OCTOBER 2017 E.B 2017-08

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

CHARLESTON STORE, WEST VIRGINIA

Kristen S. Park, Miguel Gómez, Kate Clancy

Food Industry Management Program
Charles H. Dyson School of Applied Economics and Management
College of Agriculture and Life Sciences
Cornell University, Ithaca, NY 14853

This research was supported by USDA-NIFA AFRI Grant #2011-68004-30057:
Enhancing Food Security in the Northeast through Regional Food Systems,
a joint project of 11 institutions led by the Northeast Regional Center for Rural Development.

Case Studies of Supermarkets and Food Supply Chains in Low-Income Areas of the Northeast: Charleston Store, West Virginia. By Kristen S. Park[1,4], Miguel Gómez[2], Kate Clancy[3], Extension Bulletin 2017-08. Charles H. Dyson School and Applied Economics and Management, College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853.

Acknowledgements

This case study was conducted as part of a U.S. Department of Agriculture funded project titled "Enhancing Food Security in the Northeast through Regional Food Systems" (EFSNE). This seven-year research, education, and outreach project examines food production, distribution, and consumption in the Northeast U.S. (defined as 12 states from Maine to West Virginia and the District of Columbia) with the goal of understanding the potential for regional food systems to address food security challenges in the region. The project includes collaborators from 11 different universities and other institutions. As part of the project's distribution, consumption, and outreach objectives, five urban and four rural study locations in the Northeast have been identified for community- and store-level analysis.

The authors would like to acknowledge the enormous contributions of the store participants. In addition we would like to thank the EFSNE project investigators for their support to the case studies and to Elaine Hill, Bobbie Smith, III, Irin Nishi, Susan Parker, Derek Simmonds, and Dan Kane for their interviews and data collection efforts.

This work was supported by USDA grant #2011-68004-30057

[1] Extension Associate, Charles H. Dyson School of Applied Economics and Management, Cornell University

[2] Associate Professor, Charles H. Dyson School of Applied Economics and Management, Cornell University

[3] Food Systems Consultant

[4] Author contact: 475C Warren Hall, Charles H. Dyson School of Applied Economics and Management, Cornell University, Ithaca, NY 14853-7801, ksp3@cornell.edu, +1-607-255-7215

Table of Contents

List of Tables

List of Figures

Charleston Store, West Virginia

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 2014 to 2016. Fictitious names are used to maintain confidentiality of the case study participants.

Place: Charleston, WV

This case describes one retail supermarket in a neighborhood of Charleston, West Virginia and two of its product supply chains.[1] The Charleston neighborhood has a population of 15,006 with a median household income of $45,350, slightly higher than the median household income for West Virginia, $41,576 (Table 1). Almost one in five individuals in the neighborhood, however, is impoverished. The neighborhood has a large African American population (13 percent) relative to the rest of the state (4.1 percent).

The U.S. Census Bureau reports five grocery stores, excluding convenience stores, 22 convenience stores and no warehouse clubs or supercenters in the neighborhood. The neighborhood thus contains 3.33 grocery stores per 10,000 residents within the neighborhood along with 14.66 convenience stores per 10,000 residents (Table 1), higher concentrations than those in the county or the state. The concentration of food retailers per 10,000 persons is included in Table 1 to illustrate how this compares to the 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: Demographic and Food Environment Statistics for Charleston Store

	Neighborhood zip code	Kanawha County	West Virginia
DEMOGRAPHICS			
Population and Age			
Population[1]	15,006	191,765	1,853,881
Median age[1]	43	42.5	41.6
Less than 5 years of age[a,1]	6.0%	5.6%	5.6%
Average household size[1]	2.15	2.29	2.43
Education			
High school degree or higher[a,1]	90.8%	87.6%	84.4%
Bachelor's degree or higher[a,1]	27.0%	24.9%	18.7%
Race and Ethnicity			
African American or Black[a,b,1]	13.0%	5.7%	4.1%
Hispanic[a,c,1]	0.7%	1.0%	1.3%
Poverty and Program Participation			
Poverty rate[a,1]	19.1%	15.0%	18.1%
Food insecurity rate[a,2]	13.7%	15.3%	18.4%
Share SNAP recipients[a,d,1,3]	N/A[e]	18.4%	18.9%
Income			
Median household income[1]	$45,350	$46,583	$41,576
FOOD ENVIRONMENT			
Grocery stores[f,4]	3.33	1.98	0.18
Convenience stores[f,4]	14.66	5.06	1.49
Warehouse clubs and supercenters[f,4]	0	0.21	0.24

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.

Charleston Store

Charleston Store is independently owned but is a licensed member of a chain of grocery stores. The owner also owns other grocery stores in the region which are not part of this chain. This store has been in business for over 20 years and is a small store with a limited number of grocery items.[2] Most of the products it sells are private label brands with few national brands. In addition, the products are displayed still on pallets, reducing labor needed to shelve products and reducing the need for shelving fixtures themselves. These features enable the store to sell products at extremely low prices.

The store has a selling area of about 10,000 square feet plus 2,000 square feet for backroom storage (Table 2). It averages about $6 million annually and employs 15 full-time and 12 part-time employees.

Almost everything the store sells is supplied by Integrated Wholesaler which sells to all the chain stores under its umbrella of operations. This grocery wholesaler has 16 distribution centers around the U.S. serving its retail store members. Some items sold in the store, however, such as bread, chips, candy, etc. are delivered directly to the store by the manufacturer. The store can order from other suppliers in case of emergency or out-of-stocks.

The store is only about one-quarter the size of the average supermarket (Table 2), and its weekly sales reflect the smaller size. The estimated weekly sales per square foot, however, is similar to the average U.S. supermarket. Its weekly sales per full-time equivalent is estimated as $5,494 compared to the U.S. average of $4,423. The owner reports that 70-85 percent of the store's sales are Supplemental Nutrition Assistance Program (SNAP) sales.

