Chicagoland FOOD

Seizing the Opportunity
to Grow Chicagoland's Food Industry

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RW Ventures

IMEC manufacturing improvement specialists

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Acknowledgements

Chicagoland FOOD (**F**irms **O**rganizing for **O**pportunities and **D**evelopment) is the culmination of a three-year investigation into industrial clusters in Chicagoland, leading to the determination that the food processing and packaging cluster offers enormous opportunity for driving inclusive regional economic growth.

This project would not have been possible without the ambitious vision, generous support and commitment of the MacArthur Foundation. In particular, Julia Stasch and Craig Howard have provided invaluable insight and guidance in driving the work forward.

We are grateful for the participation of the many food manufacturing and packaging firms, food-related institutions and organizations, regional stakeholders and other experts in the food industry. Their knowledge of the food industry, provided over the course of scores of interviews and meetings, forms the core of this report. We hope the report captures at least a small measure of the opportunities they identified, and of their enthusiasm. Their support of and interest in the development of the food cluster bodes extremely well for the future of Chicagoland's food industry. A list of the participants in the interview process can be found in Appendix E.

The project, particularly in its early stages, had the benefit of a national advisory group of leading experts in cluster analysis and organization, including Joseph Cortright (Impressa Consulting), Edward Feser (University of Illinois at Urbana-Champaign), Teresa Lynch (Mass Economics), Manuel Pastor (University of Southern California) and Stuart Rosenfeld (Regional Technology Strategies, Inc.). We are grateful for their extraordinary expertise and assistance.

Project Team

The project was led by RW Ventures, LLC, with the Illinois Manufacturing Excellence Center (IMEC) as a lead partner (particularly David Boulay and John Bradarich). Mary Stonor Saunders, a Chicago-area food entrepreneur and consultant, served as a core member of the project team, particularly undertaking outreach, interviews and research on best practices in the food industry and in food cluster organizations. Rebecca Bagley, the former President and CEO of NorTech (the organization responsible for managing Northeast Ohio's priority clusters), contributed her experience and insight on cluster organization and management at a critical juncture in the project. Sophie Cohen and Matt Schuneman of RW Ventures are the primary authors of this report.

Introduction

Since the mid-19th century, the Chicago region has been a center for food production and distribution – the place where much of the Midwest's agricultural output came to be processed, packaged and distributed to the marketplace. **Today, Chicagoland's Food and Beverage industry is the second largest in the nation, trailing only Los Angeles**.[1] Approximately 4,500 firms make up the cluster,[2] accounting for 130,000 employees and $32 billion in sales.[3] The economic development agencies of both the City of Chicago and Cook County have recognized the food cluster's impact on the regional economy, and prioritized support for its growth.[4]

While the food cluster is a crucial part of the regional economy, its growth has been lackluster over the last 25 years, trailing other parts of the country. Worldwide, the food industry is changing rapidly – food industry firms face increasing pressure from competition abroad and at home, volatile input prices and new regulations, threatening their already slim profit margins. The requirements of the new Food Safety Modernization Act, deficient workforce training, technology changes such as ingredient tracking and other issues present new challenges.

At the same time, shifts in consumer demand present major growth opportunities for those companies that successfully harness new trends - and risks to those that do not. Trends favoring local, healthy and artisan food products particularly offer opportunities to small and medium-sized enterprises (SMEs). Many consumers are willing to pay a premium for these types of food products, helping to offset some of the higher marginal costs of small-scale production. Similarly, increasing demand for convenience and customization is creating opportunities for new products and processes, from cutting up vegetables and packaging them for easy preparation and consumption, to letting consumers choose their own granola bar ingredients. Trends ranging from functional foods to new packaging technologies offer additional opportunities.

To better confront these threats and seize emerging opportunities, **many regions around the country and the world have formed cluster organizations,[5] bringing together disparate resources to jointly tackle common concerns**. Despite Chicagoland's considerable institutional resources and firms in the food industry, and many disparate food-related initiatives, no such organization exists here. Local company executives and institutional partners have expressed strong support for creating a cluster organization.

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[1] http://www.clustermapping.us

[2] The cluster, broadly defined, includes firms in food and beverage manufacturing, food packaging, food wholesale and distribution, food-related equipment, tools and machinery and farm product wholesalers. See "Defining 'food'" section for more detail.

[3] Estimates as of 2010, based on RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) database. See Appendix A for a discussion of methodology, which covers the merits and flaws of the NETS database, including its tendency to over count firms and employment relative to other data sources, in particular for smaller firms.

[4] See, Cook County Council of Economic Advisors, Partnering for Prosperity, April 2013 & World Business Chicago, Plan for Economic Growth and Jobs, March 2012.

[5] A cluster is a group of firms and related economic actors and institutions that are located near each other and "draw productive advantage from their mutual proximity and connections." (Cortright, "Making Sense of Clusters") Clusters exist naturally in the economy, with or without recognition as such, but may also be formalized through organizations or other targeted efforts. See Appendix C for more information on existing food cluster organizations.

Given the impact of this cluster on the Chicago region's economy and industry trends that are presenting various opportunities and challenges, **the time is right to more deliberately focus on Chicagoland's food cluster and develop collaborative efforts to support its growth**. A formal food cluster organization, directed by the needs and interests of the area's food firms, would provide the infrastructure and resources to deliberately and strategically enhance the productivity and prosperity of firms in this sector. These efforts would bolster a cluster that by its nature would drive considerable, and inclusive, growth of the regional economy.

This report begins by defining the food cluster in the Chicago region, and exploring the characteristics of the cluster and its firms. Chapter 2 focuses on the trends and challenges affecting the food and beverage industry, including firms in Chicagoland. The last chapter highlights some potential strategies for growing the food cluster and suggests next steps for moving forward.

Overview of Chicagoland's Food Cluster

Defining "food"

Considered broadly, the food cluster encompasses everything from farming to the initial processing of ingredients to final processing and packaging for consumption to distribution to the restaurants and stores that ultimately reach the consumer. Several other industries interface with this process, including suppliers of packaging materials, equipment, machinery and transportation services.

