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Improving Systems of Distribution and Logistics for Regional Food Hubs

By Jonah Rogoff

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Executive Summary

Consumer demand for locally sourced food is rising and leading food hubs to scale up operations. This report builds upon the extensive research on local and regional food hubs by examining common practices of distribution and logistics. For food hubs based in rural areas at farther distances from urban markets, the logistics of aggregating and distributing product is a major burden that limits growth and the potential to generate income among farmers.

The Central Appalachian Network (CAN) asked the MIT Wealth Creation Clinic to study the topic of distribution in an effort to expand opportunities for small to mid-sized producers in the region of Central Appalachia. This report consists of three main components: (1) an analysis of literature on distribution and logistics, (2) five case studies that highlight key lessons and features of sustainable systems and (3) recommendations for strengthening a regional food hub that CAN should adopt. The five case studies are Eastern Carolina Organics (ECO), La Montañita Co-op, Regional Access, Organically Grown Company (OGC) and United Natural Foods, Inc. (UNFI).

Models of distribution vary by scale of operations, especially as companies transition to inter-regional or nationwide operations. Nonetheless, the case studies reveal a series of shared practices:

- » Leasing trucks with maintenance agreements
- » Efficient management and scale of physical assets
- » Partnerships with private carriers and distributors
- » Strong commitment to every product sold
- » Compliance with Hours of Service as a first priority
- » Forming agreements with anchor buyers

Based on the case studies and a review of literature, we find five recommendations for CAN to more efficiently manage its system of logistics and distribution:

- » Continue developing the regional brand for Central Appalachia and marketing support to differentiate products
- » Establish a for-profit Producer's Alliance
- » Cultivate partners along existing routes
- » Perfect routing logistics as a first priority
- » Experiment with transportation innovations

In addition to these recommendations, two external factors were found to be important for enabling regional food hubs to scale up: (1) the active improvement of consumer education and (2) infrastructural-based support for food hub distribution channels.

Introduction

The U.S. food and agriculture industry has reached a major turning point. Consumer demand for products labeled organic or natural is steadily rising, along with the desire to source products locally or from within a nearby region. A national movement towards sustainable agriculture is influencing every part of the food industry, calling attention to alternative models that support a set of social, economic and environmental values. Despite projected growth in demand for such products, the U.S. food system remains highly fragmented. Large-scale producers that maintain conventional practices continue to thrive, leaving smaller to mid-size producers unable to compete in the larger market or reach optimal economies of scale.

Efforts to address the existing disparities in our food system have led to the sudden growth of local and regional food hubs, a model that strives to advance a “values”-based system and provide a sustainable alternative to conventional industry practices. Among the numerous values associated with food hubs is a mission to bring greater economic opportunities to farmers, growers or suppliers of agricultural products. For regional planners and practitioners of economic development, this topic is particularly salient, as food hubs can generate wealth in rural areas that suffer from scarce job opportunities and high rates of poverty.

Presently, the United States Department of Agriculture (USDA) lists 301 food hubs in operation. Food hubs based in rural areas farther from urban-based markets, such as the Central Appalachian region, face additional challenges with aggregating and distributing product to buyers. The burden of increased distance between buyers and suppliers can require enormous investments of resources in managing transportation and logistics, as well as using cost-saving infrastructure and equipment. For these rural-based food hubs, addressing issues related to distribution are essential for their ability to appropriately scale up operations and having a more impactful presence in the local economy.

In an effort to strategically analyze these issues, the Central Appalachian Network (CAN) partnered with the MIT Wealth Creation Clinic in conducting research on financially sustainable models of distribution and logistics. As a client-based project, the primary purpose is to assist the member organizations of CAN, though the research discussed has applications to food hubs and producers based in rural and urban areas alike. This report reflects the culmination of research reviewing existing literature on the topic and gathering information from case studies.

MIT Wealth Creation Clinic

The Ford Foundation-sponsored Economic Development Clinic, modeled after the transactional Community Economic Development Legal Clinics established by the Ford Foundation in the 1970s, provides a range of economic development and planning services to client partners. The “transactional” model provides community-based development practitioners (clients) with access to the skills and knowledge of economic development practitioners working in business and commercial settings within academia (faculty and students) and provides a venue for training future practitioners. The Clinic is based on a pragmatic approach that emphasizes skill development (of both the student and client) and service provision in support of wealth creation and livelihood generation activities.



The Central Appalachian Network (CAN)

The Central Appalachian Network (CAN) is a network of six non-profit organizations dedicated to working for a more just and sustainable Appalachia. Together they work to advance the economic transition of the region by fostering the development of enterprises, organizations, and policies that promote and protect the health of local economies, communities, and the environment. For almost 20 years, CAN member organizations have been coming together to learn, build relationships, and collaborate to build capacity and impact on a regional scale. They work across five states in Central Appalachia (the Appalachian counties of Kentucky, Ohio, West Virginia, Virginia, and Tennessee) and are currently transitioning from a deep sector focus on building local food systems towards a multi-sector approach to advancing sustainable development in the region.



About the Study

Purpose

The region of Central Appalachia—encompassing counties in Kentucky, Ohio, West Virginia, Virginia, and Tennessee—has historically struggled with chronically high rates of poverty and job loss. The coal and tobacco industries, once relatively stable sources of employment and regional wealth, continue to decline, alongside other traditional economic bases. Pursuing new opportunities that help generate, capture and retain wealth in the region have become key priorities. To this end, farming has become an attractive option and broader economic development strategy as a means for both primary and supplemental income. Within the past decade, a few companies and non-profit organizations, most notably Appalachian Sustainable Development (ASD), have stepped in to assist farmers aggregate, market and distribute their products.

While farming remains a culturally rich tradition in Central Appalachia, many producers have difficulty accessing markets in larger metropolitan regions, which limits their earning potential and prevents valuable sources of wealth from entering rural communities. As a result, ASD, through their Appalachian Harvest food hub initiative, end up filling this gap by taking on the role of aggregator and distributor, connecting producers with markets. However, the high cost and

complicated nature of distribution make fulfilling this role unsustainable in the long-term. In order to overcome this barrier, members of CAN are seeking financially sustainable models of distribution and logistics that improve their operations, while still maintaining a firm commitment to a values-based supply chain. Unlike previous studies of food hub distribution models, this project focuses squarely on the problems faced by rural-based food hubs and recent strategies used to solve them.

This research project seeks to answer a core question: *What are financially profitable methods of distribution linking dispersed rural producers to concentrated urban markets?*

Other questions will also be explored:

- » What are common traits and characteristics of profitable distribution models?
- » What are successful examples of food hubs or conventional distributors that work in remote regions of the United States?
- » How do logistics or supply chain managers track finances and efficiently manage transportation costs?
- » What lessons on scaling up distribution can be adopted by food hubs based in Central Appalachia?
- » How does distribution fit into the overall food system and relate to other parts of the supply chain?

Methodology

This project employs both primary and secondary sources of research. Academic literature, industry-based publications and online resources on distribution and logistics were reviewed as essential background information. Due to the recent growth of food hubs, an emphasis was placed on research produced in the past decade. Generally speaking, literature is divided into work covering the burgeoning food hub movement and material written for the food distribution industry as a whole.

In an attempt to gain insight into these topics, a few researchers were contacted for strategic advice and suggestions. Then, to obtain more information on individual models, a group of food hubs and distributors were selected as case studies and contacted for further discussion. The cases selected are intended to represent models operating at different scales and geographic contexts with deep experience working with small and medium-sized producers in rural areas. During the course of the project, bi-weekly conference calls were set up between CAN and the MIT Wealth Creation Clinic to provide updates and maintain regular communication on the project. Analysis and findings from the research were synthesized and presented as part of this report.

Structure

This report is organized into six sections:

- 1. Introduction:** overview of the project and its purpose, goals and methodology.
- 2. Distribution in an Evolving Food System:** reviews literature on food hubs and how distribution fits within the agricultural industry.
- 3. Food Distribution and Logistics:** examines common features, terms and standards of food distribution and logistics.
- 4. Drawing Lessons from Case Studies:** five cases are selected to showcase their practices.
- 5. Analysis:** synthesizes cross-cutting themes and models for best practices
- 6. Recommendations:** offers steps by which CAN and its members may adopt such models.

Distribution in an Evolving Food System

The Vanishing “Middle” of Agriculture

Within the past few decades, the United States food system has undergone a period of bifurcation. Researchers describe this trend as a disappearing “agriculture of the middle.”¹ From 1997 to 2012, there has been an increase in the number of farms with yearly earnings of \$250,000 or more and \$5,000 or less, with across-the-board decreases in the middle categories of farms earning between \$5,000 and \$250,000. During this period of time, there has been a marked increase in the number of farms between 1 and 99 acres of land and above 2,000 acres of land, while the number of farms between 100 and 2,000 acres of land has decreased. Figures 1 and 2 depict this widening gap.

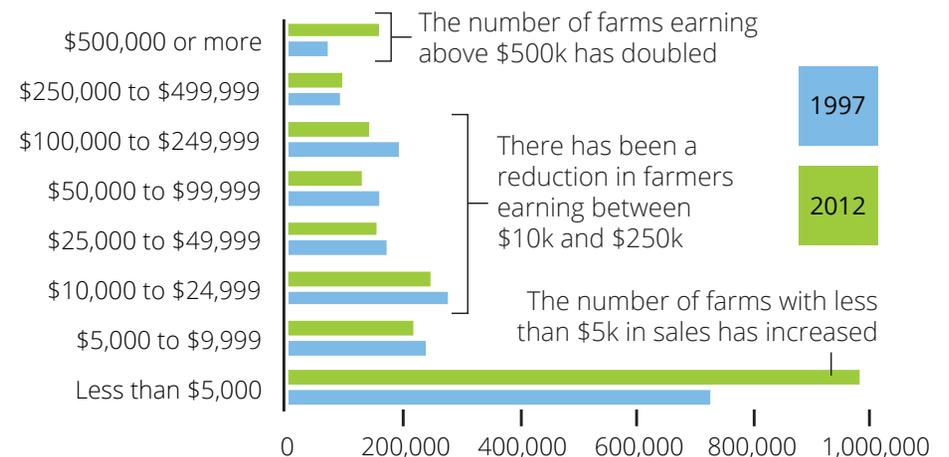
Though the total market value of agricultural products sold increased from \$297 billion in 2007 to \$394 billion in 2012, the total number of farms and workers reporting farming as their main source of income has fallen. Similarly, farm sales are deeply concentrated among larger-sized farms in the highest sales classes, illustrating an industry-wide trend of consolidation and uneven distribution of sales. 75% of U.S. farms report annual sales of less than \$50,000, but only ac-

¹ Lev and Stevenson, *Values-Based Food Supply Chains: An Introduction to Nine Case Studies*.

Figure 1

Number of Farms by Annual Sales

Source: US Census on Agriculture, 1997 and 2012 (Current Dollars)



count for 3% of total sales. Meanwhile, farms reporting \$5 million or more in annual sales account for only 0.4% of all farms, yet a striking 31.7% of total sales (Figure 3); farms reporting \$1,000,000 or more in annual sales receive a majority (66.4%) of total sales.

Recent reports and articles suggest that the movement towards acquisitions and mergers in the food industry will continue in the near future. A 2010 white paper from the

Hale Group, sponsored by the International Foodservice Manufacturers Association (IFMA), found that population growth and the rise of a global middle class are two factors that will contribute to increasing demand for food and a subsequent expansion of business opportunities for large-scale producers. The report also argues that the “local food movement” will not gain a significant market share due to low transportation costs—making up 4% of the total food costs borne by the consumer—and relatively stable energy costs.² Other researchers stress the globalized nature of demand for agricultural commodities, which has broadened the customer base of specific products and pushed producers to increase the scale of production.³

The bifurcation of the food industry poses a number of issues and concerns. As consolidation occurs, small and mid-sized producers lose bargaining power. They are relegated to the realm of price takers, instead of price makers, resulting in less income and fewer

² *Foodservice 2020: Global, Consolidated and Structured.*

³ Lyson, Stevenson, and Welsh, *Food and the Mid-Level Farm.*

Figure 2
Number of Farms by Land Size (acres)
Percentage Change from 1997 to 2012