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

	Charleston Store	2014 U.S. average
Store size	10,000 sq ft	46,000 sq ft
Weekly sales	$115,385	$325,478
Weekly sales per sq ft of selling area	$9.62	$9.77
Weekly sales per full-time equivalent employee	$5,494 est.	$4,423

Source: Food Marketing Institute, "Supermarket Facts" and *Progressive Grocer*, "82st Annual Report of the Grocery Industry." April 2015.

[2] 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 in 2014.

The store's strategy is to be a limited assortment store and to reduce operational costs. The layout and product assortment emphasizes shelf-stable groceries. The store sales reflect the product assortment. Fresh meat is the largest food department and accounts for 12 percent of store sales, while produce accounts for eight percent (Table 3), both less than the U.S. average. Percent of store sales in the other food categories are higher than the U.S. average.

TABLE 3: Percent of Store Sales by Various Departments and Categories

Department or category	Charleston Store[1]	Industry Average[2]
	percent of store sales	
Produce	8	11.6
Fresh meat (incl. poultry)	12	14.1
Fluid milk	3-4	2.4
Canned fruits and vegetables	6-6.5	1.0
Frozen fruits and vegetables	0.5	0.2
Bread (loaf/bagged, not bakery goods)	4-5	2.9

[1] Case study interview.
[2] *Progressive Grocer,* "Consumer Expenditures Study", July 2015.

The overall gross margins for the store, which is the difference between the purchase price and selling price as a percent of the selling price, is 18 percent, much lower than the industry average. Gross margin 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.

Although sales during the last three years have stayed the same, the manager was not troubled by the stagnant sales. The owner recently opened a store nearby, and he and the manager feel that this might be taking some sales away from the store. They anticipate sales in the next three years to stay the same or increase and believe the store will be in business in ten years.

When asked what factors limit the store's ability to procure regionally produced foods from the Northeast, they replied that they have to buy from Integrated Wholesaler's distribution center unless a product is out of stock. When asked about healthy

products, the owner and the store manager also replied that the distribution center did not have low salt, "light" products, or organic products.

Neither the owner nor the manager perceive any limitations to staying in business.

Market basket items – Bread and Potatoes

Eighty-five percent of Charleston Store's bread sales is for white bread while five percent is for the WIC-approved 100% whole-grain bread. The most popular brand is the private label white bread which is $0.99 per 20-ounce loaf while the WIC-approved 100% whole grain bread is $3.19 per 16-ounce loaf. Although this could be a deterrent for some of the population, WIC-approved items, such as the 100% whole-grain bread, are free to WIC participants.

Charleston Store sells russet and red potatoes; however, it does not sell round white potatoes. Russets are the most popular potato variety at the store. About 75 percent of potato sales are russet potatoes in a 5-pound bag. The store manager believes they come from Idaho, Michigan and the Northeast.

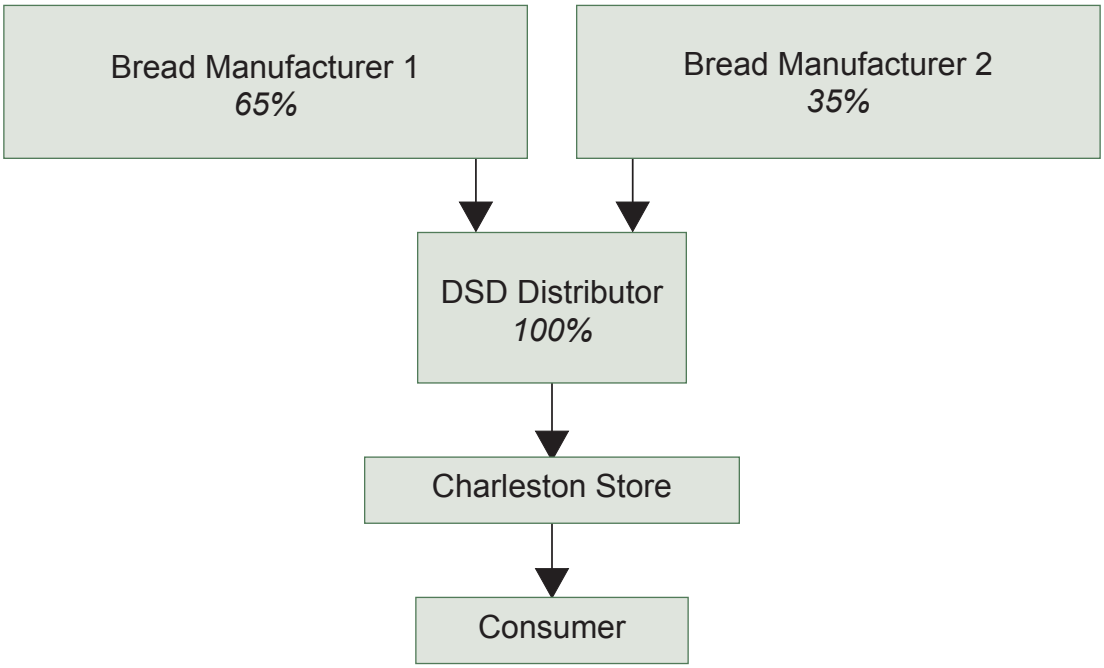
Supply Chains

We trace the supply chains of two of our market basket products sold by the Charleston Store, bread and potatoes, to determine the sources of these foods and the extent of regional food system participation.

Product 1: Bread

Charleston Store buys its bread from two national bread manufacturers both of whom have plants in West Virginia. Figure 1 depicts the general supply chain for Charleston Store's bread. Starting at the store and tracing back the supply chain, the boxes upstream indicate percent of the downstream member's purchases. For example, two bread manufacturers provide 100 percent of Charleston Store's bread, 65 percent from Bread Manufacturer 1 and the remaining 35 percent from Bread Manufacturer 2.

FIGURE 1: Bread Supply Chain for Charleston 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.
Source: Author's calculations based on case interviews.

Suppliers

DSD Distributor
A direct store delivery (DSD) distributor delivers all the bread made by WV bread manufacturer 1 and by WV bread manufacturer 2. Invoices are paid directly to the manufacturers.