This project focuses on the manufacturing/processing portion of the chain, but recognizes the importance of the other components. Within this core manufacturing function, dozens of business types exist, making a wide range of food products. These have been divided into eight sub-clusters:[6]

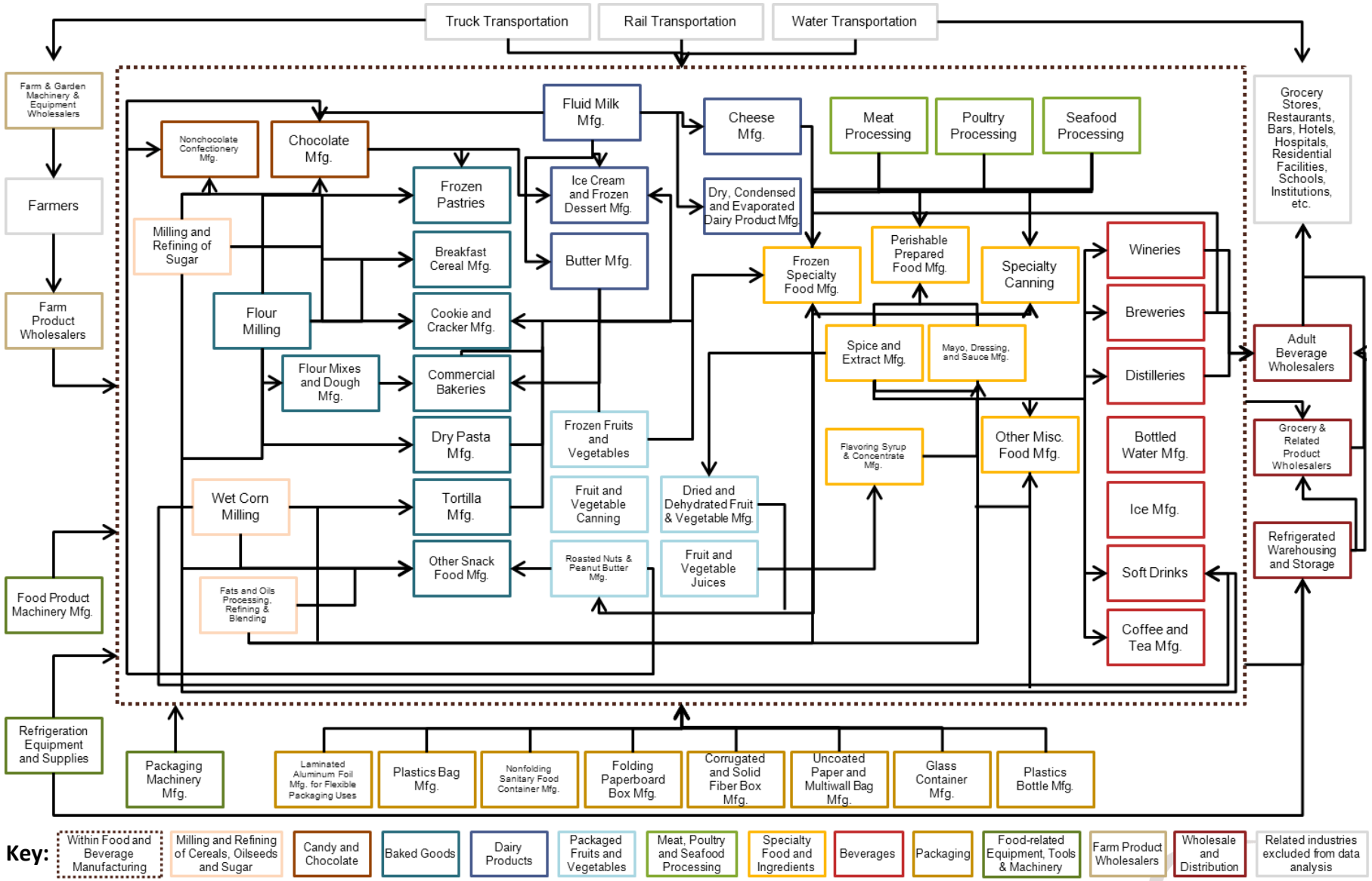
- Baked Goods
- Specialty Food and Ingredients
- Beverages
- Meat, Poultry and Seafood Processing
- Candy and Chocolate
- Dairy Products
- Packaged Fruits and Vegetables
- Milling and Refining of Cereals, Oilseeds and Sugar

Some companies focus on a few related core products, while other larger firms may create hundreds of items under dozens of brands, falling into multiple sub-clusters. The relationships among businesses within the food cluster are complex - competition among companies in the same or similar categories is fierce but, at the same time, firms rely on each other as buyers and

[6] For a list of SIC and NAICS codes that fall into each sub-cluster and an explanation of how these sub-clusters were devised, see Appendix A (Figure 1 below also provides some information on which industries are included in each sub-cluster).

suppliers and face many parallel obstacles and opportunities. A conceptual map detailing some of these relationships follows on the next page. Arrows represent buy/sell relationships, while colors group together similar types of businesses/food products, and correspond to sub-clusters.

Figure 1. Food Cluster Map

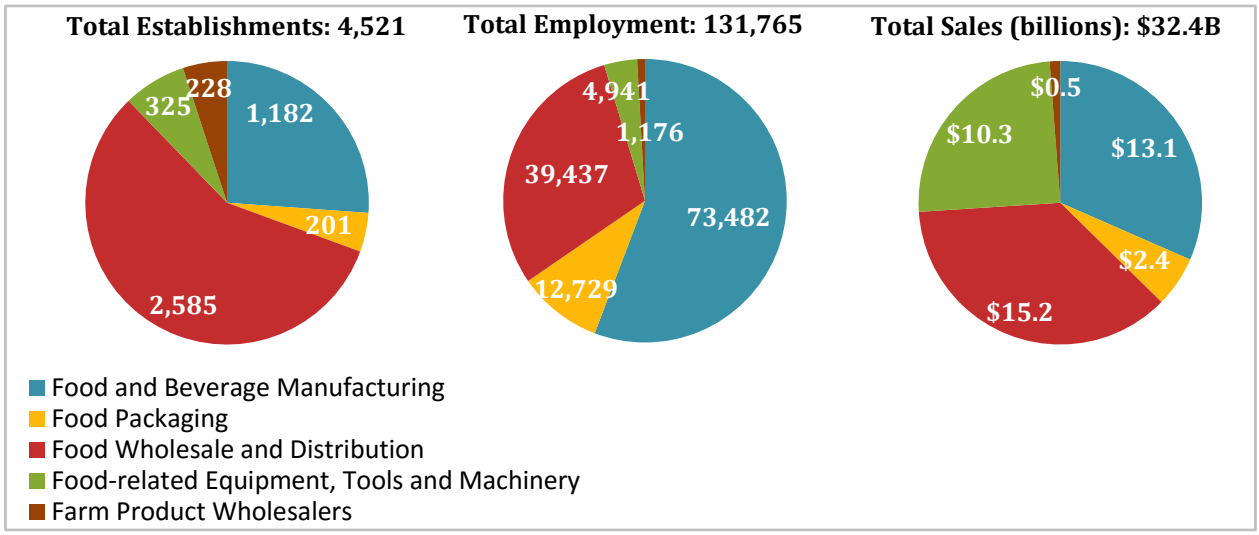


Analysis of Chicagoland's Food Cluster

For purposes of analysis, Chicagoland's food cluster is grouped into 5 categories: Food and Beverage Manufacturing, Food Packaging, Food Wholesale and Distribution, Farm Product Wholesalers and Food-related Equipment, Tools and Machinery. Excluded from analysis are primary activities associated with farming/agriculture on the front end (e.g., everything but wholesale of farm products, which is the segment that most directly interfaces with Food and Beverage Manufacturing), and all forms of retail and dining on the back end. This report focuses primarily on food manufacturing and packaging, as offering particularly important inclusive economic growth challenges and opportunities. Nevertheless, the boundaries of the cluster are inherently fluid, and trends in farming and retail of course impact other food-related sectors.