Source: US Census on Agriculture, 1997 and 2012

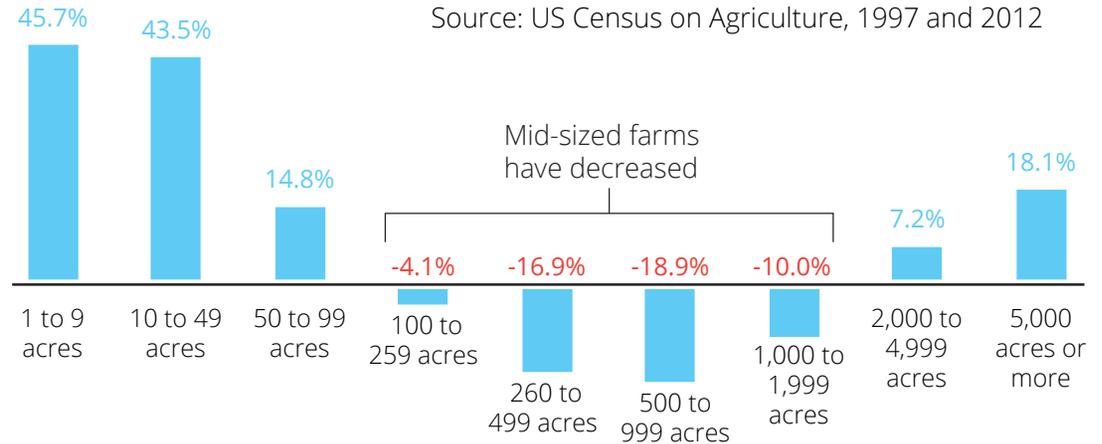
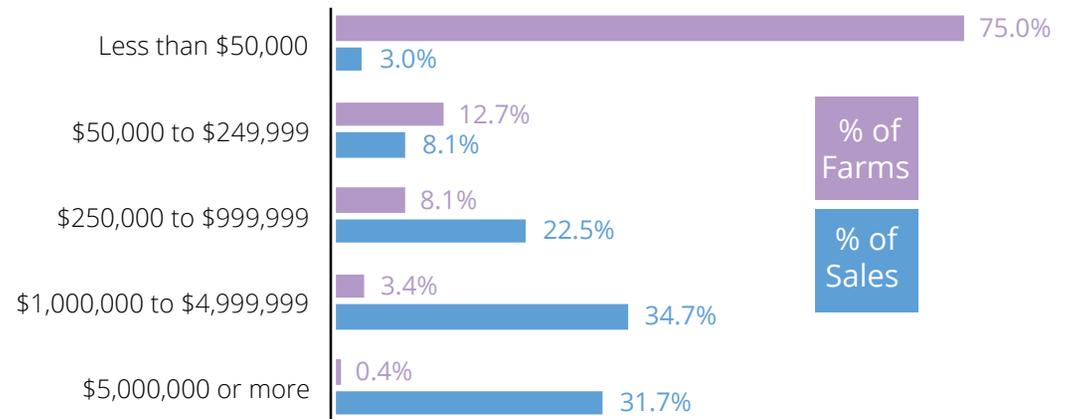


Figure 3
Share of Farms and Farm Sales by Sales Class

Source: 2012 Census on Agriculture



profits. In 2012, the USDA reported that farmers received a share of 17.4 cents for every dollar sold to non-farm establishments. Comparatively, 44 cents of every dollar covers the services from retailers and foodservice establishments. For small and mid-sized producers, taking in a smaller share of the food dollar hurts the earning potential of farmers and limits the number of opportunities for full or part-time employment. Aside from the economic effects, larger-sized producers are also associated with industrial farming practices that degrade the environment and raise long-term health risks.

The widening divide between small and large-sized producers created as system where small to mid-sized producers struggle to gain a foothold in the market. Hoppe, Macdonald and Korbe indicate that smaller farms often lack access to capital, pay higher transaction costs across the supply chain, and cannot use technology designed for commodity-scale farms.⁴ These producers face obstacles in different stages of the supply chain—processing, packaging, distribution and marketing—which limit their potential to sell products in the wholesale market, even when strong consumer demand is present. Moreover, meeting federal regulations, investing in new equipment and technology, and obtaining certification to grow organic products contributes to high start-up costs long before farmers see their first sale.

4 Robert A. Hoppe, MacDonald, James M., and Korb, *Small Farms in the United States: Persistence Under Pressure*.

Consumer Demand for “Local” Food

In the midst of consolidation and centralization in our food system, demand for locally sourced products is experiencing a wave of growth. The meaning of “local” is often defined on an ad hoc basis, typically in a range of 100 to 400 miles. To provide a benchmark for the term “local,” the 2008 Farm Act adopted a definition as food produced less than 400 miles from its origin, or within the State in which it is produced.

Analyzing data from the 2008 Agricultural Resource Management Survey, Vogel and Low estimated that local food marketing accounted for \$4.8 billion in sales.⁵ Private, industry-based organizations have also conducted research to measure and quantify consumer demand. A 2009 survey from the Food Marketing Institute (FMI) found that a majority of respondents buy local foods because of freshness (82%), support for the local economy (75%) and knowledge of a product’s source (58%).⁶ In 2013, the management consulting firm A.T. Kearney released a report revealing that consumer interest in local food surpassed organic food. The study found that 66% of consumers believe buying local food benefits their local economy; a remarkable 70% of consumers would be willing to pay more for local products and 30% would consider shopping elsewhere if their preferred store

5 Low and Vogel, *Direct and Intermediated Marketing of Local Foods in the United States*.

6 Food Marketing Institute, *U.S. Grocery Shopper Trends*.

didn't carry such products.⁷ Lastly, a consumer panel convened by the National Grocery Association in 2014 found that 87.2% of consumers regarded having locally made products to be "very/somewhat important" with only 3.3% expressing "not at all important." The shift in public sentiment towards local food raises questions about how farmers and distributors can adapt to the existing market structure. Natural and physical constraints—including regional climate, size of farmland, transportation access and population density--can also greatly influence the cost of supplying local food and its variety.

The number of channels available to farmers to sell "directly" to consumers, such as farmers markets and Community Supported Agriculture organizations (CSA), has risen dramatically in the last two decades. The count of farmers markets voluntarily listed in the USDA National Farmers Market Survey increased from 1,755 in 1994 to 8,144 in 2013, a more than quadruple increase, while Local Harvest reports over 4,500 active CSAs on their online listing. Simultaneously, a growing number of small to mid-sized farmers are forming partnerships with wholesale markets, restaurants, retailers and institutional buyers. In Vogel and Low's 2011 study, \$2.7 billion (of the \$4.8 billion total) in local food sales came from these "intermediate" channels, as opposed to "direct" channels.

7 Rushing and Ruehle, *Buying into the Local Food Movement*.

Sustainable Agriculture and the Rise of Local/Regional Food Hubs

Local and regional food hubs have become a popular model to supply consumers with fresh, locally sourced food. The exact roots of food hubs are tough to trace and, to a certain extent, woven into the history of agriculture. Part of its origins lie in prior movements that promoted social justice and sustainable agriculture, such as the back-to-the-land and environmental movements during the second half of the 20th century. Other aspects of its origins lie in the history of the U.S. cooperative movement and coordinated efforts to assist small-scale farmers and protect their interests.

Operationally, one core feature that unites food hubs is their work in connecting producers with buyers—large and small—in nearby markets. In this regard, food hubs build a network of farms and *manage* the aggregation, distribution and marketing of food or specialty items they produce. Borrowing a term common in business and managerial studies, food hubs act as *supply chain managers* for local food. USDA reports offer the following definition: A regional food hub is a business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand.⁸

8 Barham et al., *Regional Food Hub Resource Guide*.

Occupying a diverse array of shared and distinct features, food hubs:

Bring economic opportunities to small and medium-sized producers: Food hubs are credited with spurring economic growth and new job opportunities across the food system. According to a 2013 survey of food hubs conducted by the Michigan State University Center for Regional Food Systems and the Wallace Center, average food hub sales exceeded \$3.7 million and created 19 paid positions.⁹ In response to a survey question on the type of producers, 76% of food hub respondents reported that “all” or “most” of their suppliers were small to mid-sized producers. Results from the survey also found that food hubs work with an average of 80 producers/suppliers, with a median of 36, and a range from 5 to 2,000.

Broadly speaking, food hubs function as a means for food dollars to circulate and remain in the local economy, generating income for multiple participants in the food system. Testing this belief, Brown et al. compared sales of farms engaging in “community-focused agriculture” and changes to county-level income between 2002 and 2007, finding great variation from region to region. Nationally, the study found that a \$1 increase in farm sales led to an annualized increase of \$0.04 in county personal income, a relatively modest im-

9 Fischer et al., *Findings of the 2013 National Food Hub Survey*.

pact.¹⁰ This research, however, will likely need to be repeated due to the sharp growth of food hubs since 2007. In 2013, Schmidt et al developed an economic impact assessment tool for Regional Access, a for-profit food hub based in New York State, which showed a gross output multiplier of 1.82 and a net multiplier of 1.63, meaning that for every additional dollar of demand for food hub products, there was an additional \$0.63 generated in related industrial sectors.¹¹

At a more fundamental level, food hubs help ensure that a greater proportion of the food dollar goes directly to producers, rather than to other intermediaries. It is common for food hubs to incorporate this principle into the business model itself by ensuring that farmers receive a fair price point or percentage of sales. For farmer cooperatives, producers are guaranteed a share of the returns on any profits generated.

Help producers gain access to new markets: Food hubs play a key role in cultivating business partnerships between buyers and producers. This relationship goes in both directions: operators assist growers in marketing products to potential buyers, while also working with buyers to ensure food is prepared and packaged appropriately. In essence, food hubs enable farmers to reach wholesale, retail and institutional markets that would be difficult to access on their own.

10 Jason P. Brown et al., “Linkages between Community-Focused Agriculture, Farm Sales and Regional Growth.”

11 Schmit, Jablonski, and Kay, *Assessing the Economic Impacts of Regional Food Hubs: The Case of Regional Access*.

Further, food hubs seek buyers in nearby urban areas and make delivery runs in a range of distances.

Manage physical infrastructure in the supply chain: Like conventional distributors, food hubs fulfill a role of bringing products to market. This normally involves the operation of a warehouse space in which products are processed or packaged, temporarily stored through an inventory system and then palletized for delivery. In some circumstances, food hub operators pick-up products directly from producers, while in other instances, products must be delivered to a distribution center.

All food hubs could be said to engage in the aggregation, distribution and marketing of products, but there's great variation in performing these functions in-house or through a third-party contract. Some food hubs own their infrastructure and operate an independent trucking fleet, while others adopt a more hands-off approach by overseeing private contractors. The 2013 Wallace Center survey found that operational services of food hubs widely varied; 84% and 82% reported engaging in distribution and aggregation services, respectively, but only 42% offered brokering services and even fewer dealt with packaging/repackaging (30%).

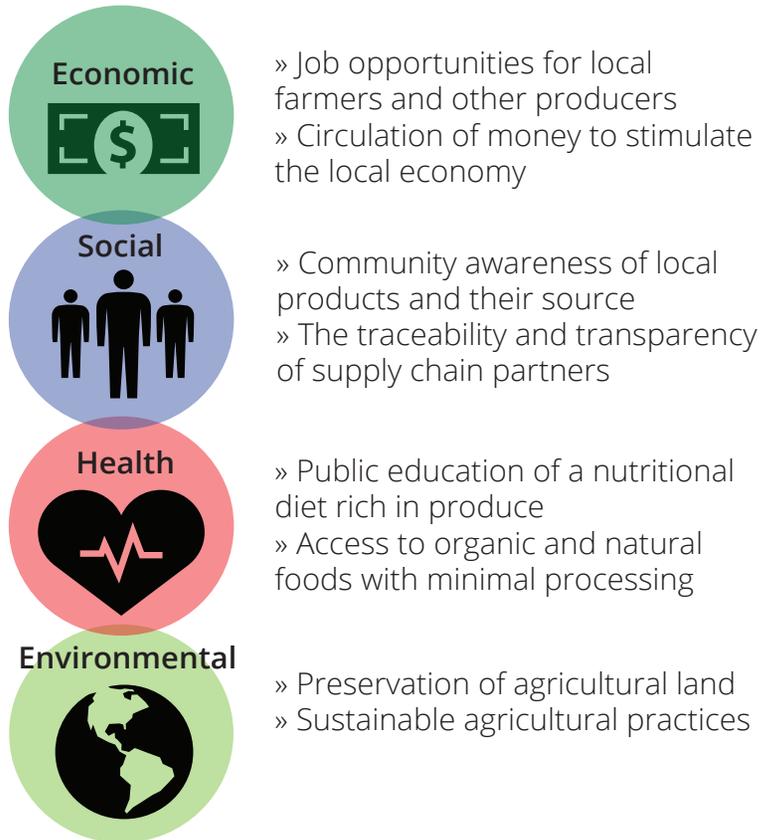
Meet consumer demand for locally sourced food: In a speech from May 2013, USDA Secretary Tom Vilsack declared that consumer demand for food hubs was "skyrocketing." A critical element of food hubs is their ability to satisfy demand

for local food. Operators are uniquely positioned to work with local farms or ranchers, whose output of products may not meet volume requirements established by conventional distributors. In addition, many food hubs are built upon existing relationships between producers and operators with deep knowledge and attachment to the region in which the products are made. As wholesale and foodservice markets seek distributors offering "local" products, food hubs are well-equipped to market products and tell the story of the producer.

Commit to a "values-based" supply chain: Food hubs represent an "alternative" model to the conventional system because of a commitment to economic, social and environmental values. Business models incorporate principles of equity by aiming to compensate producers fairly and allowing them to have greater control over setting the price.

The growth of food hubs is moving at an astonishing pace. According to a working list set up by the National Good Food Network, in 2000 there were 47 food hubs. The most recent estimate from July 2014 lists 301 food hubs, indicating a more than sixfold increase during this period of time. More than 100 forming within the past three years alone. Much research has been devoted to documenting and analyzing the growth of food hubs. The Agricultural Marketing Service (AMS) and Rural Development divisions of USDA have completed numerous studies and maintain a web-based resource hub. Similarly, many academic institutions and non-

What are the **values**?



profits serve as research centers, including the Center for Integrated Agriculture Systems (CIAS) at the University of Wisconsin-Madison, the Center for Regional Food Systems (CRFS) at Michigan State University and the Wallace Center, which operates the National Good Food Network. Literature on food hubs provides a rich set of case studies and practical guidance for organizations in various stages of growth.

