are interested in freshness of food or in slowing down modern life generally. The FAF database, based on origins and destinations of movements, can provide a possible answer to the question of food origins.

Figure 2.6: Food Origins depicts total percentages of the origins of food that are destined for Greater Philadelphia by weight. In 2002, over half (61%) of all food movements originated from within the region or the 100-Mile Foodshed. While both of these movement types have projected growth through 2035, that growth is forecasted to be significantly lower than that for goods originating from other domestic and international sources. Within movements have forecasted growth of 20% and inbound

Food originating from international sources is projected to increase by more than 100%. Data provided by the Philadelphia Regional Port Authority (PRPA) shows that the tonnage of fruit imported through the PRPA increased by 52% from April 2008 to April 2009.

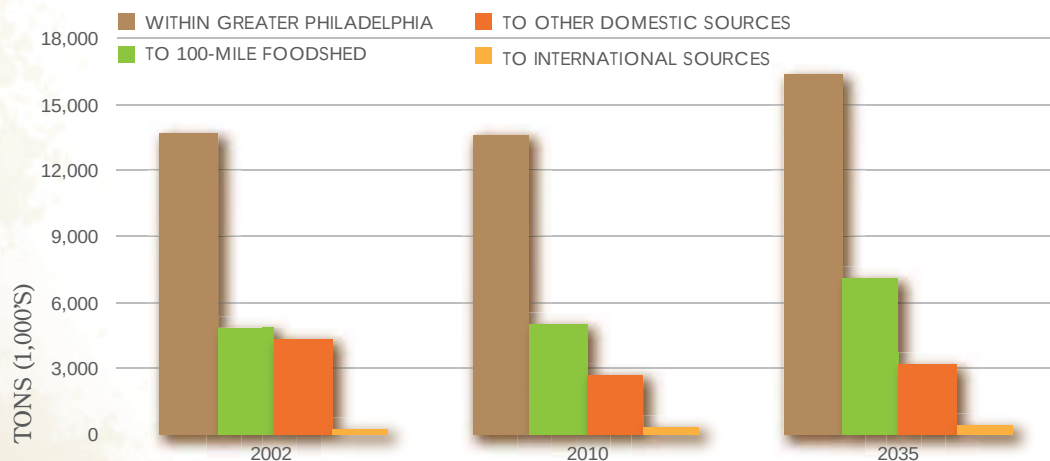
Both the FAF and local information suggests that the average length of food travel from source to shelf is increasing.

FIGURE 2.6
Food Origins



Source FHWA 2007, DVRPC 2009

FIGURE 2.7
Food Destinations



Source FHWA 2007, DVRPC 2009

movements from the 100-Mile Foodshed to Greater Philadelphia are forecasted to grow at a 40% rate. Meanwhile, food originating from other domestic sources is projected to grow by 75%, and from international sources by more than 100%.

A conclusion that one can draw is that while movements of all types, including within-region movements, are forecasted to grow, a larger share of goods will be coming from farther away in 2035. Trends suggest that the average length of travel from source to shelf will also increase.

Food Destinations

The FAF data depicted by **Figure 2.7: Food Destinations** shows that Philadelphia is not a large exporting region. However, like all regions, Philadelphia exports food in some quantity. In terms of outbound weight,

shipments to the 100-Mile Foodshed from Greater Philadelphia are forecasted to grow 45% through 2035. However, outbound movements from Greater Philadelphia to other domestic locations beyond the 100-Mile Foodshed are projected to decrease by 25%, and outbound movements to international locations are projected to drop by 70%. That is, more of the food grown or manufactured within Greater Philadelphia will be consumed within Greater Philadelphia and the 100-Mile Foodshed.

Movements through the Ports

Philadelphia's regional ports are in competition with nearby deepwater ports, like Newark / New York and Norfolk, Virginia. Since Philadelphia's ports cannot accommodate the largest container ships, they have concentrated on break bulk cargo, such as food items, paper products,

and steel shipments. According to the Bureau of Transportation Statistics, the ports of South Jersey and Philadelphia, together, account for 3% of the weight moving through all US ports. Some of the shipments coming through the Philadelphia and Camden ports are destined for other consumer markets. The FAF data suggests that most food items (68%) entering the country through Greater Philadelphia's numerous ports make at least one stop within the region, creating economic activity for the region. **Figure 2.8: Destinations of Food Imported through Greater Philadelphia's Ports (2002)** summarizes the data.

The data also suggests that 93% of all food is generating a value-added activity (such as repackaging) or a sale (to the retail or wholesale market) within Greater Philadelphia or the 100-Mile Foodshed.



Value-added products from Lancaster County for sale at Reading Terminal Market, Philadelphia

PHOTO CREDIT: JIM AUCHINLECK

FAF data suggests that 93% of all food movements through Greater Philadelphia are generating value-added activity, such as repackaging, or a sale to wholesaler or retailer.

The peak season for food imports entering through Greater Philadelphia's 33 ports begins in October and ends in May, as the growing season in the Southern Hemisphere comes to a close.

- Philadelphia Regional Port Authority



Shipping containers

PHOTO CREDIT: ISTOCKPHOTO.COM

The FAF aggregates on a yearly basis. Information provided by the Philadelphia Regional Port Authority reveals an increase in fresh food imports (“other agricultural products”) in the colder months of the year, and a decrease in those imports during the region’s harvesting months.

It is important to note that imported cargo, whether entering at a port or at an international border, will be transported by domestic trucks.

This transfer increases the amount of freight appearing to originate from domestic sources, the 100-Mile Foodshed, and within Greater Philadelphia. See **Map 2.4:**

California Avocados Case Study for a depiction of this movement.

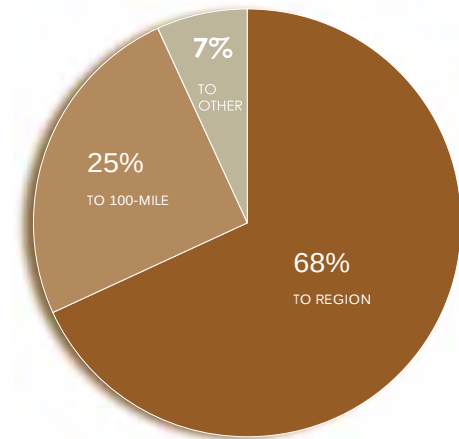
There appears to be significant port data missing in the FAF database.

According to the data, only four food-related commodities (live animals, other agricultural products, cereal grains, and animal feed) move through the Philadelphia ports.

However, based on interviews and common knowledge, the other four food commodities (meat and seafood, milled grain products, other foodstuffs, and alcoholic beverages)

FIGURE 2.8

Destinations of Food Imported through Greater Philadelphia’s Ports (2002)



Source FHWA 2007, DVRPC 2009

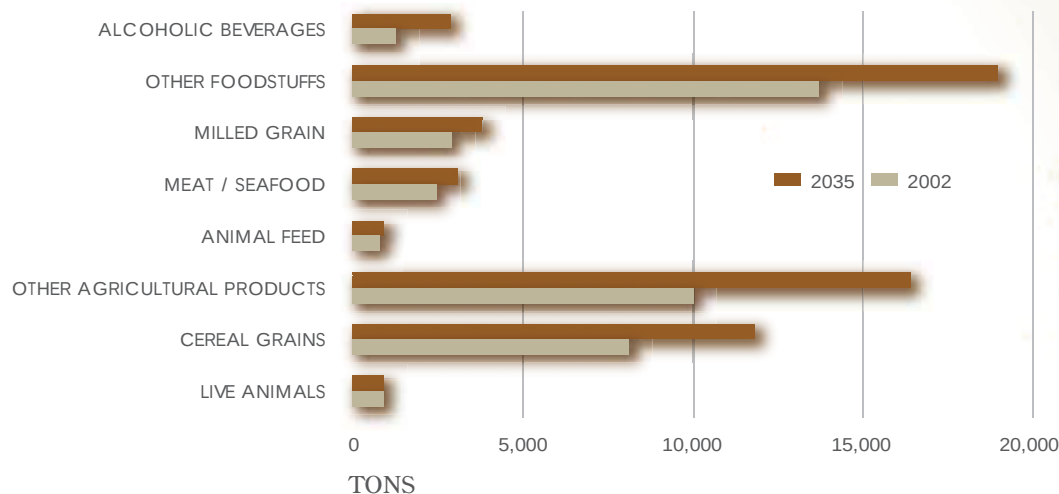
are regularly imported through the ports.⁴⁶ The case studies found at the end of this chapter illustrate the movements of some of these food commodities.

⁴⁶ It is probable that data was lost when FHWA converted the data in the International Waterborne Commerce Inventory, which is produced by the Army Corps of Engineers.

FOOD COMMODITIES

Eight different commodity categories are identified in the FAF data as shown in **Figure 2.9: Total Weight of Food Movements by Commodity**, and can be divided between raw materials (cereal grains and milled grains), processed items (other food stuffs and alcoholic beverages), fresh food (meat / seafood and other agricultural products), and feed for animals. Each commodity is detailed in this section. In terms of weight, three commodities are predominant: other foodstuffs, other agricultural products, and cereal grains. For Greater Philadelphia, other foodstuffs are estimated to have made up just over one-third of all food movements in terms of weight in 2002. Other agricultural products, with over 10 million tons in 2002 movements, and cereal grains, with just fewer than eight million tons, also are major food commodities in terms of weight.

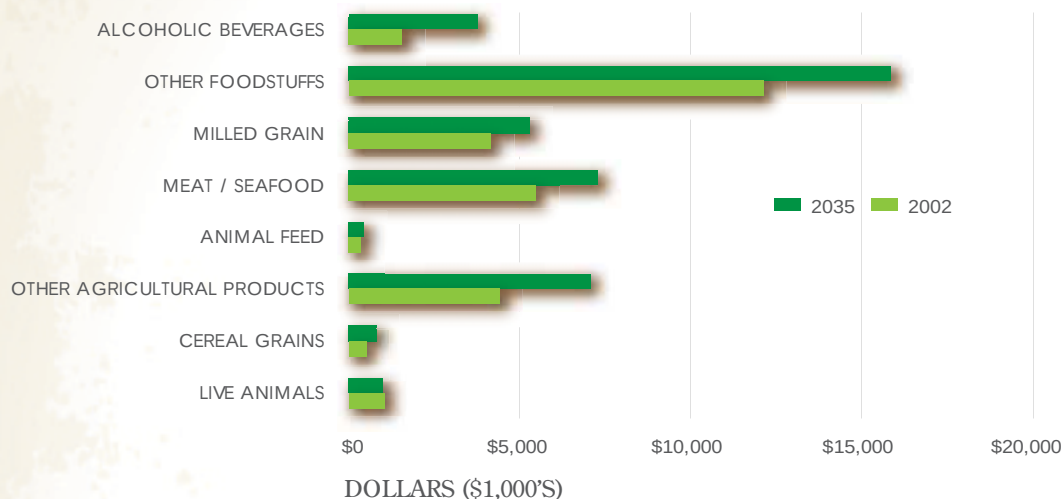
FIGURE 2.9
Total Weight of Food Movements by Commodity



Source FHWA 2007, DVRPC 2009

Figure 2.10: Total Value of Food Movements by Commodity illustrates the food items by total dollar value. The top four commodities are: 1) other foodstuffs, 2) meat and seafood, 3) milled grain products, and 4) other agricultural products. As with weight, other foodstuffs is the predominant food commodity for the region. The value of other foodstuff movements in 2002 is estimated to have made up 41% of the value of all food-related movements.

Cereal grains were the second-most common freight in terms of weight, but made up a very small portion of the total value of food movements. Thus, cereal grains can be labeled as a relatively high-weight / low-value commodity. Both milled grains and meat / seafood are high-value freight, but constitute less weight compared to the other food commodities. They can be labeled as relatively low-weight / high-value commodities.

FIGURE 2.10**Total Value of Food Movements by Commodity**

Source FHWA 2007, DVRPC 2009

Food Commodity Summaries

In **Appendix C: Food Commodity Summaries**, each of the eight food commodities is described in greater detail. The weight and value of food movements is quantified, the domestic and international trading partners are named, and an example of the food item and movement within Greater Philadelphia is identified.

An abbreviated summary for each food commodity is below:

(1) Live Animals and Live Fish

- Shipments associated with this commodity group made up just 2% of all food commodity shipments by weight in Greater Philadelphia in 2002.
- *Within* movements are predicted to decrease by 34% by 2035, while *inbound* movements are forecasted to grow by 60%.
- Greater Philadelphia's top trading partner (Ohio) shipped 38 thousand tons to the region in 2002.

(2) Cereal Grains

- In 2002, shipments associated with this commodity group made up 20% of all food shipments by weight in Greater Philadelphia. However, this group made up 44% of all food shipments by weight in the United States.

(3) Other Agricultural Products

- Shipments of "other agricultural products" made up 25% of all food commodity shipments by weight in Greater Philadelphia in 2002.
- This commodity group, by far, is the most common commodity moving across international borders.
- FHWA projects that domestic shipments of fresh fruits and vegetables into Greater Philadelphia will increase by 160% in 2035. International imports are projected to increase to 118%.
- Greater Philadelphia's top trading partner (California) shipped almost 1.2 million tons of fresh fruits and vegetables in 2002.
- In 2002, Greater Philadelphia shipped 1.6 million tons of fresh fruits and vegetables to Connecticut.

(4) Animal Feed

- In 2002, animal feed made up a small proportion (2%) of food shipments by weight in Greater Philadelphia.

- *Inbound* movements of animal feed are forecasted to grow 79% by 2035, while *within* movements are forecasted to decrease by 37%.
- As with category (1), Ohio is Greater Philadelphia's top trading partner for animal feed shipments.

(5) Meat and Seafood

- Shipments associated with this commodity group made up just 6% of all food commodity shipments by weight in Greater Philadelphia in 2002. However, this group made up 18% of total value of food shipments in Greater Philadelphia for the same year.
- Similar to all other food commodities, FHWA projects that Greater Philadelphia will rely on more *inbound* movements for meat and seafood. *Inbound* movements will increase by 187%, making Virginia the region's top trading partner. *Within* movements will decrease by almost 50% by 2035.
- In 2002, Greater Philadelphia shipped 19,600 tons of meat and seafood to Massachusetts.

(6) Milled Grain Products

- Shipments associated with this commodity group made up just 7% of all food commodity shipments by weight in Greater Philadelphia in 2002. However, this group made up

14% of total value of food shipments in Greater Philadelphia for the same year.

- Movements around the region are somewhat unique. *Within* movements made up 32% of total movements; *inbound* made up 28%; and *outbound* made up 39% in 2002. The proportions are relatively even, suggesting large amounts of trade between Greater Philadelphia and other regions.
- *Outbound* movements are higher in value than *inbound* movements, suggesting that higher-value products leave the region.

(7) Other Foodstuffs

- Shipments of "other foodstuffs" made up 35% of all food commodity shipments by weight and 40% by value in Greater Philadelphia in 2002.
- FHWA projects that domestic shipments of processed food into Greater Philadelphia will increase by 71% in 2035. International imports are projected to increase by 62%.
- Greater Philadelphia's top trading partner (Illinois) shipped almost 3.5 million tons of processed food in 2002.
- In 2002, Greater Philadelphia shipped 1.9 million tons of processed foods to Massachusetts.

(8) Alcoholic Beverages

- Alcoholic beverages are one of the only commodities in which the growth of *outbound* shipments is forecasted to grow significantly faster than *inbound* shipments. FHWA projects that *within* movements will increase 57% by 2035, *inbound* movements will decrease by 32%, and *outbound* movements will increase by 82%, with Illinois as the top trading partner.
- FHWA projects that in 2010, Greater Philadelphia will become a net exporter of alcoholic beverages, with increased trading with neighboring states.

SUPPLY CHAIN CASE STUDIES

To supplement the FHWA's FAF data, DVRPC undertook several supply chain case studies. These case studies illustrate some of the complexities of the global and regional food systems. They are also sometimes outside the purview of food miles and life cycle assessment (LCAs) studies. For example, food miles studies are a common way to look at food supply

chains, but the data is highly generalized and looks only at average overall distances rather than at the complex and unique steps involved in moving food from producer to consumer. For a comprehensive discussion of food miles and LCA studies, please see **Appendix D: Food Miles Literature Review**.

Track-backs, which take a real item and specifically track it back from the consumer to the producer, are nearly impossible to complete in a timely manner unless there are public health and safety concerns. Individual companies hold this data and are reluctant to share it due to concerns about public safety and confidentiality of client relationships.

The Food FAF counts individual movements of food items by detailing the origins and destinations of a trip, but allows for items to be double counted. This data, while extremely

useful for transportation planners and policymakers, does not clearly demonstrate how food gets from the producer to the consumer, with stops along the way. While the movement of items is captured in the FAF database, the case studies illustrate that these movements of both imported food and locally produced food create economic activity and jobs for the region.

Items for the Supply Chain Case Studies were chosen according to the eight Food FAF commodity categories and represent items that may be produced locally, domestically (within the United States), or globally. However, DVRPC found that some FAF categories were more difficult to track than others. Relatively unprocessed fresh foods, like produce, meat, and seafood, were easier to track from a producer to the point of sale. While DVRPC originally selected 16 food items, studies for only seven items were successfully completed.

These successes were due to the help of several Stakeholder Committee members, who provided time, knowledge, and professional connections, which were all essential.

Those completed case studies, depicted as maps 2.2 through 2.8, are located on the following pages. In order from farthest away to closest, they are:

- Beef, from Australia (FAF Commodity Category 1);
- Grapes, from Chile (FAF Commodity Category 3);
- Avocados, from California (FAF Commodity Category 3);
- Scallops, from Cape May County, NJ (FAF Commodity Category 1);
- Hatfield Hotdogs, from Lancaster County (farms) and Montgomery County (processor), PA (FAF Commodity Categories 1 and 5);
- Tomatoes, from Salem County, NJ (FAF Commodity Category 3); and
- Apples, from Adams County, PA (FAF Commodity Category 3).

Inset

6

6. Major U.S. Customers

Because of concerns about the confidentiality of business relationships, it is difficult to know exactly where food goes from these freezers. Since there are many cuts of beef within a container, it may go to a variety of customers, from supermarkets to fast food restaurants. Because the meat is frozen, it can also be transported by rail farther than fresh food can be transported. The beef may even end up in Canada.

4

5

5: Freezer Warehouse

From the port the containers are transported by truck to one of the area's 12 refrigerated warehouses. The Philadelphia area has the highest density of freezers of any other metropolitan area in the country, an asset that causes ships to travel eight hours up the Delaware River to the Port of Philadelphia, rather than stopping at coastal ports.

4: Port of Philadelphia

Freezer containers are off-loaded from the ship. This process may take as little as six to eight hours. Inspection of the meat by the Department of Homeland Security may occur at either the port or the next destination, the freezer warehouse.

See Inset 4

1: Most beef imported through the Philadelphia Port comes from Australia, Uruguay, or Chile. These farms tend to be large and may have direct relationships with large U.S. customers, such as Burger King. Imported beef tends to be grass-fed, while a large portion of domestic cattle tends to be grain-fed.

1

2

3

3: Australian Port

At the Port of Sydney, the freezer containers are loaded onto ships for their approximately 40- to 60-day trip directly to the Port of Philadelphia.

2: Processing Plant

Australian cattle are taken to a processing plant, where they are slaughtered and packaged in freezer containers.

GREATER PHILADELPHIA FOOD SYSTEM STUDY

MAP 2.2

Australian Beef Case Study

1

Starting Location

Direction of Product Movement



Primary Source: Frank Camp, Philadelphia Regional Port Authority
Geographic Data Source: ESRI

1: Grapes tend to come from Chile between December and April, in between the California and Brazilian growing seasons. Most Chilean grapes are grown on large farms and put directly onto pallets, or gathered from many small farms by a cooperative and aggregated onto pallets.

2: Valparaíso, Chile
At the Chilean port, the grapes are loaded onto the ships. The entire hold of the ship is then refrigerated. This type of cargo may be referred to as "break bulk," as it is not containerized, but is placed on pallets instead. This is a fairly common way for fresh fruit to travel from southern hemisphere fruit-exporting countries, such as Chile.

3: South Philadelphia Port Complex
A break-bulk ship may stay at the port for up to three days, given that break-bulk cargo takes more manual labor to unload than containerized cargo. In contrast, a container ship may stay in port only six to eight hours. At the port, pallets of fruit are inspected by the Department of Homeland Security's Agriculture Division and approved to enter the country.

4: Delaware Avenue Distribution Center, Philadelphia, PA
Importers will take the fruit to a nearby warehouse. The grapes will not stay in the warehouse long before a retail customer orders a local delivery.

5: Super Fresh - Haddon Twp., NJ
Because the grapes are fresh fruit, they must be delivered quickly by truck. One ship containing fresh fruit may have 150 truck loads in it. These Chilean grapes may be taken to retailers within the region or as far away as the Midwestern states.

New York

Connecticut

New Jersey

100-Mile Foodshed

Maryland

Delaware

Virginia

D.C.

GREATER PHILADELPHIA FOOD SYSTEM STUDY

MAP 2.3
Chilean Grapes Case Study

1 Starting Location

Direction of Product Movement



Primary Data Source: Frank Camp, Philadelphia Port Authority
Geographic Data Source: ESRI

4: Philadelphia Regional Produce Market

The avocados arrive at the Philadelphia Regional Produce Market to be sold with other fruits and vegetables to retailers and distributors. The market houses dozens of competitive wholesale produce merchants together at a central location and offers easy access for customers from around the metropolitan area.

5: Distributor

Killian's Harvest Green, a specialty distribution company, purchases the avocados from a vendor and may store them temporarily in its warehouse in Yeadon, Pennsylvania, before delivering to restaurants within a 50-mile radius of Philadelphia.

3: Ripening Center

The avocados arrive via truck at the ripening center in Vineland, New Jersey. Here, they are placed in a specialized ripening room that brings the fruit to the desired level of ripeness for particular stores or distributors.

2: Packing House

The avocados are taken from the farms to a packing house in Oxnard, California, where they are prepared to be sent across the country.

1: Avocados are produced in different parts of the world, including the United States, Mexico, and Chile. California's production of avocados matches that of Chile, making it one of the top avocado producers in the world. Avocados distributed by Mission Produce, based in California, come from farms in seven counties in the state. Avocados grown in Mexico and destined for markets in the U.S. will cross the international border and go right to Mission Produce for packing, or be transferred from a Mexican truck to an American truck due to different auto emission and safety standards. The initial trip over the border is considered an "international import" in the FAF. However, the trips from California to the East Coast are counted as "domestic inbound" in the FAF.

GREATER PHILADELPHIA FOOD SYSTEM STUDY

MAP 2.4

California Avocados Case Study

1

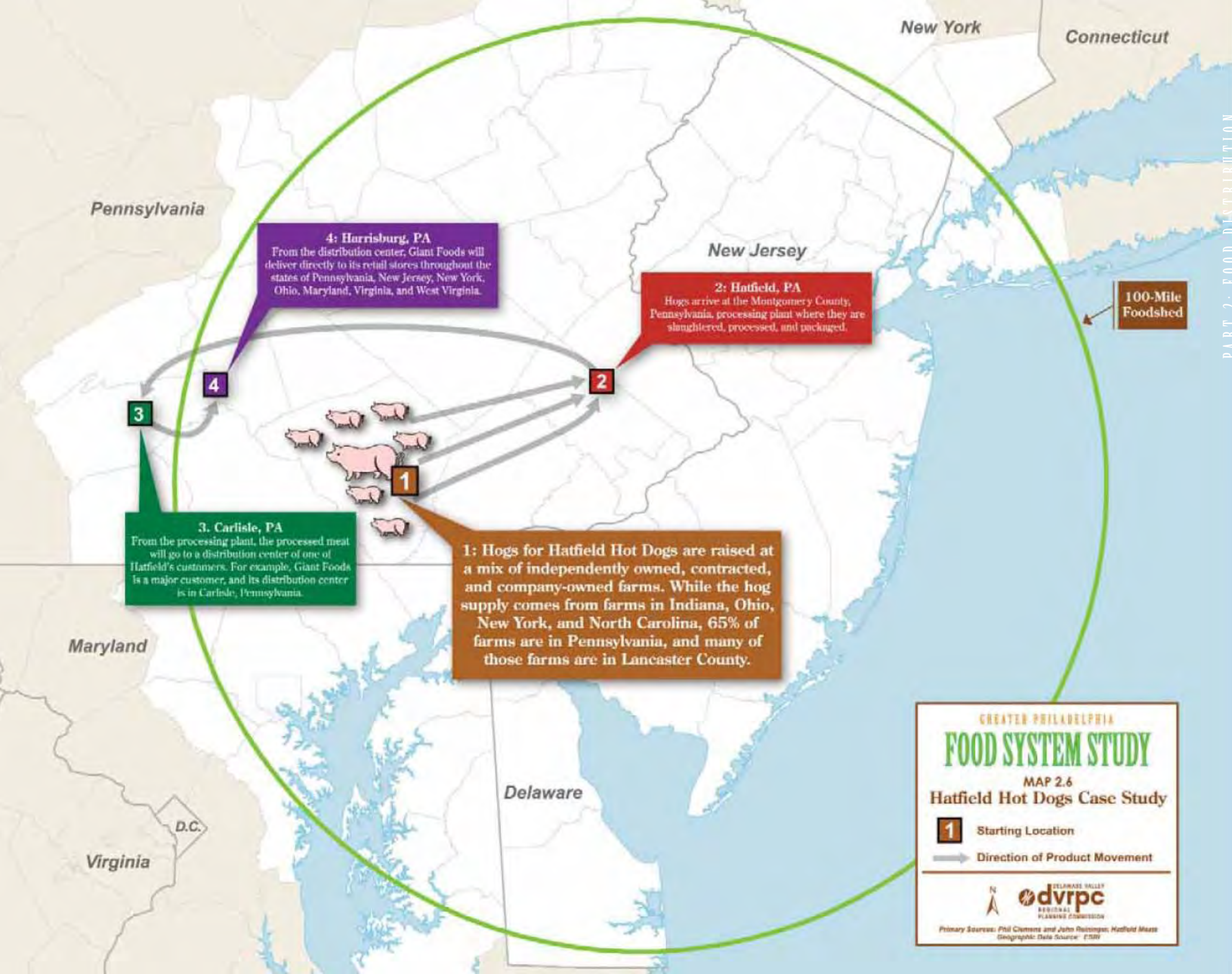
Starting Location

Direction of Product Movement



Primary Sources: James Storey, Quaker City Foods; mississauga.com; usam.org
Geographic Data Source: ESRI





GREATER PHILADELPHIA
FOOD SYSTEM STUDY
MAP 2.6
Hatfield Hot Dogs Case Study

1 Starting Location
→ Direction of Product Movement

dvrpc
DELRWARE VALLEY
REGIONAL
PLANNING COMMISSION

Primary Sources: Phil Cimini and John Reisinger; Hatfield Meats
Geographic Data Source: ESRI





Greater Philadelphia is becoming increasingly dependent on sources of food from far away places, and, therefore, dependent on low-fuel prices.



A farm truck bringing products to the Vineland Auction in NJ

PHOTO CREDIT: DVRPC

SUMMARY

The most comprehensive freight database available to the public is the FHWA's FAF database, which combines several survey sources to quantify freight movements in legs of trips. As explained earlier in this section, the FAF has one major shortcoming—it does not capture complete trips from the starting point, with stops along the way, to the final

destination, and therefore double and triple counts items. Despite the database's shortcomings, the Food FAF analysis yields two significant findings:

- Most food produced within the region is consumed within the region, as evidenced by the low outbound movements. This further suggests that Greater Philadelphia's demand for local food outweighs the 100-Mile Foodshed's local supply.
- Forecasted demand, based on 2002 data, will continue to exceed local supply and the region will rely more heavily on domestic trade and international imports. These forecasts can, and most likely will, shift based on energy costs, policy changes, and widespread consumer choices.

