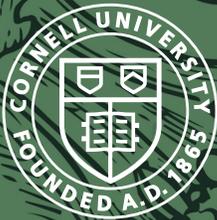


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CASE STUDIES OF SUPERMARKETS AND
FOOD SUPPLY CHAINS IN LOW-INCOME
AREAS OF THE NORTHEAST:

NEW YORK CITY STORE, NEW YORK

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New York City Store, New York

Introduction

As part of a collection of EFSNE projects that examined distribution systems, 11 store case studies were conducted to gain a better understanding of stores serving low-income areas and their role in the regional food system of the Northeast. The cases are an effort to record important characteristics of the participating stores and their supply chain partners. This case describes a supermarket and with it the supply chains of two of the eight foods in the EFSNE project's market basket, which served as a focal point for many of its research activities.

Case study interviews were conducted from 2013 to 2015.

Fictitious names are used to maintain confidentiality of the case study participants.

Place: Harlem Neighborhood, New York, NY

This case describes one retail supermarket in a neighborhood of Harlem, New York City, and two of its product supply chains. In 2013, the neighborhood¹ has a population of 38,372 (Table 1) and a median household income of \$47,318, substantially less than the median household income for New York City (\$71,656) and for New York state (\$58,687). The neighborhood is largely African American (59.7 percent) and Hispanic (20.9 percent). It also has a high poverty rate of 28.7 percent of individuals.

The U.S. Census Bureau reports 22 grocery stores, excluding convenience stores, and one convenience store in the neighborhood. This equates to 5.73 grocery stores, excluding convenience stores, and 0.3 convenience stores per 10,000 residents in the neighborhood (Table 1) compared to 8.42 and 1.17 respectively for New York boroughs. The concentration of food retailers per 10,000 persons is included in Table 1 to illustrate how this compares to county and state metrics.

Supermarkets and other grocery stores sell a variety of foods, such as canned and frozen foods; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry. Supermarkets are traditionally defined in the food retail industry as large grocery stores having \$2 million or more in annual sales. Convenience stores or food marts (except those with fuel pumps) primarily engage in retailing a limited line of goods that generally includes milk, bread, soda, and snacks.

¹ The neighborhood is defined as the zip code that contains the store.

TABLE 1: 2013 Demographic and Food Environment Statistics for NYC Store.

	Neighborhood zip code	New York City	New York State
DEMOGRAPHICS			
<i>Population and Age</i>			
Population ¹	38,372	1,618,398	19,594,330
Median age ¹	34.3	36.6	38.1
Less than 5 years of age ^{a,1}	7.1%	5.0%	6.0%
Average household size ¹	2.58	2.09	2.62
<i>Education</i>			
High school degree or higher ^{a,1}	82.0%	86.3%	85.4%
Bachelor's degree or higher ^{a,1}	40.7%	59.3%	33.7%
<i>Race and Ethnicity</i>			
African American or Black ^{a,b,1}	59.7%	17.2%	17.0%
Hispanic ^{a,c,1}	20.9%	25.7%	18.2%
<i>Poverty and Program Participation</i>			
Poverty rate ^{a,1}	28.7%	17.7%	15.6%
Food insecurity rate ^{a,2}	15.3%	13.5%	16.5%
Share SNAP recipients ^{a,d,1,3}	N/A ^e	16.5%	16.3%
<i>Income</i>			
Median household income ¹	\$47,318	\$71,656	\$58,687
FOOD ENVIRONMENT			
Grocery stores ^{f,4}	5.73	8.42	5.22
Convenience stores ^{f,4}	0.26	1.17	1.76
Warehouse clubs and supercenters ^{f,4}	0	0.01	0.07

Notes:

^A Percentage of entire population.

^B Alone or in combination with other races.

^C Of any race.

^D Calculated by dividing the number of SNAP recipients by the population.

^E Data not available at the zip code level.

^F Number per 10,000 people.

Sources:

¹ American Community Survey 5-Year Estimate, 2010 - 2014, copied from http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml on April 27, 2016.

² Food insecurity, 2013, FeedingAmerica.org, downloaded from <http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/data-by-county-in-each-state.html> on April 27, 2016.

³ Small Area Income and Poverty Estimate, July 2013, downloaded from <http://www.census.gov/did/www/saipe/data/model/tables.html> on April 27, 2016.

⁴ County Business Patterns Database, 2013, downloaded from https://www.census.gov/econ/cbp/download/13_data/ on April 29, 2016. Currently online at <https://www.census.gov/data/datasets/2013/econ/cbp/2013-cbp.html>.

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Its productivity of
weekly sales per
square foot is well
over the average.
”

NYC Store

The store is an independently owned supermarket that belongs to a consortium of stores under the same banner but not under the same ownership. The current owner owns four other stores. The manager has been with the store for 12 years and also manages some of the other stores for the owner.²

The store has 22,000 square feet, of which about 20,000 is selling space. It has 60 full-time and 20 part-time employees. The store does about \$17 million in sales per year and has about 18,000 customers per week. It buys products from about 50 suppliers.

Although the store is smaller than the average supermarket (Table 2), its weekly sales are similar. Its productivity of weekly sales per square foot is well over the average. Its weekly sales per full-time employee is estimated as \$4,670 just slightly higher the U.S. average of \$4,423.