Economic viability remains a critical issue for food hubs. In addition to their informational resources, USDA offers a variety of loan and grant-based programs that range from covering startup costs to securing working capital. In an effort to analyze profitability, the 2013 Food Hub Survey used a “business efficiency ratio” that measured the proportion of total expenses to total revenue. The results found that total expenses on average were 7% higher than total revenues, though the median ratio was equally proportional. Food hubs with for-profit or cooperative ownership structures reported a higher ratio of revenue to expenses, although food hubs with more years in operation showed not only a higher ratio of revenues to expenses, but also higher total sales. Nonetheless, a majority of respondents indicated being “highly dependent” (17%) or “somewhat dependent” (32%) on grant funding, especially those in operation for fewer than 10 years.

The “Distribution” Value Chain

A large body of research concerns what role distributors play in the local, regional and national food supply chain. Conceptually, a food supply chain captures the full cycle by which food is produced and consumed (Figure 4). As described earlier, food hubs concentrate on aggregation, distribution and marketing, linking producers with buyers in the supply chain. The USDA keeps a master list of food hubs with the following

classifications:

- » **Farm to consumer model:** producers selling directly to consumers through farmers markets, farm stands, buying clubs and CSAs
- » **Farm to business/institution model:** producers selling to supermarket chains, independent grocery stores, schools, hospitals, institutions, restaurants and other businesses
- » **Hybrid model:** a combination of the farm to consumer and farm to business/institution models

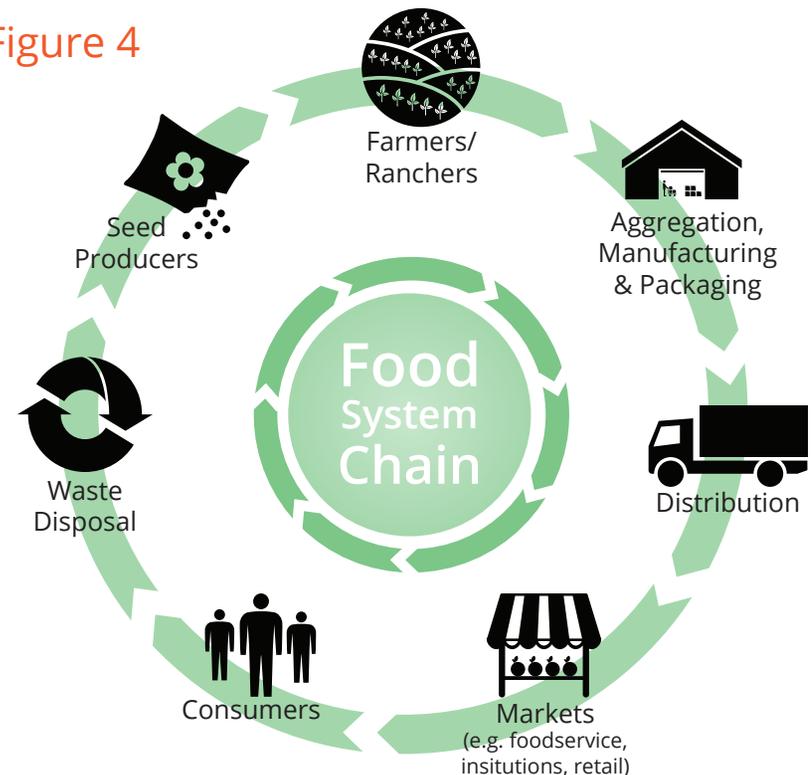
King et al. offers a more holistic approach to the entire local food supply chain by grouping them into three clusters:¹²

- » **Mainstream Chain:** A major grocery supply chain for a product category
- » **Direct Market Chain:** A supply chain for a local product that is marketed directly by producers to consumers
- » **Intermediated Chain:** A supply chain for a local product that reaches consumers through one or more intermediaries, including restaurants, schools, food coops and smaller grocery chains

12 King et al., *Comparing the Structure, Size and Performance of Local and Mainstream Food Supply Chains*.

Several articles, reports and publications on supply chains discuss how values-based models differ from conventional models as food hubs scale up and sell higher volumes of product. In examining the disappearing “agriculture of the middle,” Stevenson describes a “third tier” of the food system that sits between local direct marketing and global commodity marketing.¹³ Stevenson argues that food hubs are well-positioned to fill this gap as “midscale food value chains”

Figure 4



13 Stevenson et al., “Midscale Food Value Chains: An Introduction.”

by forming strategic alliances with businesses. These value chains can be distinguished from conventional supply chains, he says, by adopting a business model with a set of practices:

- » handle significant volumes of high-quality, differentiated food products
- » operate effectively at multi-state, regional levels, and
- » distribute profits equitably among the strategic partners.

Researchers of local food supply chains also place emphasis on the awareness consumers should have of a product's origin. The ability to "trace" a product to its origin—e.g. the farmer or rancher—through a simple and transparent process is a central tenet of food hubs. Consumers should have knowledge of a product's source, which, in turn, helps preserve the identity of farmers. Marsden et al. express this concept as short food supply chains (SFSC), which may be "(1) face-to-face chains with direct purchases from farmers; (2) spatial proximity chains that make consumers aware of local origin at the point of purchase; and (3) spatially extended chains that convey the value and meaning of a place of production to consumers outside of the region where the product is produced." The term "short food supply chains" has been used extensively in Europe, referring to both social and physical distance that minimizes the number of intermediaries and ensures that information is conveyed transparently, even under conditions where food must travel across longer regions to reach the consumer.

Figure 5
Food Hubs by Distribution Model

(Source: USDA Know Your Food, Know Your Farmer)

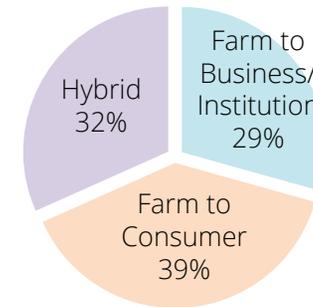
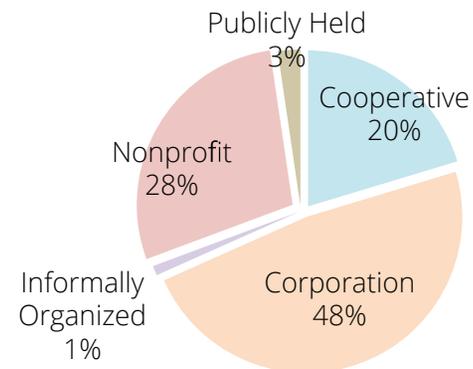


Figure 6
Food Hubs by Legal Status

(Source: USDA Know Your Food, Know Your Farmer)



Food Distribution and Logistics

Food distribution represents an essential part of the supply chain that enables agricultural products to reach consumers. The national system of food distribution is diverse, occupying a spectrum from organizations operating a single van to publicly traded companies managing a fleet of hundreds of tractors and trailers with distribution centers in every region of the United States. Regardless of its structure or size, distributors must maintain a commanding knowledge of logistics and transportation, and understand how to efficiently balance the supply of products with demand from customers. The following section examines how distribution fits within the overall supply chain, reviews its common features and characteristics, and then discusses possible best practices as applied to food hubs.

Part 1 Critical Links in the Supply Chain

Distributors play an indispensable role in bringing products to market. In the supply chain, distributors function as the critical link that connects producers to the markets where their products are sold. Put simply, a distributor stores products and delivers them as needed. That being said, several external factors influence how a distributor operates and

positions itself in the market. On the front end of the supply chain, distributors form relationships and contractual agreements with suppliers who produce marketable goods. Looking at the economy as a whole, products can be durable or non-durable based on their lifespan of use and whether or not they can be immediately consumed. It is important to acknowledge that the distribution industry involves the movement of all types of goods, though most agricultural products are by nature non-durable, since they are products meant for consumption.

Although agricultural products can be classified generally as non-durable or soft goods, they range from being relatively durable to highly perishable. Naturally, the type of goods a distributor buys has an enormous effect on how it operates. For example, **dry goods** do not require refrigeration and can therefore be stored, managed and transported at lower costs. In sharp contrast, goods that are perishable require special handling, temperature-controlled environments and time-sensitive pick-up and delivery. The management of products that must be kept at certain temperatures, either to extend shelf life or maintain freshness, is commonly referred to as the “cold chain,” implying an unbroken, temperature-controlled system in each stage of the supply chain. As a whole, the type of goods being supplied determines the necessary transportation system and physical infrastruc-

ture.

Another key distinction is whether a distributor works with commodities or differentiated products. Agricultural commodities—such as corn, coffee and raw produce—are sold at per unit rates that equalize their prices across time and

Figure 7
Basic Distribution Model



location. Financially, farmers selling goods classified as commodities have less power in negotiating prices, which are given at standardized rates. On the other hand, “differentiating” or “branding” products enhances their value, altering the financial relationship between the supplier and distributor. As would be expected, agricultural products can have characteristics of both. For instance, food hubs can differentiate products that would normally be valued as commodities, like raw produce, by promoting the identity of the farm and labeling a product as local.

Classifying Distributors by their Customer Base

On the other end of the supply chain, the nature of distribution is greatly influenced by the buyer receiving the product and the type of market where the products are finally sold to the consumer. As part of the wholesale trade sector, distributors work with a vast array of buyers or accounts.

- » **Broadline distributors** offer a range of products and customers under multiple accounts, which, for prominent national distributors, can span thousands of accounts.
- » **System distributors** supply a narrow range of products to a select group of customers that can vary in size from single, independently owned stores to national restaurant chains.
- » **Self-Distributors** (e.g. Walmart, Kroger or other retailers and supermarket chains) own and operate

their distribution network to save money in moving products sold in stores. Self-distributors typically have economies of scale large enough to vertically integrate their supply chain.

- » **Specialty distributors** work with specific product categories and develop close relationships with their manufacturers, but offer these products to a diverse range of customers.
- » **“Cash and carry” or alternative distributors** (e.g. Costco and Restaurant Depot) offer a one-stop wholesale shopping center for customers, eliminating the cost of distributing directly to conventional groceries or supermarkets. **Alternative Distributors** are also a catchall for other types of business models. While industry publications make distinctions between these categories, the boundaries between these categories can be blurry and not easily defined.

In partnership with the International Foodservice Manufacturers Association (IFMA), the Hale Group released a report entitled “Foodservice Distributor of the Future” to discuss the evolution of the industry and predict future trends. The report found that, as customers demand a variety of products at different volumes, the top broadline distributors will continue to expand, consolidate and strengthen their market share. On the other hand, the report indicated that alternative distributors will expand as well to keep pace with the growth of independently owned restaurants, grocery stores

and smaller foodservice operators.¹⁴

The segment of the market distributors serve is a critical element in their business model. Some distributors supply products mainly to grocery stores, convenience stores or other retail chains. Other distributors supply products to the **foodservice industry** because these products are meant to be prepared and consumed outside, rather than inside, of the home. As foodservice distributors, they supply products to limited and full-service restaurants, bars, educational institutions, prisons hospitals, retail chains and all types of private institutions. According to the International Foodservice Distributors Association (IFDA), the foodservice distribution industry alone accounted for \$235 billion in sales in 2014, representing a growing industry as more people eat or take out food. Compared with retail markets, foodservice distributors are more fragmented and concentrated regionally. This characteristic, however, is changing as foodservice distributors merge and consolidate, as illustrated by the announcement in December 2013 that Sysco would acquire US Foods, which would result in a commanding share of the foodservice market. That being said, many local, regional and national distributors supply products to some combination of retail, foodservice and other wholesale markets, rather than being limited to one type of buyer.

In their analysis of food distributors, the Hale Group used

¹⁴ *Foodservice Distributors of the Future - The Evolution of the Foodservice Distributor Sector.*

a metric to compare customers of broadline distributors based on the type of account. The report identifies five types of accounts that range from higher to lower income as a percentage of sales: street accounts (independent operators), public bids (schools and government agencies), large-leveraged operators (major independents operators and institutions), contract management firms or Group Purchasing Organizations (e.g. schools, hospitals or healthcare facilities that partner with a separate entity to buy products from a distributor), and chain accounts (national foodservice chains). Compared with street accounts, which give the distributor more bargaining power and higher profit margins, chain accounts have much narrower margins and result in chain operators—along with their food manufacturers—having a greater influence over purchasing decisions.

Part 2 The Role of Logistics

At the heart of distribution is managing a system in which products are transported quickly, safely and efficiently. The study of logistics, which concerns how goods flow from their point of origin to their point of consumption, helps to clarify the frequently complicated nature of distribution. In terms of physical infrastructure, logistics involves the management of a **distribution network**, including a **distribution center** or warehouse where products are stored, **equipment** to process or package products, and a **fleet** of trucks or vehicles

Figure 8 The Distribution Network

Operational Infrastructure



Technology

(transportation and warehouse management systems, sales and order tracking, sku's and labelling)



Formal Agreements

(contracts with suppliers, buyers and carriers, bill of lading)



Knowledge Base

(experience in sales, accounting, logistics and marketing)

Physical Infrastructure



Distribution Center

(warehouse, cold storage rooms, loading docks, offices)



Transportation Fleet

(vans, box trucks, tractors, trailers)



Equipment

(forklifts, pallet jacks, equipment to sort and package food)

that enable the pick-up and delivery of products. Companies in the industry often refer to the network of suppliers and customers as distribution “channels.”