The store has used this DSD for 23 years, as long as the store has been in business. The store's normal, daily bread order is about $500. Deliveries are from a straight, bread truck, and delivery is not charged separately.

The DSD manages the bread category. It orders for the store, delivers and stocks the shelves daily, removes out-of-date bread, and manages returns. But it does not own the bread products it delivers and manages.

When asked about the timeliness of deliveries, the manager indicated that in the event of a snow scare, they cannot get bread from their DSD distributor. And bread is a staple item that many people stock up on in the event of natural disaster forecasts. Other than this issue, however, he was satisfied with the timeliness of deliveries.

Prices are negotiated and contracts are not used. Payment is expected within 30 days.

Bread Manufacturer 1
Bread Manufacturer 1 is large company with over 40 manufacturing facilities throughout 16 states. It makes the distribution center's private label breads and is the source of 65 percent of Charleston Store's bread.

The company primarily uses direct store deliverers to distribute its products. Over 80 percent of its sales are distributed by this method. Only 17 percent are delivered to customers' warehouses. The store could order more from Bread Manufacturer 1, but likes having the variety and prices provided by its other supplier Bread Manufacturer 2.

Bread Manufacturer 2
Bread Manufacturer 2 owns more than 60 bakeries, employs more than 22,000 associates and distributes products through 11,000 sales routes throughout the United States.

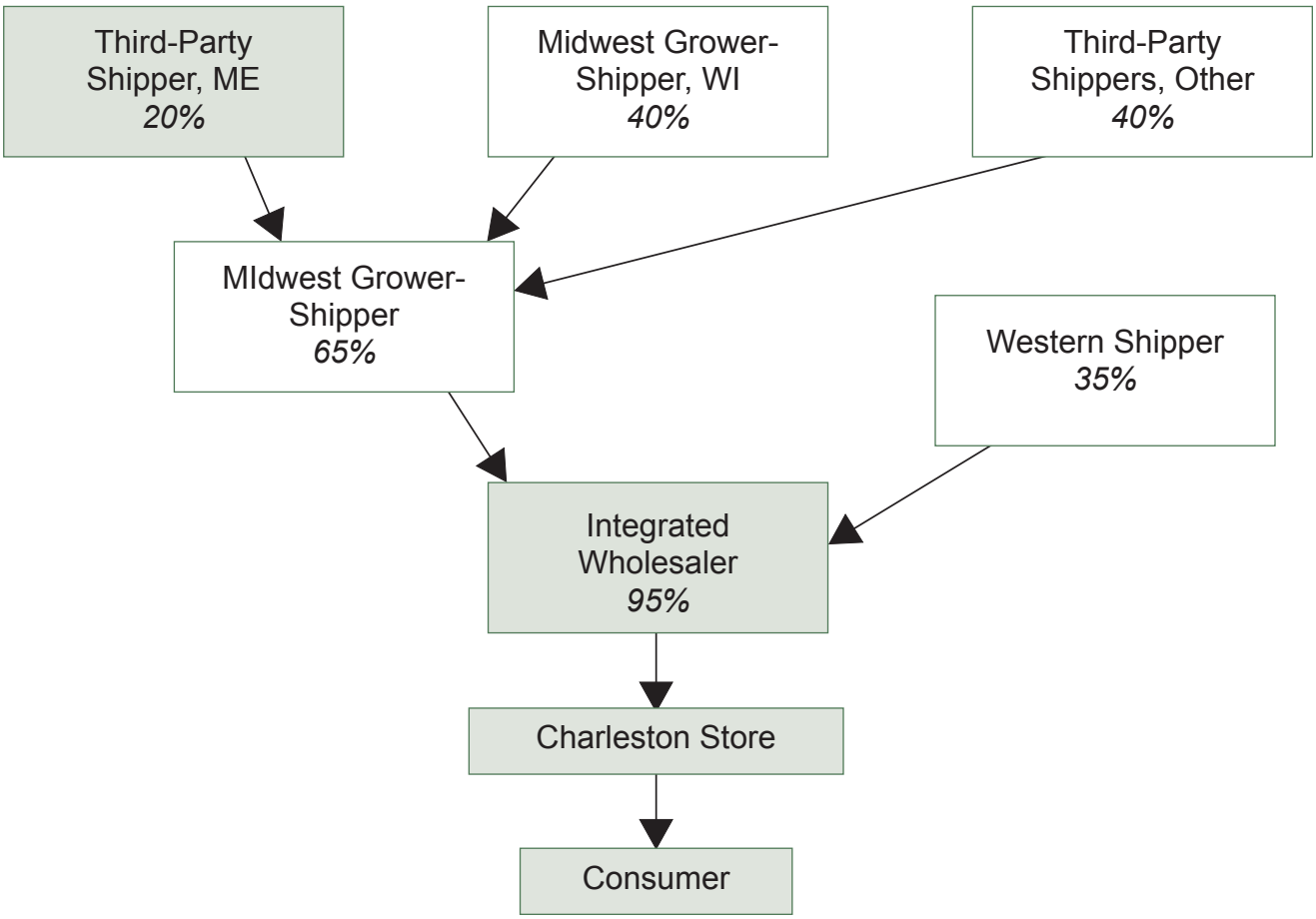
The store does not buy more products from Bread Manufacturer 2 because the manufacturer does not offer the wholesale chain's private label breads. The store manager is also dissatisfied with the weekly payment terms.

Prospects for Expansion of Regional Food System: Bread
We define a regional supply chain as one where the product is produced, or grown, in the region. Wheat is the primary ingredient for making bread, however, the bakeries use many other ingredients as well. While we cannot say that the wheat used to make the bread is from the region, we can say that the manufacturers and the bakeries are regional, and therefore, all the value-added activities from manufacturing to retail are regional.

Product 2: Potatoes

Charleston Store buys its potatoes from its primary wholesaler. Figure 2 depicts the general supply chain for Charleston Store's potatoes. Starting at the store and tracing back the supply chain, the boxes upstream indicate percent of purchases of the downstream member. For example, the store's Integrated Wholesaler provides 95 percent of Charleston Store's potatoes.