Food and Beverage Manufacturing makes up roughly one-quarter of all food cluster establishments, but over half of the employment and approximately one-third of the sales in the cluster (see Figure 2). Furthermore, **Food and Beverage Manufacturing, along with Food Packaging, is highly concentrated in the Chicago region**,[7] and became more so from 1990 to 2010 (see Figure 3).

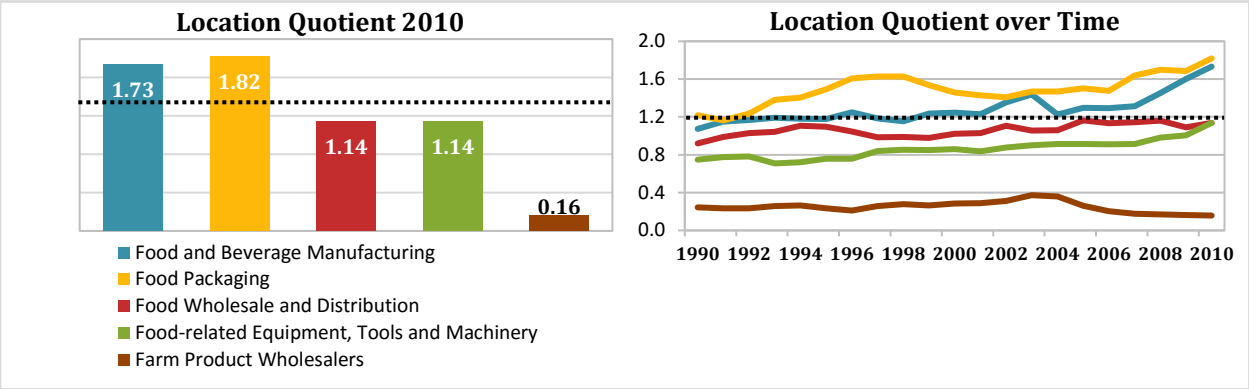
Figure 2. Establishments, Employment and Sales by Food Cluster Segment



Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

[7] As indicated by location quotient (LQ), which measures employment share in the region compared to nationwide.
LQ= (regional industry employment/total regional employment)/(national industry employment/total national employment)

Figure 3. Location Quotient by Food Cluster Category



Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

As a result of Food and Beverage Manufacturing's substantial size in the Chicago region's food cluster, and because of its impact on the other sub-clusters, the rest of this section will focus exclusively on the dynamics within this sub-cluster. Later sections will address the cross-cutting opportunities and trends that affect multiple food sub-clusters.

Food and Beverage Manufacturing

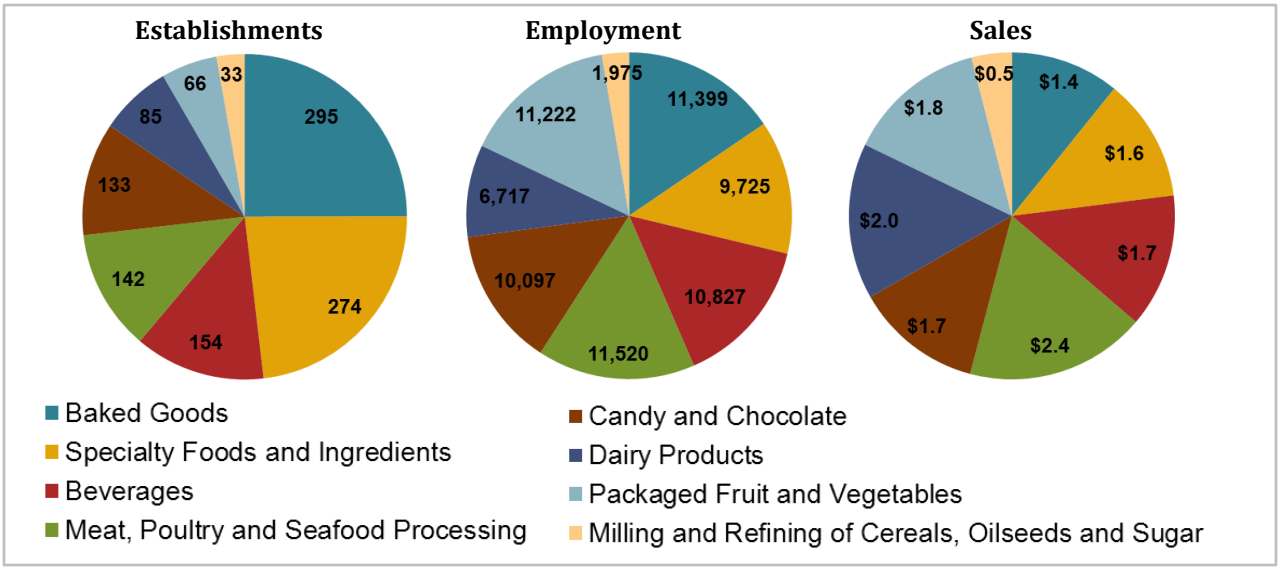
Chicagoland's Food and Beverage Manufacturing sub-cluster is made up of approximately 1,180 firms accounting for 73,500 jobs and $13 billion in sales. Of these establishments, two-thirds are "standalone" companies, 14% are global, national or regional headquarters and 18% are branches of larger firms with multiple locations.[8] Unsurprisingly, smaller firms are much more likely to be independent than larger firms,[9] owing in part to the prevalence of mergers and acquisitions of companies that reach a significant size.

Though once known primarily for its capacities in meat processing and candy making, the Chicago region's Food and Beverage Manufacturing core is now relatively evenly distributed among the eight sub-clusters identified previously (see Figure 4), especially in terms of employment and sales (with the exception of Milling and Refining of Cereals, Oilseeds and Sugar, which is considerably smaller than the other sub-clusters). This suggests that **Chicagoland's food cluster is well rounded, rather than focused around just one or two types of food**. Moreover, all sub-clusters except for Meat, Poultry and Seafood Processing are significantly concentrated in the Chicago region compared to nationwide, with Candy and Chocolate particularly standing out given its location quotient of 5.5 (see Figure 5).

[8] Analysis used NETS standalone classifications, cross-referenced with whether headquarters DUNS number matched establishment DUNS – the 29 (out of 825) that did not were re-classified as branches.