Distributors frequently distinguish between **inbound logistics**, the movement of raw materials, unfinished products and other goods from a supplier, and **outbound logistics**, the storage and movement of a product to the end user. For foodservice and retail distributors, inbound logistics is an essential topic that covers how food is brought from the farm or manufacturer to a restaurant, grocery store or buyer before reaching the final consumer. Unlike a typical distributor, many food hubs play an active role in packaging, processing and marketing products, rather than simply storing them in a warehouse. Food hubs that use direct-to-consumer channels (e.g. farmers markets, CSAs and buyers clubs) integrate methods of inbound and outbound logistics.

In order to transport products across longer distances or pick up products from a geographically dispersed group of suppliers, distributors enter into contracts with **commercial carriers**, which are businesses that own and operate a fleet of trucks, freight trains or other mode of transportation. By partnering with a carrier familiar with making runs in a geographic region, this approach can reduce operating costs, get more competitive prices for shipping and relieve the burden of performing these functions in house. A related trend among distributors is the use of **third-party logistics providers**, who manage part or all of the supply chain. A third-party

logistics provider or “3PL” is regarded as a company that performs a supply chain function for a client that would otherwise be performed in-house. The Consumer Product Safety Act of 2008 defines the term Third Party Logistics Provider as “a person who solely receives, holds, or otherwise transports a consumer product in the ordinary course of business but who does not take title to the product.”¹⁵ Unlike regular commercial freight carriers, 3PLs typically offer an array of “value-added” services. Though it is difficult to find a definitive classification of 3PLs, a few prominent industry-based providers, such as Transportation Insight, publish information on existing models:¹⁶

- » **Brokers:** Partner with carriers upon request to acquire rates and then resell shipments at higher rates
- » **Freight forwarders:** Consolidate shipments from a manufacturer or producer to a final point of distribution, frequently for overseas markets and cross regional hauls
- » **Warehouse 3PLs:** Assist companies in owning and leasing warehouse space, as well as managing inventory, purchase orders, labeling and cross-docking
- » **Enterprise 3PLs:** Provide a range of services and solutions tailored to the needs of the customer

¹⁵ *Consumer Product Safety Act.*

¹⁶ “Quick Guide to 3PL Models.”

Industry-based reports and publications, including Food Logistics and Inbound Logistics, make a distinction between **asset-based providers** that *own* their assets (e.g. trucks, warehouse and equipment) and **non-asset-based providers** that do not own these assets, but offer expertise in supply chain management.

Part 3 Common Practices

There exist several common practices and features of distribution that are necessary to tease out. The Hale Group's report on the future of foodservice distributors gives an insightful list of six supply chain characteristics that should be expected of distributors:¹⁷

- » **Reliability:** performs against defined expectation.
- » **Integrity:** safe, secure, and traceable; consider the changes in the capacity models to meet FDA product lot control.
- » **Transparency:** visibility to movement, inventories, in transit and customer feedback in real time.
- » **Efficiency:** eliminates waste and redundancy to perform at low cost.
- » **Social responsibility:** in business practices to include

¹⁷ *Foodservice 2020: Global, Consolidated and Structured.*

being humane, sustainable, fair and “green.”

Constant communication is a feature that underpins all aspects of a distribution network, especially for distributors working with produce or goods that require special handling. In 2012, the North American Produce Transportation Working Group (NATWG)—a coalition of more than 25 national and regional produce associations and transportation providers—released a detailed list of best practices, finding that clear, ongoing communication between all supply chain partners remained the top issue in becoming more efficient and achieving success.¹⁸ Day-Farnsworth and Miller affirm this issue in a recent analysis of the Upper Midwest local and regional food system, suggesting that “relational infrastructure—the relationships between supply chain participants—is at the core of any supply chain or distribution network.”¹⁹

Trucking

By and large, trucks remain the most common mode of transportation used by companies distributing agricultural products nationwide. The American Trucking Associations (ATA), a trade association serving the U.S. trucking industry, estimates that in 2013 trucks moved 69.1% of all domestic

¹⁸ *Produce Transportation Best Practices.*

¹⁹ Day-Farnsworth and Miller, *Networking Across the Supply Chain: Transportation Innovations in Local and Regional Food Systems.*

freight tonnage and collected 80.2% of all freight revenue.²⁰ Employing approximately 7 million people, trucking is not only a critical link in the supply chain, but also a major part of the U.S. economy. The Commodity Flow Survey (CFS) from the U.S. Census reported that in 2012 trucking—as a single mode of transportation—moved 73.7% of all goods and carried 8.2 billion tons of freight with an average of 216 miles per shipment and a total value of just above \$10 trillion.²¹ In the near future, the ATA forecasts that truckload volume will grow 3.5% a year through 2019, then slow down to 1.2% annually from 2020 to 2025 as more companies pursue intermodal transportation options, especially combinations of rail and trucking freight.²²

While segments of the food distribution industry have undergone mergers and consolidations, the trucking industry remains highly competitive and fragmented. Over 96% of trucking companies operate fewer than 20 trucks and almost 50% have only one truck. Economists from USDA and the US Department of Transportation (DOT) note that the competitive nature of the industry stems from (1) the ease of entry and exit of the business, (2) the large number of owner-operator drivers and (3) the large number of used trucks, tractors, and trailers available.²³ Overall, some researchers

20 ATA, *ATA American Trucking Trends 2014*.

21 Margreta, Ford, and Grube, *U.S. Freight on the Move: Highlights From the 2012 Commodity Flow Survey Preliminary Data*.

22 ATA, *Forecast*.

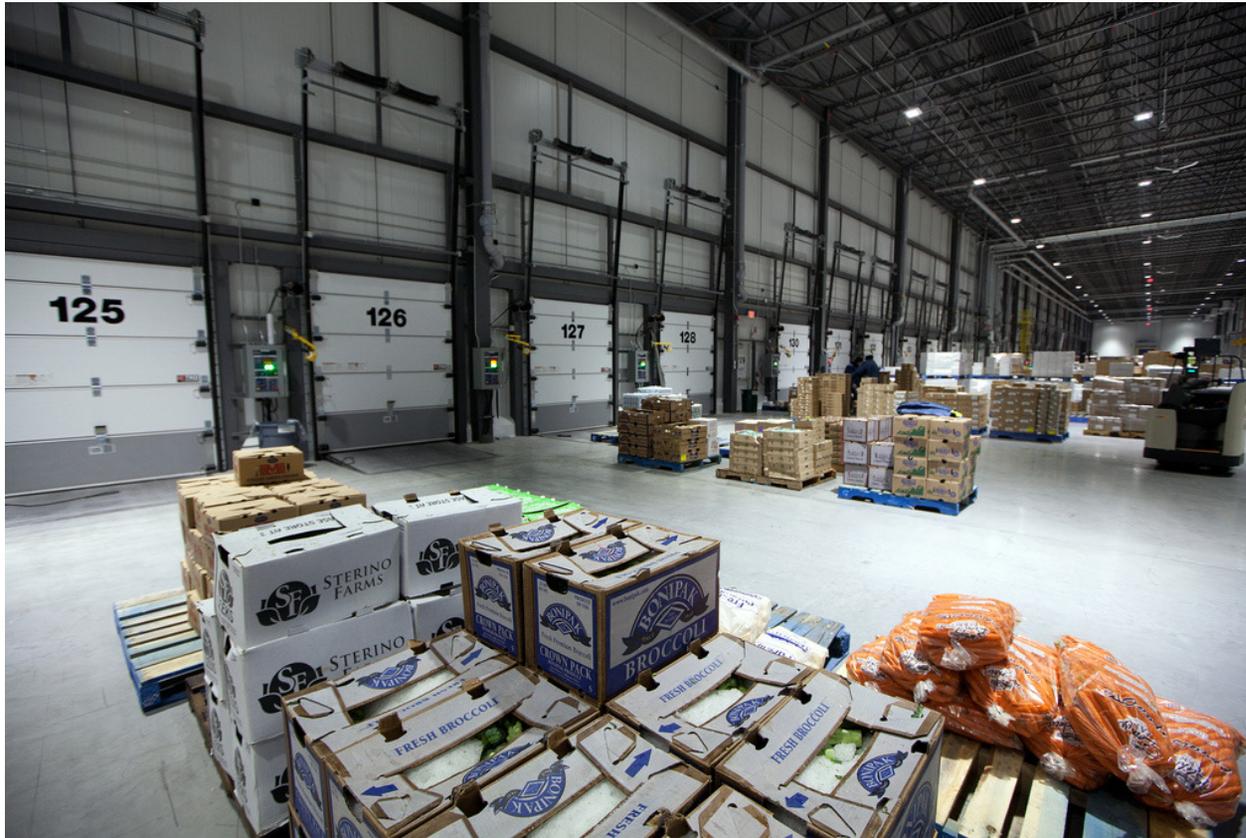
23 Casavant et al., *Study of Rural Transportation Issues*.

suggest that tight competition benefits the agriculture industry by keeping costs low, though these costs vary by type of goods, the region in which goods are picked-up and delivered, and long-term fluctuations in fuel prices.

US DOT breaks down trucking into two broad categories: *Long-haul Interstate Operations* in which driving is the principal occupation of the driver and *Local Operations*, such as farm trucks, that are typically on short-haul routes less than 150 to 200 miles and may not require a Commercial Drivers License (CDL). A second distinction is between companies—mainly large distributors and food/beverage manufacturers—that operate *private fleets* and companies that operate on a *for-hire* basis, either leasing their services to other carriers or delivering products independently.²⁴

One of the most significant differences in cost per mile relates to truck load volume. Private carriers often specialize in *Full Truckload (FTL)* shipments and *Less-Than Truckload (LTL)* shipments that range from loads weighing as low as 150 pounds to as high as 2,000 to 20,000 pounds, depending on the load requirements set by the carrier. Because many food hubs cannot meet the volume required to fill an entire truck, they must seek opportunities with LTL carriers, which can substantially increase base mileage rates and other transportation costs. Nevertheless, the flexibility offered by LTL carriers in shipping smaller quantities can be an appealing option if one pays close attention to how the base

24 Ibid.



Perishables palletized and placed by loading docks at the Balzac Fresh Food Distribution Center
Source: Walmart

rate is calculated, the freight classification, agreements that allow multiple items to be pooled together, and the shipment weight.²⁵ To control inventory and measure the volume of goods, products are usually packed, organized and loaded through a standard-sized pallet or case system and, if feasible, tracked through an item-tagging system, such as a Radio Frequency Identification Device (RFID).

²⁵ Isasi, "Seven Tips to Help Save Money on LTL Shipping."

The capacity of a distributor is also determined by the size of the fleet and their respective load volumes. The Federal Highway Administration (FHWA) defines eight vehicle classes based on their Gross Vehicle Weight Rating (GVWR). Vehicle Classes 1-2 holding less than 10,000 lbs are classified as "light duty," while Classes 3-6 are considered as "medium duty," holding between 10,000-26,000 lbs; all weights above (Classes 7-8)

are “heavy duty.”²⁶ Due to their flexibility in handling smaller loads, it is common for food hubs to use vans or box trucks, which range in length from 10 to 26 feet or more and carry loads in the light to medium duty vehicle classes. As demand from buyers increases and food hubs scale up operations, semi-trailers—trailers without a front axle, ranging from 26 to 53 feet—are used to accommodate the transportation of products at higher volumes. For the transportation of perishables that must be refrigerated, carriers own and operate “reefer” vans or trucks that support “temperature-controlled” climates. Though refrigerated trucks are more costly to purchase and maintain, the ability to set precise temperature controls is an indispensable feature for transporting produce, dairy, meat and other perishable foods.

The Warehouse or Distribution Center

Alongside a fleet of trucks, warehouses represent the second pillar of a distributor’s physical infrastructure. Conventional distributors rely on warehouses (or “distribution centers”) to track the movement of products, store goods through an inventory system and process goods being picked up or delivered. In terms of size, distribution centers can range in space from a few thousand of square feet to millions of square feet with a series of loading docks where goods can be efficiently delivered and picked up. Once inside the warehouse, goods are processed and packaged through a conveyor belt system and then moved around using forklifts or pallet jacks before

26 “Vehicle Weight Classes & Categories.”

being placed onto storage racks or directly into an outbound truck. Distributors carrying perishable foods face the added challenge of moving time-sensitive products which must stay within a preset temperature range. To handle these goods, distributors store goods in refrigerated rooms as part of a “cold chain” and then use a Warehouse Management System (WMS) to monitor individual items before shipment.

In regards to the physical character of a warehouse, food hubs differ tremendously from conventional distributors. Since they frequently play a role in aggregating and marketing products, food hubs can take on responsibilities that, using industry terminology, a manufacturer would normally do, like aggregating, processing, labeling and packaging produce. These “value-added” services alleviate the burden on the farmer or original producer, but can vastly expand the equipment, physical infrastructure and amount of space necessary to operate successfully.

Operational Requirements

In terms of operations, the North American Produce Transportation Working Group (NAPTWG) developed a checklist based upon the different points of view of a supply chain’s stakeholders: the shipper, receiver (e.g. wholesaler or distributor), and transportation provider. NAPTWG lists a set of practices that supply chain partners should engage in, such as agreeing on pick-up and delivery times, load management plans, daily check-in calls en route and on arrival, appoint-

ment scheduling efficiencies, and temperature and handling requirements stipulated in a Bill of Lading (BOL) or separate contractual agreement.