TABLE 2: U.S. Store Operations versus NYC Store

	NYC Store	2013 U.S. average
Store selling space	20,000 sq ft	33,250 sq ft
Weekly sales	\$326,923	\$318,462
Weekly sales per sq ft of selling area	\$16.35	\$9.58
Weekly sales per full-time equivalent employee	\$4,670est.	\$4,423

Source: *Progressive Grocer*, “81st Annual Report of the Grocery Industry.” April 2014.

The store sells a complete array of products with strong produce and fresh meat sales. These two departments, meat and produce, contribute more to the store than the average supermarket (Table 3). These departments are also important profit drivers with high gross margins. They are also very important to customers. According to the Food Marketing Institute’s *2014 Shopper Trends* report, when consumers were asked the importance of features when selecting their primary store, they answered, “high quality fruits and vegetables” as the leading feature and “high quality meat” as the third feature behind “low prices.”

² The store interview was conducted in 2013. Although this case study is written in present-tense, it is meant to provide a snapshot in time, and the authors make no claims that the data reflect anything other than the store’s situation at that time.

TABLE 3: Percent of Store Sales by Various Departments

Department or Category	Percent of Store Sales	
	NYC Store	Industry average
	%	
Produce	12.4	11.3
Fresh Meat (incl. poultry)	15.1	13.8
Dairy	14.7	9.0
Canned fruits and vegetables	2.4	1.0
Frozen foods	7.6	6.4
Bread (loaf/bagged, not bakery goods)	2.6	3.0

Source: Progressive Grocer, "Consumer Expenditures Study: Stretching Dollars". July 2014; Store interview.

The store's overall gross margin is 38 percent. Gross margin is the difference between the purchase price and selling price divided by the selling price and is an important measure of the margin available to pay for all operations above and beyond the cost of the product. The 2015 median gross margin for supermarkets reported by the Food Marketing Institute is 28 percent.³

The manager said that sales in the last three years have stayed the same, although he sees sales growing in the next three years. He sees the store being in business in 10 years.

The manager identified taxes, variability of demand from users of SNAP, the Federal policy change to reduce benefits, and food prices as external factors that impact his store's ability to stay in business, although he indicated that they are not major limitations.

The manager also reported that some factors have a slight effect on the store's ability to sell more regionally produced foods, such as higher expense, procurement and negotiation costs, availability of labor, and proximity to supplier.

The manager listed two factors that have a slight effect on the store's ability to sell more healthy foods: higher expense and procurement and negotiation costs.

³ *The Food Retailing Industry Speaks 2016*. The Food Marketing Institute. Arlington, VA 22202.

Market basket items –Frozen Broccoli and Potatoes

National Brand 1 is the store's leading brand of frozen broccoli, and it represents 70 percent of the store's frozen broccoli sales. Along with National Brand 1, the store sells frozen broccoli from regional, ethnic, and second-tier national brands.

Sixty percent of the store's frozen broccoli sales are for broccoli with sauce, and the remaining 40 percent are for broccoli without sauce. The prices are the same, with or without sauce.

The leading variety of potatoes at NYC Store are russets, although round white potatoes are also popular. About 80 percent of the store's total potatoes are from Idaho with the "Grown in Idaho®" seal. In addition to the russets and round whites, the store sells red and gold and organic potatoes.

Losses in the store for potatoes are very low, about one percent, and damage is the most common reason for losses.