FIGURE 2: Potato Supply Chain for Charleston 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.
Source: Author's calculations based on case interviews.

The store manager orders potatoes twice per week with an average order of 30 five-pound bags per order. Potatoes arrive on the semi-truck from the warehouse with other orders. Trade promotion programs are always collaborative, and Integrated Wholesaler always has some sort of potato item being advertised. The manager is very satisfied with the prices the chain provides.

Supplier

Integrated Wholesaler
Charleston Store's primary supplier, Integrated Wholesaler, purchases the majority of its potatoes, 65 percent, from Midwest Grower-Shipper, a grower, shipper, distributor, and broker of potatoes. The wholesaler has been using Midwest Grower-

> “Integrated Wholesaler orders an enormous volume of potatoes, so Midwest Grower-Shipper believes it would be hard for any one supplier in the Northeast to supply it with potatoes.”

Shipper as a potato supplier ever since the category merchandiser has been with the company, which has been 18 years, and says it provides the right potatoes to the right distribution center (DC) at the right time. It sources potatoes from around the country, including grower-shippers from the Northeast as well as other grower-shippers. Midwest Grower-Shipper optimizes prices, logistics, and transportation to various Integrated Wholesaler's distribution centers. The wholesaler relies heavily on the shipper and trusts it enough to manage the shipper's potato inventories in the wholesaler's DCs.

Midwest Grower-Shipper

Midwest Grower-Shipper is located in the Midwest. It grows its own potatoes and also markets potatoes for other growers, which can include all or part of their crop. It grows and/or sells product from the major production areas in Idaho, Wisconsin, Colorado, California, as well as the Northeast and other growing areas in the U.S.

Midwest Grower-Shipper does use Northeast potato suppliers to help fulfill orders from the Integrated Wholesaler's DC. The percent used varies tremendously from year to year. Currently, it is sourcing about 20 percent of the DC's orders from Northeast growers, 40 percent from the Midwest, and 40 percent from Canada.

Integrated Wholesaler orders an enormous volume of potatoes, so Midwest Grower-Shipper believes it would be hard for any one supplier in the Northeast to supply it with potatoes.

Midwest Grower-Shipper grows and markets russets, reds, yellows and fingerling potatoes and offers several value-added forms of potatoes, such as microwaveable packs, herbed and seasoned. It will also pack private label for its customers on request.

The grower-shipper also maintains a quality assurance team that works with its growers and assists them with their food-safety programs to ensure their food safety certifications are maintained.

It manages its potato inventory in Integrated Wholesaler's DCs as needed. This means it places an "automatic vendor fulfillment order" with the DC twice per week or once per week depending on whether the DC needs the potatoes or not. The order is always a full tractor-trailer load which translates roughly into 840 50-pound bags (40,000 pounds). Deliveries are 1-2 days after ordering. The grower-shipper arranges the transportation logistics.

Prices are established weekly. Midwest Grower-Shipper provides a free-on-board (f.o.b.) as well as a delivered quote, even though the wholesaler always uses the delivered quote. This provides the wholesaler information about what the grower-

shipper is charging for transportation. The wholesaler monitors transportation prices on the open market to make sure the grower-shipper's transportation charges are remaining competitive. Price negotiations start with the USDA weekly market.

Western Shipper

Integrated Wholesaler buys the remaining 35 percent of its potatoes from Western Shipper. It has used the company as a supplier for about 15 years. This shipper does not procure regionally in the Northeast.

All orders are placed via electronic data interchange (EDI) weekly. Delivery is about 10 days after the order is placed. The orders are delivered via tractor-trailer and delivery is included in the price. Prices are negotiated weekly and in a similar fashion to Midwest Grower-Shipper negotiations.

The only challenge Integrated Wholesaler has with this shipper is timeliness of delivery as delays can compound when produce is transported over long distances.

Regional Comparisons

In this section we examine three of Charleston Store's russet potato supply chains. We define a regional supply chain as one where the product is produced, or grown, in the region. Some of the store's russet potatoes are indeed grown in the Northeast by third-party grower-shippers from Maine, New York and Pennsylvania and are sourced by Midwest Grower Shipper. For purposes of discussion, we compare a russet potato supply chain from a hypothetical shipper in Maine with other supply chains originating in Wisconsin and in Idaho. We use Maine since it is the largest potato producing state in the Northeast.

Table 4 shows the price margin[4] per five-pound bag of potatoes received by each member of the supply chains. 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, "shipper" is the first member listed in each of the supply chain. The price for a five-pound bag of potatoes from Midwest Grower-Shipper is $0.99 and from Western Shipper is $0.83 f.o.b.

To estimate the shipper price for a third-party shipper located in Maine and shipping russet potatoes to Integrated Wholesaler on behalf of Midwest Grower-Shipper, we use the Agricultural Marketing News Service Maine f.o.b for 2014 which was $0.84 per five-pound bag. Transportation was estimated as $0.26. Subtracting these third-party costs from the price negotiated by Midwest Grower-Shipper for managing its potato inventories at the distribution center, leaves an estimated margin for the Midwest shipper of $0.30 for its management efforts.

[4] Price margin is defined here as the sale price minus the purchase price.

The price margin for Integrated Wholesaler is $0.39 and $0.29 from Midwest Grower-Shipper and Western Shipper respectively. We note that the price margin is what is left to pay for all other business expenses and profits. It is not an indication of profitability.

The retailer's price margin is the same for Midwest Grower-Shipper and for Western Shipper potato supplies, because the five-pound bag of russet potatoes has the same product specifications regardless of where it was produced, and the cost for the five-pound bag of russet potatoes from Integrated Wholesaler is the same.

Transportation costs in the Western Shipper supply chain are greater than in the Midwest Grower-Shipper supply chain due to the greater distance traveled. Transportation costs from Midwest Grower-Shipper were calculated from headquarters in the Midwest and transportation from a third-party shipper in Maine.