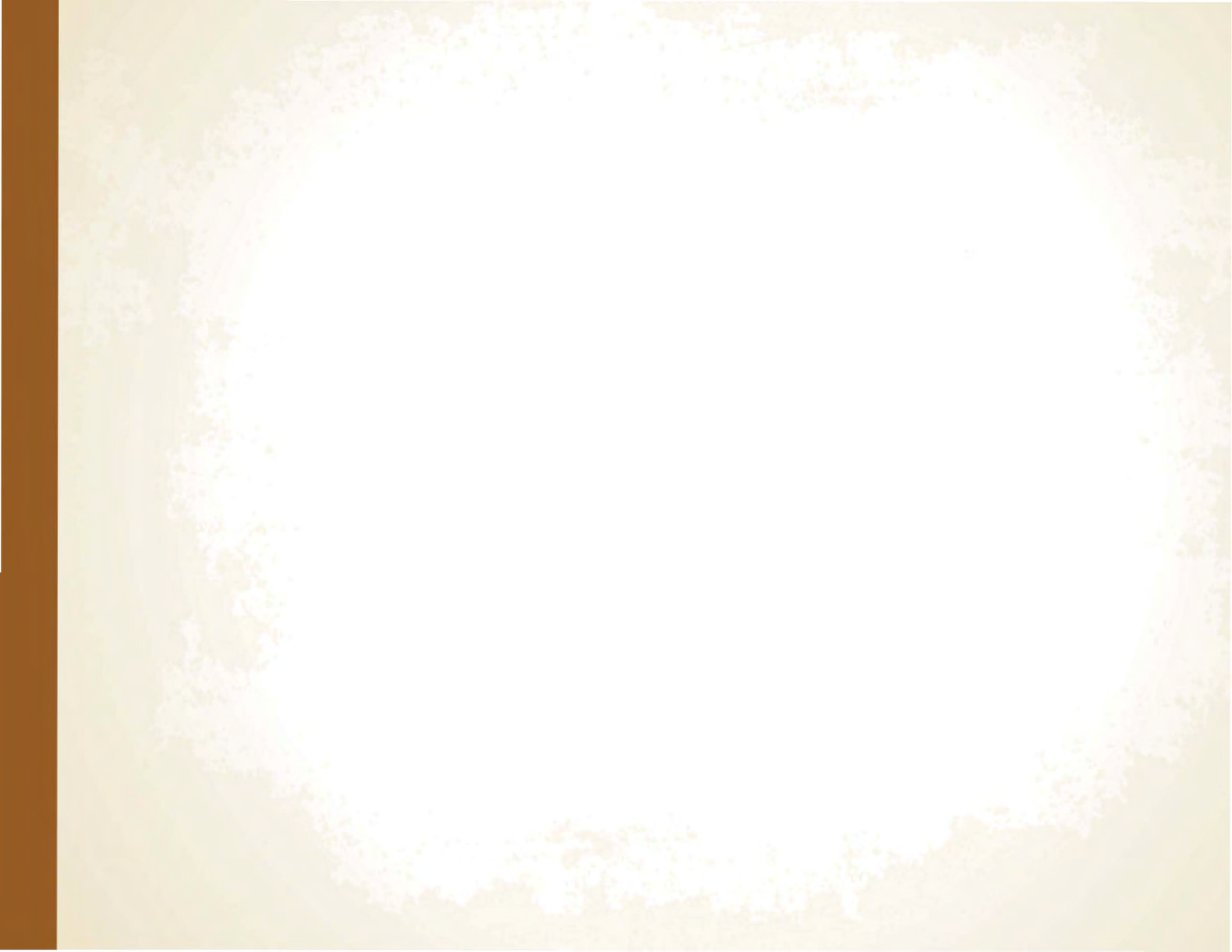
Unfortunately, there are no public data sources that track food from producer to consumer or adequately capture the external costs, such as greenhouse gas emissions, not associated with a food item's final cost.⁴⁷ Supply Chain Case Studies illustrate the various links in trips and can offer actual food-mile

⁴⁷ While Life Cycle Assessments (LCAs) seek to capture these externalities and highlight inefficiencies in a given system, they require a significant amount of data from numerous sources not widely available. See **Appendix D: Food Miles Literature Review** for a detailed summary and analysis of various food-related transportation studies.

calculations. However, case studies require patience, perseverance, and, often, personal connections to complete accurately. The lessons learned from the seven case studies are that:

- It is easier to track local fresh-food products because there are significantly fewer links in the supply chain. This suggests that fresh food, and especially fresh local food, may be safer, as there are fewer occasions for contamination, and the source can be identified more quickly.
- While people want to know where their food comes from for numerous reasons, including food safety, freshness, and supporting local farmers and the local economy, there are several barriers to implementing a comprehensive food tracking system. One such barrier is that some companies prefer to retain confidentiality as part of trade secrecy. Supply chains are based on cultivating business relationships. In this case, the trade secret is the accumulated knowledge associated with relationships between producers, manufacturers, importers, and distributors.

Moving beyond the Food FAF and supply chain case studies, the lessons learned in the last year suggest that energy costs, while low in an economic downturn, will surely increase in a period of economic growth. Additionally, as environmental externalities, such as carbon emissions, are internalized, energy prices rise, and increase the price of all food items, from gourmet to basic needs. The Food FAF illustrates just how dependent Greater Philadelphia is on sources of food from far away places and therefore, dependent on low fuel prices. Investment in a stronger local food system, while not intended to make the region self-sufficient or protectionist, may become a necessity to meet the growing demands of Greater Philadelphia's population.





PART 3

Food Distribution



This chapter addresses three elements of the food economy. First, *What We Eat* looks at the dietary patterns and nutritional value of Americans' food and beverage consumption, as well as diet-related health problems and food insecurity. Second, *How We Spend Our Food Dollars* looks at the amount spent on food and beverages in Greater Philadelphia over time and compared to other areas. Third, *The Food Economy* evaluates the many different industries and activities that bring food from the point of production to the point of consumption in Greater Philadelphia.

Previous chapters looked at the 100-Mile Foodshed, encompassing 70 counties in five states. Although the modern American food system consists of the entire planet, the 100-mile radius around Philadelphia is one representation of the food resources that could possibly serve the population of Greater Philadelphia on a local scale. However, the primary geographic unit of analysis in this chapter is Greater Philadelphia, defined as the 11 counties of the Philadelphia Metropolitan Statistical Area (MSA), with the addition of Mercer County, New Jersey (equal to the Trenton-Ewing MSA). The 100-Mile Foodshed makes up the theoretical production base of Greater Philadelphia (see **Part 1: Agricultural Resources**), while the 12-county Philadelphia MSA and Trenton MSA constitute the population base of the study of the food economy.

The US Census Bureau organizes the Philadelphia MSA into three separate metropolitan divisions—Philadelphia, Camden, and Wilmington—covering 11 counties in four states. The Philadelphia Metropolitan Division covers the Pennsylvania counties of Philadelphia, Bucks, Montgomery, Chester, and Delaware; the Camden Metropolitan Division covers the New Jersey counties of Burlington, Camden, and Gloucester; and the Wilmington Metropolitan Division covers the counties of Salem (New Jersey), New Castle (Delaware), and Cecil (Maryland).

WHAT WE EAT

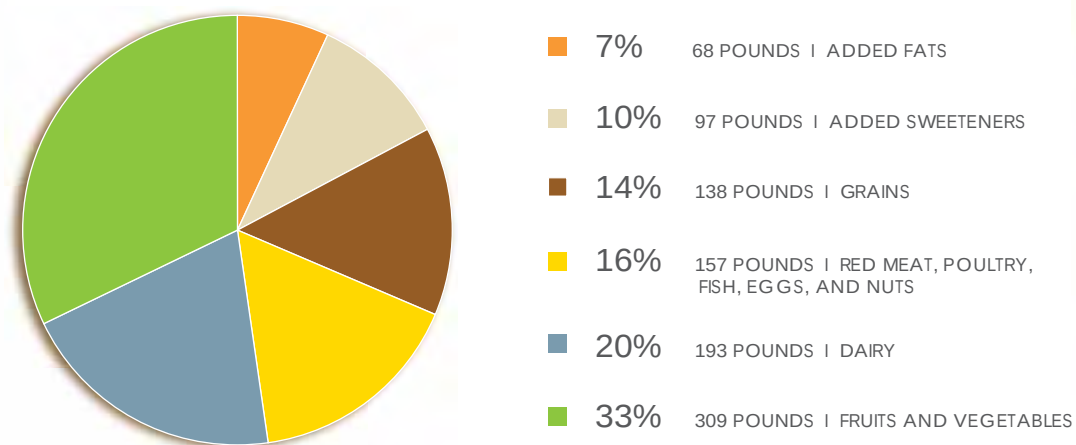
The choices that individuals make about what to eat affects their overall health and wellness. Many in Greater Philadelphia suffer from malnutrition and food insecurity, and another concern is the overconsumption of foods high in sugars and fats and underconsumption of whole and fresh foods like fruits, vegetables, and whole grains.

Poor diets are associated with health conditions like diabetes and obesity, which impact individuals as well as a community and the larger society.

How Much We Eat

The best source of data for measuring food consumption comes from food availability data compiled by the United States Department of Agriculture's (USDA) Economic Research Service (ERS).⁴⁸ The Food Availability (Per Capita) Data System reflects the total amount of food available for human consumption in the United States. Food availability is measured by taking the total annual food supply—equal to production plus imports and beginning stocks—and subtracting measurable nonfood uses, which include farm inputs (for feed and seed), food exports, ending stocks, and industrial uses. Estimates are adjusted for nonedible food parts (such as seeds

FIGURE 3.1
Per-Capita Food Availability in Pounds, Adjusted for Loss (2007)



Source: USDA ERS 2007, DVRPC 2009

and bones) and food lost due to spoilage (waste in transportation and storage, and waste in the home). The ERS food availability data measures the availability of hundreds of kinds of foods and is the only time-series data on food availability in the country that can be used as a proxy for an average American's actual food intake.

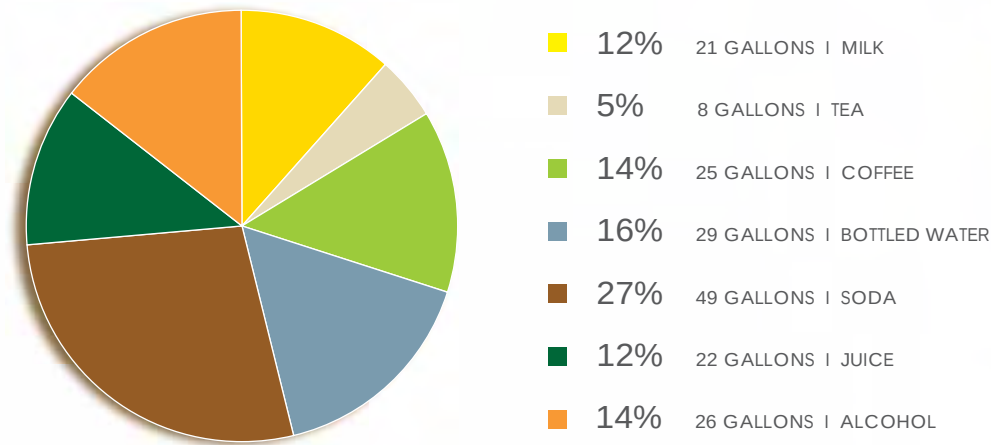
In 2007, there were 961 pounds of food available per capita, adjusted for loss, in the United States. **Figure 3.1: Per Capita Food Availability in Pounds, Adjusted for Loss (2007)** details what categories of food were available for human consumption in the United States in 2007. In every category of food except dairy, Americans ate more pounds in 2007

⁴⁸ Food Availability data is available at: www.ers.usda.gov/Data/FoodConsumption/FoodAvailIndex.htm. The data was last updated on February 27, 2009.

than they did in 1970, the earliest year for which complete information is available. It is important to note that this data measures the availability of food in the marketplace, adjusted for estimated loss, and not necessarily actual consumption.

Notably, the amount of added fats and oils available in the marketplace increased by more than half during this time period, mostly due to the increased availability of salad and cooking oils, such as those used in fried foods. Although the overall category of added sweeteners increased by just 14% during this period, the amount of high fructose corn syrup increased exponentially, by over 10,000%, from just 0.5 pounds in 1970 to 56.2 pounds in 2007, down from a peak of 63.7 pounds in 1999. However, per capita dairy availability was 20% less in 2007 than in 1970 due to a steady decline in the production of and demand for liquid milk, although

FIGURE 3.2
Per-Capita Beverage Availability in Gallons (2007)



Source: USDA ERS 2007, DVRPC 2009

cheese nearly tripled in availability during this time, which offset the milk decline.

The USDA's food availability data also calculates beverage consumption. In 2007, there were 179 gallons of beverages (excluding tap water) available for per capita consumption, shown in **Figure 3.2: Per Capita Beverage Availability in Gallons (2007)**. This is a dramatic increase

from the 99 gallons available per capita in 1970, although those estimates do not include a number of categories. Most notably, carbonated soft drinks (soda) are the largest category of beverages, with nearly 50 gallons available per person annually, up from 34 gallons in 1980. Bottled water consumption increased exponentially (1,718%), from 1.6 gallons in 1976 to 29.1 gallons in 2007.

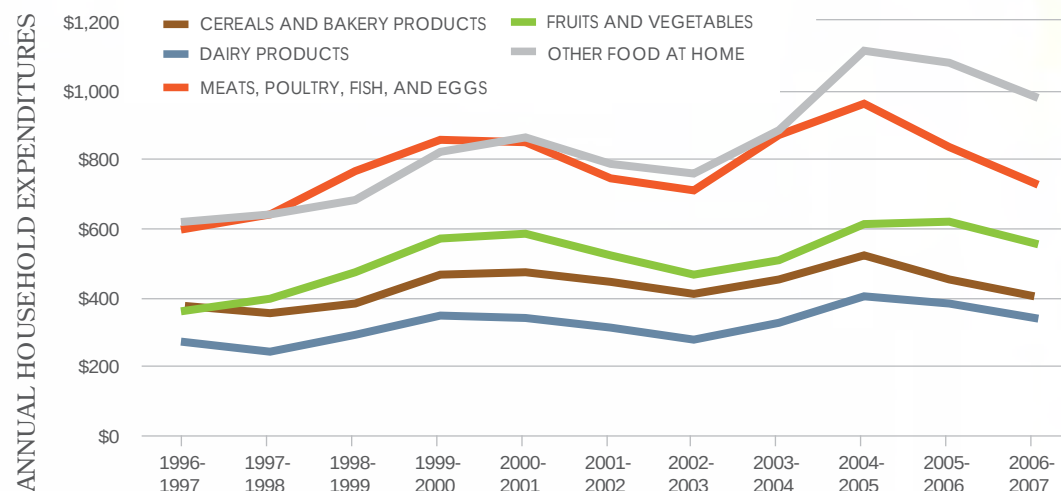
What We Buy

Although food availability data shows the amount of food available for human consumption, it does not tell the whole picture of what people actually eat. Another source of data regarding what we eat is the Consumer Expenditure (CE) Survey, which provides continuous annual information on the buying habits and household characteristics of Americans.⁴⁹ This data is based on interviews and dairy surveys and is collected for the Bureau of Labor Statistics (BLS) by the US Census Bureau. Data for MSAs is based on the annual average of a two-year period.

According to the CE Survey, the amount spent on food at home in the Philadelphia MSA⁵⁰ has increased for every category of food over the past decade (not adjusted for inflation), as shown in **Figure 3.3: Annual**

FIGURE 3.3

Annual Spending on Food at Home in the Philadelphia MSA



Source US Bureau of Census, BLS 2008, DVRPC 2009

Spending on Food at Home in the Philadelphia MSA. In particular, the amount spent on “other food at home” has increased 58% since 1996 to 1997, from \$621 that year to \$984 annually in 2006 to 2007. The category of “other food at home” includes many processed foods, so it is difficult to say how much of this increase is due to higher prices

versus increased consumption. Within expenditures on food at home, more is spent on “other food at home” (32%) than on meats, poultry, fish, and eggs (24%), fruits and vegetables (18%), cereals and bakery products (13%), and dairy products (11%).

⁴⁹ Consumer Expenditure Survey is available at www.bls.gov/cex/. The data was last updated on November 26, 2008.

⁵⁰ Data was unavailable for the Trenton-Ewing MSA (Mercer County).



Peppers at Reading Terminal Market, Philadelphia

PHOTO CREDIT: JIM AUCHINLECK

Nutritional Content

Data measuring the actual nutritional content of food consumed in the nation is measured by the USDA Agricultural Research Service (ARS) in a study called “What We Eat in America.”⁵¹ This study monitors and evaluates food consumption and related behavior of the United States’ population and is based on a survey of a nationally representative sample population. Each survey participant provided interviewers with a detailed

inventory of the food and beverages that he or she ate in a two-day period. The resulting data reported from these surveys is processed using the Food and Nutrient Database for Dietary Studies (FNDDS), which converts individual foods and portion sizes into nutrient equivalents. Like food availability, this data is only obtainable on the national level, and the most recent data is from 2005 to 2006.

Caloric consumption is one indicator of human health, nutrition, and food access. The average American aged 2 and over consumes about 2,157 calories (kcal) per day. Caloric consumption is highest for women in their twenties (1,959 kcal) and men in their thirties (2,978 kcal). For the average person aged 2 and over, half of his or her energy intake (calories) comes from carbohydrates, followed by fat (34%), protein (15%), and alcohol (2%). According to the USDA, the recommended share of dietary energy is 45 to 65% from carbohydrates, 20 to 35% from fat, and 10 to 35% from protein.

As income increases, so does the average intake of most categories of nutrients, including food energy (calories), protein, carbohydrates, dietary fiber, fat, and cholesterol. Additionally, the percentage of calories that come from protein and fat is slightly greater in higher-income groups, as shown in **Figure 3.4: Percentage of Calories from Nutrients by Income Group (2005-2006)**. This suggests that with higher income, individuals and households have more access to and can afford more quantities of food high in protein and fat, like meat. The exception to this trend is the intake of total sugars, which decreases somewhat as income increases. This suggests that lower-income individuals and households may consume less expensive processed foods high in refined sugars. However, another trend is that higher-income groups also have a greater percentage of calories coming from alcohol consumption, which contributes calories but not nutrients.

⁵¹ What We Eat in America data and documentation is available at: www.ars.usda.gov/foodsurvey. The data was last updated on February 5, 2009.

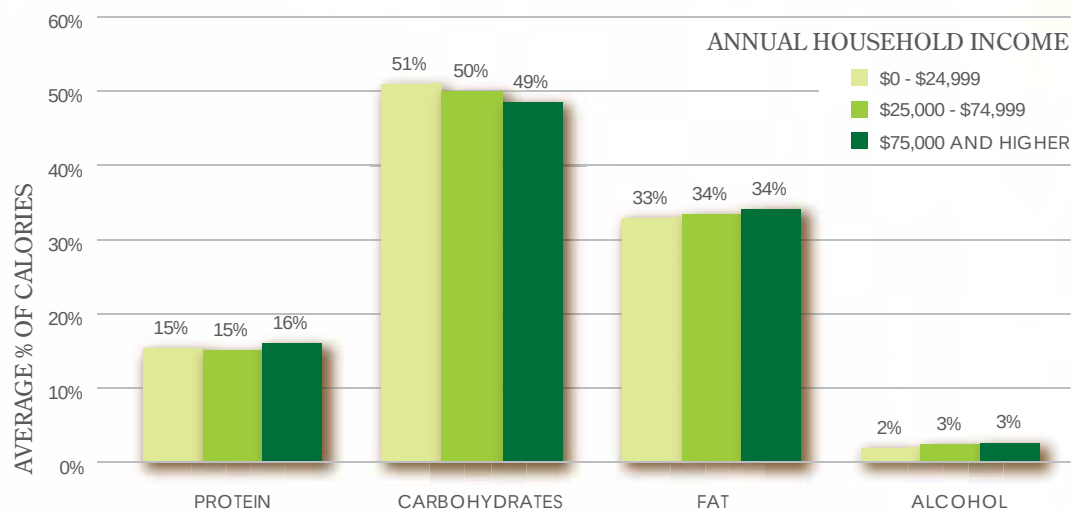
Diet-Related Diseases

The Center for Disease Control and other health organizations estimate that three out of four deaths in the United States can be linked to diet and other behavioral habits. Researchers have determined that improving nutrition and increasing physical activity can significantly lower the risk of developing cardiovascular diseases, certain types of cancer, diabetes, and other chronic diseases.

In Greater Philadelphia, more attention is being paid to the social and economic impacts of poor health in local communities. Researchers and health care professionals from universities, hospitals, nonprofits, and community groups are working together to develop educational programs that provide prevention information and foster skills that can lead to healthier lifestyles. Programs like The Food Trust's School Nutrition Policy Initiative and Kindergarten Initiative have already shown potential for fighting obesity and increasing children's awareness of preventative health and nutrition.

FIGURE 3.4

Percentage of Calories from Nutrients by Income Group (2005-2006)



Source USDA ARS 2009, DVRPC 2009

Health

Unhealthy dietary patterns are associated with an increased risk of certain health conditions, including coronary heart disease, cancer, stroke, diabetes, hypertension, obesity, and osteoporosis. In addition to impacting the health and well-being of individuals, poor eating patterns

impose a heavy economic toll in terms of medical costs, lost productivity, and premature deaths.⁵²

The incidences of two diet-related health conditions, diabetes and overweight / obesity, as well as healthy eating patterns, are tracked by the Behavioral Risk Factor Surveillance System (BRFSS) of the

⁵²Frazao, Elizabeth. "High Costs of Poor Eating Patterns in the United States." USDA ERS, 1999.

Centers for Disease Control (CDC). The BRFSS is a behavioral health survey that has been conducted every year since 1984.⁵³

Diabetes

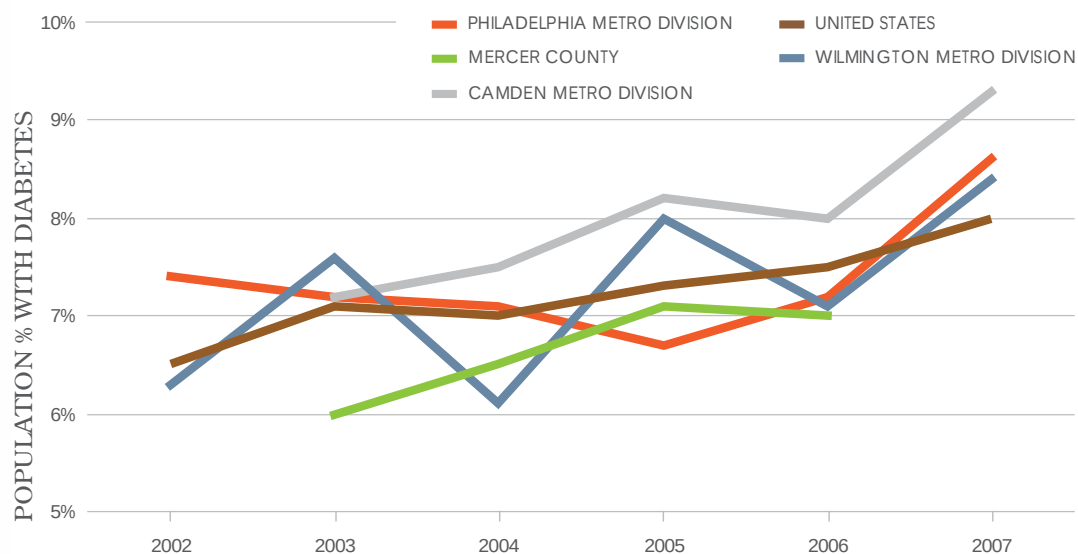
Over 23 million people in the United States have diabetes, the seventh-leading cause of death in the nation, and the incidence of diabetes has nearly doubled nationwide since 1995. Type II, or adult-onset diabetes, is most common among overweight or obese adults and can be prevented or controlled by maintaining a healthy weight through diet and exercise.

The BRFSS asks survey participants, “Have you ever been told by a doctor that you have diabetes?” Since 1995 (the earliest year of data), the tri-state area has generally had a slightly higher percentage of respondents who answered “yes” than in the nation as a whole. In 2007, the national diabetes rate was 8%, compared to 9.2% in New Jersey and 8.7% in both Delaware and Pennsylvania. Likewise, the three divisions of the Philadelphia MSA

also had a higher percentage of adults with diabetes than the national average in 2007. The Camden, Philadelphia, and Wilmington metropolitan divisions had diabetes rates of 9.3%, 8.6%, and 8.4%, respectively, as shown in **Figure 3.5: Adults with Diabetes in Greater Philadelphia**. Mercer County,

however, had a lower rate of diabetes than the national average in 2003 (6%) and 2006 (7%). However, the American Diabetes Association estimates that one-fourth of all people with diabetes are unaware they have the condition, so these self-reported statistics are most likely conservative estimates.

FIGURE 3.5
Adults with Diabetes in Greater Philadelphia



Note: Data set incomplete for Camden Metro Division and Mercer County.

Source: CDC 2008, DVRPC 2009

⁵³ BRFSS data is available at www.cdc.gov/brfss. The data was last accessed on May 11, 2009.

On the county level, Philadelphia, Gloucester, and Camden counties had the highest rates of diabetes, at 12.2%, 10.6%, and 8.6%, respectively, within the 12-county Greater Philadelphia area in 2007. The counties of Mercer,⁵⁴ New Castle, Burlington, Montgomery, and Delaware had diabetes rates below the national average of 8%. Data was unavailable for the counties of Salem, Cecil, Bucks, and Chester.

Overweight and Obesity

Like diabetes, being overweight or obese can affect a person's overall health and quality of life. It is also a leading precursor of premature death in the United States. For most people, overweight and obesity are associated with dietary patterns. Today's food system has made high-calorie processed foods widely available and affordable. Many rural areas and lower-income urban neighborhoods are

poorly served by retail food outlets, reducing access to fresh and healthy food. In addition to increasingly sedentary lifestyles and other factors, this new food landscape has exacerbated the incidence of overweight and obesity, which is an indicator of the quality of food and access to healthy food within Greater Philadelphia.

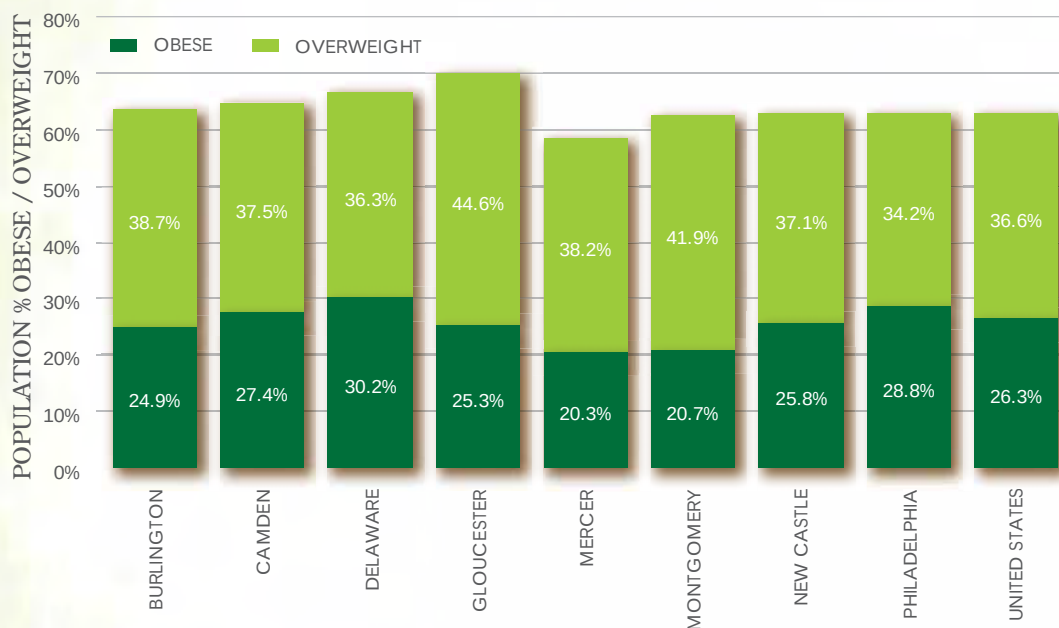
The classification for being overweight is having a Body Mass Index (BMI) between 25.0 and 29.9, and obesity is defined as having a BMI of 30.0 or above. Nationwide, about 62.9% of the population is either overweight or obese, compared to 60.7% in the Philadelphia metropolitan division, 63.7% in both the Camden and Wilmington metropolitan divisions of the Philadelphia MSA, and 58.5% in Mercer County. See **Figure 3.6: Overweight and Obese Adults in Selected Counties of Greater Philadelphia (2007)**.