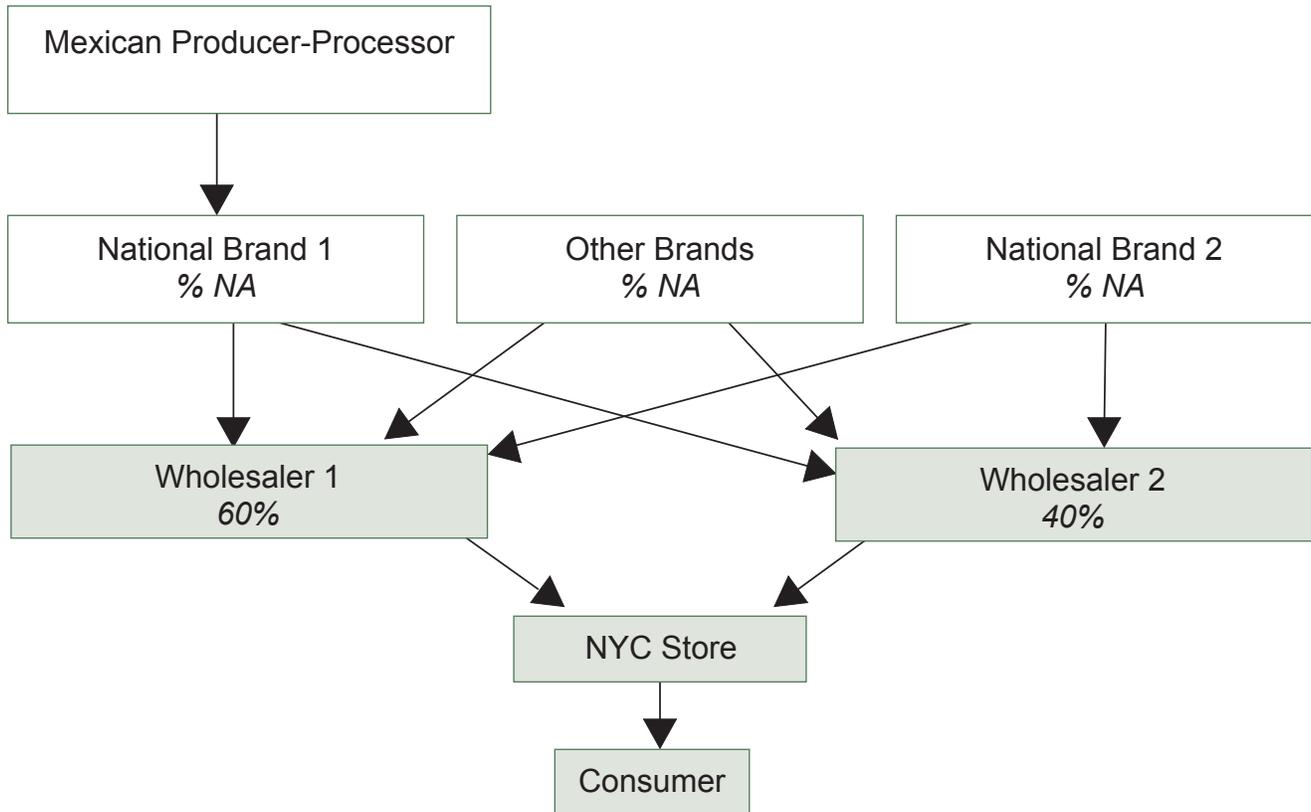
Supply Chains

As part of this case study, we trace the supply chains of two products from our market basket sold by NYC Store to determine the sources of these foods and the extent of regional food system participation.

Product 1: Frozen Broccoli

Broccoli production in the Northeast is quite small and is all for fresh consumption. Frozen broccoli production and processing is handled almost exclusively overseas. Although frozen broccoli is not produced in the Northeast, companies that repackage frozen loads of broccoli for retail and institutional sales do exist in the region.

Figure 1 depicts the general supply chain for NYC Store frozen broccoli florets. Starting at the store and tracing back the supply chain, the boxes upstream indicate the percent of the downstream member's total purchases. Both wholesalers that provide frozen broccoli to NYC Store are located in the Northeast.

FIGURE 1: Frozen Broccoli Supply Chain for NYC Store

Note: Shaded boxes represent supply chain members located in the Northeast Region. Numbers in boxes represent the percent of the next member's supply.

NA=Not available

Source: Author's calculations based on case interviews.

Suppliers

Wholesaler 1

Wholesaler 1 has been supplier of NYC Store for nine years, and it supplies 60 percent of the store's frozen broccoli. Orders are placed every other day via phone, e-mail, or online, and product is delivered in one day. The average order volume is 15 pounds and is delivered on a straight truck along with other products. The frozen broccoli is a small percent of the delivery. Delivery is not charged separately.

Prices are set by supplier. No contracts are used. Payment is expected in 21 days. Credit is given for any rejects. Wholesaler 1 collaborates on marketing and provides services for ads, merchandising, market share data, and the web.

NYC Store thinks very highly of Wholesaler 1, particularly

for its product diversity, quality products, timeliness of delivery, trustworthiness, and stock availability. Wholesaler 1's prices are the same or similar to other suppliers.

Wholesaler 2

The store gets the remaining 40 percent of its frozen broccoli from Wholesaler 2, and has been purchasing from this wholesaler for four years.

Orders are placed weekly via phone and online, and product is delivered in three days. The average order volume is 15 pounds and is delivered on a straight truck along with other products. The frozen broccoli is a small part of the delivery. Delivery is not charged separately.

Wholesaler 2's prices are comparable to Wholesaler 1's. Prices are set by the supplier. No contracts are used. Payment is expected in 21 days. Wholesaler 2 does not collaborate on marketing services. Credit is given for any rejects.

NYC Store 1 rates Wholesaler 2 well as a supplier but not as highly as it does Wholesaler 1.

National Brand 1

The National Brand 1 frozen broccoli is grown and processed in Mexico. Almost all frozen broccoli is commercially produced and processed overseas. The U.S. imports frozen broccoli primarily from Mexico, Guatemala, Ecuador, and China. Over 80 percent of U.S. processed broccoli consumed, most of which is frozen, is imported.

National Brand 1 is a leading frozen vegetable brand in the U.S. with a market share of 25.7 percent of frozen vegetable retail sales. National Brand 1 has two frozen vegetable processing plants in the U.S. that process other frozen vegetables; however, all of its frozen broccoli is imported, primarily from Mexico and Guatemala.

National Brand 1 is still highly dependent on the leading customer retailers. Wal-Mart, including all its divisions, and the rest of National Brand 1's 10 leading customers account for about 60 percent of National Brand 1's sales.⁴ The company reports that private label is a significant competitor.

⁴ National Brand 1's Form 10-K, Annual Report

Regional Comparisons

In this section we examine one frozen broccoli supply chain for NYC Store.

Table 4 presents the price margin⁵ per pound received by each member of this supply chain. In addition, it shows the percent of total or proportion of the retail price received by each member, using the member's price margin. For example, the store's price margin per pound is approximately 41.8 percent of the retail price. We note that the margin is what is left to pay for all other business expenses and profits, including marketing and transportation. It is not an indication of profitability.

The frozen broccoli supply chain starts with National Brand 1, which purchases the broccoli from a processor who has contract growers in Mexico. Insufficient data were collected to estimate the producer-processor and wholesaler price margins or shares of the retail price.