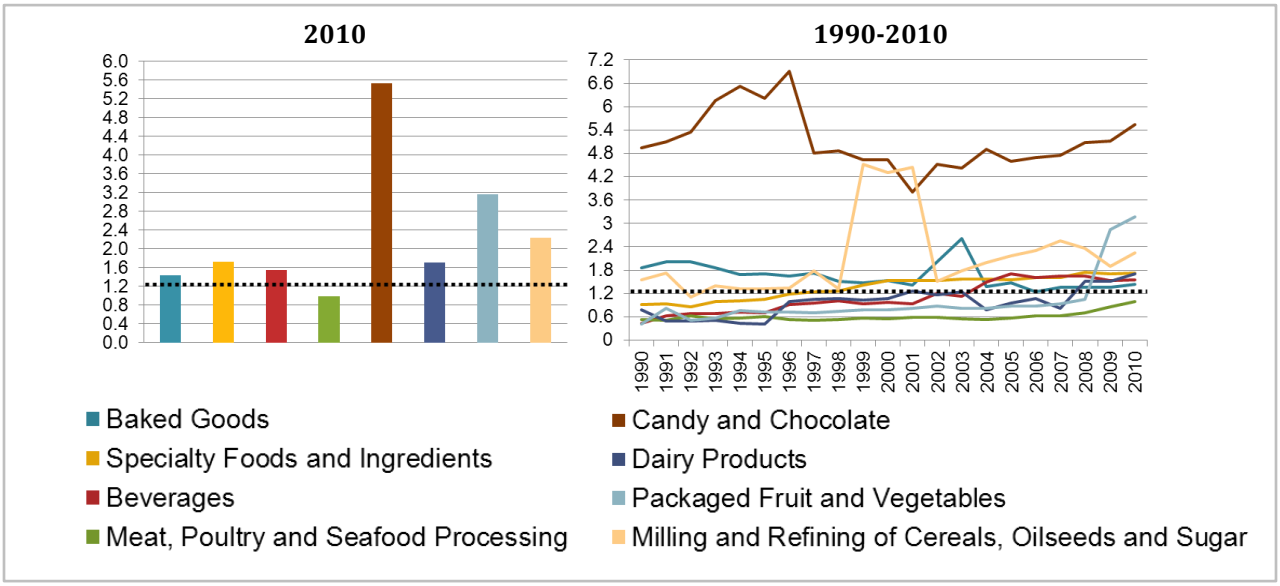
[9] 89% of establishments with fewer than five employees are "standalone" compared with just 28% of establishments with 250 or more employees.

Figure 4. Establishments, Employment and Sales by Sub-cluster, 2010



Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

Figure 5. Location Quotient by Sub-cluster

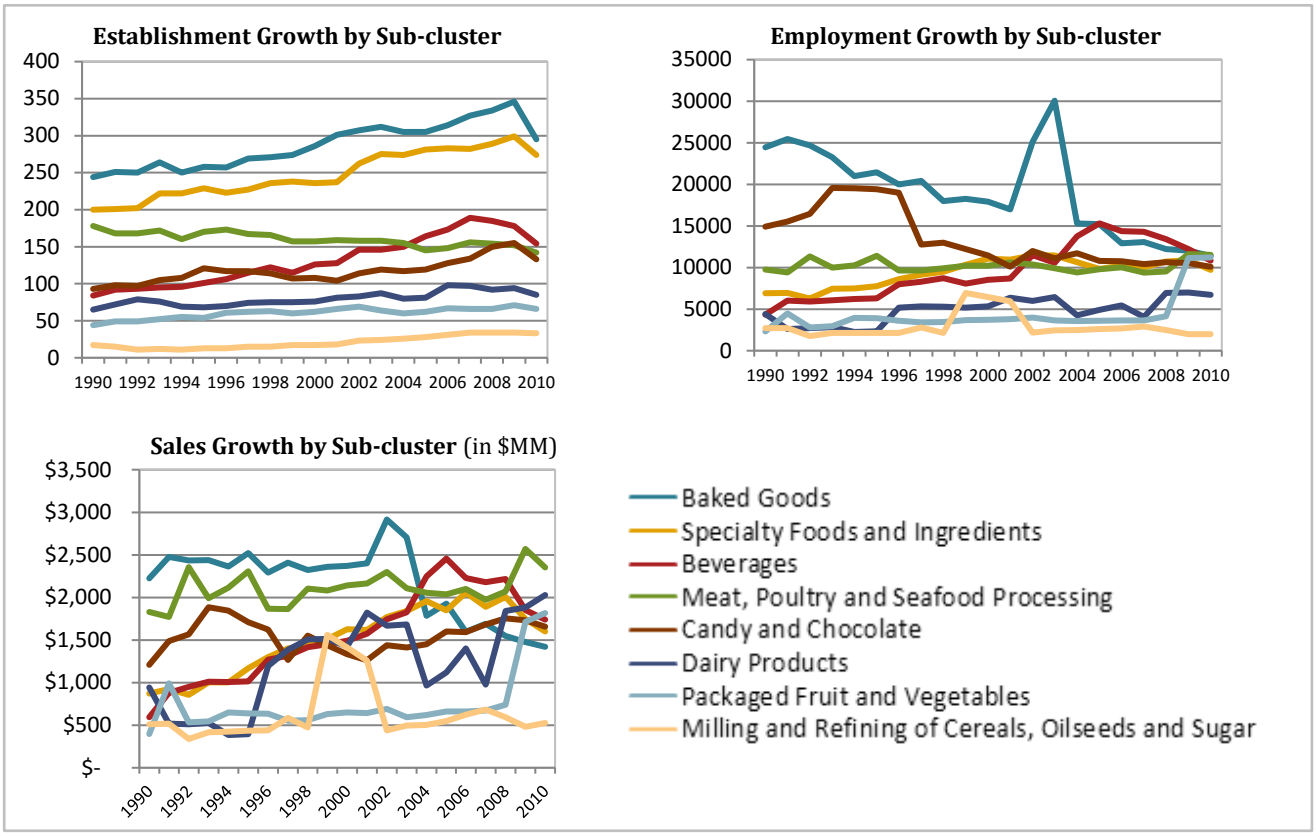


Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

The number of establishments in all sub-clusters has grown relatively steadily over the last two decades, excluding an across the board decrease from 2009 to 2010 amidst the recession (see Figure 6). The picture is more variable when looking at employment and sales trends. Some sub-clusters saw relatively sharp fluctuations in those metrics, which could usually be attributed to just one firm.[10]

[10] For example, the move of ConAgra's grocery division from Irvine, CA to Naperville caused employment and sales in Packaged Fruits and Vegetables to leap (Jargon, Julie, "ConAgra Foods planning hiring binge in Chicago," Crains Chicago Business, February 8, 2006) The large spike and subsequent fall in Baked Goods employment (and to a lesser extent sales) can be traced

Figure 6. Growth by Sub-cluster



Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

High Productivity, but a Shrinking Advantage

In food manufacturing overall, and in most of the industry's sub-sectors, Chicagoland's firms have had above average productivity for much of the last 35 years.[11] In 2010, Chicagoland's food manufacturing firms produced 13% more output per worker than the national average.[12] Within the industry's sub-sectors, the Chicago region out-performed national productivity in seven out of ten segments (see Figure 7).