The epidemic of obesity has disproportionately affected people of lower socioeconomic status, and that is reflected in this data. In 2007, the four counties in Greater Philadelphia with the lowest median household income—Philadelphia, Camden, New Castle, and Delaware counties—had the highest obesity rates. Conversely, the four counties with the highest median household income—Mercer, Gloucester, Burlington, and Montgomery counties—had the lowest obesity rates. Again, data was not available for the counties of Salem, Cecil, Bucks, and Chester.

Healthy Eating Patterns

Consumption of fruits and vegetables is critical to ensuring good health and reducing the risk of certain chronic diseases. However, less than one-fourth of the population nationwide consumes the recommended daily intake of five servings of fruits and vegetables.

⁵⁴ Mercer County data is available for 2006, but not for 2007.

FIGURE 3.6**Overweight and Obese Adults in Selected Counties of Greater Philadelphia (2007)**

Source CDC 2008, DVRPC 2009

In the last few years, healthy eating patterns, measured by consuming at least five servings of fruits and vegetables, have increased in the Philadelphia metropolitan division, but have decreased in the Camden and Wilmington metropolitan divisions and the Trenton-Ewing MSA (Mercer County).

The percentage of adults in the United States eating the recommended daily intake of five servings of fruits and vegetables has increased gradually from 2003 (22.6%) to 2007 (24.4%). Within Greater Philadelphia during this time period, the percentage meeting this daily intake has grown in the Philadelphia metropolitan division



The Spring Garden in Philadelphia

PHOTO CREDIT: MARISA MCCLELLAN

Community Gardens

University of Pennsylvania professor Domenic Vitiello is undertaking a comprehensive survey of community gardens in Philadelphia, Camden, and Trenton. The 2008 survey of Philadelphia community gardens identified food sources not reflected in traditional data sources, such as the Economic Census.

The Penn research team found 220 community gardens growing food in the city. A preliminary estimate calculates roughly 2.2 million pounds of food harvested from the active gardens, worth an estimated \$4.4 million. Professor Vitiello writes that “the majority of gardeners in low-wealth communities distribute a significant proportion of their harvest to extended family, neighbors, fellow church members, and strangers who are hungry.” There are also over 150 “ornamental” gardens growing flowers or other ornamental plants, and 250 inactive gardens in the City of Philadelphia.

Source Vitiello, Domenic. “Planning the Food Secure City: Philadelphia Agriculture Retrospect and Prospect.” In development.

(26.2% to 28.9%), although it has declined in both the Camden (26.3% to 23.5%) and Wilmington (24.2% to 22.9%) metropolitan divisions, both of which were slightly lower than the national average in 2007. Between 2003 and 2005, the percentage of people eating the recommended daily intake of fruits and vegetables in Mercer County decreased from 29.3% to 27.5%, although this percentage was still much higher than the national average.

Five counties in Greater Philadelphia—Montgomery, Delaware, Camden, Burlington, and Philadelphia—had rates higher than the national average for the recommended daily intake of fruits and vegetables, while two counties—New Castle and Gloucester—had lower rates. Data was unavailable for the counties of Salem, Cecil, Bucks, and Chester.

Food Insecurity

Food insecure households are those that are uncertain of having, or are unable to acquire, adequate food to meet the needs of all of their members because they have insufficient money or other resources for food. Over the past 10 years, food insecurity has been slightly lower in the tristate area than in the United States as a whole. Between 2005 and 2007, the average prevalence of food insecurity was 11% nationwide, but just 10% in Pennsylvania and 9% in both New Jersey and Delaware. This is equivalent to nearly 800,000 households in the three states that are food insecure each year. Food security statistics are based on a national survey conducted by the USDA Economic Research Service (ERS), in which respondents were asked a series of questions about behaviors and experiences relating to the difficulty in meeting food needs.

Households with food insecurity may employ any number of methods to meet their food needs, which may include participation in one or more food and nutrition assistance programs. The USDA's Food and Nutrition Service (FNS) administers 15 domestic food and nutrition assistance programs to combat food insecurity. The first federal distribution program to address food insecurity during the Great Depression was called the Needy Family Program, which has evolved into the Food Distribution Program on Indian Reservations (FDPIR). The National School Lunch Program was enacted in 1946, although it has its roots in a Great Depression-era program for low-income children. Food stamps also have their origin in the Great Depression, although the program began in its modern form in 1961 and is now called the Supplemental Nutrition Assistance Program (SNAP). The Special Supplemental Nutrition Program for

Women, Infants, and Children (WIC) began in 1972 and provides supplemental foods, healthcare referrals, and nutrition education at no cost to low-income pregnant, breastfeeding and non-breastfeeding post-partum women, and to infants and children up to 5 years of age at nutritional risk. The Farmers' Market Nutrition Program (FMNP), established in 1992, issues coupons to WIC recipients to be used for purchasing fresh produce at participating farmers' markets.

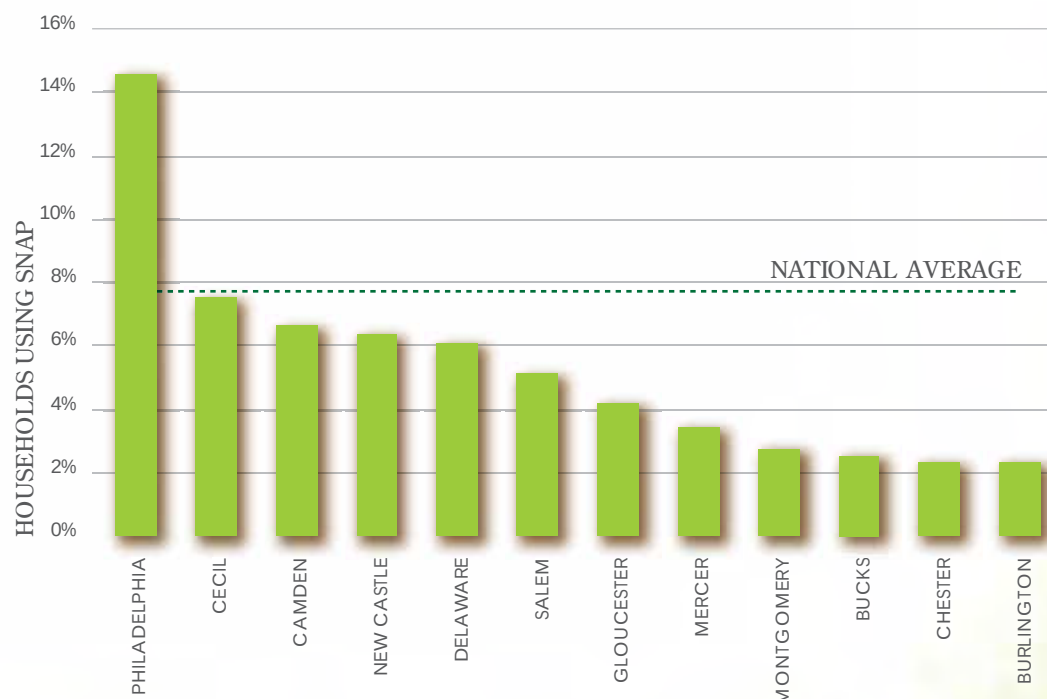
Today, an estimated one in five Americans participates in at least one USDA food and nutrition assistance program at some point during the year.⁵⁵ One of the largest of these programs is SNAP (also known as food stamps). Since at least 2000, participation in SNAP has increased in the three states of Pennsylvania, New Jersey, and Delaware, following the national trend. As shown in

Figure 3.7: Households Using Food Stamps in Greater Philadelphia (2007), 7.7% of all US households used food stamps in 2007, compared to 7.9% in Pennsylvania, 7.1% in Delaware, and just 4.2% in New Jersey. Within the three states, 540,775 households

participated in SNAP in 2007, far fewer than the 796,718 households with food insecurity.

In Greater Philadelphia in 2007, over 154,572 households participated in SNAP, or 6.7% of all households.

FIGURE 3.7
Households Using Food Stamps in Greater Philadelphia (2007)



Source: CDC 2008, DVRPC 2009

⁵⁵ USDA ERS, www.ers.usda.gov/Briefing/FoodNutritionAssistance/. Accessed 11 May 2009.

The New York MSA had a higher household SNAP participation rate of 8.0, while Boston (5.5%), Baltimore (5.4%), and Washington, DC (3.5%), had lower participation rates. Within Greater Philadelphia, every county except Philadelphia had a lower rate of household SNAP participation than the national average of 7.7%. In Philadelphia County, over 82,085 households—14.6% of all households—used food stamps in 2007.

Many hunger advocates believe that far fewer households participate in the SNAP program than those that are eligible. In 2000, an informal survey conducted by the Greater Philadelphia Coalition Against Hunger found that half of the clients at community food cupboards in Philadelphia were not receiving food stamps. In response to this need, several nonprofit organizations in Greater Philadelphia have undertaken outreach campaigns to register more eligible households. Additionally, the City of Philadelphia

initiated the BenePhilly program in 2008, with the goal of enrolling thousands of residents who are eligible for, but not receiving, state and federal benefits, such as SNAP.

Data for other federal programs addressing food insecurity is only available on the state level. The largest USDA nutrition assistance program in terms of participation is the National School Lunch Program, which provides low-cost or free lunches to eligible students. Schools receive cash subsidies and federally donated food from the USDA for the program. The school lunches must meet nutritional requirements for the recommended daily allowances of calories, protein, and other nutrients, although decisions on what specific foods to serve and how they are prepared are left to individual schools. In New Jersey, Pennsylvania, and Delaware, participation has steadily increased since at least 2004, and about 1.9 million students participated in the National School Lunch Program in the three states in 2008.

In 1991, the School District of Philadelphia, in cooperation with the USDA Food and Nutrition Service (FNS), initiated the Universal Feeding Program, which allows all students in the school district to be automatically able to participate in the National School Lunch Program and the School Breakfast Program without having to complete eligibility applications. This streamlined program, the only one of its kind in the country, was terminated by the USDA in May 2009, although it was quickly reinstated following public and political opposition.

Participation in the following federal nutrition programs also increased in the three states between 2004 and 2008. The number of participants within New Jersey, Pennsylvania, and Delaware in 2008 is shown in parentheses:

- the School Breakfast Program (457,207);
- the Child and Adult Care Food Program (205,336);⁵⁶

⁵⁶ Average daily attendance.

- the Special Milk Program (8.9 million half-pints of milk served);
- the Commodity Supplemental Food Program (Pennsylvania only) (14,527);
- the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (432,441); and
- The Seniors Farmers' Market Nutrition Program (SFMNP) (Pennsylvania and New Jersey only) (216,847).

Average daily attendance in the Summer Food Program, however, declined somewhat in the three states between 2004 (193,632) and 2008 (154,112). The Emergency Food Assistance Program (also known as TEFAP) is another USDA food and nutrition assistance program that distributes free, federally donated food to low-income eligible people through state agencies and local organizations like community food cupboards. In 2008, over \$14 million worth of food was donated to the three states, down from \$18 million in 2004.

Food Access

Food access can mean several things, including physical access (no stores in a neighborhood, or limited transportation between residential and retail areas), financial access (low household income, total lack of income, or lack of cooking facilities or storage space), and / or a lack of personal knowledge of healthy eating habits.

The steady increase in diet-related diseases in America has led to an array of research on hunger, health, and access to fresh, nutritious food. Throughout the country, and in Greater Philadelphia, grocery stores and supermarkets left urban neighborhoods and followed higher-income demographic groups to the growing suburbs. The absence of full-service grocery stores in urban (and rural) areas creates "food deserts."

A number of organizations in Greater Philadelphia are working to address food access and food security issues:

- *The Food Trust regularly undertakes scientific and policy studies on food access. Communities that lack grocery stores may have an inordinate number of convenience stores, corner stores, or fast food restaurants. The Food Trust has pioneered several programs and policy initiatives focused on creating food access in underserved communities. These include the Fresh Food Financing Initiative, the Corner Store Campaign, and the Farmers' Market program, among many others.*

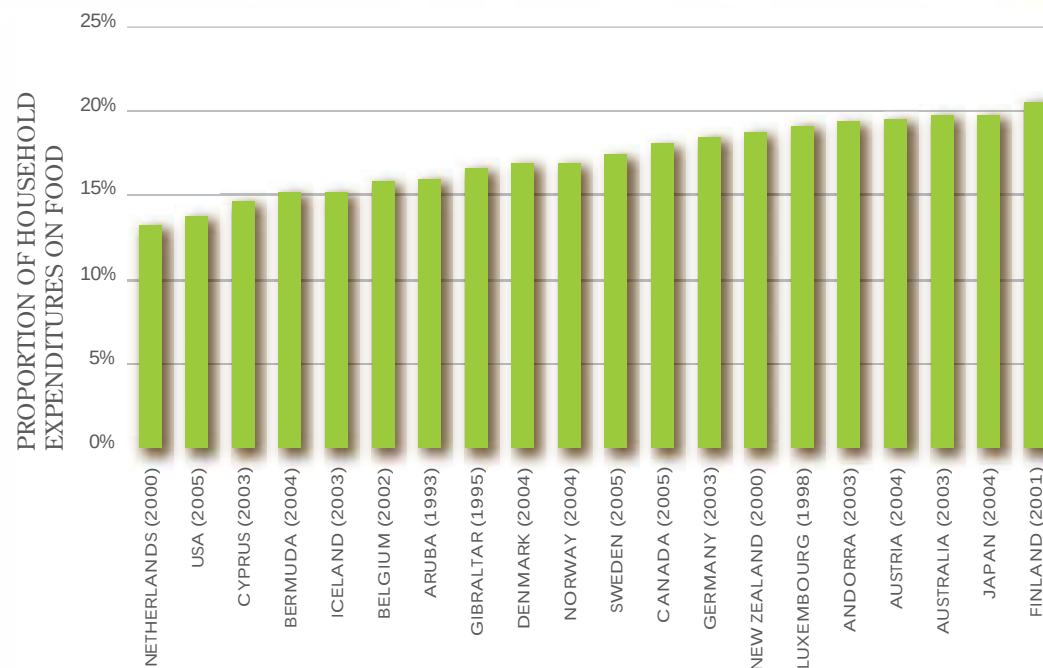
- *The Community Design Collaborative, through its Infill Philadelphia initiative, asked architects to create visions for various types of food retail in remarkably different urban spaces.*
- *Philabundance is Greater Philadelphia's largest hunger relief organization, assisting more than 1,100 human service agencies across nine counties and feeding more than 574,000 residents.*
- *Other organizations like the Greater Philadelphia Coalition Against Hunger, the Pennsylvania Hunger Action Center, and many others work to ensure food security by encouraging policy action around hunger issues.*
- *Academic institutions in the area also promote healthy lifestyles and nutrition education through research and program-related centers. Two such examples are the University of Pennsylvania's Urban Nutrition Initiative (UNI) and Drexel University's GROW Project.*

HOW WE SPEND OUR FOOD DOLLARS

Household Expenditures on Food

The United States spends just 13.7% of its annual household expenditures on food and alcohol. As seen in **Figure 3.8: Share of Household Expenditures Spent on Food for Selected Countries**, of the 20 countries in the world that spend the smallest share of household expenditures on food and alcohol, the United States is second only to the Netherlands in how little it spends on food and alcohol, compared to other expenses.⁵⁷ The amount that Americans spend on food (excluding alcohol) relative to other expenses has fallen greatly over time, from 22.7% of disposable personal money income⁵⁸ in 1929 to just 11.6% in 2008.⁵⁹

FIGURE 3.8
Share of Household Expenditures Spent on Food for Selected Countries



Source: FAO 2009, DVRPC 2009

The Consumer Expenditure Survey (CE) series of the Bureau of Labor Statistics (BLS) reveals how Americans' spending patterns have changed over the past 20 years.

The CE series is available for the nation and some regions and MSAs (although Mercer County is not included in this data series).

⁵⁷ Food and Agricultural Organization of the United Nations (FAO) Statistics Household Survey Database; International Labour Organization (ILO) and country publications.

⁵⁸ Disposable personal money income equals disposable personal income (the amount left over after taxes are paid) minus food produced and consumed on farms, government transfer payments, and supplements to wages and salaries. Disposable personal money income is not necessarily the same as total household expenditures.

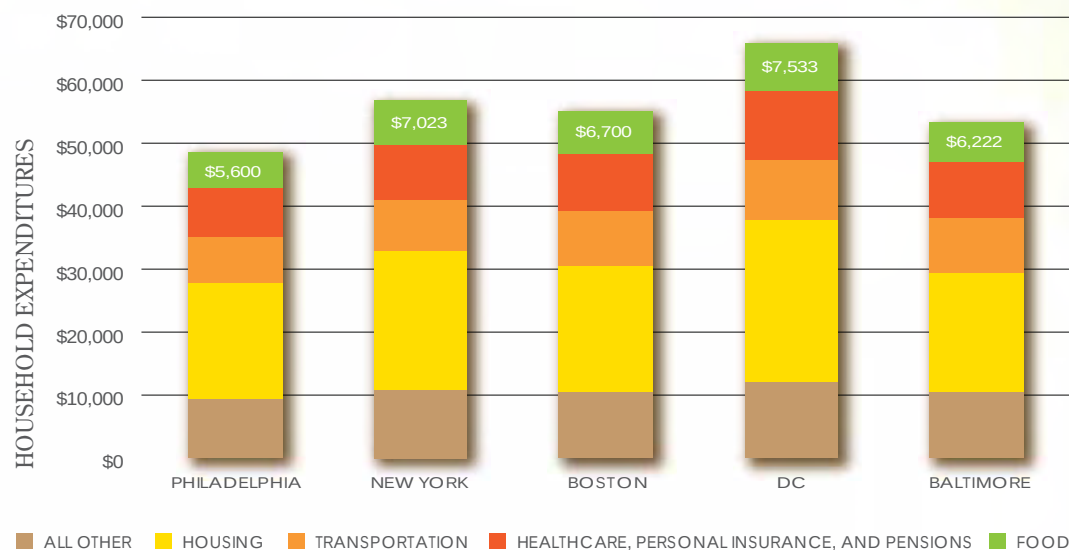
⁵⁹ ERS Food Expenditures Series, Economic Research Service, USDA.

Expenditures are analyzed at the household level, which averaged 2.5 persons nationwide and 2.4 persons in the Philadelphia MSA in 2006 to 2007.⁶⁰

According to the CE series, the average household income before taxes in 2006 to 2007 in the Philadelphia MSA was \$65,637, compared to just \$63,091 for the United States on average. Although the before-tax income in the Philadelphia MSA is higher than the national average, its expenditures are less. Total annual expenditures in the Philadelphia MSA totaled \$48,649, compared to \$49,638 in the United States. This disparity is most likely due to taxes being higher in the Philadelphia area than the national average, reducing the amount of disposable household income.

As shown in **Figure 3.9: Household Expenditures by MSA (2006-2007)**, the Philadelphia MSA spends more on housing than the national average, although it spends less on food,

FIGURE 3.9
Household Expenditures by MSA (2006-2007)



Source: FAO 2009, DVRPC 2009

transportation, healthcare, and “all other” expenditures. As a percentage of total household expenditures, the Philadelphia MSA spends approximately 12% of its total annual expenditures on food,⁶¹ equal to the national average and other northeastern MSAs. This percentage is also similar to previously discussed estimates from the United Nations and the USDA.

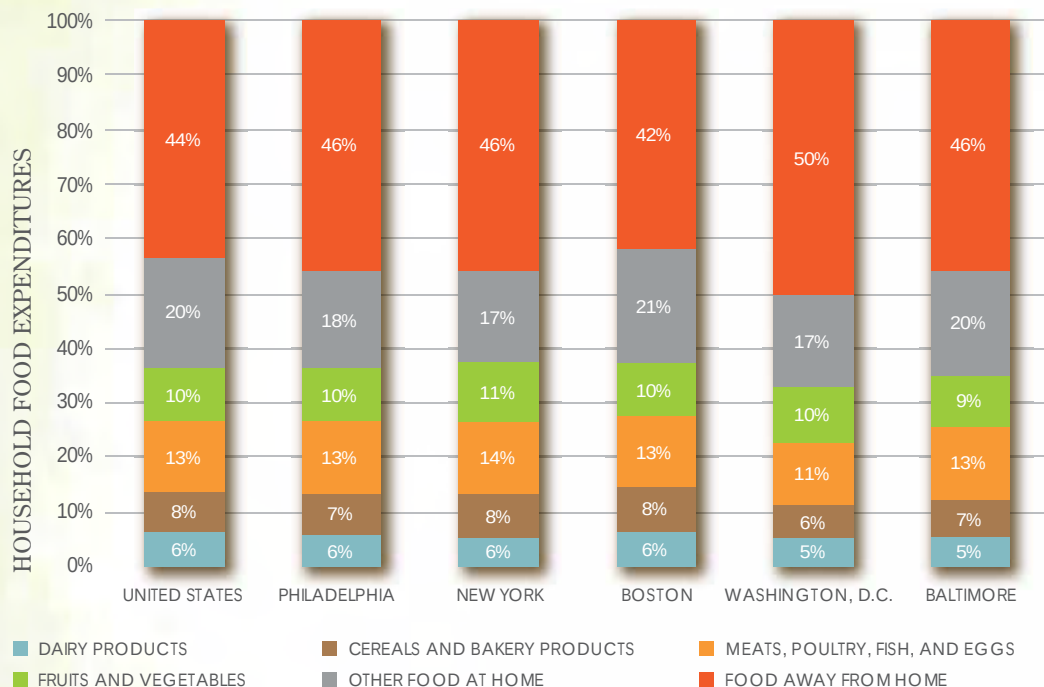
As shown in **Figure 3.10: Household Food Expenditures by MSA (2006-2007)**, the Philadelphia MSA spends less than all other northeastern MSAs on every category of expenditures. In 2006 to 2007, annual household food expenditures equaled just \$5,600 in the Philadelphia MSA. With its 2.7 million households, the Philadelphia MSA generates over 15 billion food dollars,⁶²

⁶⁰ Data is based on the average annual income and expenditures over a two-year period.

⁶¹ Excludes alcohol.

⁶² The total food dollars was calculated by multiplying the annual household food expenditures by the total number of households for each MSA.

FIGURE 3.10
Household Food Expenditures by MSA (2006-2007)



Source: BLS 2008, DVRPC 2009

compared to \$6 billion in the Baltimore MSA, \$16 billion in the Washington, DC, MSA, \$19 billion in the Boston MSA, and \$61 billion in the New York MSA.

Food expenditures can be further broken down by types of food and where the food was purchased.

The Philadelphia MSA spends roughly the same percentage on different types of food as the national average, although it spends less on “other food at home” and more on “food away from home.” Over the past 10 years in the Philadelphia MSA, the share of food expenses has remained relatively

constant, with 44% of food expenditures spent on food away from home and 56% spent on food at home.

Consumer Price Index

The Consumer Price Index (CPI) is a measure of changes in prices paid by urban consumers for a defined set of goods and services.⁶³ It is one measure of inflation and is used to calculate the change in the amount that consumers might spend to maintain a “constant level of satisfaction” in their daily living expenses. The CPI is calculated monthly by the BLS for the United States, four regions of the country (West, Midwest, Northeast, and South), and 27 metropolitan areas.

In terms of food and beverages alone, the Philadelphia-Wilmington-Atlantic City Consolidated Metropolitan Statistical Area (CMSA), which encompasses a larger area than the MSA, has had a lower CPI than that of the United States, the Boston CMSA,

⁶³ CPI data available at www.bls.gov/cpi/. Accessed 8 April 2009.

and the New York CMSA for at least the last decade.⁶⁴ For the last two to three years, this gap has increased, which means that the relative price of food and beverages has risen at a slower pace in the Philadelphia area than in other northeastern metropolitan areas.

In early 2009, the food and beverage CPI was 219 for the United States, but just 207 for the Philadelphia CMSA, which means that the average food or beverage item that cost \$1.00 in each area in 1982 to 1984 would cost \$2.19 in the United States and \$2.07 in the Philadelphia CMSA in 2009.⁶⁵ That same \$1.00 item from 1982 to 1984 would cost \$2.28 in the New York CMSA and \$2.29 in the Boston CMSA.

The rate of increase in food and beverage prices since the 1980s has been similar to the increase in the prices for all items. In early 2009, the CPI for all items was 212 in the United States and 220 in the

Philadelphia CMSA. In this case, the rate of inflation has been higher in Philadelphia due to higher price increases in medical care and other goods and services.

THE FOOD ECONOMY

Out of every food dollar, 19 cents goes to the farmer, and the remaining 81 cents goes to the food marketing system.⁶⁶ The USDA estimates that 92% of the increase in food prices between 1990 and 2000 was due to increases in the food marketing system. After marketing, which costs about 38 cents per food dollar, and farm production, packaging is the next greatest cost, at eight cents per dollar. Other marketing costs include transportation, energy, and business taxes, among other costs.⁶⁷

The food economy involves a highly integrated web of activities and businesses and consists of many different kinds of establishments.



Baked goods at Philadelphia's Headhouse Farmers' Market

PHOTO CREDIT: MARISA MCCLELLAN

The primary elements of the food economy are: a) agricultural production; b) natural resources and agricultural support; c) wholesale trade; d) food and beverage manufacturing (processing); e) transportation and warehousing; f) food and beverage stores; and g) food services and drinking places.

Agricultural production, discussed in **Part 1: Agricultural Resources**, is measured by the USDA Census of Agriculture, not the US Census Bureau, and is not included in the following

⁶⁴ The Washington, DC-Baltimore Primary MSA has a base period of 1996 and so could not be used for comparison.

⁶⁵ Most of the CPI indices are based on a baseline established in 1982 to 1984. The BLS sets the average price index for the years 1982, 1983, and 1984 equal to 100, and changes are measured in relation to that baseline.

⁶⁶ "Farmers' Share of Retail Food Dollar." National Farmers Union. www.nfu.org/wp-content/080309_farmersshare.pdf. Accessed 20 August 2009.

⁶⁷ USDA ERS. USDA Agriculture Factbook 2001-2002.

analysis. The six remaining elements of the food system and their subsectors are listed below with their corresponding North American Industry Classification System (NAICS) identification codes:

Natural Resources and Agricultural Support

- Fishing, hunting, and trapping (114)
- Support activities for crop production (1151)
- Support activities for animal production (1152)

Wholesale Trade

- Grocery and related product merchant wholesalers (4244)
- Farm product raw materials merchant wholesalers (4245)
- Beer, wine, and alcoholic beverage merchant wholesalers (4248)
- Farm supplies merchant wholesalers (42491)

Food and Beverage Manufacturing

- Food manufacturing (311)
- Beverage manufacturing (3121)

Transportation and Warehousing

- Truck transportation (484)⁶⁸
- Refrigerated warehousing and storage (49312)
- Farm product warehousing and storage (49313)

Food and Beverage Stores

- Food and beverage stores (445)

Food Services and Drinking Places

- Food services and drinking places (722)

Economic data for these sectors is measured by the US Census Bureau in the Economic Census (released every five years) and the annual County Business Patterns data. Where relevant, these comprehensive sources of information have been supplemented by additional data sources, such as Global Insight, a provider of economic and financial analysis.