TABLE 4: Allocation of Retail Price in Charleston Store's Potato Supply Chains

	Russets					
	Midwest Grower-Shipper				Western Shipper, ID	
	Midwest, WI		Third-Party Shipper, ME			
Supply chain segment	Price margin ($/5-lb bag)	% of retail price	Price margin ($/5-lb bag)	% of retail price	Price margin ($/5-lb bag)	% of retail price
Third-Party Shipper[1]	NA	NA	0.84	33.8	NA	NA
Transportation	NA	NA	0.26	10.3	NA	NA
Shipper[2]	0.99	39.9	0.30	12.1	0.83	33.3
Transportation[3]	0.41	16.3	NA	NA	0.67	27.0
Integrated Wholesaler[2]	0.39	15.7	0.39	15.7	0.29	11.6
Transport[2]	0.16	6.1	0.16	6.4	0.16	6.4
Charleston Store[2]	0.54	21.7	0.54	21.7	0.54	21.7
Total Retail Price	2.49	100.0	2.49	100.0	2.49	100.0

Note: NA = "not applicable"
[1] USDA-AMS Market News Shipping Point Report
[2] Case study interviews
[3] USDA-AMS Specialty Crops Truck Rate Reports, 2014

Table 5 shows estimates of the distance and fuel used to transport potatoes from the producer to the retailer. The potatoes supplied by Western Shipper travel about twice as far as potatoes from Midwest Grower-Shipper and Third-party Shipper from Maine with about twice as much fuel used. Aroostook, the major producing region in Maine is actually the same distance from Integrated Wholesaler's distribution center as Midwest's primary growing region in Wisconsin.

TABLE 5: Food Miles and Fuel Use in Charleston Store's Potato Supply Chains

	Food miles	Truck miles[1]	Truck capacity	Fuel use[2]	Fuel use per cwt shipped
Supply chain segment	*number*		*cwt*	*gallons*	
Regional: Third-Party Shipper, ME to Charleston Store					
Shipper (ME) to Integrated Wholesaler DC	844	844	400	141	0.35
DC to Store	290	290	400	48	0.12
All segments	1,151	1,151		189	0.47
Non-regional: Midwest Grower-Shipper to Charleston Store					
Shipper (WI) to Integrated Wholesaler DC	861	861	400	144	0.36
DC to Store	290	290	400	48	0.12
All segments	1,151	1,151		192	0.48
Non-regional: Western Shipper to Charleston Store					
Shipper (ID) to Integrated Wholesaler DC	2090	2090	400	349	0.87
DC to Store	290	290	400	48	0.12
All segments	2,380	2,380		397	0.99

[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] Trailer trucks used for shipping potatoes from shipper to distribution center and from distribution center to the store have a capacity of 40,000 pounds and obtain 6 mpg
Source: Author's calculations based on case interviews.

Prospects for Expansion of Regional Food System: Potatoes

The store is located in Charleston, West Virginia which is the western edge of our defined region. One regional supply chain currently exists with potatoes originating from Maine which is the largest potato producer in the Northeast. In this case, Maine is a third-party supplier and is engaged by Midwest Shipper to provide some potatoes to Integrated Wholesaler's DC. Maine is roughly the same distance from the distribution center as Midwest Shipper's major growing region in Wisconsin. While Pennsylvania and New York produce potatoes and are located closer than Midwest Shipper, they do not produce many russet potatoes, the variety purchased most by the store.

> “...the Maine supply chains only provides 11.4 percent of the entire value-added activity along all the supply chains.”

According to estimates by the USDA Economic Research Service, potato producers generally receive a high share of the retail price because relatively little processing is added to this fresh commodity. Revenues pay for the value-added activities, including the production or growing as well as the handling, storage, grading, packing, sales, and shipping as well as profits. Potatoes can be maintained in long-term storage in climate-controlled rooms and shrinkage for potatoes is usually small.

Table 6 presents estimates of the value-added activities by each member of the various supply chains. Members that are located in the Northeast are shaded gray. We weight the member's revenue share (see Table 2) by the proportion of the store's total potatoes that they provide (see Figure 2) to calculate the extent of total regional participation in the supply chain. Table 6 summarizes the extent of members' participation in the supply chains as well as the total extent of regional value-added activity in the potato supply chains.

The regional supply chain described from Maine provides 13 percent of the store's potato supplies. However, some of the value-added activity is provided by Midwest Shipper which is from outside the region. Therefore, the Maine supply chain only provides 11.4 percent of the entire value-added activity along all the supply chains.

Some members of Charleston Store's other potato supply chains are located in the region, and their value-added activities are therefore conducted in the region. All value-added activities conducted by the distribution center, store transportation/delivery, and the store are provided in the region. These include the receiving, handling, storage, and distribution activities from the distribution center as well as the receiving, handling, and retailing activities by Charleston Store.

TABLE 6: Extent of Regional Value-Added Activity in the Charleston Store's Potato Supply Chains

	Percent of retailer's potatoes supplies	Value-added[1]	Value-added retained by supply chain member	Extent of regional value-added activity[2]
Supply chain segment	*%*	*% of retail price*	*%*	*%*
Regional: ME Grower- Shipper to Charleston Store- arranged by Midwest Shipper				
Third-Party Shipper	13.0	33.8	4.4	
Transportation		10.3	1.3	
Midwest Shipper		12.1	1.6	
Integrated Wholesaler	100.0	15.7	2.0	
Transportation		6.4	0.8	
Charleston Store	100.0[3]	21.7	2.8	
All segments	13.0	100.0	13.0	11.4
Non-regional: Other Grower-Shipper to Charleston Store - arranged by Midwest Shipper[4]				
Shipper	26.0	NA	NA	
Transportation		NA	NA	
Midwest Shipper		NA	NA	
Integrated Wholesaler		15.7	4.1	
Transportation		6.4	1.7	
Charleston Store	100.0[3]	21.7	5.7	
All segments	26.0	100.0	26.0	11.4
Non-regional: Midwest Shipper to Charleston Store, WI				
Shipper	26.0	39.9	10.4	
Transportation		16.3	4.2	
Integrated Wholesaler		15.7	4.1	
Transportation		6.4	1.7	
Charleston Store	100.0[3]	21.7	5.7	
All segments	26.0	100.0	26.0	11.4
Non-regional: Western Shipper to Charleston Store				
Shipper	35.0	33.3	11.7	
Transportation		27.0	9.4	
Integrated Wholesaler	100.0	11.6	4.1	
Transportation		6.4	2.2	
Charleston Store	100.0[3]	21.7	7.6	
All segments	35.0		35.0	13.9
Added-value performed in region				**48.1**