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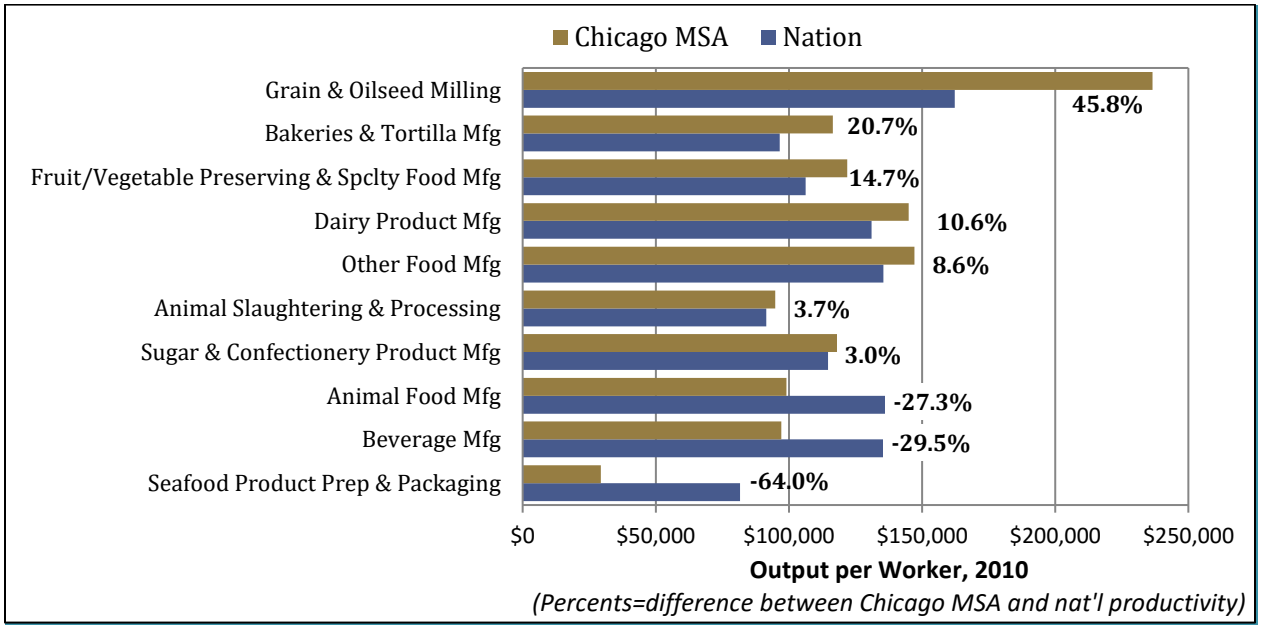
to Specialty Foods Corporation, a cookie maker based in Deerfield, Illinois, which according to the data went from 10 employees in 2001 to 7,000 in 2003 to nearly 14,000 in 2003, and then disappeared in 2004. Internet research has found that the company filed for bankruptcy in 2000 and was out of business as of May 2003 ("Company News: Specialty Foods Is Filing for Bankruptcy," New York Times, Sept. 19, 2000; "Specialty Foods Corporation: Private Company Information," Bloomberg Businessweek, http://investing.businessweek.com/research/stocks/private/snapshot.asp?privcapId=34618, accessed Jan. 23, 2015). The substantial changes in employment figures may be an artifact of the company's restructuring efforts. Corn Products International (now Ingredion) is primarily responsible for the increase and decrease in sales and employment within Milling and Refining of Cereals, Oilseeds and Sugar. Spinning off from its parent company, CPC International, Corn Products International in 1998, the company operated out of a headquarters in Bedford Park, IL until 2002, when it moved to a new facility in Westchester, IL ("History | About Us | Ingredion Incorporated," http://www.ingredion.com/about-us/history/, accessed January 23, 2015; "Corn Products Moves HQ," Crain's Chicago Business, March 23, 2002). NETS data shows 4,400 employees in Westchester from 1999 to 2001, then 700 to 800 from 2002 onward.

[11] Note that productivity data is not available at the level of detail necessary to replicate the sub-clusters used in other sections of this report. When discussing productivity by sub-sector, data is grouped by 4-digit NAICS codes, and the sub-sector descriptions reflect those codes.

[12] Brookings Institution analysis of Moody's Analytics data.

Figure 7. 2010 Food Sub-Sector Productivity, Chicago MSA v. Nation



Source: Brookings Institute analysis of Moody's Analytics data

Though these productivity figures speak to Chicagoland's food manufacturing strengths, they do not identify what is driving this above-average productivity. Further analysis is needed to determine whether the higher output per worker is due to more advanced production processes at Chicago-area firms, which functions of the industry are represented by Chicagoland companies (e.g., the presence of food company headquarters v. production facilities) or other factors.

While Chicagoland food manufacturers are currently more productive than other U.S. firms, recent trends show that this advantage has been shrinking. **From 2000 to 2010, productivity increased nationally more than it did in Chicagoland for 7 out of 10 food manufacturing sub-sectors** (see Figure 8). While the Chicago area's firms demonstrated larger-than-average productivity increases in the remaining three sub-sectors (Beverage Manufacturing, Animal Food Manufacturing and Seafood Product Preparation and Packaging), those increases were tempered by the fact that Chicagoland's companies in those segments remain significantly less productive than national averages. Again, further inquiry will identify the drivers behind these productivity trends and the opportunities for supporting further gains.

Figure 8. Changes in Food Manufacturing Productivity, 2000 to 2010

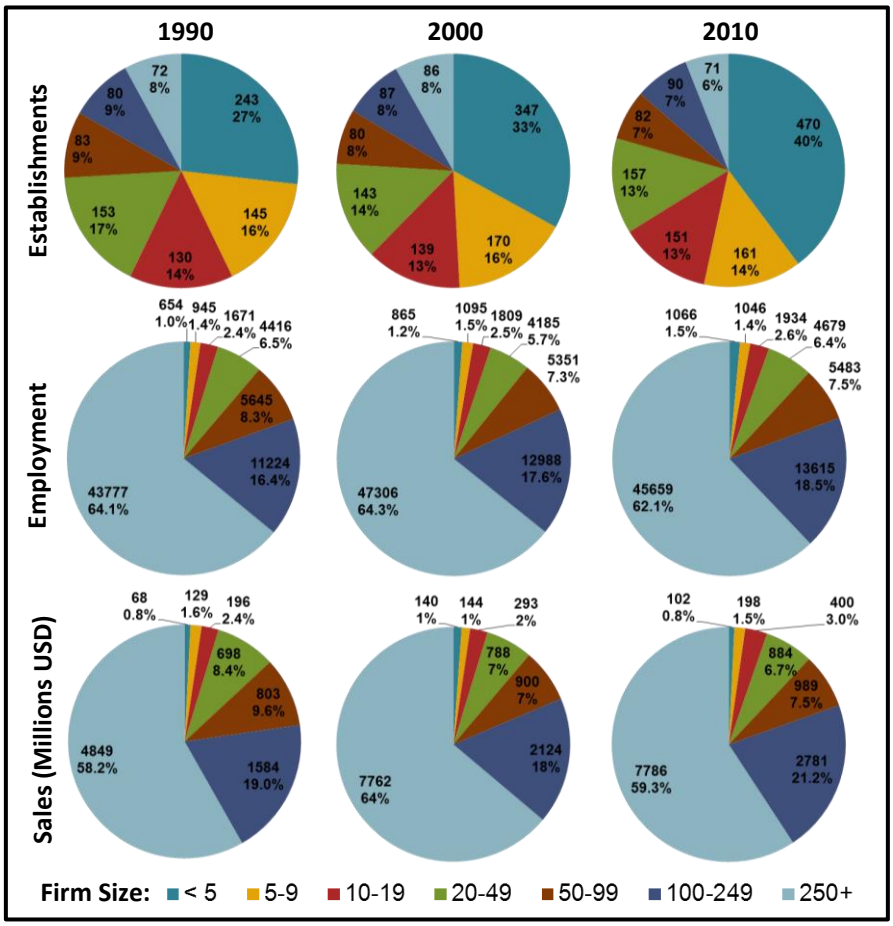
NAICS	Industry	Nat'l Δ%	Chicago MSA Δ%	Chicago MSA to Nat'l Diff
3112	Grain & Oilseed Milling	23.8%	-18.9%	-42.8%
3118	Bakeries & Tortilla Mfg	10.7%	-10.6%	-21.3%
3119	Other Food Mfg	11.3%	-3.6%	-14.9%
3114	Fruit & Vegetable Preserving & Specialty Food Mfg	27.7%	-2.7%	-30.4%
3115	Dairy Product Mfg	26.9%	-2.3%	-29.1%
3113	Sugar & Confectionery Product Mfg	21.8%	4.4%	-17.3%
3116	Animal Slaughtering & Processing	19.9%	14.7%	-5.2%
3121	Beverage Mfg	10.0%	40.3%	30.2%
3111	Animal Food Mfg	21.3%	47.0%	25.7%
3117	Seafood Product Preparation & Packaging	20.4%	291.1%	270.7%