Again, “Greater Philadelphia” is defined as the 11-county MSA—Burlington, Camden, Gloucester, Mercer, and

Salem in New Jersey; Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; Cecil in Maryland; and New Castle in Delaware—plus Mercer County.⁶⁹

Each of the six food economy sectors is detailed in **Appendix E: Food Economy Sector Summaries**.

In 2006, the six sectors comprising the food economy made up 11% of all establishments, as well as 11% of all jobs,⁷⁰ in Greater Philadelphia. A total of between 286,526 and 310,084 employees worked in one of 17,977 establishments of the six food system sectors in 2006.

According to Global Insight, the total output⁷¹ for these food sectors was \$49 billion in Greater Philadelphia in 2006. Crop and animal production added another \$1.1 billion in output, (as noted in **Part 1: Agricultural Resources**, the 70-county 100-Mile Foodshed produced over \$6 billion). The total

⁶⁸ As discerned in the Food FAF analysis (**Part 2: Food Distribution** of this study), 14% of truck transportation is used as a proxy for the transport of food by truck.

⁶⁹ Where noted, Global Insight data was used to supplement the Economic Census and County Business Patterns. This detailed dataset does not include Cecil County, Maryland.

⁷⁰ Since employment is often expressed as a range, the midpoint of the range was used.

⁷¹ Total output is equal to the value of all the goods and services produced.

output for all economic sectors combined was \$628.7 billion, and food-related output made up about 8% of all economic activity in Greater Philadelphia.

The fact that the food economy makes up about 11% of all establishments and jobs, but only 8% of economic output, suggests that food-related activities produce lower economic value than other sectors in the economy. Consequently, the majority of food-related occupations earn less, many far less, than the nation's median annual salary of \$35,270.⁷²

Food services and drinking places constitute over two-thirds of all food economy establishments, and food and beverage stores make up nearly one-quarter. Food-related wholesale trade businesses, food and beverage manufacturers, and all other businesses combined make up just 10% of all establishments in the food economy. The division among food economy sectors in terms of number of

employees is very similar to the trend in the number of establishments. However, food and beverage manufacturing makes up a larger share, while food services and drinking places comprise a smaller share of total employees in the food economy.

The share among food economy sectors in terms of total economic output is very different than with establishments and employees. Whereas food and beverage manufacturing and food-related wholesale trade each make up less than 10% of establishments and employees, they constitute 22% and 27%, respectively, of the total output of the food economy. Also, whereas food services and drinking places make up more than half of establishments and employees, they produce just 17% of total output.

The percentage of all establishments in the United States that are within the food economy is also 11%. In major MSAs across the country, the food

economy makes up between eight and 12% of all establishments. On the low side are Miami, Atlanta, Phoenix, and Minneapolis. MSAs with 12% of establishments in food sectors include New York, Boston, and San Francisco.

The number of food economy establishments in an MSA roughly correlates with population, although there is a great deal of variation that may be associated with population density. The Philadelphia MSA, which had the fifth-highest population in 2006, had the fourth-highest number of food economy establishments. The low-density MSAs of Dallas, Houston, Phoenix, and Riverside-San Bernardino each have a comparatively small number of establishments relative to their populations.

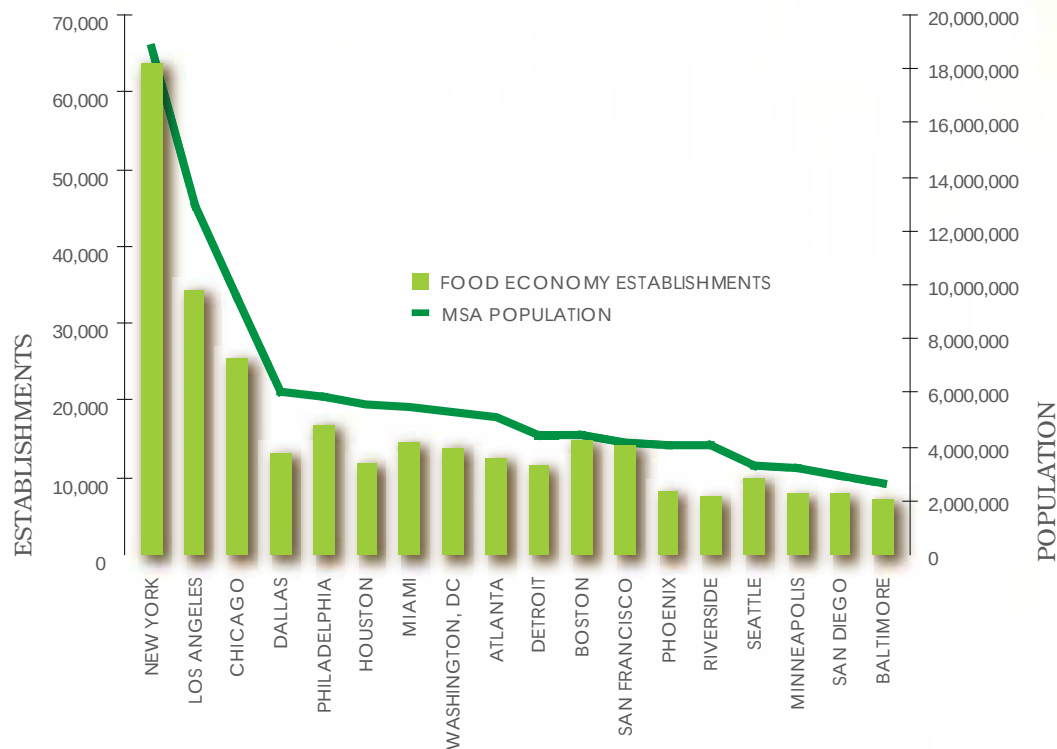
The higher-density MSAs of New York, Boston, San Francisco, and Seattle, on the other hand, have a large number of food economy establishments

⁷² Bureau of Labor Statistics (BLS), May 2007 National Occupational Employment and Wage Estimates.

relative to their populations. **Figure 3.11: MSA Population and Food Economy Establishments (2006)** illustrates this relationship. In addition to population density, other elements, such as tourism and port activity, factor into the relationship between the food economy and population. **Map 3.1: Number of Food and Beverage Manufacturers (2006)** illustrates the concentration of manufacturing establishments within the 100-Mile Foodshed.

If food and beverage stores, as well as food services and drinking places, are removed from the number of establishments, leaving just the nonretail side of the food economy, Miami and San Francisco have more establishments than Philadelphia due to their greater numbers of food-related wholesalers.

FIGURE 3.11
MSA Population and Food Economy Establishments (2006)

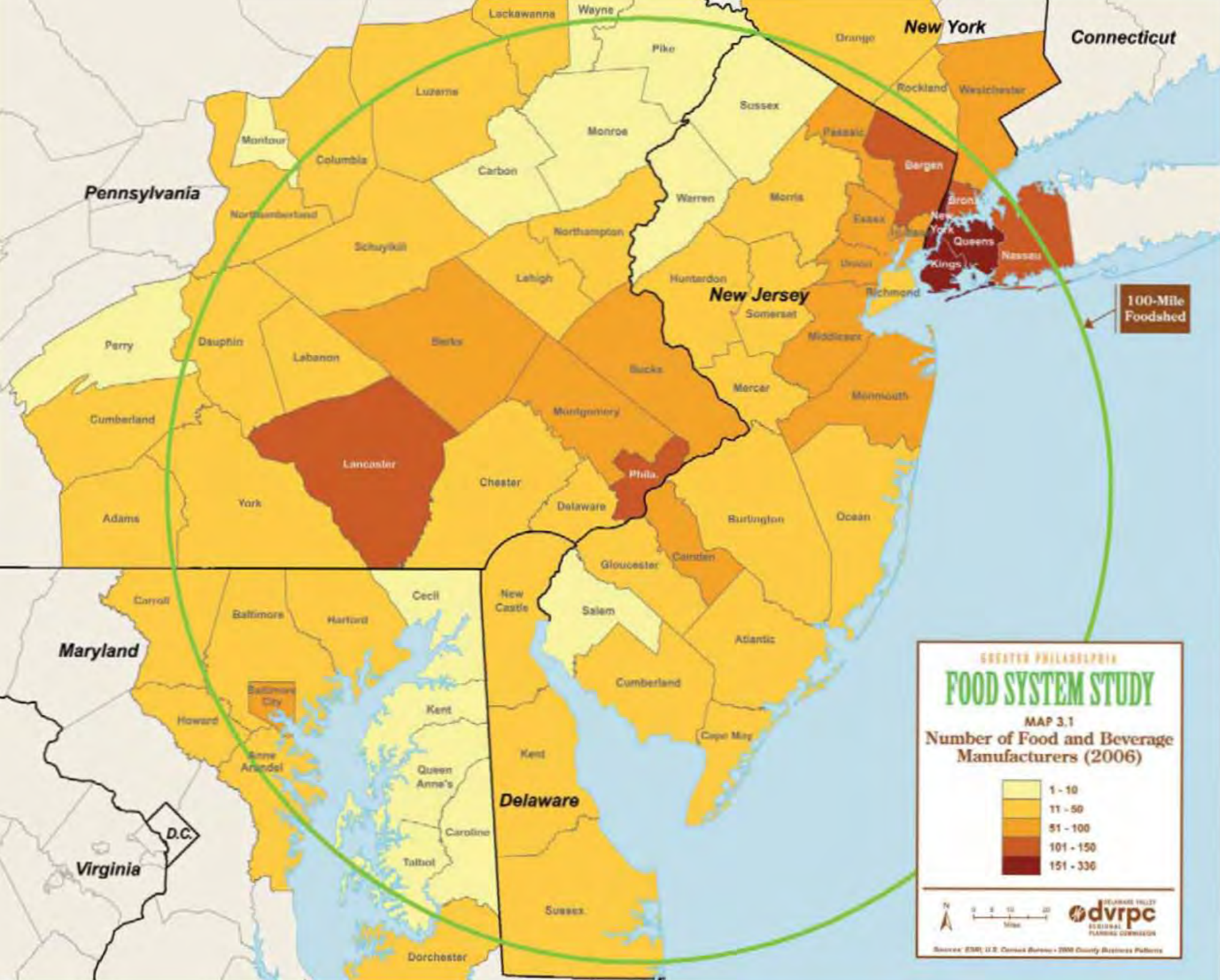


Source US Census Bureau 2008, DVRPC 2009

Major Changes in the Food Economy Sectors

Like many industries in the overall economy, there has been a great deal of consolidation in food economy establishments over the past 10 years.

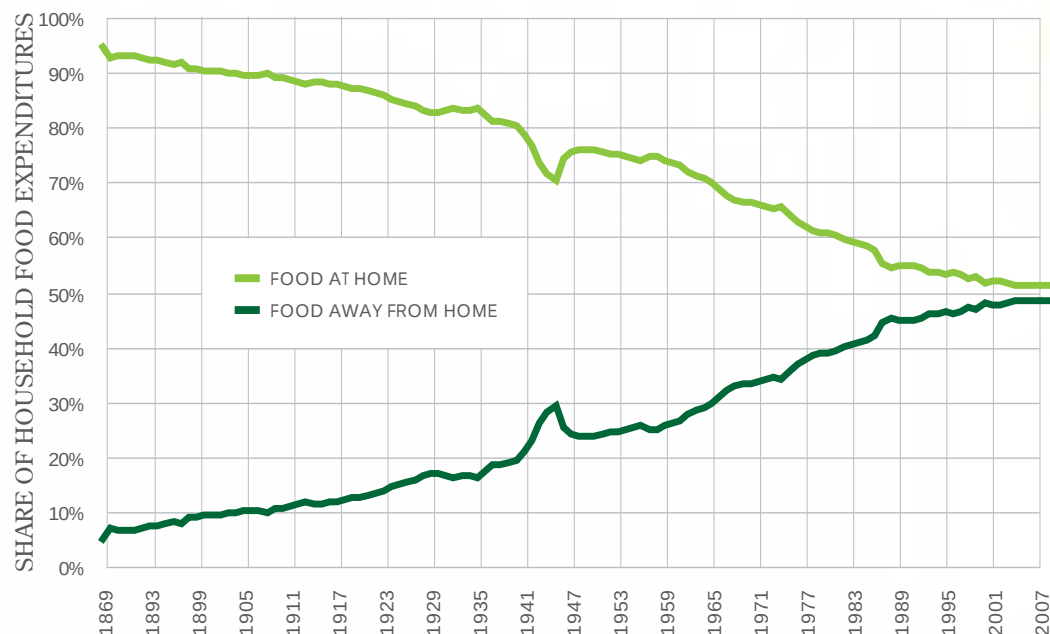
Many food and beverage retail establishments have consolidated through mergers or acquisitions in order to cut costs. Other food and beverage stores have gone out of business due to competition from larger retail chains. In turn, food and



beverage manufacturers have consolidated to meet the sizable needs of these large retailers. These changes are further discussed in **Appendix E: Food Economy Sector Summaries**.

In addition to consolidation, another trend in the food economy is the increasing share of food purchases made at food service establishments, as eating outside the home grows in frequency and popularity.⁷³ According to the Economic Research Service (ERS) of the USDA, the share of food expenditures spent away from home⁷⁴ has increased gradually over time from 5% in 1869 to 49% in 2008.⁷⁵ As seen in **Figure 3.12: Share of Food Expenditures At and Away from Home (1869-2008)**, the share of food expenditures spent away from home spiked in 1945, as servicemen returned from World War II and food rationing was lifted.

FIGURE 3.12
Share of Food Expenditures At and Away from Home (1869-2008)



Source: USDA ERS 2008, DVRPC 2009

The percentage of food expenditures spent away from home leveled off in the 1950s, but then began to rise steadily from the mid-1960s onward.

The recent economic downturn, or the Great Recession, may be causing Americans to spend less on food away from home. However, expenditures on food at home may also decrease, and so

⁷³ Martinez, Steve W. The US Food Marketing System: Recent Developments, 1997-2006, ERR-42. USDA ERS, May 2007.

⁷⁴ In the ERS series, "food at home" includes cash purchases plus home production, food stamps, donations, and WIC benefits; "food away from home" includes cash purchases plus food supplied to employees, inmates, patients, schools, and institutions.

⁷⁵ Unlike the survey-based Consumer Expenditure Survey from the BLS, the ERS food expenditures series is based on actual sales, although it is only available on the national level.

the proportion of expenditures at home versus away from home may remain roughly the same. This was the pattern following the stock market crash of 1929.

Location Quotient

The food economy of Greater Philadelphia⁷⁶ was further analyzed by comparing the local employment in food sectors to the national employment in those same sectors and determining the location quotient (LQ)⁷⁷ for each food sub-sector. A location quotient of 1 indicates that the local share is equal to the national share. A location quotient greater than 1 means that the local share is greater than the national average and it is assumed that the additional jobs, services, or products represent what is exported from the local

area; a location quotient less than 1 means that the local area may rely on importing those economic activities.

As a whole, the location quotient of employment in food economy sectors is 0.86, which means that Greater Philadelphia has less than the national share of employment in these food sectors. As seen in the table below, most food subsectors⁷⁸ have an LQ of less than 1, and so it is assumed that Greater Philadelphia relies on importing many food economy activities.

Within most of the subsectors listed in **Figure 3.13: 2008 Location Quotients in Greater Philadelphia's Food Economy Sectors**, there are multiple subdivisions, many of which have high LQ scores, although their parent subsector may not. For example:

- Although grocery stores have an LQ of 1.01, which means that its employment is about the same as the national share, Greater Philadelphia has a preponderance of convenience stores (LQ=2.17) rather than supermarkets (LQ=0.69).
- Six of the seven types of bakeries have an LQ greater than 1.0, and specifically dry pasta manufacturing (LQ=2.93). Tortilla manufacturing has an LQ of 0.0 (a null value).
- Within different types of specialty food stores (LQ=1.42), only fish and seafood markets (LQ=1.57) and fruit and vegetable markets (LQ=1.85) have more than the average share of employment.
- All three types of special food services (LQ=1.84) have high LQ scores. This includes food service contractors (LQ=1.97), caterers (LQ=1.45), and mobile food services (LQ=1.01).
- Within sugar and confectionary product manufacturing (LQ=0.89), chocolate and confectionery manufacturing from cacao beans has a very high LQ of 2.66.

⁷⁶ With the inclusion of Mercer County, NJ but the exclusion of Cecil County, MD.

⁷⁷ A location quotient, which can also be called an economic base analysis, is a calculated ratio between the local economy and an economy of a larger geographic scale, such as the United States. This ratio can be calculated for all industries to determine if the local economy has a larger share of that industry than expected.

⁷⁸ Where the NAICS-4 level (four digit) included nonfood sectors, the NAICS-5 level was used.

FIGURE 3.13
2008 Location Quotients in Greater Philadelphia's Food Economy Sectors

NAICS Code	Sub-Sector Description	Greater Philadelphia	
		Employment	Location Quotient
	Total for All Sectors (Food and Nonfood)	3,049,045	
1141	Fishing	7	0.05
1142	Hunting and Trapping	75	1.51
1151	Support Activities for Crop Production	351	0.38
1152	Support Activities for Animal Production	288	0.95
3111	Animal Food Manufacturing	509	0.49
3112	Grain and Oilseed Milling	13	0.03
3113	Sugar and Confectionery Product Manufacturing	1,150	0.89
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	649	0.18
3115	Dairy Product Manufacturing	1,448	0.5
3116	Animal Slaughtering and Processing	6,649	0.61
3117	Seafood Product Preparation and Packaging	13	0.02
3118	Bakeries and Tortilla Manufacturing	8,512	1.33
3119	Other Food Manufacturing	2,468	0.69
3121	Beverage Manufacturing	3,006	0.85
4244	Grocery and Related Product Wholesalers	15,230	0.91
4245	Farm Product Raw Material Merchant Wholesalers	569	0.39
4248	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	2,483	0.64
42491	Farm Supplies Merchant Wholesalers	738	0.43
4451	Grocery Stores	57,731	1.01
4452	Specialty Food Stores	4,990	1.42
4453	Beer, Wine, and Liquor Stores	3,903	1.29
49312	Refrigerated Warehousing and Storage	590	0.65
49313	Farm Product Warehousing and Storage	15	0.09
7221	Full-Service Restaurants	85,157	0.86
7222	Limited-Service Eating Places	60,093	0.66
7223	Special Food Services	22,362	1.84
7224	Drinking Places (Alcoholic Beverages)	7,739	0.98
	Total for Food Sectors	286,738	0.86

Note: Gray indicates location quotients over 1.

Source: Global Insight 2009, DVRPC 2009

Some areas of the food economy where Greater Philadelphia is strong, like chocolate manufacturing, inherently rely on imported goods like cacao beans and sugarcane, which are not grown locally. However, the region also has a great strength in bakeries and bakery product manufacturing (including dough and pasta manufacturing) that may be supplied, at least in part, by local production. Wheat, an essential ingredient in most bakery products, is grown on over 300,000 acres on 4,600 farms that produce over 19 million bushels within the 100-Mile Foodshed. Much of this wheat may be added to animal feed, but it may also be used for human consumption.

SUMMARY

Americans generally eat more food today than at any other time in the country's recent past. The food we eat is also more likely to be processed in some way and high in fat and sugar.

Nearly one-third of the average grocery bill is spent on “other food at home,” which mostly includes processed or prepared foods that tend to be unhealthier than whole foods like fresh produce and whole grains. In fact, the average American consumes 165 pounds of added fats and sweeteners a year, a substantial 17% of all food consumed by weight.

The consequences of unhealthy eating patterns, combined with increasingly sedentary lifestyles, include increased incidences of diet-related health conditions like diabetes and obesity in both Greater Philadelphia and the nation. The rate of diabetes has long been higher in Greater Philadelphia than the national average, which itself has nearly doubled since 1995.

Although Greater Philadelphia has lower rates of obesity than the nation as a whole, several counties in the region have much higher rates.

Food and nutrition choices may differ depending on whether one is eating out or preparing food at home. Although one can control, or at least be aware of, the amount of fat, oil, and sugar used in cooking and baking at home, consumers often do not have a clear idea of the nutritional content of food eaten outside the home and are likely to be eating unhealthier foods.

However, eating outside the home has transitioned from an occasional luxury to currently making up nearly half of all food purchases. Even in the midst of an economic recession, it is anticipated that this trend will continue, as it did throughout even the Great Depression, since grocery purchases will likely decline as well.

When dining out, consumers may be more likely to eat at limited-service places like cafes and take-out restaurants than at full-service restaurants. Limited-service places have also increased in number in Greater Philadelphia to a greater

extent than in the nation as a whole. Another source of food outside the home is special food services, such as food service contractors like ARAMARK, of which there are proportionately more in Greater Philadelphia than in other northeastern MSAs or the United States, most likely owing to the region’s concentration of universities and hospitals.

In spite of how inexpensive food is in this country relative to other expenses, 11% of American households suffer from food insecurity, or the inability to meet their food needs due to lack of money or other resources. Households with food insecurity may participate in any number of federal food and nutrition programs, such as the Supplemental Nutrition Assistance Program (SNAP). Every county in Greater Philadelphia had a lower rate of SNAP participation than the national average, except for Philadelphia County, which had nearly

double the participation rate. The costs of living in Greater Philadelphia are significantly more affordable as compared to other metropolitan areas in the Northeast. Additionally, the prices of food and beverages have increased at a much slower rate in the Philadelphia region than in the United States or other northeastern MSAs. As a result, the average household in Greater Philadelphia spends just \$5,600 a year on food, far less than other MSAs such as New York (\$7,000) and Washington, DC (\$7,500). However, food makes up the same share (11 to 12%) of total household expenses in these and other northeastern MSAs, as well as in the country as a whole. Although food is relatively cheap in the Philadelphia region, lower average incomes and steep inflation in the cost of medical care and other expenses impact the region's affordability.

Before food is available to be purchased by households, it passes through a

number of channels either within or outside Greater Philadelphia. These channels, or food sectors, make up what we call the food economy. In between agricultural production and retail sale, at a store or eating and drinking place, food is bought and sold by wholesalers, processed by food and beverage manufacturing plants, transported by truck, and may be held temporarily in specialized warehousing and storage facilities. All these activities (with the exclusion of on-farm production, discussed in **Part 1: Agricultural Resources**) constitute 11% of establishments and 11% of employees in Greater Philadelphia, although together, they contribute a total of just 8% of the region's total economic output.

Greater Philadelphia has a lower share of its workforce in the food economy than the national average. However, the region has relatively high employment in certain sub-sectors of the food economy, such as dry pasta

manufacturing, chocolate manufacturing, convenience stores, food service contractors, and fruit and vegetable markets.

One of the major changes in the food economy in recent years is widespread consolidation across many food sectors. Consolidation in sectors like transportation and wholesale trade, food and beverage manufacturing, and grocery retail has been driven by cost-cutting efforts, technological change, and response to consolidation in other economic sectors as companies adapt to meet wider geographic and population bases. While much consolidation has occurred within sectors as, for example, one food manufacturer may merge with another, there has also been a great deal of vertical integration between different sectors. This has occurred as warehousing firms have merged with transportation firms to maximize economies of scale, and as large supermarket firms have acquired warehouses and trucking fleets to

better negotiate with suppliers and efficiently restock their inventory. However, some of the consequences of this consolidation include decreased consumer choices and increased money leaving the region, as many corporate headquarters are located in other parts of the country.

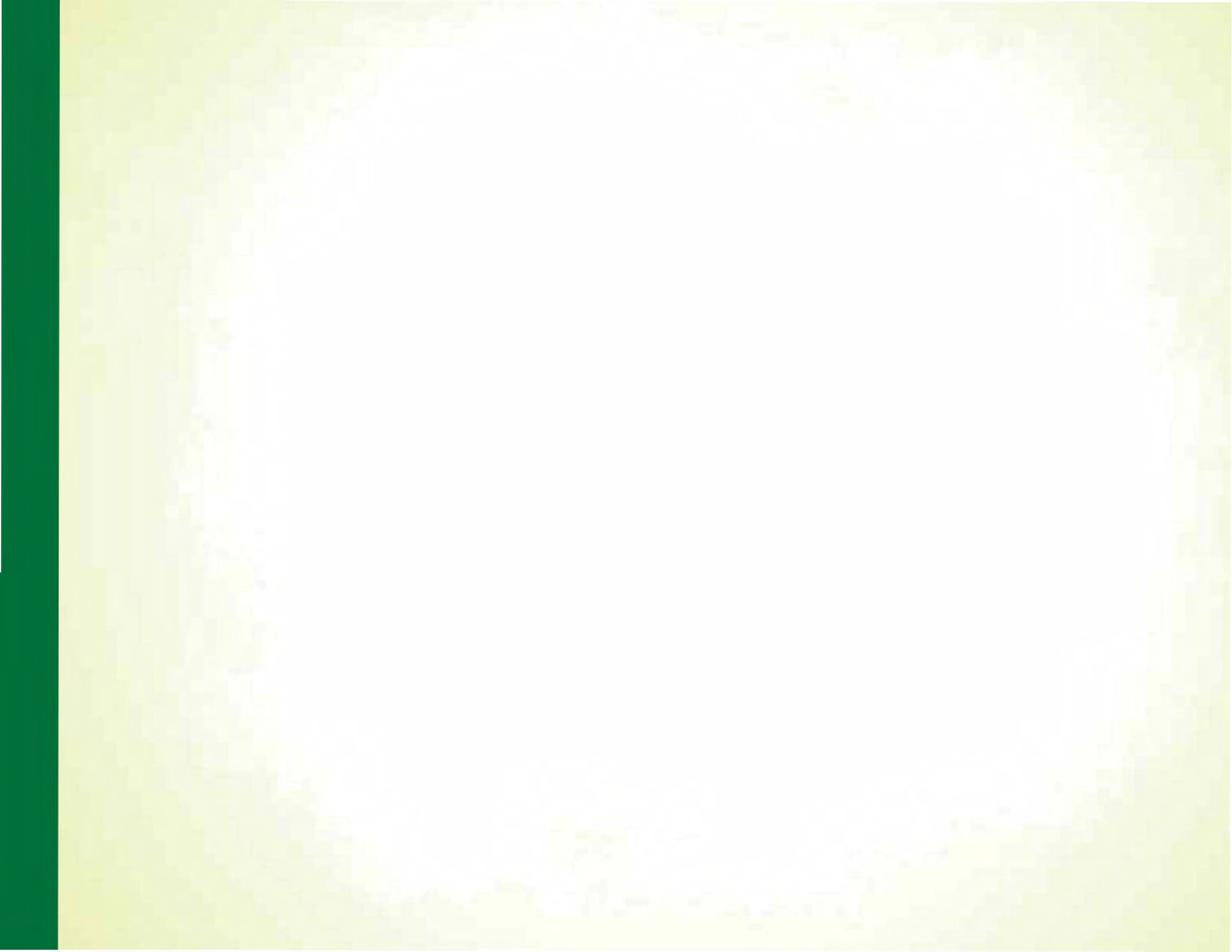


Reading Terminal Market, Philadelphia

PHOTO CREDIT: BECKY SWEGER

Some emerging opportunities in the food economy of Greater Philadelphia include growth in limited-service restaurants and specialty food stores, as inexpensive prepared foods grow in popularity. Another opportunity is the region's strength in food service contractors.

Lastly, one of the major food-related trends in recent years is rising interest in locally and sustainably produced foods. This movement has been driven by a number of issues, including concerns about food miles and the fuel, packaging, and time associated with transporting food across the country. There has also been a growing awareness that local produce tastes more fresh and flavorful. In addition, a number of high-profile outbreaks of food-borne illnesses caused by a wide range of tainted foods have drawn greater attention to the origins of food. Once a niche market, local foods are now sold in mainstream retailers, including major retail chains such as Safeway, Pathmark, and Wal-Mart. As fuel prices rise, along with concerns about public health, food safety, and food security, Greater Philadelphia is in a crucial position to take advantage of its base of food manufacturing, wholesale distribution, and diverse agricultural production to support a more sustainable regional food system.