When partnering with private carriers, food distributors enter “transportation,” “shipper” and “carrier” agreements that go over handling instructions, shipping requirements and fees associated with loading, unloading, reconsignment, stop-offs and trailer/driver detention. In forming partnerships with individual farmers and food manufacturers (i.e. the “supplier” or “vendor”), large distributors often maintain compliance manuals with strict guidelines and a list of prerequisites that need to be met. These documents cover a detailed list of responsibilities for becoming a supplier, including operational requirements for pallets and loads, purchase order processes, notifications of Overage, Shortage and Damage (OS&D), and quality assurance methods.²⁷ While food hubs use similar manuals in order to partner with suppliers, these manuals can embody a more collaborative approach that promote the story of the farm or producer. As an example, the supplier manual for Intervale Food Hub in Vermont mentions not only product quality standards and information on billing/pricing, but also requirements for attending farmers meetings, engaging in marketing and outreach efforts, and coordinating with the food hub in pre- and post-season planning.²⁸

27 “Supplier Compliance Manual: Redistribution Center (RDC) Network.”

28 “Intervale Food Hub Manual for Farmers, Processors and Vendors.”

During a recent conference on transportation innovations for supplying locally sourced foods in the Upper Midwest, participants discussed delays in picking up and dropping off products, an issue with the “first and last mile” of a haul. Delays occurred in the first mile when suppliers did not have their products packed or palletized for pick-up and then in the last mile when drivers confronted traffic congestion in urban areas or faced waiting periods to unload products onto an open dock.²⁹ On both ends, delays were cited as financially costly and detrimental for keeping a track record of reliability.

Federal Rules and Guidelines

Distributors closely follow an assortment of federal rules, regulations and guidelines governing the handling and processing of food. The USDA and FDA are the primary federal agencies that maintain standards for the processing, handling and storing of food to protect the safety of consumers and prevent foodborne illnesses. Different sets of regulations apply to each participant in the supply chain. Producers are regularly asked to receive training in Good Agricultural Practices (GAP) and Good Handling Practices (GHP), as well as become certified as an organic grower and obtain compliance in Hazard Analysis and Critical Control Points (HACCP)

29 Day-Farnsworth and Miller, *Networking Across the Supply Chain: Transportation Innovations in Local and Regional Food Systems*.

systems. Food hubs often take on a *dual* role in assisting farmers to meet these standards, while also abiding by regulations related to proper storage and distribution. The US DOT Federal Motor Carrier Safety Administration (FMCSA) administers regulations for carriers, including the registration of commercial vehicles and Hours of Service requirements, which were recently changed in July 2013. The USDA also publishes handbooks, like “Protecting Perishable Foods: During Transport by Truck,” that provide detailed recommendations on how to safely transport, load and protect perishables.³⁰

Technology

As distributors scale up, the use of technology can play a vital role in reducing costs and streamlining operations. Local and regional distributors frequently use accounting software, such as Quick Books or Microsoft Excel, to track financial transactions and other numerical data, and then attach a Stock Keeping Unit (SKU) to various products to manage inventory. As supply chain logistics become increasingly complex with more partners and a bigger fleet of trucks, distributors commonly use a **Transportation Management System (TMS)**. Many nationwide distributors not only use a TMS, but also develop these systems in-house and customize their own program. A TMS serves a variety of purposes that allow companies to optimize and map routes, select carriers,

³⁰ Ashby, *USDA Protecting Perishable Foods: During Transport by Truck*.

schedule delivery appointments and capture real-time data on order statuses. A separate but related technology-based feature is attaching GPS trackers to trucks and using smartphones to monitor the time and location of deliveries.

Business Models and Financial Management

Regional and nationwide distributors are overwhelmingly private enterprises that use “income” or “Profit and Loss” statements (P&L) to keep track of annual operating expenses and profits. For a regular broadline distributor, a simplified P&L will consist of total sales or revenue, cost of goods, the gross profit margin, operating expenses (i.e. warehousing, transportation and General and Administrative expenses) and the final operating margin.³¹

Underscoring the business model of a food distributor is their capacity to gauge supply and demand. On the supply side, distributors develop relationships with farmers, suppliers or “vendors” that produce a volume high enough to make a run logistically possible. On the demand side, distributors form partnerships or “accounts” with buyers or “operators” in a nearby market. Buyers are occasionally referred to as anchor customers if they enable a run to work for other customers purchasing a smaller quantity of products. As such, natural constraints faced by farmers—such as weather unpredictability, seasonality and limited space to grow crops—result in constraints upwards along the supply chain. In the case

³¹ *Foodservice 2020: Global, Consolidated and Structured*.

of local food, distributors are often unable to meet rising demand or fulfill agreed upon, pre-season orders. Meanwhile, nationwide distributors have more agile operations that can tap into suppliers from different regions to fill any gaps that may occur. Regardless of the size of the distributor, maintaining constant communication, from the grower to the buyer to the final consumer, is paramount.

Distributors use a number of variables to calculate and analyze transportation costs. Measuring the available space for pallets/cases and a fleet's shipping capacity, many food hubs evaluate the cost per trip, projecting how many runs can be accomplished per week and what routes optimize time and costs. Major distributors develop a system of base mileage costs with accompanying surcharges for fuel and fees for stop-offs and detention. In determining the cost per trip or cost per mile, expenses are divided into *fixed costs* (e.g. lease, loan payments, insurance, highway use taxes) and *variable costs* (e.g. payroll and fuel). Over the course of making trips, distributors fine-tune their operations by establishing stable delivery times and even build customers along routes.

One major consideration, especially among food hubs and smaller distributors, is the choice to own or lease a trucking fleet. Investing in new infrastructure can incur significant costs that may limit a company's growth potential and access to further credit. Purchasing reefer trailers, in particular, can result in a sizable amount of debt that must be paid each month. In addition, owning your fleet doesn't account

for maintenance costs when trucks encounter problems that need to be fixed immediately on the road. For these reasons, many distributors enter lease arrangements that cover maintenance. A Terminal Rental Adjustment Clause (TRAC) gives the option of buying the vehicle at the end of the lease (otherwise known as a "lease-to-own") or exchange for new equipment.³² The price can be predetermined through a contractual agreement or "Fixed Purchase Option" (FPO) using the Fair Market Value of an asset. In a recent webinar tutorial on leasing from the National Good Food Network (NGFN), the participants offered a rule of thumb: if an asset appreciates in value, it should be owned, but if an asset depreciates, it should be leased. Due to their high-value and extended useful life, leasing trucks can fall under a purchased asset in accounting as a "capital lease," rather than an "operational lease."

Backhauling and Cross-Docking

In the trucking industry, *backhauling* is a common practice used by distributors at all scales. The concept of backhauling involves carrying goods on a return trip, usually by partnering with distributors who want to deliver goods along the same route and in the opposite direction. The ability to fill a truck that would otherwise be empty provides a crucial source of income and, to a large extent, makes the initial trip economically viable.

³² Shiflett and Matteson, "Ins-Truck-Tion Manual: Lease, Buy or Other."

A second strategy, less commonly used but often discussed, is **cross-docking**, a practice that involves loading goods from an inbound truck directly to outbound trucks by minimizing, or outright eliminating, the time goods are spent in storage. In terms of physical design, facilities that cross-dock are configured with short connections between loading docks where goods are first delivered and outbound docks where goods are shipped to their next destination. Many of these facilities are designed in the shape of an “I” or thin rectangle to minimize storage space. Warehouses and distribution centers that adopt these practices use a “hub and spoke” model in which goods are sorted quickly and consolidated in a central section before being placed in outbound trucks. Like backhauling, cross-docking is viewed as a method to cut costs and improve logistics operations. For distributors working with produce and perishable goods, cross-docking is an appealing option for transporting food in and out of a facility as efficiently as possible to preserve freshness and lessen risks associated with direct handling.

Part 4 Food Hub Distribution Systems

Over the past few years, the Agriculture Marketing Service (AMS) of USDA has discussed models of distribution for nascent, emerging and developed food hubs. These models are delineated by ownership structure and relationships

between producers and consumers. The 2012 report from USDA, entitled “Moving Food Along the Value Chain: Innovations in Regional Food Distribution,” identifies four types of distribution models:³³

- » **Producer-driven:** single or group of producers perform aggregation and distribution roles, rather than contracting to a third party
- » **Nonprofit-driven:** nonprofit organizations distribute and market products by facilitating connections between producers and the wholesale market
- » **Retail-driven:** a food cooperative or private company provides business development, distribution and marketing services for producers whose products will be sold in store locations
- » **Consumer-driven:** buying clubs use online networking platforms to connect producers with consumers

As food hubs scale up operations, one of the report’s main findings was that the level of investment in infrastructure should match the organization’s stage of development and marketing capacities. The authors suggest that organizations start with an asset-based approach by tapping existing resources within a region, rather than a needs-based

³³ Diamond and Barham, *Moving Food Along the Value Chain: Innovations in Regional Food Distribution*.

approach that concentrates on trying to fill what is lacking. Similar to industry-based reports, *Moving Food Along the Value Chain* highlights the success of specific practices to improve logistics (e.g. backhauling, cross-docking, dropship programs and finding convenient halfway points for farmers to aggregate product). The report also mentions practices which have helped keep food hub operations financially afloat, such as sub-leasing part of a facility or sharing its ownership; contracting with private carriers and partnering with existing distributors; and securing a customer base in a target market that maximizes the products delivered on each run. Some supply chain efficiencies related to distribution and logistics include:

La Montañita Co-op (Albuquerque, NM)

- » Consolidate trucking routes to coordinate deliveries
- » Post-harvest refrigerated space for small-scale producers
- » Backhaul products from larger distributors to cover overhead costs
- » Establish 'Preferred Vendor Pre-pay Program' to overcome early season cashflow constraints
- » Separate products that can be delivered directly to a store and those needing to be processed and packaged in the warehouse

Co-op Partners (St. Paul, Minnesota)

- » Use drop-ship program for small deliveries
- » Separate warehousing sections for refrigerated, frozen and dry goods
- » Sub-lease part of the warehouse for added income
- » Use third party contracts for longer hauls

Red Tomato (Canton, MA)

- » Work with small to mid-sized farmers in marketing a differentiated product—the "Eco-Apple"
- » Provide extensive off-season planning to prepare for consumer demand the following season
- » Organize convenient aggregation points for farmers that serve as midway delivery points
- » Employ price negotiation strategy by asking farmers for three prices: price from past sales, realistic/desired price and a dignity price

New North Florida Cooperative (Marianna, FL)

- » Tap into schools and institutional market in a rural region with longer hauls
- » Develop "Rolling Store" pilot program, which uses churches as drop-off sites for produce

Morales and Day-Farnsworth have a parallel analysis for



Pallets of fresh produce ready for pick-up at the Common Market food hub in Philadelphia, PA
Source: USDA

studying small to mid-sized regional distributors, identifying six distinct ownership models: the independent business, the nonprofit, the cooperative, the producers' alliance, the produce auction, and third-party logistics orchestration.³⁴ Notably, the researchers discussed the concept of a producer's alliance, a model that shares characteristics of an agricultural cooperative but with fewer requirements of members. Producers that join such an alliance may sign a Memorandum of

³⁴ Morales and Farnsworth, *Satiating the Demand: Planning for Alternative Models of Regional Food Distribution*.

Understanding (MOU) or informal agreement to have their product marketed under a single, umbrella brand. In regions where a robust, well-established distribution system already exists, food hubs can function as Third Party Logistics providers (3PL) that coordinate private carriers and distributors in satiating demand for local food.

One innovative strategy for scaling up operations is pursuing opportunities for *vertical integration* in the supply chain. Expanding horizontally by increasing the output of products



Employees at the Appalachian Harvest facility (left) operate equipment to grade and package produce while working with a range of small to mid-sized farms (right) Source: Appalachian Harvest

or the number of buyers is important, but it is also valuable to take control over more parts of the supply chain.³⁵ Alsum Produce, a Wisconsin-based provider of produce, has been profiled for using this method to evolve into a national distribution network, while still being committed to sustainability and adopting a values-based supply chain.

Ongoing Challenges

³⁵ Day-Farnsworth et al., *Scaling Up: Meeting the Demand for Local Food*.

Despite the rise of demand for local food, food hubs continue to grapple with distribution-related issues that limit their size and scale. Many large conventional distributors (e.g. Sysco and UNFI) manage fleets of hundreds of trucks with regional distribution centers that provide easy access to different urban markets. This contrasts starkly with food hubs or mid-sized distributors with one or two distribution centers. Due to their larger economies of scale and expansive network of suppliers, larger distributors offer competitively low prices

for goods that food hubs, for the most part, simply cannot match. Although branding helps differentiate local products, consumers in the conventional retail market mainly buy food based on its cost and quality. As such, consumers tend to be unwilling to pay slightly higher for a “local” product, a limitation expressed in a study of Alsum Produce.³⁶ Looking at the bigger picture, industry-based reports, like those from the Hale Group, view the local food movement with a skeptical eye, predicting that global demand will fuel the growth of large suppliers, continuing the trend of acquisitions and mergers across the industry.