Source: Brookings Institute analysis of Moody's Analytics data

Shifting to Smaller Firms

SMEs (those with fewer than 250 employees) account for 94% of all food and beverage manufacturing establishments, and roughly 40% of employment and sales (see Figure 9 for a more detailed breakdown by size). **These shares grew from 2000 to 2010, as SMEs gained in number, employment and sales, while large firms saw shrinking figures across all three measures.** The shift towards smaller firms reflects trends in the industry, discussed below, as well as decisions by multinational firms to close Chicago-area plants. Of the large firms that closed between 2000 and 2010, less than 20% were standalone companies – the rest were branches or headquarters of firms with multiple locations.

Figure 9. Establishments, Employment and Sales by Firm Size



Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

The increase in small firms' fortunes, reflected in part by a near doubling in the number of the smallest establishments (those with fewer than 5 employees) over 20 years,[13] reflects broader national trends favoring "artisan" and local foods.[14] **As with small companies generally, the food cluster's small firms face particular challenges when trying to grow their business**. The survival rate of firms that employed fewer than five people in 2000 was lower than that of larger establishments; 55% of those small firms were still open in 2010, versus 67% of all other firms.[15] Further analysis of the trends affecting food SMEs and their implications can be found in the Industry Trends and Challenges section.

[13] From 243 in 1990 to 470 in 2010; RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

[14] http://www.foodprocessing.com/articles/2005/365/, http://www.foodbusinessnews.net/articles/news_home/Consumer_Trends/2014/06/Ten_food_trends_unveiled_at_IF.aspx?ID=%7BC8BEEAF6-9CD1-401B-9A19-972D66B243C4%7D; see page 19 for more detail.

[15] RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

Food and Beverage Manufacturing: Naturally Leads to Inclusive *Regional Growth*

To maximize economic growth, regions must utilize as many of their economic assets as possible. This means that regions that are more inclusive (i.e., those in which more of the people and places are productively engaged in the economy) do better.[16] The food cluster, by virtue of its employment structure and needs, and the ways in which industry restructuring is creating opportunities for SMEs and urban land re-development, naturally creates opportunities for a broad range of people and places within the region, enabling more sustainable economic growth.

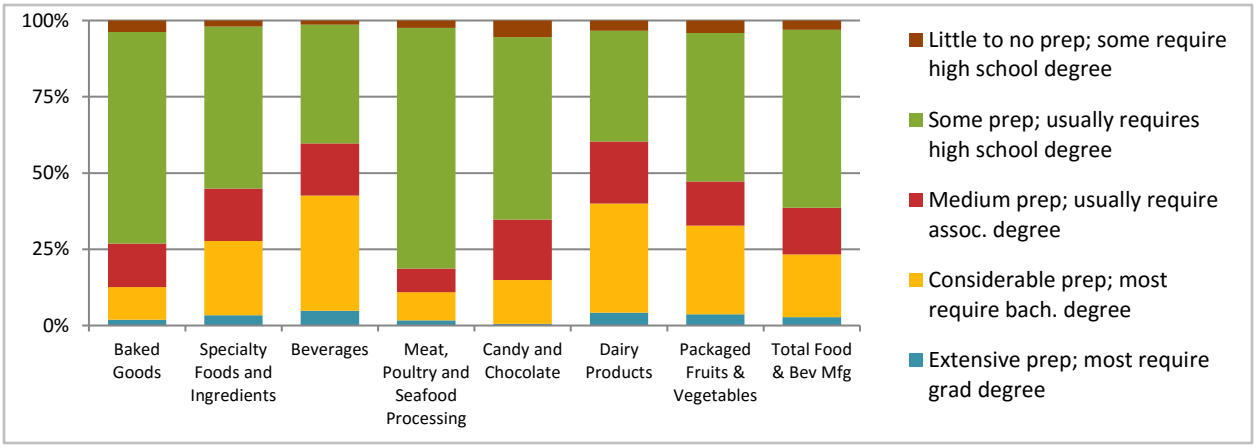
Accessible, Quality Employment Options

Many jobs within food and beverage manufacturing are open to individuals without college degrees; in fact, more than half the jobs require little more than a high school degree (see Figure 10). The cluster also offers a wide range of occupations accommodating an assortment of skills and interests. The most common food cluster jobs include those related to production, transportation and material moving, office and administrative support, sales and management (see Figure 11). In addition to entry level employment, the cluster offers substantial career ladders. Entry-level food manufacturing jobs have clear career pathways to well-paying supervisory roles in the industry, and that advancement can occur with minimal additional education[17]. Though the industry offers relatively accessible career paths, firms still find it difficult to attract and train their workforces, as further discussed in the Industry Trends and Challenges section below.

[16] For more on the relationship between inclusiveness and economic growth, see Weissbourd and Berry (2004), "The changing dynamics of urban America," http://rw-ventures.com/publications/downloads/Changing%20Dynamics%20report.pdf; Ostry, Jonathan D., Berg, Andrew, and Tsangarides, Charalambos G., "Redistribution, inequality, and growth," IMF Staff Discussion Note, April 2014, http://www.imf.org/external/pubs/ft/sdn/2014/sdn1402.pdf; OECD Directorate for Employment, Labour, and Social Affairs, "Does Inequality Hurt Economic Growth?" Focus on Inequality and Growth, 9 December 2014.