[1] This column contains the percent of retail price from Table 5 above.
[2] This column captures all regional activity in the Northeast within each supply chain (excludes supply chain activity outside of the Northeast).
[3] As default, the retailer percent is 100 percent.
[4] Insufficient information to calculate shipper and transportation margins for Other Grower-Shipper; however, the wholesaler, transportation, and store margins, which are contained in the region, will be the same for all supply chains from Midwest Shipper.

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

Source: Author's calculations based on case interviews.

The store might be able to expand the use of regional potatoes by carrying round white potatoes or other varieties that are produced well in the Northeast. Pennsylvania and New York, states closer to the distribution center, produce round white and red potatoes but not many russets.

Key Lessons for Charleston Store

Charleston Store is a small supermarket located in the city of Charleston, West Virginia. The product supply chains described in this case are bread and russet potatoes.

The Store and Its Environment

Effect of size and economies of scale

- The store is small and less than a third the size of the average supermarket; however, it is designed for highly efficient operations with low labor costs, displaying product on pallets and eliminating the labor needed to shelve products. The store has a limited assortment of products and most of them are private label brands.
- By being a low-cost operator, it can compete by offering extremely low prices. This, as well as the small store size, make it possible to operate in lower income neighborhoods in urban areas.
- The store gains economies of scale by being a licensed member of an integrated wholesale-retail chain. It purchases almost all of its supplies from one of Integrated Wholesaler's distribution centers.

Effect of ownership structure

- Although the store is owned by an individual proprietor, it is under a licensed agreement with the Integrated Wholesaler. The license stipulates most operations and limits purchasing outside of the distribution center assigned to the store. The owner reports that while there might be interest in healthier foods from his customers, healthier versions are generally not available from Integrated Wholesaler. This structure does not allow flexibility in sourcing products.

Market Basket Supply Chains

Effect of regional production/industry

- Bakeries have historically been located very close to consumption because of the perishability of its products. The proximity of bread manufacturers to consumer markets may support the DSD model of distribution. A bread distributor delivers bread to the store daily and restocks the shelves for the store.
- The Northeast does supply the store with about 13 percent of its potatoes. The percent can vary greatly depending on the supplies available in the Northeast. In this case study, potato production in the region was lower than in previous years, and Midwest Shipper was only sourcing about 20 percent of its sales to Integrated Wholesaler from the Northeast.
- The store is roughly the same distance from its primary potato shipper in the Midwest as to Maine, the major producer in the Northeast. Therefore, transportation savings are not a major factor when looking for Northeast supplies.
- The store does not carry round white or red potatoes varieties which many of the states in the Northeast produce.

Extent of regional value-added activity

- All of the manufacturing, transportation, and retailing activities for bread are contained in the region.
- Although most of the russet potatoes sold in the store are not grown in the Northeast, some value-added supply chain activities are conducted in the region by Integrated Wholesaler and by the store itself.
- We see that even for supply chains in which the origin is very far away there is a lot of value-addition 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

- Midwest Grower-Shipper takes advantage of growers who are closer to the distribution center. The shipper sources from the Northeast as well as from Michigan and Ohio. However, the largest Northeast producer, Maine, is as far from the distribution center as Midwest Grower-Shipper's main production region in Wisconsin.
    - 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.

- Charleston Store does not have any incentive to use potatoes grown regionally. In order to expand the use of Northeast potatoes, Integrated Wholesaler would need to provide an incentive, perhaps a price incentive, to the store to purchase round whites, the variety produced in the Northeast states closer to the distribution center. The wholesaler might also provide activities aimed at increasing the consumer demand for red and white potatoes. Along with the company promotions, these activities might also include education from Cooperative Extension or other sources, even the producers.

Appendix

Packaged Bread Industry Profile

Consumption

Retail supermarket sales of packaged bread have been stagnant throughout the early decade 2011-2015 (Table A.1). Most of the weakness in the market has been for traditional white sandwich-style breads. Declining sales for these white breads has been offset somewhat by interest in artisanal, whole grain and multi-grain breads as well as those made with sprouted grains.