TABLE 4: Allocation of Retail Price in NYC Store's Frozen Broccoli Supply Chain¹

Supply chain segment	Price margin (\$/10 oz)	% of retail price
National Brand 1 producer-processor	NA	NA
Transportation	0.11	4.5
Wholesaler 1	NA	NA
NYC Store	1.00	41.8
Total Retail Price	2.39	100.0

¹Frozen broccoli florets shipped from Mexico.

NA=Not available

Source: Author's calculations based on case study and expert interviews

Table 5 shows the distance and fuel used to get frozen broccoli from the processor to the retailer. The estimated total fuel used to transport a hundred pounds of packaged frozen broccoli from Mexico to Wholesaler 1 via truck is 1.0 gallons. The remaining transportation from Wholesaler 1 to NYC Store uses an estimated 0.2 gallons per hundredweight.

⁵ Price margin is defined here as the sale price minus the purchase price.

TABLE 5: Food Miles and Fuel Use in NYC Store’s Frozen Broccoli Supply Chain

Supply chain segment	Food miles	Transport miles ¹	Truck capacity	Fuel use ²	Fuel use per cwt shipped
	<i>number</i>		<i>cwt</i>	<i>gallons</i>	
Non-regional: Mexico to NYC Store 1					
Celaya, Mexico to Wholesaler 1	2,491	2,491	400	415	1.0
Wholesaler 1 to NYC Store	194	388	150	35	0.2
All segments ³	2,685	2,879		450	1.3

¹ We assume trucks from the distribution center are returning empty.

² Miles per gallon (mpg) vary by segment. Trailer trucks used for shipping from the processor to the wholesaler’s distribution center have a capacity of 40,000 pounds and obtain 6 mpg. Transport from the wholesaler to the store is in straight trucks with a capacity of 15,000 pounds and obtain 11 mpg.

³ May not sum to total due to rounding.

Source: Author’s calculations based on case interviews.

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The store's leading brand of frozen broccoli: originates in Mexico and Guatemala.

”

Prospects for Expansion of Regional Food System: Frozen Broccoli

We define a regional supply chain as one where the product is produced, or grown, in the region. Therefore, we can say that a regional supply chain for frozen broccoli does not exist for NYC Store. The store’s leading brand of frozen broccoli originates in Mexico and Guatemala. We use the Mexican source to represent the international supply chain (see Figure 1).

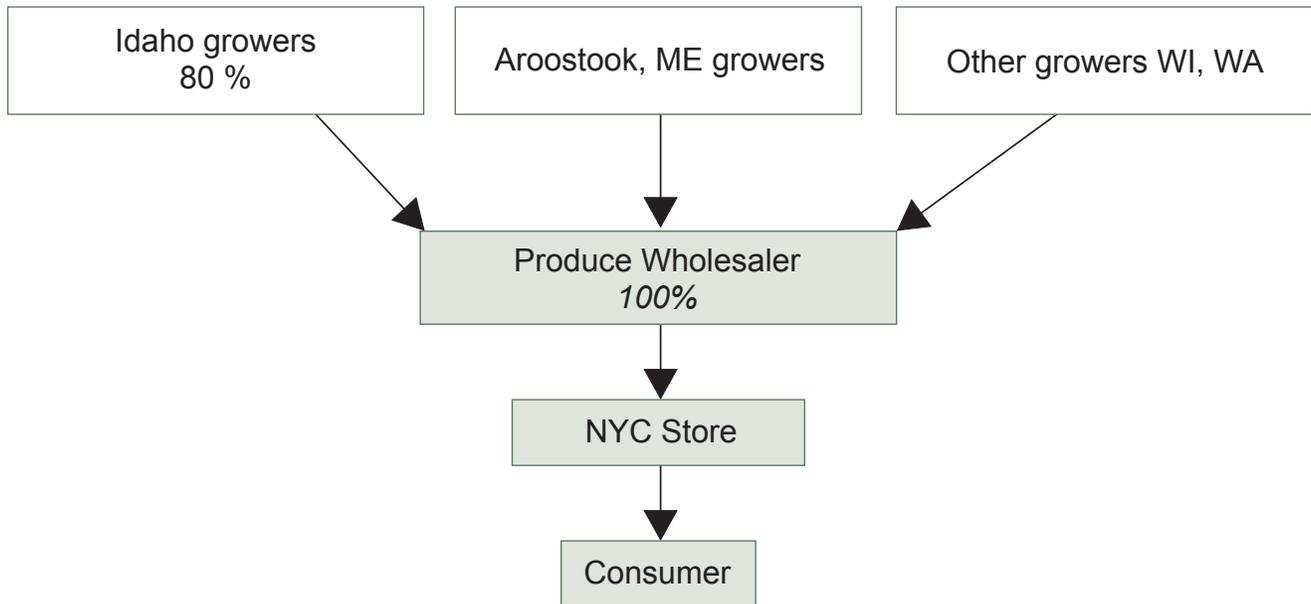
Although insufficient data were collected to estimate the value-added activity performed in the region, we do know that the activities performed by wholesaling and retailing are conducted in the region. In general, these activities are in receiving, storing, delivery, and sales.

Prospects for expansion of regional production of frozen broccoli on a scale to enter grocery retailing are limited.