Recent Developments

In the course of writing this report, new developments on local food distribution emerged. On May 8, 2014, Agriculture Secretary Tom Vilsack announced an investment of \$78 million in local and regional food systems aimed at supporting facilities that aggregate, process and distribute food.³⁷ This funding will be dispersed through a loan guarantee program and grants. On July 25, 2014, the White House announced the creation of a \$10 billion Rural Infrastructure Opportunity Fund to serve as a catalyst for rural-based infrastructure projects in need of financing, including local and regional

36 Ibid.

37 Office of Communication, “USDA Announces \$78 Million Available for Local Food Enterprises.”

food systems.³⁸ Simultaneously, the Administration launched Local Food, Local Places as a technical assistance program for food production.

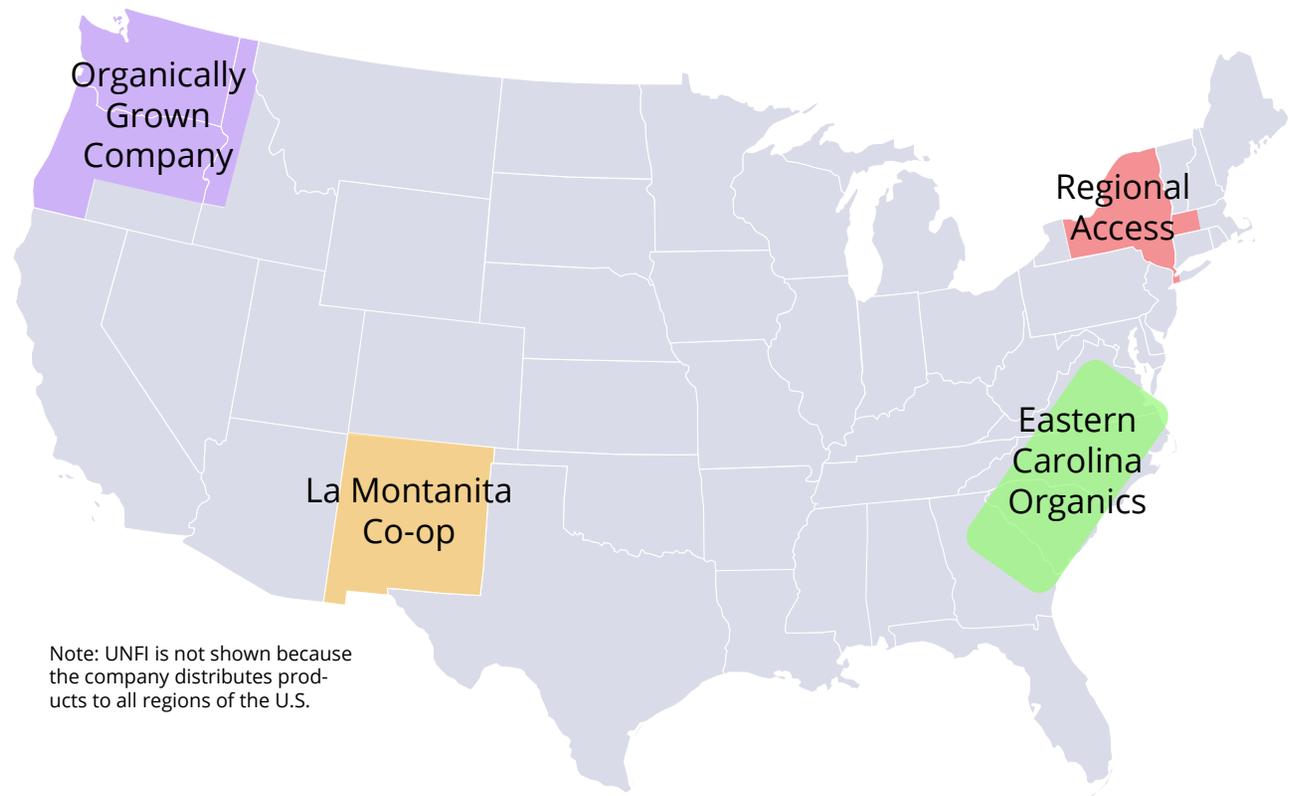
In June 2014, the Center for Integrated Agricultural Systems (CIAS) at the University of Wisconsin-Madison unveiled a report on transportation innovations in the Driftless region of the Upper Midwest. In August of 2014, the National Good Food Network (NGFN) held a webinar on leasing arrangement for trucks and methods of analyzing transportation costs.

38 Office of the Press Secretary, “Fact Sheet: Increasing Investment in Rural America.”

Drawing Lessons from Case Studies

The following section profiles five distribution models based around questions and issues from the Central Appalachian Network (CAN). Four of the cases—Regional Access, La Montañita, Organically Grown Company and Eastern Carolina Organics—are listed as food hubs and shed light on regional systems. United Natural Foods Inc. (UNFI) is analyzed as well as to understand systems of national distribution and as a point of comparison. The cases are not intended to be models in and of themselves and their inclusion in this report should not be perceived as a full endorsement of their practices. Instead, they are meant to highlight common practices and issues concerning regional distribution in rural areas.

Geographic Regions Served by Each Case



Eastern Carolina Organics (ECO)

Making its first delivery in 2004, Eastern Carolina Organics (ECO) started as a project with the Carolina Farm Stewardship Association (CFSA) and through a grant from the Tobacco Trust Fund Commission, which assists former tobacco farmers to grow new crops. ECO is a food hub serving organic produce in the southeast region of the U.S. with currently over 70 growers, 100 customers and annual sales above \$3 million. Financially, ECO has tapped into low-interest loans from Community Development Financial Institutions (CDFI), such as NCIF and Self-Help, and is a recipient of the Local Producer Loan Program from Whole Foods Market. On top of distributing local, organic produce, ECO posts promotional videos on farmers, participates in outreach events and works closely with growers on food safety training and organic certification.

ECO owns 2 box trucks and partners with LTL cold trucking companies to ship larger volumes outside of their own footprint. Customers include restaurants, grocery stores, buying clubs, food cooperatives, schools and institutions, serving a rough range of 300 miles north and southwest of Durham, NC with specific delivery routes set for each of the five days a week. As ECO grows and serves more customers, one of the major distribution issues they face revolves around technology and being able to use an integrated system that tracks inventory, shipping and receiving.

Location	Durham, NC
Ownership Status	For-profit
Annual Sales	Over \$3 million
Year Est.	2005
Geographic Area	3 hours north and southwest; LTL company for longer distances
Fleet	2 box trucks and one semi-trailer
Transportation Management	Box trucks are owned with maintenance agreements; 2.5 and 3.5 years old, respectively
Mileage Costs	Approximately \$1 per mile
Business Model	80% of sales go to farmers and 20% retained by ECO
Warehouse Space	26,000 sq ft



Box trucks (left), semi-trailer truck (right) and team at Eastern Carolina Organics
Source: ECO

La Montañita Co-op

Incorporated in 1976 with three hundred families, La Montañita is a consumer cooperative that has grown to over 17,000 members with six stores throughout New Mexico and a distribution center based in Albuquerque. Presently, the co-op supplies a full range of grocery items, including 1,100 locally made products from 400 local producers, while a Co-op Distribution Center (CDC) manages shipments to individual stores and acts as a separate regional distributor for locally sourced goods. Operating as a co-op that was already purchasing local food, in 2007 La Montañita launched a food-shed initiative, which expanded the range of products bought from local producers and built a distribution center to help these producers gain access to the broader wholesale market. Their slogan of “fresh, local and fair” is a testament to the co-op’s multi-faceted mission of providing fresh food to customers, sharing ownership of the business and ensuring small to mid-sized producers are given opportunities to thrive.

Since beginning with an initial investment of \$150,000 over seven years ago, La Monanita has invested over \$800,000 in the CDC and recently moved from a 7,000 square foot facility to a facility with 18,000 square feet to increase their capabilities and reach a higher economies of scale in the regional



Filling a box truck for delivery
Source:
La Montañita

food system.³⁹ During these years in operation, there were critical turning points. One deal with Organic Valley led the CDC to become one of its primary distributors in the southwest, which kept the center active year-round, instead of being restricted to seasonal produce. In 2010, the co-op established the La Montañita Fund, an investment program that allows Co-op members to make investments in the company that are subsequently collateralized into low-interest loans for regional producers; the loan program is administered by the New Mexico Educators Federal Credit Union (“NMEDFU”).

Michelle Franklin, Manager of the Co-op Distribution Center (CDC), shared information on how the co-op manages distribution logistics. In deciding whether or not to pick up products from smaller suppliers, she explained that the decision varies case by case and depends on the history of the rela-

³⁹ Seydel, “Rooting the Local Food System: La Montañita’s Co-Op Trade/Foodshed Initiative.”

tionship with the farmer. Sometimes La Montañita negotiates convenient drop-off points and, when possible, sets aside extra space in the truck for small vendors. The new facility also offers cross-docking services to shorten delivery and pick-up times. The two temperature-controlled box trucks used to deliver products are under a regular lease with a maintenance agreement and renewed every two years. In planning routes, Franklin stressed that one must do “serious networking on who is driving trucks on the same route—analyzing the compatibility, timing and size of vehicles.”

To cover overhead costs, the CDC engages in the backhauling of food and non-food products from larger distributors, like Veritable Vegetables and United Natural Foods Inc. (UNFI). This approach has been described as a hybrid model that combines local and non-local goods on the same truck to secure a much-needed source of revenue.⁴⁰ To help suppliers reach wholesale markets, the CDC assists regional farmers to obtain vendor status with Sysco, Whole Foods and other retail distributors. Further, the CDC developed a streamlined vendor intake process with a food safety survey to assess what farmers understand and what practices they’re using. As a general rule of thumb for distribution, Franklin said, the co-op “tries not to say no” and “pauses at every opportunity.”

Despite the co-op’s success, some daily obstacles are its limited infrastructure to support the transportation of produce, as well as the steep learning curve in both logistics planning and educating farmers on packing, handling and food safety.

40 Diamond and Barham, *Moving Food Along the Value Chain: Innovations in Regional Food Distribution*.

Location	Six stores; Co-op Distribution Center (CDC) in Albuquerque
Ownership Status	Consumer Cooperative
Annual Sales	Over \$40 million (total) and \$5 million (CDC)
Year Est.	1976
Geographic Area	300 mile radius from Albuquerque in the Rio Grande River Valley Rift
Fleet	Two 24-foot refrigerated box trucks that hold 11 pallets each
Leasing Structure	Truck lease is renewed every 2 years with few breakdowns; regular lease that covers maintenance, licensing and tax fees
Route Planning	5 days a week with as much as 20 stops and 700 miles round trip, taking as much as 14 hours
Mileage Costs	Fixed charge of \$1,840 per month with 9 cents per mile charge plus reefer charge, amounting to \$2,300 per month
Business Model	Charge suppliers 13% of invoice with a \$50 pallet fee; sales tracked through Quickbooks; two-tiered pricing structure to separate store profits from other sides of business; distribution gross margin of 10% with 50% of sales going to the store
Warehouse Space	18,000 sq ft facility with 2,832 sq ft of refrigerated storage, 1,152 sq ft of frozen storage, post-harvest storage space and cross-docking services

Regional Access

Based in Ithaca, NY, Regional Access has been in operation since 1989 with the mission of supporting local economies and sustainable food connections. The company assists in the aggregation of products from small to mid-sized suppliers and then distributes products to buyers across most of New York State and parts of New England. Deliveries to New York City, the largest urban market served by Regional Access, are made five days a week.

Dana Stafford, the President of Regional Access, described managing the profitability of distribution as a “constantly shifting matrix” that at certain times means using non-class trucks and carrying different loads. “Scaling fleet size to business” is critical for becoming a successful distributor. To calculate a cost per mile, fixed costs (e.g. leasing, loan payments, insurance and highway use taxes) are combined with variable costs (e.g. fuel and payroll). In terms of profitability, Stafford explained that Regional Access has unusually high gross margins because they have to spend more time and energy on investment, pick-up and deliveries. They also must charge more than broadline distributors working in the same region. Their mission-driven but financially-conscious approach, he remarked, “keeps the barrier of entry low” for smaller producers, though they must still be selective. In navigating the market segment for locally sourced goods, Regional Access openly acknowledges its inability to compete with larger dis-

Location	Ithaca, NY
Ownership Status	For-profit
Annual Sales	Unknown
Year Est.	1989
Geographic Area	Most of New York State and western Massachusetts
Fleet	7 temperature-controlled box trucks and 4 semi-trailers; most are 4-5 years old with the oldest truck at 10 years
Leasing Structure	Half of equipment is owned; trucks are all under regular lease from 4-6 years; maintenance agreement with lease
Loading System	Tiered system based on pallet space; first pallet is \$120 and then each additional one is \$70-\$100
Route Planning	Multiple trips a day to aggregate and distribute products; trip to New York City five days a week; backhaul when geographically feasible
Mileage Costs	\$2.35 per mile for box trucks and \$2.55 per mile for tractor trailers; calculated by combining fixed and variable costs; 8% fuel surcharge
Business Model	Separates gross margin of freight side of operations (37.5%) and then food sales (27%)
Warehouse Space	Freight and Storage Services; sq ft unknown

tributors, such as UNFI, but instead uses a strategy to differentiate its products.

To work with smaller suppliers, the company maintains a tiered pricing system based on available pallet space. And before bringing on a supplier, Regional Access first evaluates whether or not they are committed to selling the product. "Investment in the product" was cited as a key element in growing a sustainable relationship. Financially, backhauling freight is another component of the business model, covering 12% of sales. In order for backhauling to work, it has to "make sense geographically," usually scheduled on a weekly basis and requiring some form of re-aggregation on an out-bound run. However, Stafford explained that maintaining sales and orders from regional producers is always a first priority. To illustrate this point, he mentioned that in the past decade, Regional Access experienced "breakneck growth," particularly owing to its expanded freight services for wine. But the company found that these additional services were becoming a burden on operations, and despite the extra revenue, decided to scale back wine-related operations.