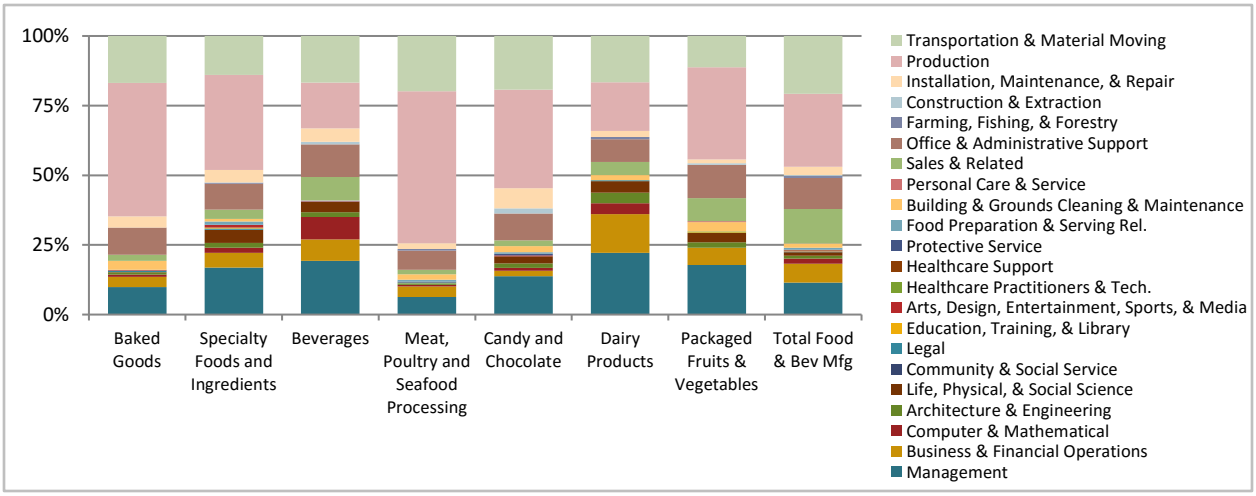
[17] San Francisco Office of Economic and Workforce Development, Makers & Movers, Economic Cluster Strategy, November 2014, p. 28, http://www.sf-planning.org/ftp/files/Citywide/Food_System_Policy_Program/foodsys_Makers&Movers_Economic_Report-NOV2014.pdf; The Institute for Decision Making University of Northern Iowa and Iowa Workforce Development, Iowa's Creative Corridor, December 2012, p. 13, http://www.kirkwood.edu/pdf/uploaded/1148/Strategic%20Skills%20Alignment%20Final%20Report.pdf; Washington State Community Trade and Economic Development and Northwest Food Processors Association, Food Processing Industry Job Ladder, http://www.powershow.com/view1/4d942-ZDc1Z/The_Economic_and_Employment_Contributions_of_the_Food_Processing_Industry_to_the_Central_Valley_powerpoint_ppt_presentation.

Figure 10. Distribution of Occupational Skill Levels[18] by Sub-cluster



Source: RW Ventures and ICIC analysis of US Census Bureau's Public Use Micro Sample (PUMS) data and O*NET "Job Zone" classifications.

Figure 11. Occupational Distribution by Sub-cluster

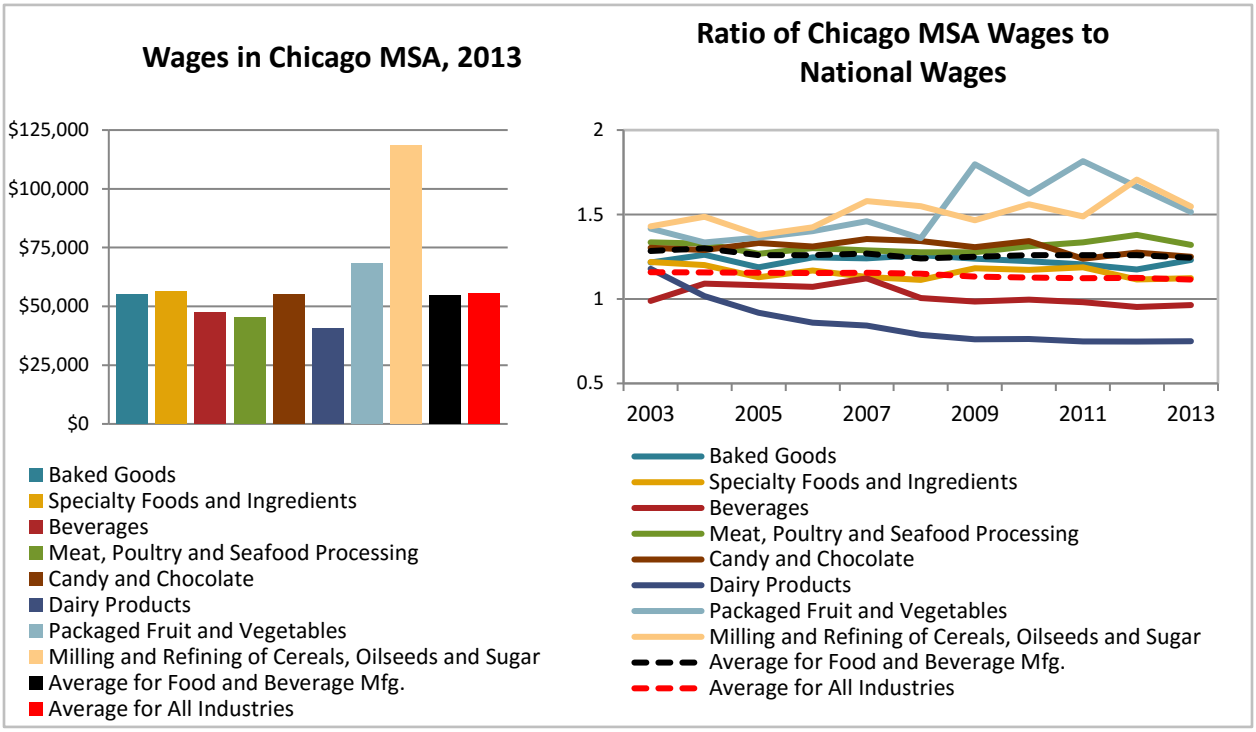


Source: RW Ventures and ICIC analysis of US Census Bureau's Public Use Micro Sample (PUMS) data.

The industry not only provides an accessible job ladder, but also competitive pay for its workers. Average wages in food and beverage manufacturing as a whole are roughly on par with other industries, at $54,500 annually (see Figure 12). Excluding Milling and Refining of Cereals, Oilseeds and Sugar, a high-wage outlier, the average falls to $51,500. **Wages in food and beverage manufacturing are higher in the Chicago area than in the US**, and they exceed national averages to a greater degree than other industries. Over the past decade, wages have been relatively flat in real dollar values, even declining slightly.

[18] Based on O*NET "Job Zone" classifications of occupations; see http://www.onetonline.org/help/online/zones.

Figure 12. Average Annual Wages by Sub-cluster[19]



Source: RW Ventures analysis of Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW)

Opportunities for Entrepreneurs and SMEs

As discussed in more detail in the Industry Trends and Challenges section, changes within the food industry (e.g., increasing demand for local, artisan and ethnic foods) provide an opening for SMEs, including women and minority-owned businesses, to capture a larger share of the food market. Smaller firms can now reach customers more easily, relying on social media, online sales, farmers markets and food hubs instead of on large retailers and distributors. Meanwhile, the large retailers and distributors are also beginning to stock niche, local brands.