Product 2: Potatoes

Figure 2 depicts the general supply chain for NYC Store's potatoes. Starting at the store and tracing back the supply chain, the boxes upstream indicate the percent of the downstream member's total purchases.

FIGURE 2: Potato Supply Chain for NYC Store, NY



Note: Shaded boxes represent supply chain members located in the Northeast Region. Numbers in boxes represent the percent of the next member's supply.

NA=Not available

Source: Author's calculations based on case interviews.

Produce Wholesaler

Produce Wholesaler supplies 100 percent of NYC Store's potatoes. Although the store manager believes 80 percent of the store's potatoes come from Idaho, he also believes the wholesaler procures regionally from the Northeast.

Produce Wholesaler is located five miles from NYC Store. It supplies a full house of fruits and vegetables with organic and conventional produce and Latin and Asian vegetables and tropical roots. Customers include independent and chain supermarkets, foodservice and other wholesalers. It also offers "local" product, from growers located in Long Island, upstate New York, New Jersey and Southern Connecticut.

As well as providing quality produce the wholesaler provides merchandising staff and expertise and training for store produce staff.

Orders to the wholesaler are placed via phone and fax every day and product is delivered within one day. The average order placed by NYC store is about 350 pounds and is delivered on a straight truck along with other products. Potatoes average around five percent of the produce delivery. Separate delivery costs are not charged.

Prices are set by the supplier. No contracts are used, and payment is expected in 30 days. Produce Wholesaler does not collaborate on marketing plans or services. Credit is given for any rejects.

NYC Store rates Produce Wholesaler well in all supplier characteristics including pricing, payment terms, quality, timeliness, proximity, trustworthiness, and stock availability and very well in having a diversity of products available.

Regional Comparisons

In this section we examine part of the potato supply chain for NYC Store. Eighty percent of the store's potatoes are grown in Idaho. We trace russet potatoes from Idaho in one of the supply chains. When in season and available, the store also carries round white potatoes from Maine. We trace round white potatoes from Maine in the other supply chain. Only these two supply chains of the total are represented.

Table 6 shows the price margin for each member of these supply chains and the allocation of retail revenues. The price received by Maine grower-shippers is greater than the price received by the Idaho grower-shippers.

The retailer charges the same price for 5-pound bags of both round white and russet potatoes, and it is charged the same price for each by Produce Wholesaler. Therefore, in both supply chains, the retailer receives the same share of the retail value for both round white potatoes and russets.

The Produce Wholesaler benefits much more from Maine's round white potatoes having the larger gross margin; however, as mentioned, a large majority of the store's potato sales are for russets rather than round white potatoes. We can infer that perhaps the wholesaler's demand for round whites is less than that for russets and wholesaler overhead would be spread across fewer sales of round whites.

Transportation costs for the Idaho supply chain are greater than for the regional supply chain from Maine, as might be expected.

TABLE 6: Allocation of Retail Price in NYC Store's Potato Supply Chain

	Regional		Non-regional	
	Maine growers (Round whites)		Idaho growers (Russets)	
Supply chain segment	Price margin (\$/5-lb. bag)	% of retail price	Price margin (\$/5-lb. bag)	% of retail price
Growers	0.78 ¹	26.0	0.67 ¹	22.5
Transport 2	0.21	7.0	0.67	22.5
Produce Wholesaler 3	0.60	20.1	0.24	8.2
Retailer	1.40	46.8	1.40	46.8
Total Retail Price	2.99	100.0	2.99	100.0

¹ USDA, Agricultural Market News, reported shipping price from respective growing areas.

² We use the following calculation to obtain the transportation supply chain segment: Trucks transporting potatoes from the producer-processor are trailers with a capacity of 40,000 lbs. Freight cost/truck capacity = transport.

³ Transportation from wholesaler to store is included in the Produce Wholesaler price margin.

Source: Author's calculations based on case interviews and USDA, Agricultural Marketing Service.

Table 7 depicts estimates of the distance and fuel used to get potatoes from the producer to the retailer. Transportation from potato suppliers in Idaho to the Produce Wholesaler consumes the most fuel per hundredweight of product. The fuel used to transport potatoes from Maine to the store is almost one fourth that from Idaho.

TABLE 7: Food Miles and Fuel Use in NYC Store's Potato Supply Chains, Idaho versus Maine

Supply chain segment	Food miles	Truck miles ¹	Truck capacity	Fuel use ²	Fuel use per cwt shipped
	<i>number</i>		<i>cwt</i>	<i>gallons</i>	
Regional: ME to NYC Store					
ME grower to Produce Wholesaler	592.0	592.0	400	99	0.25
Produce Wholesaler to NYC Store	5.3	10.6	150	1	0.01
All segments ³	597.3	602.6		100	0.25
Non-regional: ID to NYC Store					
ID grower to Produce Wholesaler	2260.0	2260.0	400	377	0.94
Produce Wholesaler to NYC Store	5.3	10.6	150	1	0.01
All segments ³	2265.3	2270.6		378	0.95

¹ Truck miles are equal to food miles when potatoes travel over 150 miles. Trucks on trips longer than 150 miles will return with a backhaul.

² Miles per gallon (mpg) vary by segment. Trailer trucks used for shipping potatoes from Idaho and Maine to Produce Wholesaler have a capacity of 40,000 pounds and obtain 6 mpg; straight trucks used to transport potatoes from the wholesaler to the retailer have a capacity of 15,000 pounds and obtain 11 mpg.