As a for-profit enterprise, Stafford stressed the importance of financial management, transparency and making a continual assessment of who you are selling to and if there is enough balance in products. The ability to re-invest in the company, he indicated, has enabled them to effectively scale up their distribution network and remain profitable.



A picture of the warehouse of Regional Access' (above) and the company's logo (left)
Source: Regional Access

Organically Grown Company (OGC)



The Organically Grown Company team with a box truck in the background (Source: OGC)

Organically Grown Company (OGC) began in 1978 as a non-profit organization to assist regional farmers in growing organic foods. The success of their work led OGC to become a producer cooperative, positioned to serve farmers in distributing organic products. Due to the seasonal nature of farming in Oregon, the cooperative began purchasing out-of-state organic products to maintain year-round operations. However, as a cooperative, federal regulations required that farmer-owners grow and supply at least 50% of sales, a requirement that limited OGC's growth potential. In 1999, OGC adjusted its legal status to an S-Corporation, a for-profit en-

tity with 100 shareholders or fewer, all of whom must be located in Oregon.⁴¹

Dave Lively, Vice President of Marketing and Sales for OGC, explained that the number of product-transporting trips have gradually scaled up with an expansion of market scope, starting with a few days per week in smaller towns and increasing to 6 to 7 days per week in most cities in the northwest. As a wholesale distributor, OGC focuses primarily on selling produce to retail chains, institutions, restaurants, buyers clubs and even other wholesalers. OGC buys produce from around 400 growers with 160 being located in the Northwest. To support the local farming community, the company created the "LADYBUG Brand" that provides marketing support and packaging at discounted rates, while giving farmers an outlet to differentiate their product and sell through a regional brand.

The company began with a warehouse facility in Eugene, OR and has since expanded to build two more facilities in Kent, WA and Gresham, OR. Moving into the new 119,000 square ft facility in Gresham, WA more than tripled the amount of dry goods and refrigeration space from the previous warehouse, and substantially increased the number of loading docks.

⁴¹ Thistlewaite, *Innovative Business Models: Organically Grown Company*.

Location	Eugene, OR (headquarters); Portland, OR; Kent, WA
Ownership Status	For-profit
Annual Sales	Over \$100 million
Year Est.	1983
Geographic Area	Pacific Northwest (Washington State, north and central Oregon, parts of Idaho)
Fleet	9 box trucks; 24 trailers ranging from 32 ft to 53 ft in size
Leasing Structure	6 trailers are owned and 18 trailers are leased with full maintenance agreements; maintenance costs of \$1 per reefer hour and 7 cents per mile
Route Planning	Routes established by interstate corridors (I-5, I-84 and I-90); trips 6-7 days of the week; in the process of using a TMS
Transportation Costs	Average of \$1,500 per month for trailers; new trailers are \$1,900 per month and new box trucks are \$2,500 per month; cost per mile of \$2.19
Business Model	Third party handles large share of incoming orders; purchase orders set before routing each day; contract carriers in the wintertime to source products from other regions; cost per case of \$1.10 for all products; 80% of sales go back to grower with 1-2% net profit and 18-19% gross margin
Warehouse Space	3 facility/distribution centers; new Gresham facility has 119,000 sq ft of total space with 10 docks

Presently, OGC uses Microsoft Excel and Qualcomm to track fuel, equipment, sales, deliveries, fleet performance and mileage costs, but is in the process of switching to a Software as a Service (SaaS-based) TMS that will improve logistics.

Operating year-round, OGC wears multiple hats in giving opportunities to northwest-based farmers and sourcing from organic suppliers outside of the region (e.g. California and Arizona) during the winter off-season. Similar to other distributors, OGC backhauls products, though they focus on their own products as a first priority. Lively stressed that, for the company, backhauling was not as important for revenue as it was for sustainability. Filling trucks reduces trips for everyone, lowering the collective carbon footprint. OGC also offers cross-docking services in their Eugene facility to conserve space and speed up delivery times.

OGC has taken many steps towards being a leader in environmental responsibility, publishing a series of achievements in an Annual Sustainability Report. The company started transitioning its fleet to meet "Clean Air" certification under the Federal Diesel Emissions Reduction Act and contracts with B-Line, a company that delivers goods on motorized tricycles, bringing products into Portland's urban core without using its trailers. According to the Sustainability Report, the partnership with B-Line helped OGC avoid driving 9,308 miles and prevented more than 28,000 lbs of CO2 emissions. In addition, OGC engages in a variety of sustainable practices to avoid waste and reduce its carbon footprint: using reusable

plastic containers (RPC) and recyclable non-paraffin “wax” boxes, investing in better equipment and material, composting, purchasing renewable energy credits, and tracking energy consumption to reduce greenhouse gas emissions.

Lively discussed three premises that’s enabled OGC to work with a range of suppliers: (1) being willing to travel as far as possible, but not farther than you have to, (2) putting dollars back in the community and letting the community sell the product, and (3) asking what products are available and what buyers are using the same routes. As a whole, Lively said that “produce has become more complex” with “differentiated products moving at smaller volumes.” To compete effectively in the organic produce market, supplying “high-quality, high demand product is important.” To this end, OGC uses a more holistic approach towards distribution, looking at the “efficiency of a relationship, the consistency of the product and the packaging.”

In regards to logistics, Brian Chapman, Transportation Manager for OGC, mentioned that the company pays close attention to hours of service and whether it makes sense for them to pick up the product or hire a private carrier. To calculate cost per mile, OGC combines the truck, labor and various costs, a method they described as a cost accumulation model. Third party carriers are utilized for farther, more remote runs, like Bend and Ashland. However, when OGC makes runs to Seattle, they deliver to a warehouse outside the city that has smaller trucks, which lessens the impact of traffic

congestion. In general, Chapman explained that you always need to compare the cost and return of a run and judge if an account can rely on you to meet their needs. You need to ask: “When do you commit to runs and how often do you go there?” And then you can spend more time on “increasing the frequency of runs.” Over time, Chapman said, it is important test the waters before carrying a route.

Financially, OGC maintains a competitive-based standard of paying 80% of sales to growers, expecting that retailers will roughly double the price to the final consumer. While Lively acknowledged competition from other organic food distributors (i.e. Albert’s Organics), Lively said that the bigger threat comes from conventional distributors.

United Natural Foods, Inc. (UNFI)

The roots of UNFI can be traced to Michael Funk (now Chairman of the Board) who, after delivering organic produce from a Volkswagen van for a few years, opened the Mountain People’s Warehouse in 1976. For two decades, the warehouse scaled up operations and became a prominent distributor of “natural” products in the western United States. During this same period, Cornucopia Natural Foods, a company based in Rhode Island, was expanding operations on the East Coast and started to acquire smaller distributors and retailers. In 1996, both companies merged to form UNFI as a publicly traded company, which enabled them to establish a nationwide distribution network. Since 1996 UNFI has experienced rapid growth, acquiring numerous distributors, suppliers and other companies in the supply chain serving natural and organic products. Among the subsidiaries and divisions of UNFI include UNFI Canada, Albert’s Organics, Select Nutrition, Honest Green, Tony’s Fine Foods, Blue Marble Brands, Earth Origins Market, Woodstock Farms Manufacturing and Trudeau Distribution.

UNFI maintains a commanding, if somewhat dominating, presence as the largest distributor of organic and natural products in North America. At the end of the 2013 fiscal year, the company had 29 distribution centers totaling around 6.5 million square feet of warehousing space, offering more

Location	Providence, RI (headquarters)
Ownership Status	Publicly traded company
Annual Sales	\$6.06 billion
Year Est.	1996
Geographic Area	Mainly North America but expanding into other continents
Fleet	Capital lease on approx. 700 trucks; asset-based, best-in-class carriers are contracted on inbound side to pick up products
Leasing Structure	Capital lease for all trucks with full time maintenance agreements
Route Planning	Over 2,000 points of origin; developed in-house Transportation Management System (TMS) with privately owned software code to optimize routes and select carriers
Transportation Costs	Varies by geographic region based upon length of haul and backhauling opportunities; tracked by Roadnet and Peoplenet software
Business Model	Acquisition of successful regional distributors to expand presence and role in the market for organic and natural foods; develop long-standing relationships with major accounts (e.g. Whole Foods) and suppliers with growth potential
Warehousing	29 total distribution centers when including subsidiaries; 15 UNFI DC’s and 3 more slated for opening; 6.5 million sq ft total space



A UNFI-operated distribution center with hundreds of thousands of square feet (left) and the company's logo (above)
(Source: UNFI)

than 65,000 products from 6,000 suppliers and delivering to 31,000 customer locations. In the U.S. and Canada, UNFI remains the market leader in distributing “specialty” organic and natural products. Within the past few years, net sales have increased by double-digit growth, reaching a record high of \$6.06 billion in fiscal year 2013.⁴² And with billions of dollars in assets, UNFI has been successful in expanding into most regional markets.

In an article from Food Logistics, Blair Altemus, UNFI's National Fleet Manager, said “with the growth we’ve encountered, we’ve needed to concentrate on customer service, recruiting and retention, good business practices, policies and procedures, compensation programs, and other core elements of our business.” With respect to scaling up logistics,

⁴² “Form 10-K: United Natural Foods, Inc. (UNFI).”

Kristen Lacoste, Director of Inbound Logistics, indicated that meeting rising demand was their major issue. “We don’t have mass production yet.”

UNFI and its subsidiaries partner with a range of suppliers. Prices for products vary tremendously based on whether they are more in line with commodities or can be branded as a differentiated product. For farmers, there is a list of requirements in order to become a supplier, including organic certification. For branded products, Lacoste suggested that UNFI will often work with smaller suppliers who may not be profitable at first, but whose products show promise.

To alleviate the burden of maintenance costs and address many transportation issues, UNFI adopts a full-service leasing arrangement for its delivery fleet through a partnership

with national transportation service companies, such as Penske and Ryder.⁴³ The depth of this partnership goes beyond a simple leasing arrangement. In one instance Ryder built a maintenance facility across the street from a distribution center and two other distribution centers have Ryder-managed shops onsite. When working with contract carriers in bringing products to distribution centers, Lacoste said that they maintain a standard of only partnering with asset-based, best-in-class carriers. She explained further that a carrier management system with “dedicated contracts,” rather than spot rates, was valuable for securing capacity. To choose carriers, the company developed an annual bidding system, allowing carriers to determine how much capacity they can commit to, a number then used to dictate what volumes are needed. Additionally, carriers are held to performance standards and subject to a published scorecard metric, a feature that pushes carriers to achieve high standards, like “on-time performance.”

On the demand side of the supply chain, certain customers have been pivotal to UNFI’s growth. For example, the company has benefited from a long-standing relationship with Whole Foods Market, which accounted for 36% of its net sales in FY 2013. In 2010, UNFI amended the terms of agreement with Whole Foods to become its primary wholesale distributor for ten years.

Discussing what practices help reduce costs and enhance

43 Casper, “Shaving Down Costs.”

logistics, Lacoste emphasized two innovations. First, UNFI created a custom-built Transportation Management System (TMS), which was developed in-house with a copyrighted code. The TMS uses a resource selection module to select lower cost carriers and routes with the fastest transit time. Although costs vary across the country, she explained that transportation costs are much higher in areas such as Florida where there are few backhauling opportunities and trips are longer in time and distance. Second, the company is working with BNSF Railway to adopt a comprehensive intermodal transportation system that will lower costs and reduce the company’s carbon footprint. With intermodal services on rail freight lines, the company expects to dramatically lower fuel and labor costs associated with trucking. At full scale, UNFI projects that intermodal transportation could reduce annual freight costs for dry goods by 20% and by 11% for refrigerated shipments. As more rail containers become equipped with refrigerated space to carry perishable foods, Lacoste viewed intermodal as the future model of distribution. Plus, she said, BNSF is capable of smaller, LTL shipments that would otherwise be cost-prohibitive or simply infeasible.

As a distributor with a national—and even international—scope, UNFI benefits from a network of 29 distribution centers and enjoys market access to nearly all U.S. metropolitan regions. On average, each center has over 200,000 square feet of warehouse space and operates through a Warehouse Management System (WMS), a software-based program related to a TMS. In July 2014, UNFI opened a 425,000 square

foot distribution center near Racine, WI. The new facility is seeking LEED Gold certification by reducing the water and energy use, diverting waste from a landfill, and building with 20% recycled content. In September 2014, a groundbreaking ceremony is scheduled for a new center in Hudson Valley, NY and a second center in Prescott, WI is slated to open next year.

UNFI is remarkable for its rapid rate of growth and impact on regional food systems. Distinct from the rest of the companies and organizations profiled in this report, the mission of UNFI is not to support “local” or “regional” farms; its business model is driven by a mission to distribute natural and organic products. That being said, its subsidiaries that supply perishable food, including Albert’s Organic’s, have launched a Local Grower Program and UNFI does partner with a select group of food hubs in backhauling or sharing trucks. However, these activities were described as being in a state of infancy.