PART 4

Food System Stakeholders Analysis



DVRPC performed a Stakeholder Analysis, a social research tool, to gain more knowledge about Greater Philadelphia's food system by identifying the key stakeholders, policymakers, and other individuals who are actors and experts in various food system areas.

By surveying many different people through a variety of methods (in person, on the phone, online, and in roundtables), DVRPC collected information about other projects, reports, programs, and efforts; created a mechanism to collect diverse

recommendations; identified the food system's most influential actors; and detected gaps in research, support services, infrastructure, programs, and nonprofit activities.

This survey effort informed and shaped the subsequent parts of the Greater Philadelphia Food System Study, recognized those influential stakeholders, and identified other food systems' best management practices that warrant additional research.

SURVEY

DVRPC conducted the Food System Stakeholder Analysis between June and September 2008.

Purpose

A Stakeholder Analysis is a social research method that illuminates who is doing what, and where, and how stakeholders interact with each other.



PENN STATE UNIVERSITY
COLLEGE OF AGRICULTURAL SCIENCES
STATE COLLEGE, PA

Penn State University is a land-grant university that has a historic focus on agriculture. Penn State's College of Agricultural Sciences is one of the oldest higher — education agricultural programs. With a budget of \$140 million, the college maintains 12 academic units, 12 service units, 20 centers and institutes, and four off-site research and extension centers. It also houses the Cooperative Extension and is a partner in the Pennsylvania Women's Agricultural Network (PA-WAgN).

Within the College is the Department of Agricultural Economics and Rural Sociology, which focuses teaching and research on three major topics – Food Systems, Community Development, and Environmental and Natural Resources. Current faculty research includes third-party audits, rural development through agricultural clustering, farm-to-school programs, and organic markets.

Recently, the college completed a strategic planning process that identified energy, entrepreneurship, food, diet and health, pest prediction and response, and water quality as major research areas.

<http://extension.psu.edu/>



RUTGERS UNIVERSITY COOPERATIVE EXTENSION NEW JERSEY STATEWIDE

The Cooperative Extension in New Jersey is housed at Rutgers University within the New Jersey Agricultural Experiment Station (NJAES). There are offices in all 21 counties.

The Atlantic County Extension Office has the most agriculture staff and provides a variety of support, especially for large vegetable farmers. Staff researches emerging markets for Jersey Farmers, convenes the Mid-Atlantic Direct Marketers Annual Conference, and provides promotion and support on complying with Good Agricultural Practices (GAPs).

The Ocean County Extension Office has an extensive Marine Resources Program. It partners with NJDEP on the Barnegat Bay Shellfish Restoration Project, involving community residents in clam and oyster harvesting to educate them about the impact of human activities on shellfish populations.

The Salem County Extension Office brings together information on agricultural associations, processors, markets, service providers, and other contacts across the state in its "Green Pages: An Agricultural Resource Guide."

<http://njaes.rutgers.edu/extension/>

This study looks specifically at the Greater Philadelphia Food System's foodshed (the land area within a 100-mile radius from a point within the central business district of the City of Philadelphia) and focuses on production and supply, incorporating market and demand issues when appropriate. Through a variety of methods—online survey, in-person interviews, phone interviews, and in-person roundtables—food system stakeholders provided insight into the region's opportunities and challenges as related to food and agriculture. Respondents also identified other key actors that should be included in the regional process and other best management practices occurring in different parts of the country or world.

Development of Questions

Questions were developed based on input from the first meeting of the Greater Philadelphia Food System Stakeholder Committee. Attendees

listed the top questions that they would want to ask of a farmer, distributor, processor, retailer, support business (insurance, credit, or supply), policymaker, or nonprofit employee. While different stakeholder groups were asked different questions based on their professions and activities, all respondents were asked the same "Big Picture" questions addressing opportunities, challenges, and recommendations for the future. A sample survey is included in **Appendix H: Stakeholder Analysis Sample Survey Questions.**

Methodology

The overarching goal of the Stakeholder Analysis is to include many different food system stakeholders who represent a variety of experiences and perspectives in the food system. Such stakeholders include: farmers; processors and manufacturers; distributors; food retailers, restaurateurs, and purchasers; nonprofit organizations (including institutions); government employees and

elected officials; support businesses (such as suppliers or insurance providers); professional organizations; and interested citizens.

DVRPC's Committee members provided the starting point for the stakeholder analysis and identified over 500 influential individuals and organizations.

Responses

Throughout the summer of 2008, 171 people participated in the stakeholder survey. Of those responses, 62 were collected through the online survey. Another 109 respondents were contacted directly and participated in phone interviews, in-person interviews, roundtable discussions, and tours. Due to time constraints, the majority of respondents were from Pennsylvania and New Jersey. Additional time and funding may have allowed for more contributions from other stakeholders in the three remaining foodshed states—

Delaware, Maryland, and New York.

Figure 4.1: Survey Respondents by Stakeholder Group and Medium

depicts the breakdown of participants by food system stakeholder group and survey medium. A complete list of organizations and individuals contacted and interviewed is available in **Appendix I: Stakeholder Analysis Interview Dates and Details**. **Map 4.1: Number of Survey Respondents** depicts the location of survey respondents as reported.

OVERALL FINDINGS

Who Does What?

Based on the 500 referrals and subsequent research for the complete food system study, a Greater Philadelphia Food System Stakeholders Inventory was created (**Appendix F: Identified Food System Stakeholders for Greater Philadelphia**). The inventory lists



FAIR FOOD PHILADELPHIA

Fair Food, originally started as a program of White Dog Community Enterprises, works to connect farmers to markets in the Philadelphia region. It does this through the Fair Food Farmstand in Reading Terminal Market, restaurant consulting, farmer outreach workshops, publications, and wholesale and retail guides.

Farm to Institution is a more recent program that addresses the specific issues and opportunities of sourcing local food for institutions like schools, hospitals, and elder care facilities. The program evolved from site visits and round tables to a Working Group of Institutional Buyers, which explored the tools needed to increase local purchasing. There is also an online toolkit collating information and providing marketing materials.

Fair Food has also partnered on the creation of the Common Market, a local foods distributor to larger wholesale markets, such as institutions and restaurants, or smaller retail buyers. It is currently a nonprofit, but hopes to become a self-sustaining enterprise over the next few years. It began distributing in July 2008, renting warehouse space from SHARE. It is a self-described “values-based” business that sources from within 150 miles, while meeting the needs of larger institutions and producers.

www.fairfoodphilly.org



FARM BUREAU NATIONAL AND STATE CHAPTERS

Farm Bureau is an independent, nongovernmental organization governed by farm families from all types and sizes of farms, who have united to solve problems and advocate for advancement of agriculture and rural living. The Pennsylvania Farm Bureau is composed of 56 county Farm Bureaus and is affiliated with the American Farm Bureau Federation. Farm Bureau also offers its members many beneficial services, ranging from group health insurance to farm management consultation.

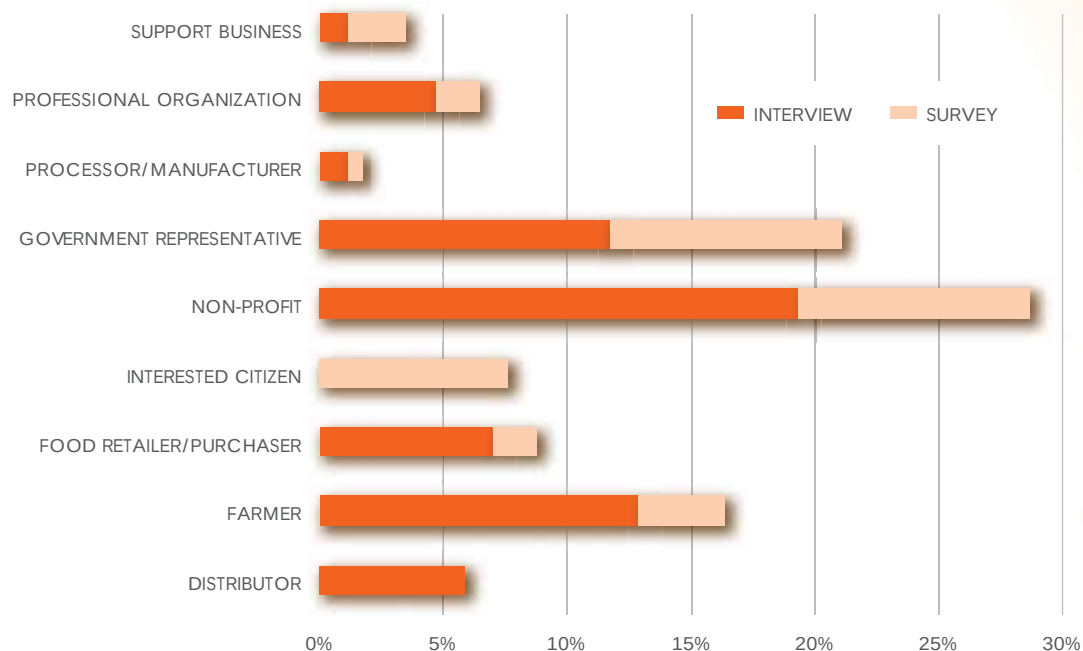
Farm Bureau policies are formed through a grassroots discussion process that begins with its county organizations. Farm Bureau's position on state and national issues is determined and updated by voting delegates at annual state and national conventions.

Farm Bureau continually interacts with lawmakers and agencies at all levels of government and fosters productive working relationships with numerous groups and missions in the public and private sectors.

www.fb.org

FIGURE 4.1

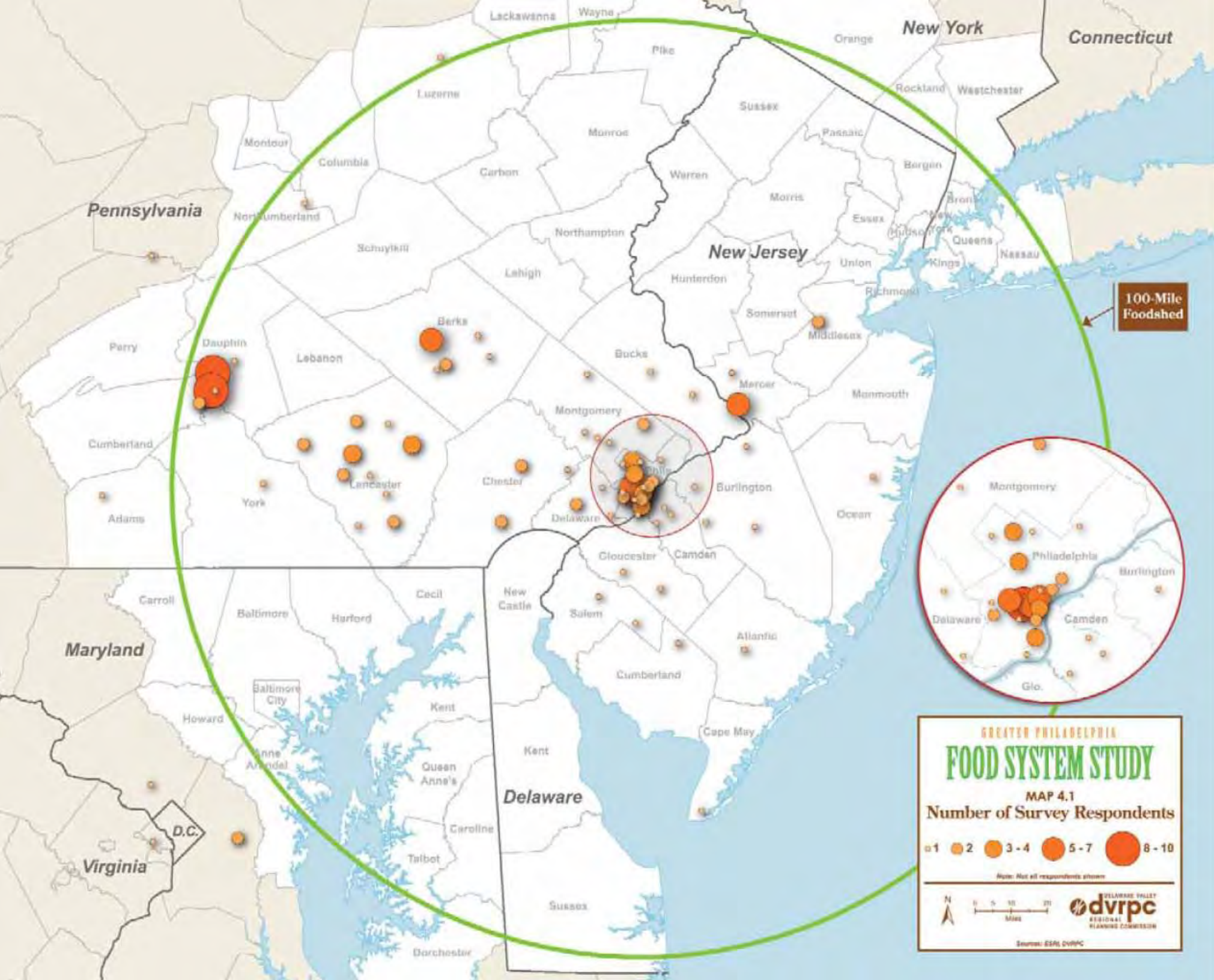
Survey Respondents by Stakeholder Group and Medium



Source DVRPC 2009

over 125 businesses, organizations, initiatives, local governments, local producers, state government programs, and US government programs operating in Greater Philadelphia. The chart demonstrates the scope, mission, and activities of these various entities.

The stakeholder inventory is not comprehensive, as many individuals, businesses, and initiatives are not known to DVRPC despite a yearlong study; nor will the inventory ever really be complete, as individuals, businesses, and initiatives come and go over time.





FARM TO CITY PHILADELPHIA, PA

Founded by long-time local food advocate and planner Bob Pierson in 2000, Farm to City is a for-profit business that advocates for farmers and connects them with consumers and markets.

Farm to City operates 15 grower-only farmers' markets throughout Greater Philadelphia. Staff provide farmers with marketing and logistical support for a nominal market fee.

Farm to City also uses the buying power of Philadelphia residents to support CSA farms by selling and marketing shares on a central website, www.farmtocity.org. This organization's services are especially useful to Amish farms, which do not use modern technology to reach new customers.

The Winter Harvest buying club was created in 2002 as a way for farmers to access local markets during the winter months (and for consumers to continue accessing local products). This past year, the club sold over 450 different items from 35 producers to over 300 members, resulting in \$200,000 in sales.

www.farmtocity.org

Based on the inventory, one can conclude that there is a concentration of activities within different types of entities:

- Much of the technical assistance and research benefiting the Greater Philadelphia food system is conducted by educational institutions and state governments, although nonprofit and professional organizations are also involved in technical assistance.
- Many of the enterprises (generally for-profit businesses, including farmers, distributors, and retailers) engage in some kind of direct marketing.
- Five "initiatives," sponsored by state government, local government, or foundations, were identified as contributing to a community's access to healthy fresh food.
- Nineteen of the 24 nonprofits operating in Greater Philadelphia perform some form of education and outreach.
- Local governments—counties and municipalities—identify the needs of their constituents and offer innovative solutions. In more urbanized communities, some farmers' markets have been started by local governments to support economic development. In more rural counties, special centers or positions have been funded to promote or facilitate new markets for farmers.
- Federal entities have specialized roles, each performing one main activity, from regulation to financing. Both the US Customs and Border Patrol's USDA Inspectors and the US Military's Defense Supply Center have a strong presence in Philadelphia because of the region's specialization in food importing.
- Food Distribution, a significant focus in this study, is mostly undertaken by private enterprises, with a few exceptions. In addition, five nonprofit organizations (Community Action Development Commission of Montgomery County, Red Tomato, Philabundance, The Common Market, and SHARE) and four state entities (New Jersey Department of Agriculture, Pennsylvania Department of Agriculture, the Philadelphia Regional Port Authority, and the South Jersey Port Corporation) are involved in food distribution. Distribution includes local and global products and the use of a range of transportation modes and destinations.

- Many of Greater Philadelphia's agricultural producers have diversified their activities or specialized in direct marketing to capture more value from the food they raise. Examples include opening on-site stores, participating in farmers' markets, processing raw foodstuffs, creating value-added products, and offering delivery services to customers.

Influential Stakeholders in Greater Philadelphia's Food System

As stated previously, the Food System Committee identified the first round of influential individuals and organizations to contact for the stakeholder survey. Staff asked all respondents, "Who else should DVRPC be talking to about these issues?" and compiled the responses to identify influential stakeholders in the Greater Philadelphia Food System. From that first round of interviews, another set of individuals and organizations was identified, and notations were made to identify those individuals or organizations that were mentioned numerous times. Those who were

mentioned repeatedly represent the most "influential" stakeholders, decision-makers, and innovators in Greater Philadelphia. This technique is commonly referred to as the "snowball effect," in that the initial number of stakeholders is small, but the resulting number of stakeholders is large, with major actors identified numerous times by diverse people.

Respondents produced a total of 526 referrals. Profiles of the 13 most referred organizations appear throughout this section. **Figure 4.2: Influential Greater Philadelphia Food System Stakeholders** shows the organizations most commonly referred to in this question. Notably, these influential stakeholders frequently operate at a state or local level, as opposed to a national level.

Like any social research, DVRPC's stakeholder analysis methodology has limitations. First, it is based solely on the perspectives of those who



GREENSGROW FARMS
PHILADELPHIA, PA

Ten years ago, Greengrow's founders wanted to grow food in underutilized spaces in the city. So they rented a previously industrial brownfield in Philadelphia's Kensington neighborhood and grew hydroponically (with water and no soil) for local restaurants. They now engage customers more directly, including a farmstand, nursery, and City Supported Agriculture (CSA) program, combining their production with a network of suppliers within a 75-mile radius. The CSA's 300 plus members, mostly from Philadelphia, receive produce and honey from the farm, supplemented by fruit, poultry, meat, dairy, and other value-added items. There has been so much interest in their CSA, which is currently at capacity, that they are exploring "Greensgrow-style" CSAs at other city locations. Greensgrow has also been recognized for energy innovation / efficiency. The water bill is three times less than the typical owner's home water bill, they make fuel with recycled cooking oil, and they use green roofs on refrigerators to lower temperatures.

www.greengrow.org



JERSEY FRESH

NEW JERSEY DEPARTMENT OF AGRICULTURE

Jersey Fresh became the first state-sponsored agricultural marketing program in the country when it began in 1984.

The program aims to enhance marketing opportunities for farmers, increase consumers' awareness of and preference for Jersey-grown products, and expand opportunities for growers to develop new markets.

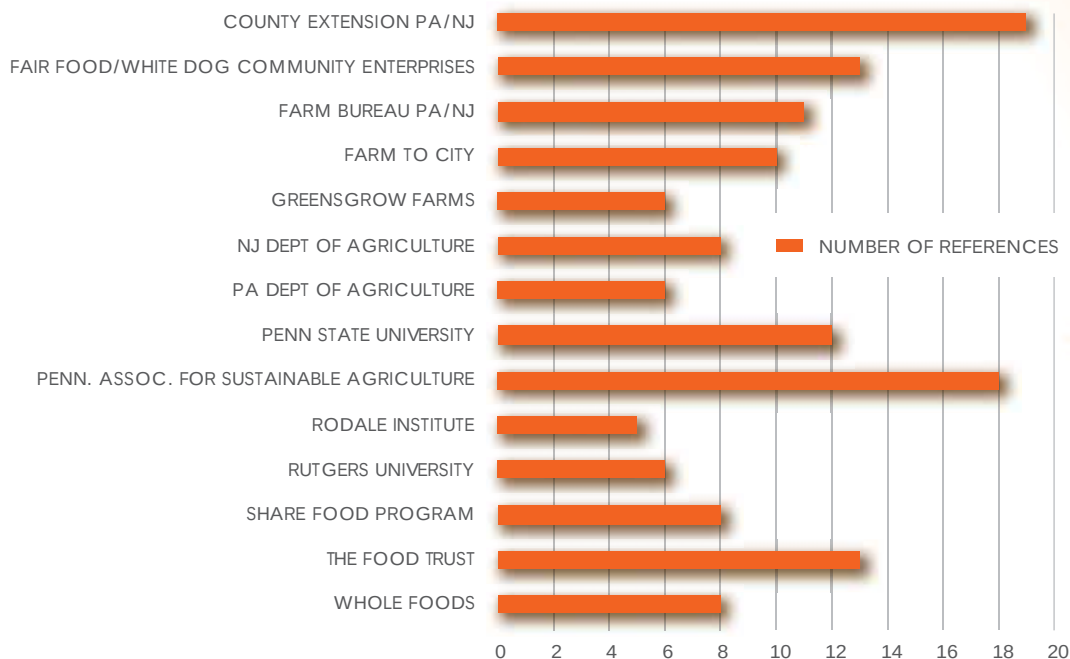
In addition to its longevity, the program is distinguished by its nominal cost of participation, creative distribution methods, and leverage of the private sector for marketing. Agricultural commodity groups can get matching grants for their own marketing ideas. The department delivered point-of-sale materials to over 3,900 outlets in the region.

Since its inception, consumer awareness of New Jersey products has increased from seven to 48%, and studies have shown that each dollar spent on the program generates another \$54 in economic output for the state. Planned expansions include Jersey Fresh Seafood, Jersey Grown (horticultural products), and Jersey Bred (livestock).

www.state.nj.us/jerseyfresh

FIGURE 4.2

Influential Greater Philadelphia Food System Stakeholders



Source: DVRPC 2009

contributed to the survey and cannot include all of the food system's stakeholders. Responses may be skewed and represent more local food and sustainable agriculture advocates than other types of advocates or producers. Second, participants may not have mentioned important

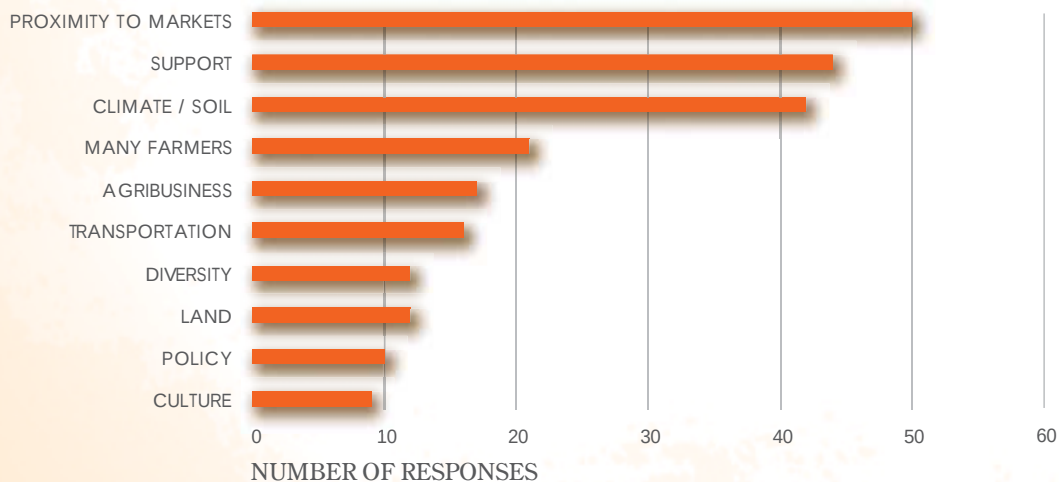
stakeholders for a variety of reasons: perhaps the individual or organization was mentioned earlier in the interview; or the respondent may have assumed that the stakeholder is influential, but would be unavailable for or uninterested in participating in this study.

BIG PICTURE QUESTIONS

The survey findings were instructive and identified a multitude of food system issues that were explored throughout the Greater Philadelphia Food System Study. Participants answered “big picture” open-ended questions, which were designed to solicit recommendations to improve the regional food system, identify best management practices, request possible case study or research topics,

and identify gaps in services or infrastructure. The responses were arranged into recurring themes to better understand frequency and popularity or to reveal trends. Responses were an individual’s perspective and opinion; therefore, there were contradictions among the answers. For example, many of the region’s attributes were considered to be both advantages and disadvantages.

FIGURE 4.3
Top Advantages of the Greater Philadelphia Food System



Source DVRPC 2009



PENNSYLVANIA DEPARTMENT OF AGRICULTURE

According to the Pennsylvania Department of Agriculture (PDA), less than 50% of farmers have an estate plan. PDA tries to address this and other finance issues through the combined efforts of PAGrows and the Center for Farm Transitions.

PAGrows is a financial resource for producers, processors, farmers' markets, and agribusiness within the state, providing information and consultation on accessing capital through various state and federal loan programs. Public financing can be used for a variety of purposes, including capital expenses like land, machinery, and real estate, and can be leveraged with private resources. PAGrows has managed to invest \$80 million and leverage \$174 million in private funds over the past three years.

The Center for Farm Transitions complements PAGrows by assisting farmers transitioning, retiring, or expanding their operations. Planning services include business and financial planning, planning for estate / retirement / succession, asset transfer or acquisition, and directories of farms for sale or buyers. Last year alone it completed 143 business plans for farmers across the Commonwealth.

www.agriculture.state.pa.us



**PENN STATE UNIVERSITY
COOPERATIVE EXTENSION
PENNSYLVANIA STATEWIDE**

The nation's Cooperative Extensions began in 1914, when USDA collaborated with land-grant universities to provide both research support and informal educational opportunities to the public. Originally focused on agriculture and natural resources, services now include family and consumer sciences, youth development, community development, and nutrition and health, among others.

Pennsylvania's Cooperative Extension is housed within Penn State University's College of Agricultural Sciences. It is funded through the USDA, state government, and county governments, operates in all 67 counties, and has six regional offices.

One of the most innovative state-level programs is Shape the Future of Agriculture in Your Community. Programs range from courses for local government officials on zoning and land use to "expanding the market for local foods."

County-level offices also have a variety of programming and services and collaborate with neighboring counties. For example, Lancaster County Extension is pioneering the Center of Excellence in Production Agriculture.

www.aers.psu.edu

Advantages and Opportunities:

What are Greater Philadelphia's greatest food system opportunities or advantages?

Figure 4.3: Top Advantages of the Greater Philadelphia Food System

outlines the top 10 opportunities and advantages identified in the surveys. The top three, "proximity to markets," "support," and "climate / soil," are explained in more detail below.

Proximity to Markets

Proximity to markets was the most commonly referenced opportunity or advantage for Greater Philadelphia, equally cited by small organic farmers, conventional farmers, distributors, food producers, and the Philadelphia Regional Port Authority (PRPA), among other government entities. More than 100 million residents of the

United States are within a 12-hour drive of Philadelphia, including those in Washington, DC, Baltimore, and the growing Carolinas to the south, Chicago to the west, and New York and Boston to the north.⁷⁹ The 12-hour driving radius also includes Toronto and Montreal, the two largest cities in Canada.

Of course, depending on the location within the region, proximity to markets is relative. For example, commercial fisheries on the South Jersey coast did not feel as accessible as places more closely aligned with the I-95 corridor (Boston to Washington). Also, proximity to larger metropolitan markets like New York has a perceived and real but different impact on actors within the food system. For example, the influx of New York buyers can drive up prices at produce auctions in Lancaster County (to the benefit of

⁷⁹Select Greater Philadelphia. "Population and Economic data." Accessed 12 November 2008. www.selectgreaterphiladelphia.com/data/popecondata/population.cfm.

producers but to the disadvantage of local buyers).

Abundance of Support

Support is a broad term that was among both the top three opportunities and challenges. Challenges are addressed later in this section. Many participants feel that they or the food system are well supported by the region's organizations, institutions, and consumers.