³ May not sum to total due to rounding.

Source: Author's calculations based on case interviews.

Prospects for Regional System Expansion: Potatoes

Although fresh potato consumption per capita has been declining for the past two decades, potatoes are still a leading item in the produce department and are the most consumed vegetable by weight and eighth by sales. The most popular potato variety is the russet which accounts for roughly half of all grocery store potato sales. The round white potatoes are the next most popular with the reds, golds, fingerlings, and other varieties making up the rest of the potato category.

We define a regional supply chain as one where the product is produced, or grown, in the region. Therefore, we can say that the supply chain that starts with potatoes grown by Maine potato farms is a regional supply chain for NYC Store. Not enough data were collected, however, to calculate the value-added activity supplied by this regional supply chain (Table 8).

Although the majority of the store's potatoes come from outside the region, some members including Produce Wholesaler and NYC Store are located in the Northeast, and all their value-added activities are conducted in the region.

We assume that the margins as a percent of retail price (see Table 6) is a proxy for the amount of value-added activity produced by each supply chain member. We then weight the percent of retail price by the amount of potatoes the supply chain provides (Figure 2) to estimate the value-added retained by supply chain members.

Since Produce Wholesaler and NYC Store are both located in the region, we add their weighted value-added estimates to obtain the extent of regional value-added activity produced by the Idaho supply chain.

Table 8 summarizes the extent of members' participation in the supply chain.

TABLE 8: An Illustration of Regional Value-Added Activity in the NYC Store Potato Supply Chain

	Percent of retailer's potatoes supplies	Value-added¹	Value-added retained by supply chain member	Extent of regional value-added activity²
Supply chain segment	%	% of retail price	%	%
Regional: ME Grower-Shipper³ to Produce Wholesaler to NYC Store				
ME Grower-Shipper	NA	26.0	NA	
Transportation		7.0	NA	
Produce Wholesaler	100	20.1	NA	
NYC Store	100	46.8	NA	
All segments	NA		NA	NA
Non-regional: ID Grower-Shipper to Produce Wholesaler to NYC Store				
ID Grower-Shipper	80	22.5	18.0	
Transportation		22.5	18.0	
Wholesaler	100	30.7 ⁴	24.6	
NYC Store	100	46.8	37.5	
All segments	80	100.0	80.0	44.0
Added-value contained in Region				NA

Note: Shaded rows indicate supply chain members located in the Northeast.

¹ This column contains the % margins of retail revenue from table 5 above.

² This column captures all regional activity in the NE within each supply chain (excluding supply chain activity outside of the northeast).

³ For this regional supply chain, ME Grower-Shipper represents ME farms selling to Produce Wholesaler, (See Figure 2).

⁴ Transportation percent of retail price is added to wholesaler percent of retail price as a function of the wholesaler

⁵ By default, the retailer percent is 100 percent.

NA=Not available

Source: Author's calculations based on case interviews.

Key Lessons for NYC Store

NYC Store is a small, independent supermarket located in a Harlem neighborhood in New York City. It purchases most of its supplies from Wholesaler 1 but also purchases from other suppliers. The product supply chains described in this case are frozen broccoli and potatoes.

The Store and Its Environment

Effect of size and economies of scale

- NYC Store is a small supermarket of approximately 20,000 square feet of selling space and solely owned. The store carries a full line of groceries and perishables.
- Like most independent stores, it purchases most of its products from wholesalers rather than directly from the manufacturer. Independent stores are often smaller companies that procure primarily from wholesalers, intermediaries between manufacturers and the store. In comparison, self-distributing supermarkets are large enough and have enough stores that they usually purchase directly from manufacturers. This allows the larger companies to buy in bulk and achieve discounts provided by the manufacturer.
- The size of the store itself can affect operations costs for delivery, replenishment, and labor. Deliveries of smaller volumes are more costly and less efficient. Wholesalers and distribution centers often have to break apart full cases to pick individual items for small orders, and transportation is more expensive for small drop sizes.
- Despite the fact that NYC Store is smaller and purchases primarily through wholesalers, it significantly outperforms the average supermarket store in some key metrics—weekly sales and weekly sales per square foot. Sales from its produce and meat departments also are above average.
- Wholesaler 1 and Produce Wholesaler provide highly satisfactory service. The high sales volume, limited storage space in the store, and smaller delivery trucks in the city requires frequent service. Because produce is fast moving and perishable, Produce Wholesaler deliveries every day, sometimes twice a day, in order to keep the store stocked.

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Despite the fact that NYC Store is smaller and purchases primarily through wholesalers, it significantly outperforms the average supermarket store in some key metrics.

”

Market Basket Supply Chains

Effect of regional production/industry

- The Northeast region produces potatoes but does not produce any frozen broccoli.
- The cost of labor has drawn frozen broccoli production to a number of countries in Latin America where production and manufacturing labor are both relatively inexpensive. Frozen broccoli packages are labeled by country of origin, although this labeling is in small print and is not prominently displayed.

- The majority of potatoes the store sells are from Idaho. It may be that because the NYC metropolitan area is a huge consumer, the store's produce wholesaler is engaging with suppliers who can supply them large quantities year round, without the wholesaler having to piece together a number of supply chains from different sources.
- While the Northeast does produce potatoes, the farms, in general, are not large enough to supply supermarket chains let alone large city wholesalers. The Northeast produces only an estimated 38 percent of the amount of potatoes consumed in the region.