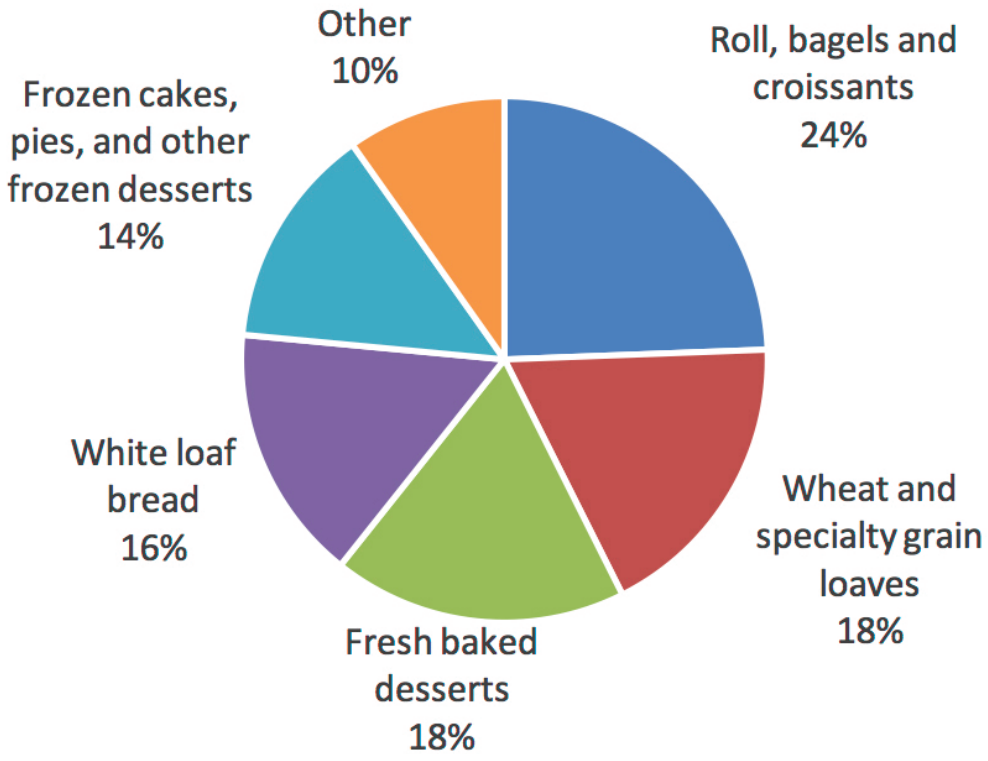
TABLE A.1: Supermarket Fresh Bread

	Sales/store/week	% change from previous year	Average retail price per unit
2011	$1,979	1.3	$2.37
2012	$1,741	-1.6	$2.33
2013	$1,760	0.2	$2.37
2014	$1,760	0.6	$2.26
2015	$1,746	-0.8	$2.26

Source: Progressive Grocer, "Retail Bakery Review". various issues.

Although wheat and specialty grain loaves are outselling white loaf bread (Figure A.1), even whole wheat conventional bread sales are slipping while demand for whole grain and specialty grain breads have increased. Gluten-free, GMO-free and organic breads are also seeing increasing demand in the otherwise mature bread market. Reasons for the weak demand for breads could include several factors, including changing consumer eating habits, interest in gluten-free foods, and other health trends.

FIGURE A.1: Bakery Product Sales



IBISWorld Industry Report, "Bread Production in the US". September 2016.

Manufacturing

The U.S. 2012 Economic Census reports total bakery sales of over $31.1 billion from 9,175 establishments (Table A.2). Commercial bakeries, those primarily engaged in manufacturing fresh and frozen bread and bread-type rolls and other fresh bakery products, report almost 90 percent of the total bakery sales. Retail bakeries, those that sell and make bakery products on the premise, account for only 10 percent of total bakery sales.

The Northeast contains 29.4 percent of the commercial bakery establishments and 31.3 percent of the retail bakeries.

TABLE A.2: U.S. Bakeries, 2012

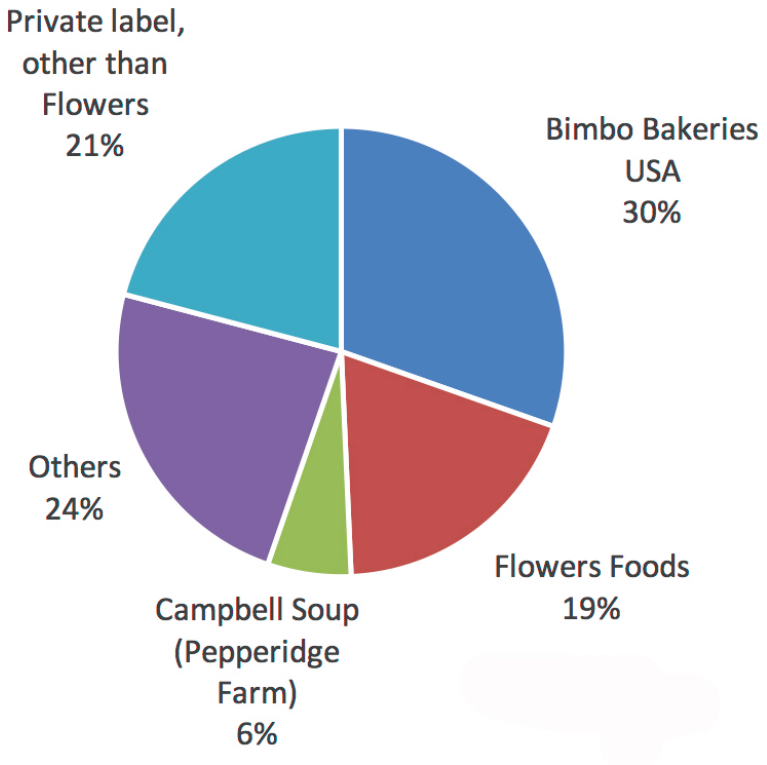
	U.S.	Northeast	
		number	% of U.S.
Commercial Bakeries			
Establishments, *number*	2,662	783	29.4%
Sales, *$1,000*	$27,934,447	na	na
Retail Bakeries			
Establishments, *number*	6,513	2,038	31.3%
Sales, *$1,000*	$3,140,696	na	na
All Bakeries			
Establishments, *number*	9,175	2,821	30.7%
Sales, *$1,000*	$31,075,143	na	na

Source: Bureau of the Census, 2012 Economic Census.

The commercial bakery industry is somewhat concentrated. Estimates from IRI report the top three manufacturers produce 55 percent of bakery sales at retail.[5] These leading manufacturers are Bimbo Bakeries USA, Flowers Foods, and Campbell Soup Company (Pepperidge Farm). The remaining companies are smaller regional bakers, local bakers and retailer-owned bakeries (Figure A.2).

[5] Flowers Foods Annual Report, 2016.

FIGURE A.2: Commercial Bakeries, Share of Sales at Retail



Source: Flowers Foods Annual Report 2016. Based on IRI Flowers custom database 52 weeks ending 1/1/2017.