Organizations such as the Pennsylvania Association for Sustainable Agriculture (PASA) and the Fair Food Project of White Dog Community Enterprises connect farmers to each other and to new markets and are largely seen as successfully fulfilling important needs of farmers, producers, and consumers. As one respondent described it, "there is a lot of PASA-envy in other states."

Specific support entities mentioned included the respective state universities, Rutgers and Penn State, and more specialized colleges or programs, such as Saint Joseph University's Food Marketing Institute or Delaware Valley College. These institutions usually provide a range of different kinds of support, including technical assistance and education, through county extensions. The institutions also increase awareness of and research into emerging issues relevant to food production, distribution, marketing, safety, and certification.

Participants also referenced local consumers' increased awareness of and interest in where their food comes from, how it is grown, who grows it, and how it gets to them. This awareness and interest is perceived as an increased demand for locally grown fresh foods.



PENNSYLVANIA ASSOCIATION OF SUSTAINABLE AGRICULTURE PENNSYLVANIA STATEWIDE

Since 1992, the Pennsylvania Association for Sustainable Agriculture (PASA) has been building bridges between farmers and consumers so that everyone can have access to fresh, locally and sustainably produced food: from "farm to fork."

As the largest statewide, member-based sustainable farming organization in the United States, PASA seeks to improve the economic viability, environmental soundness, and social responsibility of food and farming systems in Pennsylvania and across the country.

Each year over 2,000 people come together for the Farming for the Future Conference, one of the largest and most respected gatherings on this topic anywhere in the United States. The conference is followed by a full season of Field Days and Intensive Learning Programs delivering practical information on sustainable farming methods.

PASA reaches diverse audiences through statewide coordination of 10 Buy Fresh Buy Local chapters. Locally, PASA's newest regional office is based in Exton, Chester County, and serves members and eaters across Southeastern Pennsylvania.

www.pasafarming.org



RUTGERS UNIVERSITY NEW JERSEY STATE AGRICULTURAL EXPERIMENT STATION

Rutgers University is New Jersey's state land-grant institution, with a yearly enrollment of over 50,000 students on campuses in Camden, New Brunswick, and Newark. The New Jersey Agricultural Experiment Station (NJAES) is a combination of research, outreach, and service centers within Rutgers University. It houses the Cooperative Extension, which is active in all 21 counties, along with 21 other centers, research institutes, and stations throughout the state.

The Food Policy Institute at Rutgers conducts research relevant to the state's decision-makers within the food industry, government, consumers, and academia. Current research focuses on emergency preparedness, farmland tax assessment, and the impact of minimum wage policy on New Jersey's agriculture.

Based in Cumberland County, the Rutgers Food Innovation Center offers a full range of services, including a commercial kitchen and full factory production line, to entrepreneurs and food producers to develop new food products. The center's staff is composed of former food industry practitioners who bring their knowledge of business plan development and market research to New Jersey's agribusiness.

<http://njaes.rutgers.edu>

Climate and Soils

Farmers, nonprofits, advocates, and government officials alike mentioned the region's climate and soils as advantages. First, many parts of the region do not need to irrigate in the same ways or to the same extent as producers in the central and western United States. Second, there are large pockets throughout the region with highly productive soils: Lancaster County, for example, is among the 15 top-producing agricultural counties in market value of commodities produced in the United States, suggesting its soils are an advantage.⁸⁰ The region also has an abundance of soils highly conducive to growing specialty crops, such as blueberries and cranberries, mostly in New Jersey.⁸¹ Third, the relationship between agriculture and climate around the world can be an opportunity for regional producers.

Participants reported that they have found increased market opportunities when weather in other agricultural regions damage agricultural products through floods or drought. New Jersey respondents, in particular, described the state's producers as participating in a "shorts and fills" market for vegetables, supplying purchasers' unforeseen produce needs. However, inclement weather goes both ways, and the foodshed's farmers have also experienced crop failures due to droughts, hail storms, and floods.

There are also challenges associated with the region's climate and soils. The growing season is shorter than some other parts of the country, causing a loss of year-round markets and contracts and a need to reintroduce sellers to local products at the start of the season.

⁸⁰ United States Department of Agriculture, Census of Agriculture 2002, "Ranking of Market Value Products Sold."

⁸¹ New Jersey Natural Resource Conservation Service. Web Soil Survey: www.nj.nrcs.usda.gov/technical/soils/index.html.

Within the remaining top 10 opportunities:

- The phrase “critical mass of farmers” was used by respondents, which means that there is the perception that there are still enough farms in the region to support each other and to utilize supply businesses. This was reported particularly for dairy producers in Pennsylvania and vegetable growers in New Jersey.
- Respondents identified beneficial “policies” as one of Greater Philadelphia’s advantages. Some respondents referred to specific state laws and government-sponsored initiatives, such as Pennsylvania’s raw (unpasteurized) milk permitting and New Jersey’s farmland preservation program.
- Many different respondents identified the region’s unique agricultural “culture” and heritage as a characteristic that has maintained the region’s agricultural industry and encouraged preservation. Many farmers in Pennsylvania and New Jersey have inherited their farms and operations. For the Amish and Mennonite populations in the region, agriculture is an integral part of their communities and ways of life.

- Within the region, respondents had differing opinions regarding overall opportunities and advantages. Pennsylvania respondents more frequently mentioned that they saw strengths in the diversity of crops raised, the state’s raw milk legislation, and the presence of support businesses and other agribusinesses. Respondents in New Jersey were more likely to reference food processing, like Violet Packing, and produce brokerage services, like the Vineland Produce Auction, as advantages.

Disadvantages and Challenges:

What are Greater Philadelphia’s biggest food system challenges?

Similar to the Opportunity Question, respondents identified many challenges in the Greater Philadelphia food system. At the top are “costs,” “regulation,” and “lack of support.”

The top 10 challenges are shown in

Figure 4.4: Top Challenges in the Greater Philadelphia Food System.



SHARE FOOD SYSTEM PHILADELPHIA, PA

A San Diego deacon started the first Self-Help and Resource Exchange (SHARE) program in 1983 to provide affordable food to people and reward community service. SHARE Philadelphia began in 1986, providing affordable food packages to Philadelphia, Delaware, metropolitan New York, New Jersey, and the Eastern Shore of Maryland.

Through SHARE, individuals of all incomes can use credit cards or EBT cards and a promise of two hours of community service to purchase monthly food packages priced below grocery store mark-up. These are distributed by 250 local host sites. Prices stay low thanks to the 2,000 hours that volunteers spend monthly sorting and distributing SHARE food. Seasonally, SHARE provides a “Farm Fresh Package” with produce purchased directly from Lancaster farmers or at auction.

SHARE also administers hunger assistance program funding for 550 Philadelphia County food pantries, has a small educational garden plot on-site, and leases space to the Common Market.

www.sharefoodprogram.org



THE FOOD TRUST PHILADELPHIA, PA

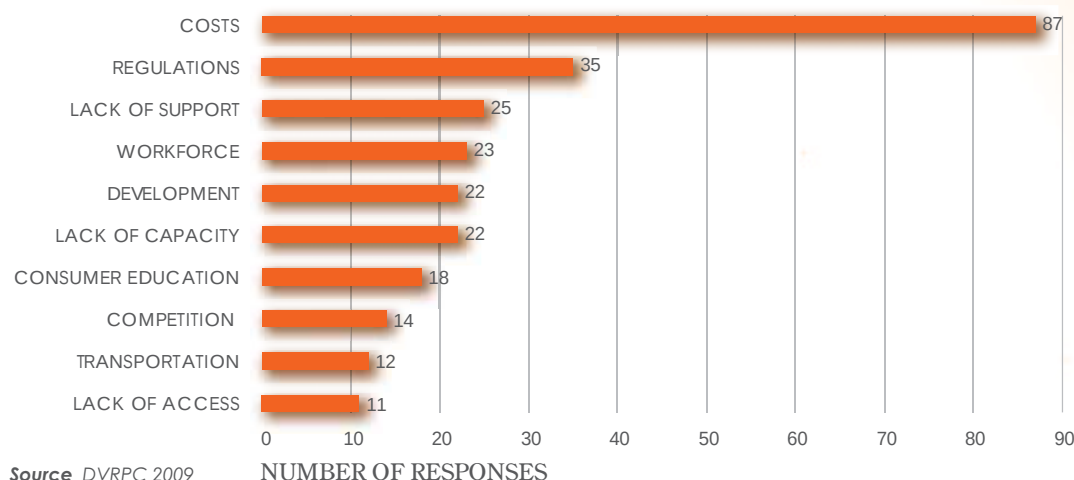
Established in 1992, The Food Trust works directly with schools by providing nutrition education, in communities by managing over 30 farmers' markets, and with businesses by finding innovative solutions to bring healthy food into underserved neighborhoods. The Food Trust complements these efforts with systematic research and evaluation.

In partnership with The Reinvestment Fund and the Greater Philadelphia Urban Affairs Coalition, The Food Trust helps to manage a \$120 million financing initiative, the Pennsylvania Fresh Food Financing Initiative, which provides capital financing for supermarkets and other fresh food retail projects in underserved communities in Pennsylvania. In 2007, this initiative was recognized by Harvard's Kennedy School of Government as one of the "top 15" government innovations in the nation. The Food Trust is working in New Jersey, New York, Illinois, and Louisiana to create similar financing initiatives.

www.thefoodtrust.org

FIGURE 4.4

Top Challenges in the Greater Philadelphia Food System



Cost

Cost, the most common challenge that participants cited in the survey, impacts producers, consumers, and everyone in between. As many reports and popular media articles have noted,⁸² food prices are on the rise across the country. While seemingly bad for the consumer, rising food prices are not usually bad for the

producer and are often welcomed as a sign of increased profitability and viability of the industry. However, if expenses, such as feed or fertilizer, rise as quickly as or faster than consumer prices, the producer loses any gains in profitability. Many participants perceived that an increase in consumer prices did not outweigh the increase in producer expenses.

⁸² Golan, Elise. "Can Low-Income Americans Afford a Healthy Diet?" *Amber Waves*, November 2008.

The costs associated with land were seen as significant challenges in the metropolitan area. This challenge is exacerbated for new and beginning farmers. Slightly more New Jersey respondents reported this as a challenge. In fact, because of high land prices, many farmers in New Jersey rely on renting land. In 2004, 36%⁸³ of all New Jersey farmers rented a portion of the land that they farmed, as compared to 31% of all American farmers.⁸⁴ Property taxes can also affect the affordability of land owned outright by a farmer. While both states offer farmland assessment, New Jersey's property taxes are the highest in the nation,⁸⁵ suggesting that property taxes for New Jersey farmers are likely to be among the highest in the nation.⁸⁶

⁸³ New Jersey State Agricultural Development Commission, "Farmland Affordability Report," 2004 (unpublished).

⁸⁴ National Agricultural Statistics Service, USDA. "2007 Census of Agriculture: Demographics." Released February 2009.

⁸⁵ The Tax Foundation, "The Facts on New Jersey's Tax Climate." Accessed 22 October 2008. www.taxfoundation.org/research/topic/44.html.

⁸⁶ Due to public controversy, New Jersey's farmland assessment rules may drastically change to avoid situations of abuse by wealthy nonfarming landowners. Under a bill pending in the New Jersey Senate, the minimum yearly income derived from the sale of agricultural products needed to qualify for the reduced tax rate will be increased from \$500 (established in 1964) to \$1,000.

A quick calculation using USDA's 2007 Census of Agriculture of reported property taxes paid and total land in farms shows that New Jersey has the second-highest property tax paid per acre, exceeded only by Rhode Island. Rising costs and difficulty accessing land often results in an "impermanence syndrome"—a farmer's hesitance to make investments in his farming operation due to uncertainty about long-term profitability, viability, and availability of agricultural land in a given geographic area. Like any idea, it can become a self-fulfilling prophecy and could lead to farmers selling land prematurely, despite positive market conditions.

Overall, the issue of prices and costs underscores two important points:



WHOLE FOODS MARKET LOCAL PRODUCER INITIATIVES MID-ATLANTIC, UNITED STATES

Whole Foods Market has regional distribution centers throughout the country that coordinate buying and implement initiatives. The Mid-Atlantic Warehouse is located in Landover, Maryland, and services eight stores in the Philadelphia area.

Local purchasing has always been a part of the Whole Foods model, but its success has varied depending on regional differences in growing conditions and priorities. Regional centers are increasingly emphasizing store purchasing, loans to producers, and the provision of space for producer-only farmers' markets.

Local is defined by the regional center and for the Mid-Atlantic as food from as close as possible, but preferably from the East Coast. There are quality standards for product and an emphasis on sustainable production. Organic certification is encouraged but not required. Bigger orders and vendors can deliver to the warehouse, but individual stores have the option of direct-to-store delivery by producers. There are also some larger producers in the region who are nationally recognized suppliers for the chain.

www.wholefoodsmarket.com

1) farming is a business and must be successful as such if agriculture is to be a viable and reasonable land use in the future; and 2) consumers and producers have drastically different reactions to rising food prices (disregarding expenses), which demonstrates a conflict of interests among food system stakeholders. Namely, what is best for one group or individual may not be best for the other.

Regardless of one's side in the supply-and-demand equation, costs and prices are affecting all stakeholders in the food system. Distributors were another respondent group that cited costs as a challenge. Rising fuel and transportation costs are causing distribution companies to think critically about current business models and customer locations. Several spoke about a new emphasis on streamlining deliveries and lowering storage costs by employing

backhauling and cross-docking.

Backhauling is the shipment of a filled container back over a route that the truck has already traveled.

Backhauling minimizes empty trucks on the roadway and increases revenue by finding deliveries to make on return routes. Cross-docking minimizes storage costs by transferring goods directly from one truck to another, or from rail to truck, bypassing the need to pay for warehouse storage.

Additionally, many distributors are using software systems to assess the cost and efficiency of clients' locations and transportation routes.

During the survey in July 2008, diesel fuel cost \$4.75 a gallon. In January 2009, diesel fuel cost \$2.75 per gallon. If fuel prices increase, more purchasers and distributors may seek sources closer to home. One survey participant described it as an opportunity to "substitute freshness for fuel."

Regulations

Challenges regarding regulations fell into three categories: 1) state and local government regulations; 2) third-party audit / food safety; and 3) nationwide regulations pertaining to seafood management.

Respondents who cited state and local government regulations as challenges referenced zoning, taxes, and water allocation (mostly in New Jersey). Zoning for agriculture can be a challenge if it is too restrictive or lacking. Respondents see restrictive zoning and other ordinances as issues in rural and suburban communities throughout Pennsylvania and New Jersey. Driven by the request of new residents and some environmental groups, local governments in rapidly developing municipalities may pass restrictions to regulate noises, smells, activities, and the use of farm vehicles on roads, although both states have "right to farm" laws that mediate the

conflicts between farmers and local residents. Additionally, some farms or facilities are located in more than one jurisdiction, resulting in increased time and expense for approval of design and building proposals in compliance with suburban zoning.

The lack of favorable zoning or permitted use is certainly a challenge in urban areas. As of January 2009, the City of Philadelphia does not allow urban agriculture as a permitted use, though the administration is amenable to and working on significant zoning changes. An urban agriculture zoning designation overlay may allow for more urban farms to operate and protect the owners / operators from real estate speculation. Other municipalities lack zoning that permits community farmers' markets, farm stores, or roadside stands.

Food Safety

Food safety is an increasingly important topic, as instances of food-borne illnesses and food allergies increase across the country. According to the Centers for Disease Control and Prevention, 76 million people nationally suffer from food-borne illnesses each year, with 300,000 hospitalizations and 5,000 deaths. The underreporting of food-related illness due to variations in symptoms and severity means the problem might be more prevalent.

Regulation and prevention is complicated by the globalization and industrialization of food, making it harder to trace food products or ingredients to the source of contamination, and by the straddled jurisdiction between the Food and Drug Administration (FDA), the United States Department of Agriculture, and state Departments of Agriculture.

President Obama recently established a Food Safety Working Group to bring internal and external government actors together to collaborate and has allocated money to state and local agencies for increased inspection. Current draft legislation in the House of Representatives would increase the authority of the FDA and the responsibility of producers to register and certify. At the state level, New Jersey has formed a Produce Food Safety Task Force for more effective regulation and coordination, and Pennsylvania has frequent updates on its website about inspections, regulations, and current recalls and alerts.

Some critics of these food safety measures juxtapose “safe food” with “good food” and argue that increased restrictions disproportionately burden smaller producers who sell directly or through “identity-preserved channels”— meaning they clearly label products with their name, creating more traceability. Others argue that it creates the false assumption that the food system can ever be entirely risk free. And still others suggest that food-borne illnesses are usually the result of one improperly preparing food, usually for oneself.

Water regulation is a significant issue in New Jersey. Several participants argue that there is not enough coordination between the state Department of Agriculture (a supportive entity) and the Department of Environmental Protection (a regulatory agency) regarding permitting and, in particular, water allocation. Some farmers suggested that farms should receive priority for water allocation permits over nonfarm applications. Additionally, preserved farmland could have a water allocation permit by right. During the survey process, Department of Agriculture (NJDA) staff specifically mentioned increasing coordination and collaboration with the Department of Environmental Protection (NJDEP) on natural resource issues, such as water and soil conservation.

Another regulatory challenge is market regulation in the form of food safety or “third party” audits. Large buyers and grocery store chains are increasingly

requiring these audits, also called Good Agricultural Practices (GAP) or Good Handling Practices (GHP), in response to increasing food safety concerns. While the audits address a justifiable concern and include many practices that producers should be doing already, the challenge arises when the requirements do not realistically or effectively address the causes of food safety scares or do not adapt to different scales or types of production. For example, GAP may prohibit crop production areas adjacent to livestock. Amish farmers, or other farmers practicing certain organic production methods, may not be able to comply with this requirement given their reliance on animal power and manure. The producer may have increased costs from the auditing process, but may not receive higher compensation for certified products. If audits are burdensome, producers cannot participate in a large market, and viability is threatened.



The County Barn Farm in Lancaster County, Pennsylvania

PHOTO CREDIT: BECKY SWEGER

Through the surveying process, DVRPC discovered that aquaculture, which includes both the farming and harvesting of saltwater and freshwater organisms, is extremely regulated for many good reasons. Although interviews and surveys did not reach a large or representative number of people involved in the seafood industry, interviews did reveal that heavy regulation affects producers, consumers, and the industry at large. In brief, seafood regulation includes national management plans, councils, and permits for different species of fish, crustaceans, and mollusks, with a “days at sea” allotment corresponding

to geographic areas. However, these regulations, while appearing onerous, can be beneficial. For example, the federal Scallop Fishery Management Plan identifies areas that are “open” to fishing and those that are “closed.” These designations alternate by season based on input from scientists, regulators, and industry representatives. Fishing boats need permits to enter the open area and have a maximum amount of seafood that they can catch or harvest. The Scallop Management Plan is considered a successful model because it incorporates input from industry and has resulted in increased yields per trip, while preventing over-fishing.

Nonetheless, domestic seafood regulation increases the cost of operating a local business. Many commercial fisheries attend or hire legal representation to sit on management councils. They also need to comply with ship and harvesting

regulations and are not allowed to combine permits for different species on one boat in a single trip, which would reduce overhead costs like fuel and maintenance. All of these costs negatively impact domestic producers’ competitiveness in a global market of unregulated international harvesters.

Lack of Support

The last challenge to be discussed in detail is lack of support. Interestingly, the abundance of support is also considered to be a top opportunity by some respondents (see previous Opportunities section on support). The perceived lack of support is equated with the absence of agriculture or food-related support businesses, technical assistance for urban producers, and political support, in general.

Participants felt that there were not enough processors and support businesses in Greater Philadelphia,

especially those support businesses that can accommodate small to medium-size producers looking to access local, direct, or niche markets.

A recent study by the Center for Rural Pennsylvania discovered that while the state has the second-largest number of meat and poultry processing facilities (over 400 federally inspected facilities), it is losing a sizable amount of facilities each year.⁸⁷ Additionally, processors and manufacturers may not be dependent on or connected to producers in the Greater Philadelphia 100-Mile Foodshed, sourcing products from outside the region because of volume or seasonality needs.

Respondents who consider themselves to be urban producers cited a lack of technical assistance for urban production. Specifically, participants stated that there is a lack of technical assistance for growing food in urban areas provided by traditional assistance conduits, like County Cooperative Extension agents.

⁸⁷ Henning, William. “An Examination of Pennsylvania’s Meat and Poultry Processing Industry.” The Center for Rural Pennsylvania, July 2007.

A nearly universal challenge mentioned was the lack of knowledge to connect producers (in urban and rural areas) to more direct markets in urban areas. Fortunately, Philadelphia County's extension offices and other organizations have also identified these needs and are building capacity to address urban producers' unique challenges. Other extension offices and state departments of agriculture are actively working on the connections between rural producers and urban markets.

Lack of political support is related to right-to-farm issues mentioned earlier, but also to the decreasing number of local and state officials who have farming backgrounds and understand agriculture and food issues. This may mean that farmers and representative organizations have to use more time, energy, and resources to educate policymakers, evaluate proposed policy impacts, and provide testimony.

Numerous respondents in both New Jersey and Pennsylvania used the example of New Jersey Governor John Corzine's controversial proposal to disband the state's Department of Agriculture as evidence of a lack of political support. It is important to note that there are strong agricultural interests represented in state politics, sometimes referred to as the "cow lobby." These special interest groups usually represent corporate, large-scale agriculture rather than family farmers.

Other identified challenges include:

- "Workforce" as related to federal immigration policy. Some respondents expressed a need to create a guest worker program, which would allow US employers to hire non-US citizens as laborers for a specified time period (for example, three years) as soon as possible. While this topic is a federal issue and not within the purview of the Greater Philadelphia food system study, it carries important implications and consequences for local actors.

- Respondents mentioned internal issues among businesses, such as a lack of storage space.
- Others mentioned understaffing at the US Customs and Border Patrol and other regulatory agencies.
- Food producers (which include farmers, seafood harvesters, processors, and manufacturers) cited "price competition" between other producers regionally, nationally, and globally as a major challenge.
- The phrase "lack of access" was used by respondents to refer to a consumer's access to affordable and healthy food (also referred to as food security or insecurity).

Based on anecdotal observations, Pennsylvanians seemed to be more optimistic about the future of food production in the region and state. In New Jersey, respondents who are farmers were more pessimistic about the future of food production, given challenges like water allocation and access to and affordability of both farmland and preserved farmland.

Changes:

What are the biggest changes to the food and agricultural industry that you have witnessed in this area in the past five to 10 years?

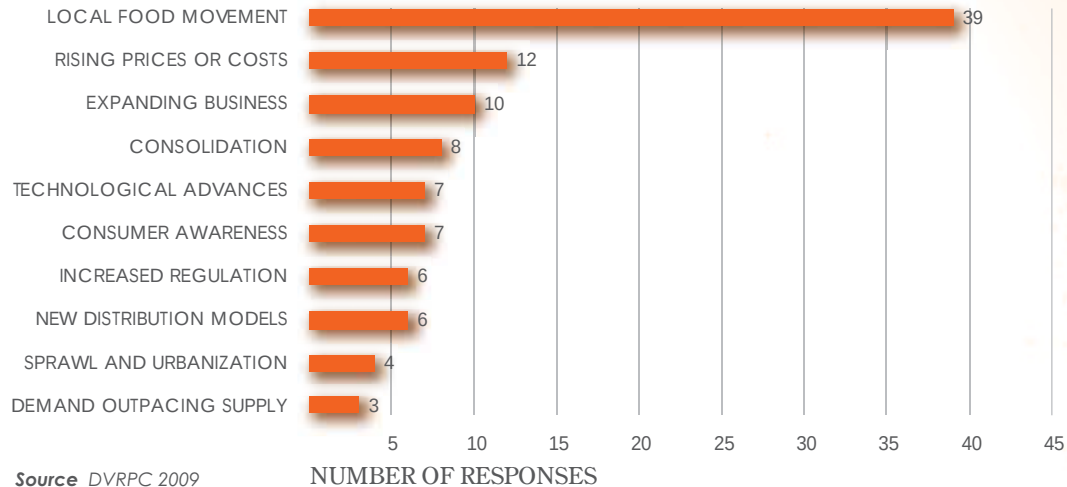
Survey respondents cited a multitude of positive and negative changes and identified promising trends in the Greater Philadelphia food system. Rising to the top are “the local food movement,” “rising food costs,” and “expanding businesses.” The top 10 changes or trends are shown in **Figure 4.5: Biggest Changes in the Greater Philadelphia Food System.**

The Local Food Movement

Many respondents reported that the biggest change in the region is the awareness of local food. Consumers want to know where their food comes from and how it was grown. Buying locally, or even directly from the producer, enables that awareness for consumers. As a result, there have been increases in the number of farmers’

FIGURE 4.5

Biggest Changes in the Greater Philadelphia Food System



markets, applications for raw milk licenses in Pennsylvania (one of the few states that have legalized raw milk), and community-supported agriculture (CSA) operations.

Many more producers are specializing in niche products, like mushrooms, heirloom tomatoes, “ethnic” vegetables like bok choy, raw milk, and value-added items like salsa and wines.

The recognition of ethnic products, in particular, may be reflective of the

changing consumer demographics in Greater Philadelphia, but it may also reflect all consumers’ interest in varying one’s diet and experimenting with recipes. Additionally, many respondents noted that this local food movement has positive impacts on other areas in the food system, such as processing, distribution, full-service restaurants, and retailing. Some respondents pointed out that because of the rapid growth of the local food movement, demand for local food may currently outweigh local food supply.



Honey Brook Organic Farm in Mercer County, New Jersey

PHOTO CREDIT: LAURA PEDRICK

Mercer County, New Jersey, is home to one of the largest and most successful community-supported agriculture (CSA) farms in the United States. Honey Brook Organic Farm in Pennington offers 2,300 shares and grows food on 90 acres, leased through the Stony Brook-Millstone Watershed Association.

For example, almost all of the CSA farms who participated in the study were at capacity with a waiting list. Many direct market farmers stated that they attend as many farmers' markets as possible, but it seems like each neighborhood or municipality wants its own market.

Some respondents also mentioned that there is a possible tension within the farming community between the small-to-medium farms that currently serve the local / direct market and larger farmers geared toward wholesale for processing and exporting. Specifically, larger farms and industry representatives believe that large-scale production methods are necessary to feed the entire metropolitan population and are disconcerted by perceived hostility from smaller producers.

Rising Food Prices

The second most frequently mentioned change is rising food prices. This change was observed by all stakeholder groups. Organizations working with lower-income communities are witnessing increasing demand for affordable food and emergency food assistance. Rising prices and an economic downturn doubly impact antihunger organizations because donations go down while demand goes up.

The increase in food prices can be tied to the increase of gas and oil prices. Again, the stakeholder survey was administered in the summer of 2008, during a time when gas had nearly doubled in price in one year, although it subsequently stabilized in December 2008. In August 2009, retail gasoline is 30% less expensive than in August 2008.⁸⁸

⁸⁸ US Department of Energy. "Weekly US Retail Gasoline Prices, Regular Grade." www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html. Accessed 21 August 2009.

Expanding Business

Another frequent change or trend is the increased opportunity to expand one's business. Possibly connected to the public's increased interest in local agriculture and growing practices, many processors and distributors that contributed to the study have recently moved to larger facilities, invested in new technology, or reduced costs by diversifying. Four Seasons Produce, a produce distribution company in Lancaster County, opened a new 262,000 square foot warehouse in 2004 that was recently awarded an Energy Star award for energy efficiency, the first awarded to a refrigerated warehouse. Similarly, both Mullica Hill Cold Storage Group in New Jersey, and Lancaster Farm Fresh Cooperative opened new facilities to accommodate growing business.

Other changes identified include:

- Consolidation of farms, food producers, and distributors.

- The emergence of “new distribution models,” like Philadelphia’s The Common Market, or producers forming distribution cooperatives, such as the Lancaster Farm Fresh Cooperative.
- Growing consumer awareness connected with a growing interest in local food.