Extent of regional value-added activity

- Frozen broccoli is grown and processed outside the region. Despite this, some value-added supply chain activities are conducted in the region by Wholesaler 1 and by the store itself. In addition, limited amounts of regionally grown potatoes are sold by the store. Handling, storage, selling, and transportation activities are conducted in the region, but we were unable to gather and measure this information.
 - We see that even for supply chains in which the origin is very far away there is value-added activity going on in the Northeast. This is important because this translates into economic activity due to the distribution and retailing system which happens in the Northeast.

Effect of geography/distance

- The fuel use for frozen broccoli and potatoes are significantly different. Estimates of fuel use for Idaho potatoes and Maine potatoes are 0.95 and 0.25 gallons per hundredweight respectively. Maine potatoes require almost one-fourth the fuel as Idaho potatoes.
- Estimated fuel use for frozen broccoli produced in Celaya, Mexico is 1.3 gallons per hundredweight.
 - The biggest competitive factors for the Northeast farms are most likely cost of transportation and proximity to market. These have been the biggest factors for decades, but because of increased transportation costs, government regulations on trucking, and deteriorating transportation infrastructure, these factors have become more important in the cost equation.

Appendix

Frozen Broccoli Industry Profile

According to the USDA Economic Research Service (ERS), 2.6 pounds of frozen broccoli were available per capita in the U.S. in 2015 (Table A.1.). In 2015, 5.9 pounds of fresh broccoli, almost twice that of frozen, were available per capita. In 2013, the last year the USDA ERS collected retail price data, retail prices for fresh broccoli florets were also higher than for frozen broccoli.

TABLE A.1: Broccoli—Average Retail Price Per Pound and Per Capita Consumption

Form	Average retail, 2013	Per capita availability, 2015
	<i>price per pound</i>	<i>pounds</i>
Fresh	-	5.9
Florets	\$2.57	-
Head	\$1.64	-
Frozen	\$1.87	2.6

Sources: USDA, ERS. "USDA ERS - Fruit and Vegetable Prices." Accessed February 10, 2017. <https://www.ers.usda.gov/data-products/fruit-and-vegetable-prices.aspx#.Ua5GqjxZ56I%20>. and USDA, ERS Food Availability (Per Capita) Data System. Accessed January 19, 2017. <https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/>.

While approximately 80 percent of the 2015 fresh broccoli supply in the U.S. was produced domestically, 82 percent of frozen broccoli consumed in the same year was imported.⁶ Indeed, in 2015 broccoli accounted for about 30 percent of all frozen vegetable imports. Frozen broccoli imports come primarily from Mexico, Guatemala, and Ecuador (Table A.2.).

⁶ "USDA, ERS Food Availability (Per Capita) Data System. Accessed January 19, 2017. <https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/>.

TABLE A.2: Frozen Broccoli, Cut/Reduced in Size: U.S. Imports from Selected Countries, 2015

Trade partner	Volume	% of total volume	Value	% of total value
	<i>1,000 pounds</i>	<i>percent</i>	<i>1,000 dollars</i>	<i>percent</i>
Mexico	444,974	78.9%	247,165	80.9%
Guatemala	62,019	11.0%	28,440	9.3%
Ecuador	38,334	6.8%	22,153	7.2%
China	15,568	2.8%	5,299	1.7%
TOTAL	564,283		305,379	

Source: USDA, ERS. "Data by Commodity - Imports and Exports." Accessed February 10, 2017.

https://data.ers.usda.gov/reports.aspx?programArea=veg&stat_year=2008&top=5&HardCopy=True&RowsPerPage=25&groupName=Vegetables&commodityName=Broccoli&ID=9457#P09f71a77e64d48e8abb51897a0ab1c10_9_384.

From 2011-2015 the volume of frozen broccoli imports remained steady while the total value grew (Table A.3.).

TABLE A.3: Frozen Broccoli Imports: Volume and Value

	Volume	Value
	1,000 lbs.	\$
2011	607,354	291,400,870
2012	584,789	288,213,977
2013	515,093	264,692,431
2014	573,756	295,000,000
2015	564,293	305,379,000

Source: USDA, ERS, "Data by Commodity - Imports and Exports." Accessed February 10, 2017.

https://data.ers.usda.gov/reports.aspx?programArea=veg&stat_year=2008&top=5&HardCopy=True&RowsPerPage=25&groupName=Vegetables&commodityName=Broccoli&ID=9457#P09f71a77e64d48e8abb51897a0ab1c10_9_384.

Data on domestic broccoli production do not differentiate production for frozen versus fresh use, and USDA does not report broccoli production statistics by state. But in Atallah, et al. 2014, authors estimated broccoli acreage and yield for several states using USDA statistics and local verification.⁷ Overall, California and Arizona dominate production, but several states in the Northeast also have significant summer and fall production by higher numbers of smaller farms (Table A.4.).

⁷ Atallah, Shady S., Miguel I. Gómez, and Thomas Björkman. "Localization Effects for a Fresh Vegetable Product Supply Chain: Broccoli in the Eastern United States." *Food Policy* 49, Part 1 (December 2014): 151–59. doi:10.1016/j.foodpol.2014.07.005.

TABLE A.4: Estimated Broccoli Acreage and Yields in Eastern and Western States.