Summary of Case Study Findings

	Eastern Carolina Organics (ECO)	La Montañita	Regional Access	Organically Grown Company (OGC)	United Natural Foods Inc. (UNFI)
Location	Durham, NC	Albuquerque, NM	Ithaca, NY	Eugene, OR (headquarters); Portland, OR; Kent, WA	Providence, RI (headquarters)
Legal Status	For-profit	Consumer Cooperative	For-profit	For-profit "S" corporation with Employee Stock Ownership Plan (ESOP)	Publicly traded company with ESOP
Year Est.	2005	1976 (the co-op) 2007 (distribution center)	1989	1978 (nonprofit); 1983 (cooperative); 1999 (for profit S-corp)	1996
Annual Sales	Over \$3 million	\$5 million (distribution only)	Unknown	Over \$100 million	\$6.06 billion
Area	300 mile radius and private carrier for longer runs	300 mile radius from Albuquerque	Most of New York State and western Massachusetts	Pacific Northwest (Washington State, north and central Oregon, parts of Idaho)	Nationwide; parts of Canada, Mexico and Latin America
Fleet and Warehouse	2 box trucks, leased truck, one semi-trailer and 26,000 sq ft warehouse	Two 24-foot refrigerated box trucks that hold 11 pallets each	7 temperature-controlled box trucks and 4 semi-trailers	9 box trucks, 18 tractors and 24 trailers (6 now owned); 3 distribution centers; new Gresham facility has 119,000 sq ft	Approx. 700 trucks; contract carriers for inbound pick-ups; 29 total distribution centers (including subsidiaries); 3 more slated for opening; 6.5 million sq ft total space
Financial Model	80% of sales go to farmers and 20% retained by ECO with roughly \$1 per mile	Charging a percentage of invoice to supplier with flat pallet fee; splitting sales with the co-op stores	Separate gross margins for freight services and food sales; tiered pricing for pallet space; cost per mile tracked by combining fixed and variable costs	Source out-of-region organic products to operate year round; use cost per case rather than by pallet; pay close attention to the cost per run; expanded General Ledger (GL) system to track fuel, mileage, sales, etc.	Strategic acquisitions and mergers that expand market access; develop an in-house Transportation Management System (TMS); hold bidding process and performance standards for carriers; long-term agreements with major accounts
Key Lessons	Identifying technology as a barrier to integrating sales, orders and information on pick-up and deliveries; use private carrier to reach larger volume buyers	Find partners on existing routes to share loads and backhaul products from rural locations, often traveling up to 750 miles round trip	Freight services and backhauling keep operations profitable and allow reinvestment in other parts of business; food hubs must think of themselves as distributors and choose products based on their commitment to selling	Food hubs can compete with national distributors; experience with contract carriers for longer hauls and third parties for pick-ups; freight services and year-round sourcing outside of region enable long-term viability; paying close attention to the cost per run; Ladybug brand serves as umbrella brand to assist market local produce; tenet of providing high quality products	Pricing differs between branded and commodity-based products; merging with distributors in multiple regions increases scope of operations and access to urban markets; public company affords opportunity to reinvest in technology, physical infrastructure and other techniques that can meet higher levels of production as demand soars; partnerships with anchor buyers and suppliers is still essential

Analysis

The data gathered from case studies and literature on food distribution reveal a series of issues and themes. This section synthesizes findings for the Central Appalachian Network (CAN) and other food hubs in the process of scaling up distribution.

Core Techniques of Distribution and Logistics

Distributors use similar practices regardless of their size:

- » **Leasing Trucks:** Since owning and managing a fleet can be costly when accounting for maintenance, a lease to own arrangement, or capital lease, was common, even for UNFI, which has the financial capacity to own their fleet.
- » **Efficient Management and Scale of Physical Assets:** As distributors scale up, the character of physical assets—tractors and trailers, refrigeration technology, warehouse design, pallet jacks or forklifts, and other equipment—remain consistent. What does change lies more in *scale* and *how* physical infrastructure is used to maximize efficiency. Staff at UNFI and OGC accumulated decades of experience planning routes, coordinating drivers and warehouse staff, and managing delivery and pick-up times.
- » **Partnerships with Private Carriers and Distributors:** This appears to be a regular practice as distributors scale up, especially for inbound deliveries. For trucks making longer hauls, contracting with carriers or using load-filling techniques—for example, backhauling or sharing loads with companies taking similar routes—can be essential.
- » **Commitment to Product:** The distributors all show a strong commitment to selling the products from their suppliers. Every one offers marketing services and is driven to act as an intermediary and proud to be a “gatekeeper” in linking suppliers with markets to sell their products.
- » **View Hours of Service Compliance as a First Priority:** As long as a run didn’t conflict with Hours of Service regulations and remained feasible economically, distributors would stretch runs to farther distances in remote areas.
- » **Agreements with Anchor Buyers:** Anchor buyers or suppliers play a crucial role in helping distributors make a leap towards scaling up infrastructure and overall operations. Regional distributors build customers and business partnerships along key interstate highway corridors and form routes around a base of customers.

A Distribution Model Changes with Scale of Operations

The cases discussed display a spectrum of operational scales. Smaller distributors are flexible in working with suppliers and customers. But as distribution systems get larger and require more efficiency, distributors need to establish formal agreements with suppliers, spread liability among distribution partners to avoid sudden loss of goods, and develop key performance indicators (KPI's) to select and evaluate carriers, accounts and suppliers. As distributors scale up, the distribution network expands physically: fleets with semi-trailers, increasing warehouse space with multiple cold storage units and building new distribution centers in strategic locations. Eastern Carolina Organics (ECO) has started to transport product with a semi-trailer, while companies such as Regional Access have a more even proportion of box trucks to trailers. Organically Grown Company (OGC) still has box trucks, but primarily uses semi-trailer trucks for major hauls. For a smaller distributor, mastering existing routes and exploring opportunities along these routes is pivotal. This approach strives for greater efficiency by cautiously evaluating the cost and benefit of each run. For OGC and UNFI, investing in technology, new warehouse space, and other innovations—like intermodal transportation—were also viewed as models for success.

Two Approaches: Partnerships and Acquisitions

Comparing OGC with UNFI illustrates how distributors can

reach higher economies of scale with different approaches and “values.” OGC was founded as a nonprofit organization by a group of farmers passionate about local produce. Although the company sources products from outside the region and hauls non-food products, OGC maintains a strong mission and commitment towards assisting local growers and marketing their produce. In many ways, the company is satisfied with its independence and has refused offers to be bought out. When asked about the company’s future goals for distribution and logistics, Brian Chapman said they do not intend on expanding outside the northwest. Rather, they are driven to become more efficient in the market they already serve. This approach is markedly different from UNFI, a company that strategically acquires regional distributors, recruits workers with industry experience, and has a national scale to establish competitive agreements with customers, suppliers and contractors. UNFI adopts conventional practices used by the largest distributors, aspiring to fully capture consumer demand for organic and natural products. The company’s geographic scope is bounded less by a physical limit and more by the scope of meeting demand for its line of products.

Distributors Have Strategies to Operate Year-round, Make Longer Distances and Source Local Products

Regional Access has a higher gross margin, but this reflects a conscious strategy to **reinvest** in the company and keep the barrier of entry low, allowing them to spend time and en-

ergy on smaller suppliers that are geographically dispersed. Representatives from UNFI also discussed re-investment as being integral to scaling up their fleet and piloting cost-saving practices. On the other hand, the **type and volume of products** being hauled has a profound influence on the choice of working with a supplier at longer distances. The success of OGC highlights how distributors supporting local farmers may need to **source additional products** and **share loads** to operate throughout the year and remain economically viable. Similarly, the **marketability of products**—in particular, whether or not they're differentiated as a brand or with a special identity—influences their selling price and the grower's share of the sale.

Recommendations

Continue developing the regional brand for Central Appalachia and marketing support to differentiate products

A distributor must be fully committed to selling their line of products to potential customers, regardless of the supplier's location. The cost of transportation seemed to be less significant than having the right mix of high quality products at sufficient volumes. Aggressive marketing to customers in markets will enable CAN to reinvest in operations and gradually scale up its distribution network. Lindsay Reul discusses how to construct a regional brand in a recent report from

2012.⁴⁴ Organically Grown Company's (OGC) Ladybug Brand could serve as a model specifically for marketing produce. La Montañita should also be examined more closely for their ability to brand local products to retailers and within their own stores.

Establish a For-Profit Producer's Alliance

Morales and Day-Farnsworth discuss how food hubs are developing hybrid models that incorporate qualities of producer co-operatives with less restrictive membership requirements. For CAN, it could be useful to form an alliance among its network of producers and food hubs that builds a common identity under which to distribute products. Meanwhile, adopting solid conventional accounting methods and business practices is necessary for long-term growth and re-investment. For these reasons, CAN should explore the possibility of spurring a for-profit enterprise to transfer food hub responsibilities and become more self-sustaining. A notable example is Good Natured Family Farms, a for-profit alliance of 150 farmers around Kansas City who agreed to operate under a single brand to reach wholesale buyers.⁴⁵

44 Reul, *Regional Branding Study for Appalachian Local Food Economies*.

45 Cantrell and Heuer, *Food Hubs: Solving Local Small-Farm Aggregators Scale Up With Larger Buyers*.

Cultivate Partners on Existing Routes

A key aspect of supply chain management is knowing when and how to partner with contract carriers and other trucking companies. Members of CAN should analyze existing carriers and other companies hauling goods along the region's major interstate corridors. Pooling together loads and sharing warehouse or truckload space is common among distributors to ensure that vehicles attain Full Truckload (FTL) status. In practice, Appalachian Harvest may look to finding partners during its runs to Jessup, MD and Atlanta, GA and pursue opportunities to increase backhauling.

Perfect Routing Logistics as a First Priority

Undoubtedly, purchasing new trucks, adding warehouse space or moving to a better location will reduce operational costs. However, developing a core competency in logistics or transportation management must be viewed as a first step to know how to schedule runs and track orders, build upon established routes, and monitor the cost per run. Put differently, Appalachian Harvest and food hubs in Central Appalachia should focus on the coordination of runs as a first priority and then scale up based on the ability to fill loads.

Experiment with Transportation Innovations

Representatives from UNFI saw intermodal transportation as a breakthrough not only for larger distributors, but also

for smaller producers, since rail carriers now offer LTL capabilities with refrigerated cars. They saw these advancements as a significant opportunity for rural-based producers that will reduce transportation costs. In addition, to better identify costs per run or cost per mile, food hubs in Central Appalachia should consider investing in a low-cost Transportation Management System (TMS) or using existing software that tracks deliveries and pick-ups. In regards to physical infrastructure, available warehouse space could be used for cross-docking by reconfiguring the orientation of truck deliveries and inventory. Lastly, some food hubs have experimented with multiple aggregation points—on farms or available facilities—that cut pick-up time and costs. When products are delivered to buyers, some food hubs and regional distributors deliver products to an intermediary warehouse outside of an urban market to avoid bringing a semi-trailer truck into a heavily congested city.

Lessons for an Evolving Food System

Improve Consumer Education and Awareness

Consumer demand represents both an opportunity and barrier for our future food system. The success stories of regional distributors like OGC and nationwide distributors like UNFI are interwoven with the soaring demand for local, natural and organic products. To trade associations and industry leaders, these products are no longer an isolated niche. They are be-

coming integrated into the mainstream system. However, as demand increases for locally sourced products--rather than just natural and organic products--consumers must be educated about basic concepts of the geography of farmland, seasonality, perishability and specific constraints faced by small to mid-sized farms. Better awareness can help consumers make informed choices on ways to support local farmers and more positively contribute to their local food system.

Expand distribution channels for food hubs

Even if Appalachian Harvest and other distributors scale up, they must contend with existing distribution centers in urban areas. In such cases, cities or metropolitan areas could create a shared distribution center to serve multiple food hubs. Directing public subsidies to terminal markets or shared use facilities could enable food hubs to more easily access these markets and reduce last-mile shipping costs.

Conclusion

The local food movement is continuing to gain traction across the country, placing pressure on food hubs to deliver higher volumes of product to a wider network of buyers. From a standpoint of rural development, this presents a unique chance to bring urban wealth into rural communities in Central Appalachia and reinvigorate a rich tradition of farming.

Distribution is not only a critical link in the supply chain, but

also the primary feature of how food hubs operate. Large or small, distributors employ a set of common practices: planning routes based on an analysis of the cost per run, finding partners to ensure trucks are fully loaded, and managing existing routes efficiently as a first priority. As distributors scale up their fleet and warehouse capacity, agreements with suppliers and buyers adhere to more formal standards, while investments in technology and physical infrastructure play bigger roles in streamlining operations.

Coordinated by CAN and its members, food hubs in Central Appalachia should work together to create a united, mutually beneficial distribution network. To achieve this goal, two aspects of distribution should be recognized. First, models of distribution are interrelated with other parts of the supply chain. Marketing products and building a strong, reliable customer base should be perceived as a core part of a distribution model as much as logistics or physical infrastructure. Second, being a successful distributor does not require reinventing the wheel or adopting costly technologies or equipment. Instead, distributors develop core competencies by continually perfecting the system that is already in place. Appalachian Harvest and other food hubs in the region should work to master the nuts and bolts of distribution: maintaining consistent delivery and pick-up times, setting standards that limit inefficient runs, making changes to existing routes and planning new ones, and establishing a growth plan as a way to prepare for scaling up operations in order to meet rising demand.

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Icons

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