Recommendations:

How could agencies, local governments, and citizens better support the food system?

One of the major purposes of DVRPC’s surveying effort was to solicit, from a variety of stakeholders, recommendations to improve the food system. Depending on the stakeholder group, the recommendation question was worded slightly differently, but it was asked of everyone. Over 250 recommendations were collected and grouped into broad categories. Suggested recommendations ranged from market changes to government interventions.

Lancaster Farm Fresh Cooperative is a farmer-owned cooperative serving individuals and organizations in the Lancaster and southeastern Pennsylvania areas through wholesale deliveries and community-supported agriculture. In 2008, its third growing season, there were 22 farms in the cooperative, consisting of mostly Amish and Mennonite families who are committed to growing sustainably. In 2007, Lancaster Farm Fresh generated over \$1 million in sales for the farms in their cooperative. Business increased so quickly that they outgrew their warehouse and moved to a new facility in Leola, Pennsylvania, in August 2008.

Figure 4.6: Top Recommendations Categories for the Greater Philadelphia Food System

The **Philadelphia Food System** shows the top eight recommendation categories. Not surprisingly, these recommendations mirror the food system's opportunities and challenges discussed in previous sections.

Innovations and Infrastructure

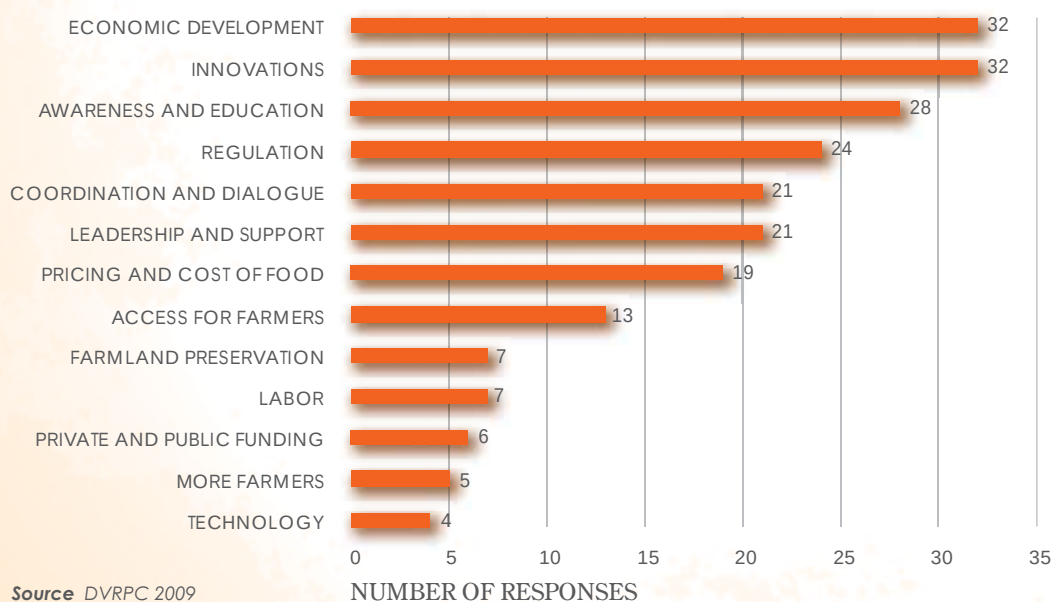
Thirty-two recommendations consisted of "innovations." Recommendations in

this category included developing new ways to connect different stakeholders in the food system or utilizing science and technology to change the way that knowledge is communicated. In regard to food production, respondents suggested that the region support processing and value-added activities. Institutional and commercial kitchens are needed to process local food for different markets. There was also a call

for more processors, especially meat and custom-feed processors of the size and capacity to accommodate small or medium producers, with occasional large orders.

Recommendations for new technology were also grouped under innovation. Several respondents identified a need for computer software that tracks and coordinates food distribution, and one suggested a system that connects trucks on the road with inventory in warehouses and demand at retail locations, minimizing the time that food is stored in a warehouse. Another respondent suggested an online auction block for seafood sales to increase transparency and connections between consumer and harvester. Other respondents suggested that a government entity or financial institution facilitate cost-sharing investments between farmers to bring innovative equipment and techniques to local farms. An auto-steer tractor was cited as an example of a

FIGURE 4.6
Top Recommendations Categories for the Greater Philadelphia Food System



technological advancement that adds workforce capacity because it requires less skill to operate and enhances productivity by more efficiently spacing and planting seed.

The third type of recommended innovation involved distribution and transportation infrastructure. The Common Market, a wholesale distributor of local food to larger regional and institutional buyers, is a model that many participants not only knew about, but also were impressed by and wanted to see grow larger or be replicated in other parts of the 100-Mile Foodshed. Many see The Common Market as playing a consolidation role integral to scaling up local food production for larger scale distribution.

Seafood harvesters specifically recommended that New Jersey invest in bridge repairs and other road improvements to access remote parts of the state's coastline. Port stakeholders recommended that investments should be made in improving inland and intermodal

transportation connections to ensure that highly perishable food products are transported quickly to processors, retailers, and other distributors.



Local heirloom tomatoes at Philadelphia's Headhouse Farmers Market

PHOTO CREDIT: MARISA MCCLELLAN

New Markets and Economic Development

Similar to innovations, 32 recommendations were grouped into “economic development.” New market recommendations included the development of local purchasing policies by larger corporations, institutions, and local and state governments, and the designation of a local section in the new Produce Terminal in Philadelphia. An

underlying theme within this category is the recognition that farming and food-related enterprises must be considered businesses and be provided the same support and resources, such as financing, business planning, and management training, received by other industries or businesses.

Awareness and Education

Consumer awareness is closely related to the development of new markets. New business opportunities, like niche products and farmers' markets, are advanced by consumer awareness. Technology can provide a medium to educate consumers. Specific consumer education topics include: a) the true cost to produce and distribute food; b) the “value” of local food; c) nutrition and food preparation; and d) the tradeoffs between different food production methods and distribution models.

Regulation and Incentives

While some respondents called for more government action through education, marketing programs, purchasing

The Pennsylvania Farm Bureau works with the Pennsylvania Department of Environmental Protection on a farmer-to-farmer mentoring program to ensure compliance with environmental regulations. They also give DEP farm tours to increase mutual understanding.

- Pennsylvania Farm Bureau

policies, and market development, other respondents cautioned that the government should not intervene at all, or only to “level the playing field” by removing incentives. Federal Farm Bill commodity subsidies, are one example of a subsidy that many participants perceived as disproportionately benefiting producers in other parts of the country, namely large-scale Midwest producers. The most recent Farm Bill, passed in the summer of 2008, has some new provisions for fruit and vegetable growers, which could better support Greater Philadelphia’s growers.

Another recommendation was to standardize interstate regulations and labeling laws. For example, some parts of Pennsylvania are regulated by federal and state milk marketing orders, which set minimum and maximum prices, while others are only regulated by state milk marketing orders, which means that they have only one set of regulation requirements to meet.

Other respondents suggested zoning changes that improve food access, encourage production in urban areas, and minimize right-to-farm issues with new neighbors in rural areas.

Commercial fisheries specifically referenced “capacity reduction” and suggested that fisheries be allowed to combine permits for different fish on one boat to save on fuel and capital costs. They also suggested that boats be allowed to transfer a fishing permit to another boat if the permitted boat is damaged.

Leadership and Support

Respondents suggested 21 recommendations that can be categorized as leadership and support. Some recommendations suggested that local and state governments should show leadership and support of local food producers by purchasing more from the region. Other recommendations suggested that elected officials be educated on what farming means and how it is affected by public policy, such as zoning and safety regulations.

Some participants, specifically farmers, also wanted to minimize competing with nonprofit farms for market share, citing the perception that nonprofits can sell products at a reduced rate. Many nonprofit farms have a central mission to educate people about farming practice, yet some respondents commented that such focus may erode the emphasis on farming as a business. Other respondents suggested that nonprofits provide more specialized services, like legal assistance for tenant farmers or writing assistance for grants, loans, and business planning.

Coordination and Dialogue

Another 21 recommendations were made regarding increased coordination and dialogue among different stakeholders. One respondent suggested that NJDA and NJDEP adopt the same definitions and regulations for water allocation and tie water allocation permits to preserved farmland, further insuring the farming operation's long-term viability. Another

respondent suggested the creation of a Food Policy Council or advisory board that connects multiple food system stakeholders on an ongoing basis to talk about policies and issues in the food system. The City of Philadelphia has recognized the need for a city food policy council and adopted a landmark Food Charter in October 2008; the council is in formation.

Similarly, an online clearinghouse, or another form of coordinated information-sharing, could be created. Citing the increase in farmers' markets across the region, a respondent recommended that an agency or organization undertake regional strategic planning for farmers' markets to ensure success. This type of coordination is ongoing within two Philadelphia-based organizations. Currently, The Food Trust coordinates the locations and hours of operation for its 30 farmers' markets, while Farm to City coordinates 15 markets located in and around Philadelphia.

Another idea was to create a regional "local Philly" brand, in addition to the successful Jersey Fresh and PA Preferred brands, and facilitate distribution. This, too, is undertaken to a large extent by a multitude of organizations and collaborative initiatives, including City Harvest, The Common Market, and Buy Fresh Buy Local.

Models:

What are some programs, policies, or initiatives from outside of the region that impress you?

While Greater Philadelphia is recognized as a leader and innovator in food system initiatives, more can be learned from other places. Survey participants were asked to identify best management practices (BMPs). They were categorized into the following themes: collaborations; transportation; financing and resources; community enterprises or community food security; government / publicly funded support; new markets; farm to

school; and education, training, and technical assistance. Study Committee members narrowed down the suggestions by voting at a Stakeholder Committee meeting, resulting in six BMP case studies included in **Appendix J: Best Management Practices**.

Additional Research:

What would you like to know about this region's food system?

Another purpose of the food system study is to identify missing information, data, or services that may benefit the region's stakeholders. Over 100 research questions or requested data points were generated (they are provided in more detail in **Appendix G: Identified Research and Service Gaps**). These results will inform and shape subsequent parts of this study, and could be a resource for other researchers. **Figure 4.7: Identified Research Gaps in the Greater Philadelphia Food System** outlines the top 10 categories of missing data or research.

FIGURE 4.7
Identified Research Gaps in the Greater Philadelphia Food System



Scaling up local

Respondents wanted to know more about the changes needed to introduce local food to larger food systems, such as institutional buyers and supermarket chains. They also wondered about the current amount of local and regional food produced, consumed, and sold in rural and suburban places. If local demand is increasing, what is needed to meet that

demand? Finally, there was a fundamental question about what the local landscape and agricultural industry would look like if scaled up.

Land availability and capacity

Without a local supply of land, the region cannot have a local supply of food. Many respondents wanted to know more about land availability and where the most

viable and productive land areas are located in the region. Other respondents asked questions such as, “Is there enough arable land in the 100-Mile Foodshed to feed the Philadelphia metropolitan area?” and “How does seasonality affect the local food supply?”

Another related question is “What are the costs associated with converting land to agricultural use?”

Finally, for urban areas, questions were raised about the availability of vacant land for community agriculture and the possibility of farming on public land, such as parts of Fairmount Park. Several respondents specifically asked if the City of Philadelphia maintained an inventory of vacant land or publicly owned land.

Related to the question of how much land it would take to feed Greater Philadelphia is the question, “How much locally produced food is consumed within the region.” In urban and underserved areas, like Camden City and Chester City, there is little known by the local residents about where

consumers should go to purchase fresh and healthy food. Several survey respondents suggested that DVRPC’s study create specific charts and maps inventorying local food producers, retailers, restaurants, and other food system agents. Some of these maps are in **Part 1: Agricultural Resources** and **Part 3: The Food Economy**.

Distribution

Distribution is one of the least well-known and understood components of the food system, although many people are involved in distributing food. Several respondents wanted information on where and how businesses receive products, and if one can identify hubs, or whether there is logic to concentrations within the current system. This type of information is very challenging to collect due to how complicated the food distribution system is. As one person explained, “How can you [accurately] account for the distribution of [local] milk when some of it is sent out of state and re-imported as butter?”



Delaware Avenue Distribution Center, Philadelphia

PHOTO CREDIT: DVRPC

Related to distribution is understanding or improving procurement policies. The average food system stakeholder has little knowledge of how large entities like governments, institutions, and corporations buy large amounts of food. Additionally, many of these large entities have streamlined how many contracts they maintain and when food is delivered. Several small producers identified meeting their buyers’ needs as a challenge. Some local governments find developing procurement policies to be a challenge and an inefficient use of staff time.

Farmland Preservation

Many survey participants wanted to know how farmland preservation and open space protection support the region's farming and food system.

"Are farms that produce food for people being preserved?" "What types of farms are currently preserved?" "Why are some vegetable growers hesitant to preserve their land?"

Several respondents suggested that "an audit" be conducted to determine if farmland preservation programs are preserving more land that grows food for people or just more "gentleman farms"- properties which a person may farm as a hobby or for pleasure, but which are not generating large amounts of income. Other questions that could be answered in a farmland preservation audit are: "Is the best farmland being preserved?;" "How is the program supporting the farmer?;"

"Are there innovative ways to fund preservation;" "Are there other ways to keep land in agricultural use rather than remove its development rights;" and "Do farmland preservation programs create artificial price increases in the real estate market for both farmers and homebuyers?"

Burlington County's farmland preservation program, one of the first preservation programs in the United States, has struggled with some of these questions. The county has preserved over 21,600 acres from 1985 to 2007, constituting about 25% of its active agricultural land.⁸⁹ The county estimates that it will reach its goal of preserving 70,000 acres in the next 10 years, and at that time, the program will shift from a preservation program to an agricultural development and viability program.

Low-income and healthy food access

Survey respondents revealed the competing challenges between providing local foods that are affordable and ensuring that the farmer receive a reasonable price for the product. Many participants suggested that future studies look closer at the economic (and community) development potential of federal food assistance programs like Supplemental Nutrition Assistance Program (SNAP) and the Farmers' Market Nutrition Program. The surveying effort revealed that many organizations are undertaking specific efforts to marry local production with food access. The SHARE Food Program and the Pennsylvania Horticultural Society's Philadelphia Green program have matched up food banks with local gardeners to provide food to needy Philadelphians in a project called City Harvest.

⁸⁹ According to DVRPC's 2005 Land Use file, Burlington County had 77,009 acres of agricultural land and 6,886 acres of agricultural wetlands or bogs.

A larger challenge facing Greater Philadelphia is determining how the region maximizes the overlapping benefits between health, affordability, and local food producers.

Clearinghouse

Although many researchers and organizations based in the region and throughout the country are conducting studies, publishing information, and producing results, most respondents expressed the need for consolidation and interpretation of data or enhanced accessibility to information. For example, an online clearinghouse tailored for Greater Philadelphia food system stakeholders could list farmer training programs or collate county health codes for food handling.

Definitions

Two of the more basic unresolved issues are 1) a definition of local food, and 2) an agreement on the most important components of “local” food production values, such as

interpersonal relationships, healthy food, energy conservation, land conservation, worker treatment, and local economy support.

Some survey respondents were confused as to the roles of organizations within the food system. For example, “What is the role of a land grant university in the food system?”

Food prices

Given the challenges of rising food prices and production costs, many survey respondents wanted to know more about Greater Philadelphia’s food economy in regard to the global food economy (“How are prices of food produced in Pennsylvania affected by prices of food produced in China?”). Other respondents are uncertain as to why production costs and food prices have dramatically increased in the last two to three years.

Some farmers interviewed for this study were curious as to the costs of

different production methods, and specifically wanted to know “Are there ways to reduce transitioning costs [associated with transition from conventional to certified organic or from wholesale to direct-to-market]?”

SUMMARY

As can be expected in any surveying effort, respondents’ opinions are somewhat conflicting and contradictory. These contradictions reflect the diversity of stakeholders engaged in the surveying effort, as well as the different mediums used to gather the opinions—in-person interviews, phone interviews, tours, roundtable conversations, and online surveys.

DVRPC identified the following contradictions, perceptions and observations:

- Respondents perceive an increased consolidation of farms, although there appears to be more people interested in farming as a profession;

- There is increasing demand for local food, but a loss of food production in the foodshed;
- There is increasing collaboration between farms, but increasing tensions between farmers using different methods;
- Farmers are making less money, while food prices rise; and
- Some respondents think that increased local food production will decrease the price of food, but local food often commands a higher price paid by more affluent buyers.

Some of these conflicting perceptions were explored in **Part 1: Agricultural Resources**.

There are many individuals, organizations, and businesses involved in various components of the Greater Philadelphia Food System, making this region rich in resources and expertise. Food system activities vary widely. There are differences in approach and variation by state, and within urban and rural contexts. For example, in urban areas, non-profits and local

governments start farmers markets' as an economic development tool or to increase a neighborhood's food access.

In more rural areas, public entities fund positions to find new and more profitable "markets" (buyers) for farmers.

Greater Philadelphia's diverse stakeholders had a range of perspectives on opportunities, challenges, and trends. Greater Philadelphia benefits from its proximity to major markets, the support of the region's institutions, educated consumers and professional organizations, and the fertile climate and soils. However, the region is not immune to rising production costs and regulatory issues related to food safety, water access, and the right to farm. Producers perceive a lack of support businesses and diminishing political support from local governments or new neighbors in suburbanizing areas. The strongest emerging market is perceived to be local, direct, and niche markets. Those businesses that are

serving these emerging markets are thriving and expanding their operations.

Many compelling suggestions were raised for changing the region's food system. Innovations in connecting stakeholders in the food system using new technologies could be useful. Farming and food-related enterprises could be incorporated more completely in economic and new-market development. Regulation can be coordinated across agencies and be more reflective of the needs of both large and small farmers. Governments can demonstrate leadership and support for farming and preservation of high-value soils. Stakeholders can enhance their coordination and dialogue.

Finally, there is still much to be learned about the food system beyond the scope and scale of this study. The identified research gaps range from the extent and use of existing preserved farmland to finding solutions for affordable, healthy, and local food.



The *Greater Philadelphia Food System Study* has explored the range of opportunities, challenges, and emerging trends within the 100-Mile Foodshed through an analysis of diverse stakeholders, an assessment of agricultural resources, an exploration of distribution channels and food freight, and an identification of the food economy.

What can this study tell us about the differences between the current and historical food system, the global, national, and regional food systems, Philadelphia and other metropolitan areas, and food and other types of

agriculture? This chapter clarifies and illustrates the answers to these questions and concludes with framing questions for DVRPC's upcoming planning phase. One of the greatest findings was the number of projects already underway and services already offered within the Greater Philadelphia food system. While some of those projects have been highlighted throughout this study, this chapter adds more of those projects so as to inform others, inspire collaboration, and avoid redundancy.

FINDINGS

The information gathered from all four parts of the Greater Philadelphia Food System Study illuminated the following:

- **Development and Land Use**

The 100-Mile Foodshed is one of the densest regions in the country, with more than 10% of the nation's population on 1% of the nation's land. This is an amazing market opportunity for the region's diverse

agricultural producers. However, sprawling, low-density development threatens the viability of agriculture close to population centers and the retention of some of the most valuable soils in the United States.

- **Cheap Food and Unhealthy Food**

There is a national culture that expects and demands cheap food, and government incentives encourage some producers to switch to more profitable commodities or nonfood products. Low prices threaten the viability of farming, especially for food-producing farmers. At the same time, the American diet has proven to cause health problems. In Greater Philadelphia, there is an apparent connection between levels of income, access to healthy foods, and the incidence of diet-related diseases. Some programs and policies are effective in addressing this challenge, but more action and policy changes are needed.

- **Capacity and Competition**

The 100-Mile Foodshed's local food supply is not sufficient to meet Greater Philadelphia's consumer demand. There is also a deficit of nearly 2.8 million acres of farmland that would be needed to supply the current population. Additionally, 100-Mile Foodshed producers often distribute their products to larger

metropolitan areas, such as New York City and Washington, DC, thus increasing the food supply deficit. The global food system, by contrast, is seemingly efficient and technologically advanced in filling that insufficiency. Thus, Greater Philadelphia, like all US cities and large cities around the world, is dependent on national and global imports to feed itself and supply its food manufacturing.

- **Consolidation in the Food Economy**

The global food system is made up of an increasingly consolidated pool of large, private actors with growing influence over consumers and regulators. That consolidation makes it difficult to track supply chains, which raises food safety concerns, among other issues.

- **Scaling up Local Food**

Efforts to strengthen a local food system have gained momentum in Greater Philadelphia. While momentum has garnered national attention for Philadelphia, it is not yet reflected in aggregate data.

- **Legislating and Planning for Change**

Policies and planning processes at all levels of government can significantly impact the regional food system. They can simultaneously create

barriers and opportunities. Innovative local policies can offset or mitigate the negative impacts of global issues.

Development and Land Use

As stakeholder interviews in **Part 4** stated repeatedly, the 100-Mile Foodshed is ideally suited for agriculture because of fertile soil and proximity to major North American cities. Producers are responding to the needs of the nearby population by growing a range of products (from livestock to dairy, from vegetables to horticultural products) and branching into agritourism, direct marketing, or other farm-related sources of revenue that benefit from proximity to markets. According to the USDA Census of Agriculture, agricultural activity is taking place on only 28% of the foodshed's total land area, as compared to 40% of the country's land area. The development pattern of lower-density residential development on prime farmland has led to a loss of farmland and agricultural support

services, and, according to the Stakeholder Analysis, an increase in "right to farm" issues between farmers and new neighbors. Development has also increased the value of remaining farmland, making it less accessible for current and potential producers and pushing affordable land farther away. High-value greenhouse, nursery, and sod products⁹⁰ are more likely to be grown in or near suburbanizing areas, suggesting that increasing amounts of farmland are not in food production.

In a home-rule state, local governments have significant control of local land use and development. A stronger food system needs agriculture to remain a dominant land use in some rural areas and be an allowed use in urbanized areas.

Local land use regulations also impact where food is processed and manufactured (typically in industrial areas), the location and design of food retail, how food is distributed through road networks (moving the food to the

store), and public transit (moving the consumer to the food). Municipal and state governments may find it necessary or beneficial to incentivize large-scale food retailers, like supermarkets, to locate near public transit.

Despite the scarcity of land in urban areas and the low affordability of farmland in suburban areas, people have been experimenting with growing food in community gardens, vacant lots, and public lands. See **Urban Agriculture**.

Cheap Food and Unhealthy Food

As evidenced in **Part 3: The Food Economy**, the average American spends a smaller proportion of his or her income on food than a citizen from almost any other country. In fact, food is 10 to 20% of consumer spending in industrialized nations, while it is 60 to

80% of income in developing countries. A United Nations Food and Agriculture Organization (FAO) report also found that commodity prices have fallen somewhat internationally because of the economic recession, but not as quickly in developing countries.⁹¹

The arguments for cheap and abundant food are compelling as an issue of food access, human services, and economic development. For example, if food remains cheap, people are able to spend money on other necessary goods, such as housing or transportation, or consumer goods, like electronics and clothing. If food is cheap and agriculture is productive, fewer people need to be farmers and can, instead, find work in other sectors of the economy. However, low food prices negatively affect food producers.

In **Part 4: Food System Stakeholders Analysis**, producers favor higher food prices because they

Urban Agriculture

For centuries, urbanites found creative ways to use vacant or underutilized land to grow food closer to home. Recently, urban agriculture has become a field of interest for entrepreneurs, hunger advocates, academics, elected officials, and municipal administrators, as it can increase the ability of residents to feed themselves in dense areas, create spaces for community connection, and provide opportunities for revenue. Although community gardens have been a long-standing tradition, entrepreneurial urban farms are popping up in Philadelphia, starting with Greensgrow Farms in 1997, and increasing in 2009 to at least 10 of various shapes, scales, and organizational structures. These include Weavers Way, Mill Creek, Flatrock, Teens 4 Good, Saul Agricultural High School, Martin Luther King High School, University City High School, Grumplethorpe, Wyck, Emerald Street Urban Farm, and the Philadelphia Orchard Project. The USDA's Census of Agriculture reports 17 farms operating within the city.

⁹⁰ As noted in **Part 1: Agricultural Resources**, mushroom production and many fruits and vegetables grown within permanent greenhouse structures are included within the greenhouse, nursery, and horticultural category.

⁹¹ Hirsch, Jerry. "Grocers, manufacturers clash as wholesale costs move upward despite cheaper raw materials." Tribune Newspapers. Printed March 4, 2009.

City Harvest*Philadelphia, Pennsylvania*

City Harvest is a unique partnership between community gardeners, the Philadelphia Prison System, and local food assistance programs to meet many objectives of different organizations. The program was created and is coordinated by the Pennsylvania Horticultural Society (PHS). Inmates of the Philadelphia Prison system “start” vegetable seedlings at a greenhouse, gaining skills in horticulture, construction, cooking, math, and marketing. The vegetable starts are donated to community gardeners throughout the city, who grow and donate the produce to SHARE. SHARE, a local nonprofit, distributes the harvested fresh food to food cupboards, where the Health Promotion Council provides nutrition education at the food cupboards. The volunteer-driven program produces more than 20,000 pounds of fresh food annually, while strengthening community connections, creating opportunities for prisoner reentry, supporting community gardening, and providing nutrition education.

can cover rising costs of production. If prices drop too low, producers will not be able to stay in business. For example, in the summer of 2009, dairy advocates attribute “low prices and high production costs” to a milk crisis and argue that dairy farmers are currently “paid less than half the cost of production.” Some estimate that as many as one-third of dairy farmers may go out of business if wholesale milk prices do not rise.⁹²

Many argue that food is artificially cheap because of subsidized inputs, such as fossil fuels and water.

However, perhaps the most important argument is that, while some food may appear “cheap” to some consumers, healthy food can be costly and unavailable, especially for those with lower incomes living in urban or rural areas. As demonstrated in **Part 3: The Food Economy**, those with lower incomes consume relatively fewer

calories and fat, but more sugar, than those with higher incomes.

The Philadelphia metropolitan area has a higher rate of diabetes than the nation. When accounting for income, the counties within Greater Philadelphia with lower median household income had higher rates of both diabetes and obesity. It is possible that healthy foods are not only expensive for lower income areas, but are also unavailable at retail outlets. It is also possible that the time to prepare fresh foods costs a lower-income household more in lost work hours.

Of course, there are promising initiatives that are working on addressing this complicated challenge. Urban agriculture efforts like those highlighted in this section bring local food production closer to urban areas. Organizations like The Food Trust and the Urban Nutrition Initiative educate youth about nutrition and cooking.

⁹² Farm Aid, email communication, June 10, 2009.

Capacity and Competition

Currently, the 100-Mile Foodshed does not grow enough food to meet Greater Philadelphia's consumer demand. **Part 1: Agricultural Resources** conservatively estimated that the Philadelphia region has a deficit of 2,764,217 acres of farmland needed to meet food demand. **Part 2: Food Distribution** also demonstrated that most food from the 100-Mile Foodshed is destined for the 100-Mile Foodshed, although not necessarily for Greater Philadelphia, and predicts that "inbound" movements from the nation and world will continue to grow faster than food movements within Greater Philadelphia. Comparing the agricultural resources findings with expenditure data, there is a sizable difference between total sales of agricultural products in the 100-Mile Foodshed (\$6,732,916,000) and total food expenditures in the Greater Philadelphia MSA (\$16,438,100,000), suggesting, again, that Greater Philadelphia's food demand exceeds the 100-Mile Foodshed's

supply, and food is needed from around the country and world.