	Broccoli acreage				Number of farms	Yield (21-pound boxes/acre)
	Spring	Summer	Fall	Winter		
Maine	0	3,300	2,200	0	71	500
Maryland	0	145	145	0	40	400
New Jersey	0	69	69	0	74	450
New York	0	400	400	0	270	450
Pennsylvania	0	100	100	0	218	550
Total Eastern U.S.	0	4,014	2,914	0	673	n/a
Arizona	5,000	0	5,000	15,000	44	600
California	32,650	32,650	32,650	32,650	416	800
Total Western U.S.	37,650	32,650	37,650	47,650	460	n/a
Total U.S.	39,741	36,824	42,069	48,706	1450	n/a
North Eastern share (%)	0	11	7	0	46	n/a
Western share (%)	95	89	89	98	32	n/a

Source: Atallah, Shady S., Miguel I. Gómez, and Thomas Björkman. "Localization Effects for a Fresh Vegetable Product Supply Chain: Broccoli in the Eastern United States." *Food Policy* 49, Part 1 (December 2014): 151–59. doi:10.1016/j.foodpol.2014.07.005.

Potato Industry Profile

According to the National Agricultural Statistics Service (NASS) Survey, in 2015 the U.S. produced 441,205 hundredweight (cwt) of potatoes for both fresh use and processing (Table A.5). Idaho produces approximately 30 percent of total U.S. production. Although potatoes can be grown year-round in parts of the U.S., potatoes harvested in the fall account for the majority, 92 percent, of production.⁸

The Northeast region produced 23,759 cwt of potatoes, totaling 5.4 percent of U.S. production. The states in the Northeast that report production are Maine, Maryland, Massachusetts, New York, Pennsylvania, and Rhode Island.

⁸ USDA, NASS. "Potatoes: 2015 Summary," July 2016. <http://usda.mannlib.cornell.edu/usda/current/Pota/Pota-09-15-2016.pdf>.

Table A.5. 2015 Potato Production in the Northeast

State	Production <i>1,000 cwt</i>	Value <i>\$1,000</i>
U. S.	441,205	3,865,538
Northeast Region	23,759	252,684
Maine	16,160	163,216
Maryland	792	8,316
Massachusetts	1,098	11,419
New York	4,144	50,557
Pennsylvania	1,484	18,253
Rhode Island	81	923

Source: USDA, NASS. "Potatoes: 2015 Summary," July 2016. <http://usda.mannlib.cornell.edu/usda/current/Pota/Pota-09-15-2016.pdf>.

Although potato production yields in the Northeast are significantly lower than the U.S. average, higher potato prices help reduce the impact of the lower yields (Table A.6).

Table A.6. 2015 U.S. and Northeast Potato Statistics

Source	Variable	U.S.	Northeast	Northeast, % of U.S.
1	Production <i>1,000 cwt</i>	441,205	23,759	5.4%
1	Value <i>\$ thousands</i>	\$3,865,538	\$252,684	6.5%
1	Acres harvested <i>1,000</i>	1,054	77	7.3%
1	Yield per acre <i>cwt</i>	418	275	65.8%
1	Value of production <i>1,000</i>	\$4,237,284	\$252,684	6.0%
1	Price received <i>\$ per cwt</i>	\$8.76	\$11.15	127.3%
2	Utilization per capita, fresh <i>lb</i>	34.0		
2	Utilization per capita, processing <i>lb</i> .	79.7		

NOTE: Northeast totals may be low because several states do not report.

Sources:

¹ USDA, NASS. "Potatoes: 2015 Summary," July 2016. <http://usda.mannlib.cornell.edu/usda/current/Pota/Pota-09-15-2016.pdf>.

² "USDA, ERS, Food Availability (Per Capita) Data System. Accessed January 19, 2017. <https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/>.

In 2015, 25 percent of the U.S. potato crop was for fresh use while 62 percent was for the processing market.⁹ With respect to retail sales, potatoes were the third highest selling vegetable item in 2015 (Table A.7).

Table A.7. Top 5 Retail Vegetable Items

U.S. Retail Produce Sales for 52 weeks ending 12/26/2015

Item	Average sales per store per week
Packaged salad	\$3,607
Tomatoes	\$3,005
Potatoes	\$2,656
Cooking vegetables	\$2,519
Value-added vegetables	\$2,519

Source: "FreshFacts on Retail: 2015." United Fresh Produce Association and Nielsen Perishables Group, January 2016.

Retailers keep potatoes in the store year round, stocking different varieties and selections of bagged and bulk (loose) potatoes. Potatoes can be stored, usually by the producer or packer, for most of the year, with most potatoes being harvested in the fall. In order to maintain stock, retailers will source potatoes grown in different regions. Purchasing from different growing regions provides risk insurance in case of regional crop failures.

⁹ USDA, ERS, Food Availability (Per Capita) Data System. Accessed January 19, 2017.
<https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/>.

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2017-11	Case studies of supermarkets and food supply chains in low-income areas of the Northeast: Madison County Store, New York		Park, K.S., Gomez, M. and K. Clancy
2017-10	Case studies of supermarkets and food supply chains in low-income areas of the Northeast: Kent Store 2, Delaware		Park, K.S., Gomez, M. and K. Clancy
2017-09	Case studies of supermarkets and food supply chains in low-income areas of the Northeast: Kent Store 1, Delaware		Park, K.S., Gomez, M. and K. Clancy
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