The majority of breads are sold through retail grocery stores. After manufacturing, bread is distributed to store customers usually through a direct-store-delivery (DSD) system. Dedicated franchisees or bakery employees are responsible for distributing the bread products to a specific route or group of store customers. They routinely inventory product on the store shelves, place orders for the store, stock the store; and invoice the store customer as well as load the trucks at the plant and drive and deliver the products. A small portion of product is delivered to retail-owned distribution centers where it is then delivered by the retailer to its stores.

Wheat production and milling industry

The primary ingredient in bread products is wheat flour. It comprises 55-60 percent of the raw ingredients by weight. Wheat quality, supplies, and prices are, therefore, very important in bread manufacturing. Bread manufacturers generally use hard wheats which have higher protein levels than soft wheat which is used primarily in cakes, cookies, and pastries.

The leading wheat producers in 2015 were North Dakota, Kansas, Montana, Washington, and Texas.[6] For hard wheat production, which is preferred for bread making, Kansas is the leading producer. Although some wheat is grown in 42 of the 50 states, none of the top 10 state producers is in the Northeast. In 2015, the Northeast states produced 3.9 percent of the wheats grown in the U.S. (Table A.3).

TABLE A.3: U.S. Wheat Production, 2011-2015

	2015	2014	2013	2012	2011
	1,000 bushels				
U.S., all wheat	2,061,939	2,026,310	2,134,979	2,252,307	1,993,111
Northeast, all wheat	79,525	75,188	86,952	76,242	83,518
Northeast as % of U.S.	3.9	3.7	4.1	3.4	4.2

USDA, NASS, *QuickStats*, downloaded 4-18-2017.

Flour mills were originally found close to production as it was more convenient and just as economical to mill close to the source. Since railroad deregulation in the early 1980s and the development of rail transport technology, it has been more costly to ship flour than to ship wheat. Flour mills now are more commonly built closer to areas of consumption at or near large urban centers.[7]

The U.S. Census reported 168 flour milling companies in 2012 down slightly from 171 in 2007 (Table A.4). The value of shipments in 2012 was reported to be $15.3 billion up from $9.8 billion in 2007. In 2012 in just New York and Pennsylvania, flour mills had product shipments of $1.6 billion, over 10 percent of the U.S. total. Data for the other states in the Northeast were withheld to avoid disclosing the operations of individual firms.

[6] USDA, NASS, QuickStats, downloaded 4-18-2017.

[7] Kim, C.S., C. Hallahan, G. Schaible, and G. Schluter, 2001. "Economic Analysis of the Changing Structure of the U.S. Flour Milling Industry." Agribusiness, Vol. 17 (1) 161-171.

TABLE A.4: Flour Milling

Flour Milling	Number of companies	Number of establishments	Product shipments, value
			($1,000)
U.S. 2012	168	305	15,262,220
U.S. 2007	171	290	9,812,455
Northeast 2012	na	33	1,584,326
Northeast 2007	na	35	na

Source: Bureau of the Census, 2012 Economic Census.

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.

TABLE A.5: 2015 Potato Production in the Northeast

State	Production	Value
	1,000 cwt	*$1,000*
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.

[8] 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 *1,000 cwt*	441,205	23,759	5.4%
1	*Value $ thousands*	$3,865,538	$252,684	6.5%
1	Acres harvested *1,000*	1,054	77	7.3%
1	Yield per acre *cwt*	418	275	65.8%
1	Value of production *1,000*	$4,237,284	$252,684	6.0%
1	Price received *$ per cwt*	$8.76	$11.15	127.3%
2	Utilization per capita, fresh *lb*	34.0		
2	Utilization per capita, processing *lb.*	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.

[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/.

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 bring in potatoes grown in different regions. Purchasing from different growing regions provides risk insurance in case of regional crop failures.

OTHER A.E.M. EXTENSION BULLETINS

EB No	Title	Fee (if applicable)	Author(s)
2017-08	Case studies of supermarkets and food supply chains in low-income areas of the Northeast: Charleston Store, West Virginia		Park, K.S., Gomez, M. and K. Clancy
2017-07	Case studies of supermarkets and food supply chains in low-income areas of the Northeast: Baltimore Store 2, Maryland		Park, K.S., Gomez, M. and K. Clancy
2017-06	Case studies of supermarkets and food supply chains in low-income areas of the Northeast: Baltimore Store 1, Maryland		Park, K.S., Gomez, M. and K. Clancy
2017-05	Exploring the Feasibility of a Rural Broadband Cooperative in Northern New York		Schmit, T.M. & R.M. Severson
2017-04	Dairy Farm Business Summary, New York Large Herd Farms, 300 Cows or Larger, 2016	($20.00)	Karszes, J., Knoblauch, W.A. & Dymond, C.
2017-03	Workforce Issues and the New York Dairy Industry, Focus Group Report		Maloney, T.R. & Eiholzer, L.
2017-02	Economic Benefits and Risks for Harvest Platform Adoption for NY Fruit Farms		Ifft, J., Freedland, J., and Wells, M.
2017-01	A Practitioner's Guide to Conducting an Economic Impact Assessment of Regional Food Hubs using IMPLAN: A Systematic Approach		Schmit, T. and B. Jablonski
2016-12	Survey of Hispanic Dairy Workers in New York State 2016		Maloney, T., Eiholzer, L., and Ryan, B.
2016-11	Dairy Farm Business Summary, New York Dairy Farms, 300 Cows or Fewer, 2015		Knoblauch, W., Dymond, C., Karszes, J.
2016-10	Cost of Loading, Mixing, & Delivering Feed New York State, 2014-2015		Karszes, J. and Howlett, A.
2016-09	The Economic Contributions of Agriculture in New York State (2014)		Schit, Todd M.

Paper copies are being replaced by electronic Portable Document Files (PDFs). To request PDFs of AEM publications, write to (be sure to include your e-mail address): Publications, Department of Applied Economics and Management, Warren Hall, Cornell University, Ithaca, NY 14853-7801. If a fee is indicated, please include a check or money order made payable to Cornell University for the amount of your purchase. Visit our Web site (*http://dyson.cornell.edu/outreach/#bulletins)* for a more complete list of recent bulletins.