Finally, the food that is grown in the 100-Mile Foodshed is not necessarily going to Greater Philadelphia because of its relatively weak aggregate food dollars. Consumers in Greater Philadelphia spend the same percentage of their income (12%) on food as consumers in the metropolitan areas of New York, Boston, Washington, DC, and Baltimore. However, metropolitan Philadelphia's lower median household income equates to an average household food expenditure of \$5,600, which is approximately \$2,000 less than New York and Washington, DC, and \$1,000 less than Boston and Baltimore. Aggregated, the Philadelphia MSA spent \$16 billion on food in 2007, compared to \$61 billion spent by New Yorkers. DC residents spent \$16 billion, despite a smaller population. This means that Greater Philadelphia is a relatively less affluent market. For producers, proximity to these other

markets is an advantage because they can get a higher price for their product. For consumers, it means competition for regional products and the threat of higher prices. This also demonstrates that Greater Philadelphia's ports, with their specialization in break bulk cargo and perishable foods, provide access to more affordable food for a lower-income metropolitan area.

Beyond consumers, some of the 100-Mile Foodshed's top food employers also rely on imported inputs. Manufactured and processed foods are the top type of commodity moving through Greater Philadelphia in terms of both weight and value, demonstrating the economic importance of the processing sector, as well as the prevalence of processed foods in the American diet.

Looking more closely at the manufacturing data provided in **Part 3: The Food Economy**, Philadelphia has a high location quotient (or more-than-average employment) in the

USDA Eastern Seaboard Food Security Study

The USDA Agricultural Research Service, partnering with land-grant universities, is undertaking a comprehensive food security analysis of local production capacity and regional consumer demand along the dense East Coast. Production capacity will be determined by analyzing land availability and soil suitability and by identifying biophysical, infrastructure, energy, and policy constraints. The study will also evaluate system viability in order to determine a sustainable balance between local production and imports to meet the demand of population increases, while considering potential risks from market fluctuations, natural disasters, and climate change.

manufacturing of dry pasta, chocolate and confectionary products from cacao beans, and creamery butter. Besides butter, the inputs needed for the other top manufacturing sectors do not or cannot grow in the 100-Mile Foodshed at a scale sufficient to supply wholesale manufacturers. The metropolitan area has specialized in food processing, among other types of manufacturing, but this is dependent on the resource-intensive global food system.

Given these findings, one can surmise that Greater Philadelphia's population consumes most of what is grown in or near the metropolitan area, does not have enough land to meet the demand, and is increasingly dependent on food sources farther away. Further research, such as the **USDA Eastern Seaboard Study**, will investigate the East Coast's needs and land capacity for food production.

The global food system, which has developed over the last 200 years due

to technological efficiencies, has yielded many economic benefits, reduced hunger in many places, and enabled labor specialization. This food system has opened trade borders with countries around the world, creating wealth. The global food system is also very efficient at transporting goods and services to consumer markets.

However, the centralized, corporate, global food system that feeds billions of people worldwide also produces a range of economic costs, negative environmental impacts, and possible crises, including: the rise of large industrial monoculture farms that reduce biodiversity and require increased chemical fertilizers and pesticides; environmental degradation and contamination due to the increased use of fertilizers and pesticides; and widespread consolidation of food producers due to the mechanisms of financial markets, which make the average consumer more vulnerable to food safety issues and price increases, while providing fewer choices.

More simplistically, Americans have benefited from the large economies of scale that the global food system offers. With the start of the industrial revolution and the emergence of mechanized harvesting, America's population drastically shifted from rural to urban, as fewer people were needed to work in agriculture. In 1910, about one-third (32%) of the working population was considered a "farmer" or "farm laborer." In 2000, less than 1% of the working population worked on a farm. The implications of this consolidation and expansion are outlined below.

Despite all of these advances and the creation of a worldwide free market for all goods, including food, the global food system has plenty of inefficiencies, treats many workers unjustly, and degrades the landscape and natural resources in some areas.

However, a relocalized food system can also have all of these externalities. Reducing the distance a food item travels

may not reduce that food item's environmental, social, and economic costs. Long-distance travel is not necessarily inefficient, especially if large volumes of food are transported far distances on fuel-efficient modes, such as water travel.



Ripening blackberries at a farm in New Jersey

PHOTO CREDIT: BLUE COLTHARP

Time and freshness are other factors to consider, particularly for highly perishable goods like fruits and vegetables. Within the United States, nearly all food is transported in high volumes over long distances by trucks, which are less fuel efficient than ships but can reduce spoilage and waste by

meeting time constraints more consistently than water or rail travel. Conversely, recent medical research supports the assertion that fresh fruits and vegetables left to ripen on the vine longer have more nutritional value and taste better, and that food harvested and allowed to ripen during transport loses nutritional value. However, some medical research asserts that frozen vegetables and fruits retain more nutritional value than fresh vegetables, as food items are usually frozen within 24 hours or less after harvest.⁹³

Farming as an occupation is also threatened by competition from other professions and an aging farming community. In order to increase the number of farmers that we have in the 100-Mile Foodshed and the amount of food that they produce for nearby populations, knowledge about food and agriculture needs to be passed down to a new generation of farmers, some of whom may not be from farming families (see **New Farmer Training**).

⁹³ Pollan, Michael. *In Defense of Food*. New York: Penguin, 2008.

New Farmer Training

As the aging population of farmers retires, the agricultural sector faces many challenges associated with recruiting and supporting a new workforce. New farmers struggle to find access to capital for land, equipment, supplies, and other operating expenses.

On a local level, Maysie's Farm Conservation Center in Glenmoore, Pennsylvania, has developed the Sustainable Agriculture Internship Training Alliance (SAITA), a program intended to increase the availability and variety of learning experiences for new farmers and organic farm interns. Beyond training in various agricultural practices, the program also offers invaluable networking opportunities.

The Southeastern Pennsylvania Agriculture Partnership is an initiative of the Chester County Economic Development Council in collaboration with the Pennsylvania Association for Sustainable Agriculture. The program will use grant funds from the Pennsylvania Department of Labor and Industry to provide resources to help local producers develop successful practices and markets and to preserve regional farmland.

Additionally, farming needs to be viewed as an attractive profession to better compete with other entrepreneurial and professional careers.

Consolidation in the Food Economy

The Stakeholder Analysis (**Part 4**) and the Supply Chain Case Studies (**Part 2**) revealed that private businesses are the main actors bringing food from farm to plate. Farmers, food manufacturers, distributors, freight forwarders, third-party logistics consultants, corner store operators, and food service workers are all independent businesspeople that develop and maintain proprietary information and professional relationships. The public entities that interact with these businesses, in areas like regulation, market support, and financing, are also limited in their ability to synthesize and disseminate

information from or to all the parties. It is no surprise that companies that are in competition with one another are less likely to share information and collaborate.

Not only is the food system composed of private entities, but these entities are increasingly consolidating or becoming vertically integrated (controlling more components of the supply chain), making their political influence and market share greater, and putting smaller businesses out of business. Consolidation can be measured by looking at the concentration ratio of the top four firms in a specific industry. For 2003, which is the latest comprehensive data available, the top four beef packers had an 83.5% market share. The top four pork packers had a 66% market share. For chicken, it is 58.5%, and for turkey it is 55%.⁹⁴ Consolidation and vertical integration can reduce a company's costs and

improve a product's quality, but may increase its possible instances of contamination and will decrease a consumer's number of choices.

There is extensive consolidation in other sectors of the food economy. The top four food service firms account for 52% of sales, 28%⁹⁴ in general-line grocery wholesales, 20% in grocery stores sales, and 14% in food manufacturing sales.⁹⁵ In fact, for distributors supplying a variety of products via consolidation, the percentage is even greater. SYSCO and US Foodservice, the first and second largest broad-line food service suppliers in the country, in combination served over 650,000 customers through 250 distribution centers for over \$57 billion in sales in

2007. They also employed over 77,000 people.⁹⁶ For foodservice providers, the top three in order are Compass Group, Sodexo, and ARAMARK. ARAMARK is headquartered in Philadelphia, employing 250,000 people and reporting \$12 billion in sales for 2007.⁹⁷

A closer look at other local examples reveals that Greater Philadelphia's regional food economy has some independent initiatives, but is deeply integrated into the national and global food systems:

• **Production**

A stakeholder interviewed in **Part 4** described New Jersey as a "shorts and fills" market for the national food system in produce. When there are floods or droughts in other parts of the country, the local producers have a bigger share of the market and fill the gaps with New Jersey product.

Thomas Jefferson University Hospital Philadelphia, Pennsylvania

Thomas Jefferson University Hospital has joined other healthcare facilities across the country to overcome traditional contracting challenges with larger food service vendors by purchasing more locally grown products. The aim is to improve nutrition for patients, visitors, and staff, support the local economy, and encourage sustainable production. The hospital sponsors a weekly farmers' market that connects the community with local farmers and bakers. Its dining services are increasingly purchasing local products through existing vendors and directly from farmers or farmer-owned cooperatives. The hospital is a founding member of the Farm-to-Institution Working Group, coordinated by Fair Food, addressing the systematic challenges to connecting larger institutional buyers with regional products.

⁹⁴ Hendrickson, Mary and William Heffernan. Concentration of Agricultural Markets. April 2007. Available online at www.nfu.org/wp-content/2007-heffernanreport.pdf. Accessed 30 June 2009.

⁹⁵ Applebaum, Eileen, Annette Bernhardt and Richard Murnane. Eds. "Too Many Cooks? Tracking Internal Labor Market Dynamics in Food Service with Case Studies and Quantitative Data." Low-Wage America: How Employers Are Reshaping Opportunity in the Workplace. Russell Sage Foundation: New York, NY: 2003.

⁹⁶ Answers.com. "US Foodservice." www.answers.com/topic/u-s-foodservice and www.answers.com/topic/sysco-corporation. Accessed 8 July 2009.

⁹⁷ www.answers.com/topic/aramark-corporation. Accessed 8 July 2009.

Philabundance and the Ports

The system of ports serving the Philadelphia area has specialized in handling food items, such as highly perishable fruits and vegetables from Central and South America, and frozen meat from Australia and New Zealand. This serves Greater Philadelphia's food economy, which consists of lots of small and large vendors and purchasers, ranging from restaurants to institutions. The Philadelphia Regional Produce Market is a marketplace for these vendors and buyers and is a large asset for international transportation companies and large food producers. Vendors at the market then donate surplus or unsold produce to Philabundance, a nonprofit food distributor serving large food banks, shelters, and emergency kitchens throughout the Delaware Valley. After distribution to client agencies, Philabundance can use any surplus, if it exists, to trade with other regional food banks for items that are in short supply in Greater Philadelphia. For example, because Philadelphia is a large "port of entry" for fresh fruit from South America, Philabundance can trade bananas for canned goods from New York.

Producers are also dependent on national suppliers of seeds, machinery, fertilizers, and other inputs.

- **Processing**

Part 3 highlighted the importance of sugar, cocoa, and gluten for food manufacturing.

- **Distribution**

The Delaware River ports in Delaware, Pennsylvania, and New Jersey depend on global imports and exports to employ residents, generate further economic activity, and even stimulate food access (see the example of **Philabundance and the Ports**). Auxiliary transporters in turn depend on the port for their own businesses.

- **Retail**

Small independent grocery stores, regional chain grocery stores, and large institutional buyers, such as schools and hospitals, often use national vendors like SYSCO and US Foods for the affordable prices and convenient delivery options.

All of these examples demonstrate that it is difficult to separate Greater Philadelphia's food system from the

national and global food systems.

This large system provides both internal costs and benefits and external costs and benefits. For example, food service providers or restaurants that outsource food preparation save on transportation costs (once peeled and sliced, fruits and vegetables can weigh less) and on worker compensation payments (fewer employees using sharp knives).⁹⁸

However, food can be less fresh or companies may not have as much autonomy in the type, quality, and origin of products that they purchase, relying instead on the decisions of the supplier.

Despite the internal costs and benefits, the consolidated food systems potentially have numerous negative environmental, social, and economic impacts, including carbon emissions and inequities in market or food access.

⁹⁸ Applebaum, Eileen, Annette Bernhardt and Richard Murnane. Eds. "Too Many Cooks? Tracking Internal Labor Market Dynamics in Food Service with Case Studies and Quantitative Data." *Low-Wage America: How Employers Are Reshaping Opportunity in the Workplace*. Russell Sage Foundation: New York, NY: 2003.



CSA share from Greensgrow Farms, Philadelphia

PHOTO CREDIT: BECKY SWEGER

Scaling Up Local Food

Recently, media attention and consumer interest have recognized the virtues of “eating local” to support local farmers, enjoy better tasting seasonal food, lessen the environmental impact of large-scale agricultural operations, reduce food travel distance from farm to plate, and provide knowledge of where our food comes from. While anecdotally there appears to be a major local food movement, data sources do

not unequivocally reveal the impact of local food and direct marketing.

The 2007 USDA Census of Agriculture revealed a growth in specialty food production, which means that farmers are growing different types of food, and the Economic Census revealed a higher-than-average growth in specialty food retail, suggesting that consumers are finding more places to get specialty and gourmet products. The supply chain case studies showed that local producers, like any businesspeople, limit their risks by using multiple distribution channels, including direct markets, to reach the end consumer. USDA Nutrition data showed increased fruit and vegetable consumption in Bucks, Chester, Delaware, Montgomery, and Philadelphia counties (the Philadelphia metropolitan division), which may be evidence that the nutrition education and food access work done by Philadelphia’s nonprofit organizations and agencies is successful.

The numbers from the censuses do not reflect perceptions about the size or impact of the local food movement. For example, the Census of Agriculture shows that direct marketing is a slim proportion (1.4%) of all agricultural sales in the 100-Mile Foodshed and less than 0.5% of total sales nationally, despite the focus on and success in expanding farmers' markets, community gardens, and CSAs. Similarly, analysis in **Part 3: The Food Economy** also did not reveal an overwhelming majority of employees or establishments in the food sectors as compared to other economic sectors.

Although they may not be distinguished as specialty or niche items, it should be noted that products produced locally are a significant part of the current food supply. Analysis in **Part 2: Food Distribution** suggests that almost all the food grown within the region is consumed within the region. Given that direct marketing is

The Fresh Food Financing Initiative

The Food Trust, partnering with The Reinvestment Fund, Greater Philadelphia Urban Affairs Coalition, and the Commonwealth of Pennsylvania, launched the Fresh Food Financing Initiative, the first statewide financing program that encourages supermarket and grocery store development in underserved neighborhoods. This innovative program, with \$120 million of funding from the state, has supported 58 supermarket projects and was recognized as a model for effective government action by the Kennedy School of Government and received special notice from the White House Office of Urban Affairs.

only 1.4% of all agricultural sales in the 100-Mile Foodshed, products must be getting to market through wholesale and other high-volume distribution channels. Food grown locally may be sold in supermarkets or served in restaurants and cafeterias but not labeled as “local.” For example, the food processor Seabrook Farms, located in Cumberland County, New Jersey, produces frozen food for large brand names, like Birds Eye, and store lines, like Stop & Shop. Seabrook Farms buys food grown within the 100-Mile Foodshed, as well as from growers along the East Coast. This complicates the discussion about strengthening the regional food system. Consumers are already buying local food unknowingly.

As mentioned previously, strengthening the regional food system may produce a new set of negative impacts. For example, will the energy needs of increased greenhouse production for fruits and vegetables out of season

produce more carbon emissions and higher energy costs than long-distance transport of out-of-season produce?

When defining the regional food system, we must also think about the specific values and desired benefits that are often assumed but not necessarily inherent in local food production. For example, is the goal merely to shorten distances between consumer and producer, or are there more values that are yet to be articulated?

Legislating and Planning for Change

Despite the importance of private actors in the food system, the public sector has a substantial role to play through regulation, legislation, and programs. Government policies can range from crop production to food and nutrition assistance. Government policies can also build barriers. Many

individuals and organizations participating in the stakeholder analysis in **Part 4** felt a lack of support from government officials.

For example, some mentioned the need for more coordination between state regulating agencies such as the Department of Environmental Protection and the Department of Agriculture.

The different levels of government also have various roles to play. The control of land use by local governments was discussed extensively in a previous section. Other state and local regulations with significant impacts on the food system include water permitting procedures and economic development funding. (See **Fresh Food Financing Initiative** on previous page.)

At the federal level, the US Farm Bill significantly influences what farmers grow and how they grow it through the commodity payments, conservation

incentives, and funding for biofuel production, among other programs. These programs do not affect the nation equally, with a higher percentage of commodity payments made to the Midwest for large scale production of corn, soybeans, and hay. These crops, often referred to as commodity crops, are also some of the top crops by acreage in the 100-Mile Foodshed, as evidenced in **Part 1: Agricultural Resources**. The U.S. Farm Bill also provides hunger relief through the Food Stamp (SNAP) program, and rural development, such as broadband internet access.

Another significant piece of federal legislation is the Child Nutrition Reauthorization Act (CNRA). The National School Lunch program is one of the largest programs included in this legislation and is administered by the USDA. In Delaware, New Jersey, and Pennsylvania alone, the National School Lunch program reached 1.9 million students in 2008. It can be an important point of intervention for

Greenworks Philadelphia

Greenworks Philadelphia is the City of Philadelphia's sustainability plan organized around five E's—Energy, Environment, Equity, Economy, and Engagement.

The Equity section recognizes the importance of food access for all Philadelphians and establishes the target to bring local food within a 10-minute walk of 75% of residents by 2015. Identified initiatives include expanding fresh food outlets, such as farmers' markets and community gardens; recreating technical assistance, food sourcing, and vacant land management; fostering commercial farming; encouraging healthy neighborhood food retail; expanding opportunities and support for food-related entrepreneurship and workforce development; and coordinating urban agriculture with anti-hunger efforts.

Philadelphia Urban Food and Fitness Alliance

Philadelphia is one of nine communities across the country chosen to be a part of the Kellogg Food and Fitness Initiative, which asks community leaders to address the complex problems of food access, physical activity, and the built environment. The first phase is a two-to three-year planning process that brings together a coalition of community members, city agencies, and other experts to create a long-term action plan for the community. PUFFA's Action Plan was released in the Fall of 2009.

improving child nutrition and affecting food procurement policies. The School Breakfast program, Child and Adult Care Food program, Summer Food Service program, Women, Infants and Children (WIC) program, and the Fresh Fruit and Vegetable program are other significant programs included in the CNRA. Local food advocates are trying to expand the legislation to make better connections between school cafeterias, gardens, and local producers, increase reimbursement rates for child nutrition programs to allow the purchase of higher-quality food, and increase local purchasing.

Planning processes by governments and nonprofits at all levels can make significant changes in the national and regional food systems. At the municipal level, the Greenworks plan is an example of a local government creating a process to measure progress toward goals. The **Philadelphia Urban Food and Fitness Alliance (PUFFA)** is a community-driven planning process with an emphasis on food access and health.

MOVING FORWARD

Food seems like it would be a straightforward research topic. However, a closer look reveals how complicated food is to grow, manufacture, transport, sell, buy, and even consume. A Greater Philadelphia resident's expectations and diet have changed dramatically in the last 50 years due to the year-round availability of fresh produce from around the world, the widespread use of refrigerated containers for transport, and the decreased price of processed foods. Similarly, the year-round availability of fresh produce also benefits the average household, with less disposable income devoted to food purchases and fewer limits on diet due to seasonality. Changes in purchasing behavior have also affected Greater Philadelphia's development patterns, as we rely less on the region's working landscapes for food supply.

Given these circumstances and moving forward into the planning phase, there are two major themes that emerge: first, perspective matters; and second, advantages can also be challenges and challenges can be opportunities.

Perspectives

All Greater Philadelphia food system stakeholders have different motivations, interests, and perspectives on the issues and challenges related to food. Any discussion about proactively changing the food system or planning for uncontrollable changes in the global food system must recognize differing, even conflicting, opinions, as well as the need to form collaborations to find solutions.

The Greater Philadelphia Food System has many different stakeholders concerned about very specific aspects of the system. For example, there is much diversity among the foodshed's farmers

and farming operations. While similarities exist, there are significant differences between New Jersey and Pennsylvania farmers. There are also differences between farmers within geographic areas. These dissimilarities require different solutions, such as differing marketing messages, regulations, and support businesses. A fifth generation farmer in south central Pennsylvania growing fruit on a preserved orchard for the wholesale market has many different needs from a new farmer looking for land to raise vegetables for an organic CSA in central New Jersey.

Beyond the farm, other individuals, organizations, industries, and businesses also have their own perspectives, motivations, and interests. A nonprofit organization concerned with food access and security may not be as interested in local food as an extension agent looking to increase farmer profitability. These different stakeholders need

Delaware Valley Grantmakers – Food Funders Affinity Group

In the spring of 2009, DVG formed a Food Funders Affinity Group, based on members' interest. The new group will meet several times a year with a two-fold purpose: "To continue learning, keeping each member and each other informed, and to explore and facilitate opportunities for collective action."

Philadelphia's philanthropy community is organizing itself around the growing interest in and importance of local food and food access.

Philadelphia Urban Farm Network

Started in February 2007, this network of urban farmers and farm supporters is an online listserv to share resources, information, and event announcements. Discussions range from job openings to advice on sources for earthworms, and the growing membership of the online group demonstrates the growing interest in urban agriculture and local food production.

different technical assistance: one for meeting needs, the other for finding niche markets. A produce manager of a local supermarket wants consistently sourced products to meet the regular demands of customers. A farmers' market must win back its market share each spring. Additionally, one relies on contracts with distributors and vendors for its product, while the other relies on good weather.

One perspective is not better than another, but the exact tradeoffs and intersections need to be clear as the study moves forward into a plan.

Advantages and Challenges as Opportunities

As stakeholders identified in **Part 4**, the Greater Philadelphia food system's attributes can be seen as both advantages and challenges. Relocalizing a far-flung global food system and relying less on imports could be a long-term benefit, especially when one considers the environmental benefits and reduced infrastructure

costs associated with retaining working farm landscapes in this region. Additionally, as more of the global population enters the middle class and the US dollar continues to decline, our international trading partners may go to the most profitable markets, which may not be in the United States.

On the other hand, a sustainable region cannot be protectionist. Importing food benefits Greater Philadelphia and nearly all metropolitan areas. Because this area has a temperate growing season, Greater Philadelphia needs food transported from domestic and international sources during the cold season. The trade of agricultural products also supports developing countries, as they gain footholds in the global economy. Food imports feed a large nonfarming population, and cheap food imports feed the hungry and disadvantaged and increase all households' disposable income. However, the Greater Philadelphia

food system is losing its working farms, local food producers, and small independent businesses because of the relatively short-term problems of expensive land, high taxes, consolidating food economy, and complicated distribution networks. Greater Philadelphia and other metropolitan areas will all face the upcoming challenges of climate change, sea-level rise, and peak oil, not to mention an infrastructure funding crisis. A strategy to prepare for this changing global economy is to ensure that we have the long-term viability of working farms producing food for nearby populations, while maintaining relationships with a larger network of markets and producers.



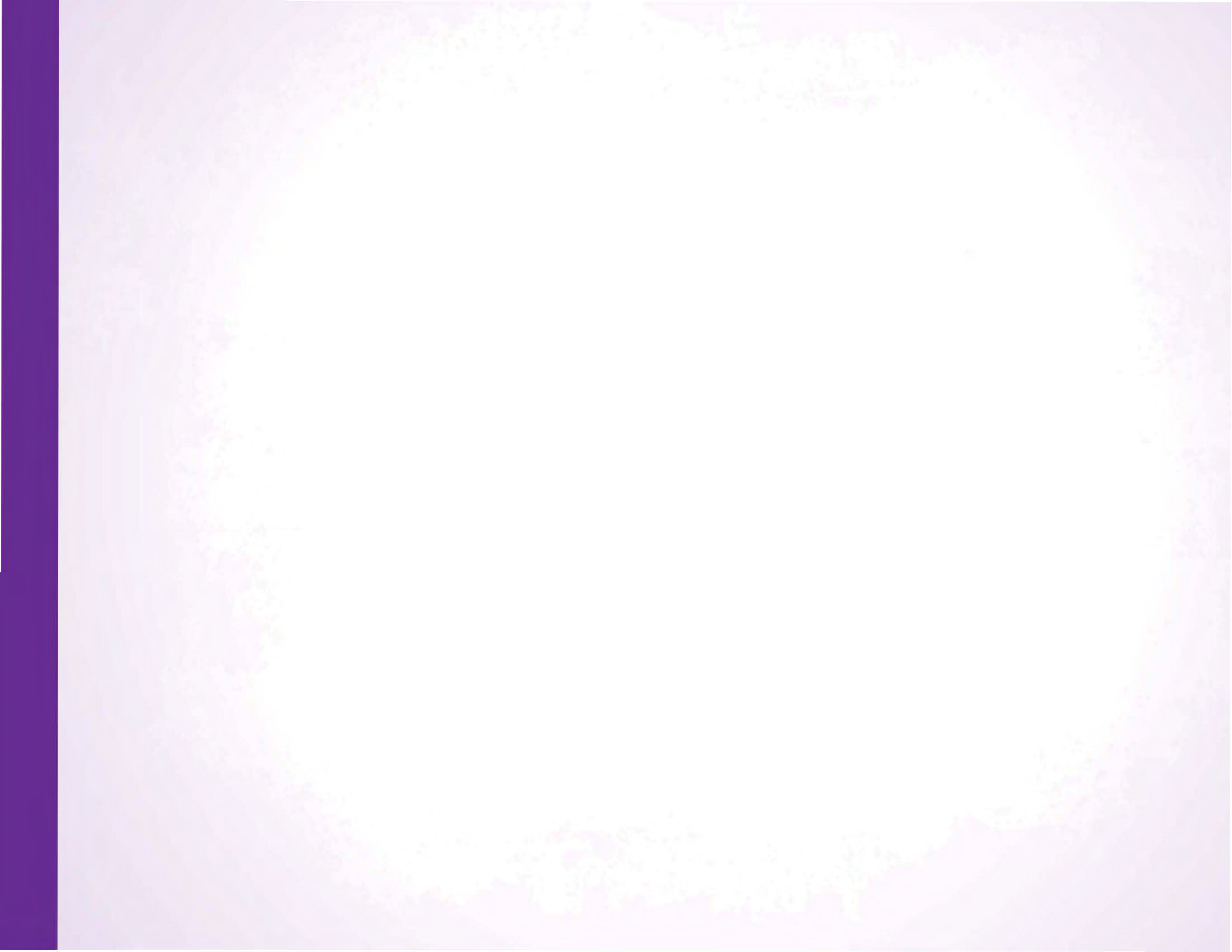
*Working farm in Gloucester County,
New Jersey*

PHOTO CREDIT: DVRPC

Next Steps

The *Greater Philadelphia Food System Study* is the first objective phase in learning about the food system and envisioning a more sustainable and resilient food system for Greater Philadelphia. In July 2009, DVRPC commenced a planning phase that draws from the knowledge gained from undertaking the study and convening a large stakeholder committee. A plan for a more

sustainable and resilient food system will produce recommendations for different audiences, ranging from federal and state policymakers to county planners, and from non-profit service providers to individuals.





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ABSTRACT PAGE

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Greater Philadelphia Food System Study

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Geographic Area Covered:

100-mile radius around the City of Philadelphia; parts of five states: Delaware, Maryland, New Jersey, New York, and Pennsylvania; and the nine county DVRPC region: Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania, and Burlington, Camden, Gloucester, and Mercer counties in New Jersey.

Key Words:

100-Mile Foodshed, Agriculture, Census of Agriculture, Economic Census, environment, farms, farming, farmland, farmland preservation, food, food access, food desert, food distribution, food economy, food miles, food policy, food system, foodshed, fossil fuels, freight analysis framework (FAF), Greater Philadelphia, land use, local food, organic, natural resources, peak oil, sustainable, stakeholder analysis, transportation, working landscapes.

Abstract:

This publication is an objective study of Greater Philadelphia's food system and focuses on the agricultural resources, distribution infrastructure, regional economy, and stakeholders acting within the regional food system. The study addresses a number of challenges and opportunities facing the food system, including: land constraints and development pressures, contradicting health effects of malnutrition and obesity, food access in urban and rural areas, food distribution, and economic development.

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