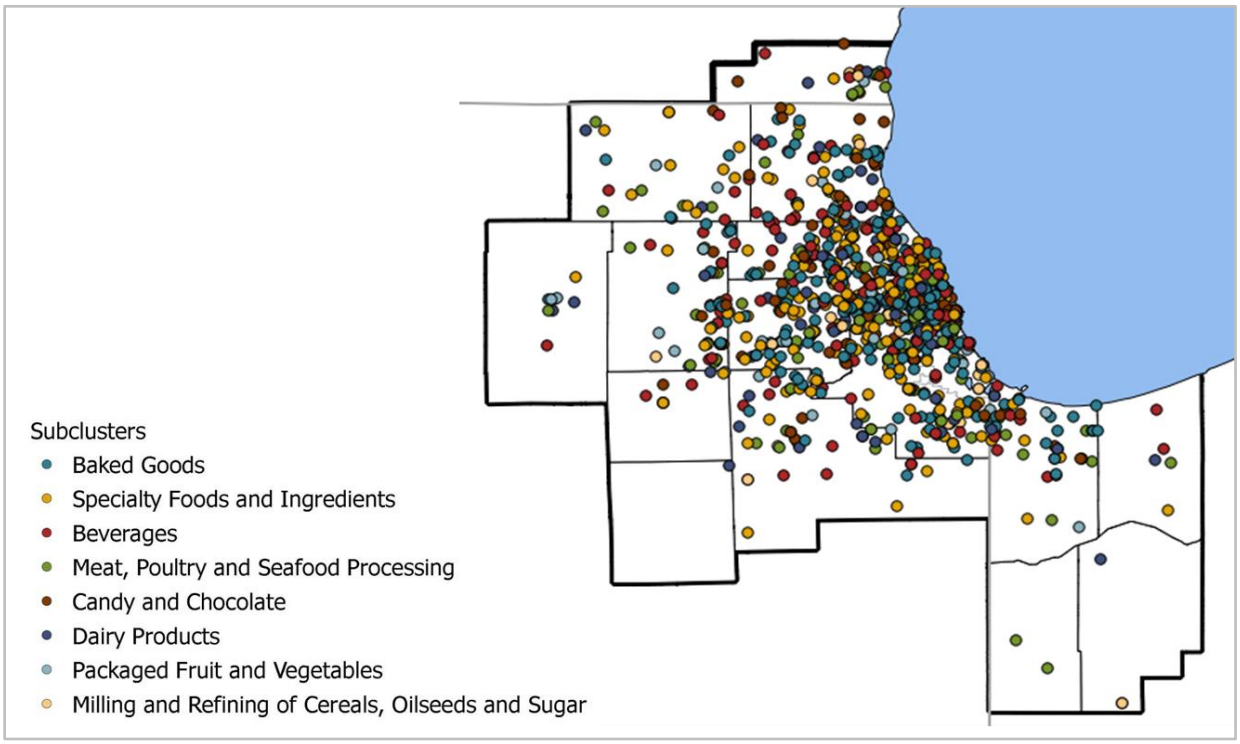
Food Firms Locate in the Region's Neighborhoods

Food and beverage manufacturing firms are spread throughout the 14-county Chicago region, making it an important cluster for the entire area. The concentration of food firms is especially dense in the City of Chicago and near-in suburbs in Cook, DuPage and Lake Counties (see Figure 13). In particular, many food businesses reside along the Kinzie Corridor in the West Loop and in the former stockyards areas of Bridgeport, Back of the Yards and nearby neighborhoods. **Many of these neighborhoods are home to the type of underutilized land that provide potential locations for new or expanding firms that wish to operate near existing food and beverage manufacturing companies, workers and customers**. In addition to standalone facilities, available land could be used for more coordinated and innovative uses such as a food

[19] Based on analysis of data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW).

manufacturing park or food processing innovation district, options that are detailed further in the Industry Trends and Challenges section.

Figure 13. Food and Beverage Manufacturing Firms in Chicago MSA



Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

Taken together, the clusters' job ladders, entrepreneurial opportunities and firm locations reveal that support for the Chicagoland food cluster can spur not only economic growth, but will naturally lead to *inclusive* – and so more sustainable – long-term economic growth for the entire region.

Industry Trends and Challenges

Global and national trends within the food industry are creating major challenges and opportunities for Chicagoland's food cluster. Changes in consumer tastes and heightened consumer awareness are spurring and interacting with developments in food production technology, distribution systems, regulations and food safety procedures. These developments are challenging firm leaders to figure out how to compete in today's globalized economy. While the trends highlighted here focus on the cluster's food processors and packagers, the impacts of these trends ripple throughout the cluster to other firms within the value chain. These varying shifts in the food landscape present new options to food companies looking to expand their operations and suggest many opportunities for growth.

Emerging Product Areas

Health

Nearly every food firm interviewed for this report cited consumer interest in healthy foods as a trend that was influencing their company. Even companies with less healthy products, like chocolate and cheesecake, have experimented with healthier options, such as Eli's Cheesecake's new vegan, tofu-based "cheese"-cake.[20] The expansion into healthy products is paying off for many companies, including one chocolate manufacturer who cited darker, less sweet chocolate varieties as a growth area for the company. Most companies in the food business are recognizing the need to evaluate their product offerings and seek ways to improve their nutritional value.

The diet buzzwords that focus on what is not in a product (e.g., low fat, sugar-free, low carb, low sodium) represent only one component of the market for health-related foods. On the other side of the coin are foods with added ingredients that support the consumer's health. For example, many food products now target people suffering from specific ailments (or hoping to prevent them) by incorporating nutraceuticals, such as glucosamine for joint health or omega-3 for brain and heart health. Aging baby boomers particularly provide an expanding market for these "functional foods," which have an estimated global value between $30 and $60 billion a year.[21] With estimated growth rates between 8% and 14%, this segment is projected to grow much more quickly than the general food industry.[22] Given the size and concentration of the Chicago region's pharmaceutical industry, there is substantial potential to develop a regional focus in this area with the proper coordination between food and pharma firms. However, companies moving into this space must use caution to avoid lawsuits related to their health claims,[23] while still appropriately marketing their health value.

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[20] http://www.elicheesecake.com/wp-content/uploads/2014/05/NRA-Vegan-2014.pdf

[21] "Consumer Trends: Functional Foods," Agriculture and Agri-Food Canada Market Analysis Report, December 2009, (http://www.gov.mb.ca/agriculture/market-prices-and-statistics/food-and-value-added-agriculture-statistics/pubs/consumer_trends_functional_foods_en.pdf).

[22] Melissa Williams, Eija Pehu, and Catherine Ragasa, "Functional Foods: Opportunities and Challenges for Developing Countries," World Bank Agricultural and Rural Development Notes, Issue 19, September 2006 (http://siteresources.worldbank.org/INTARD/Resources/Note19_FunctionalFoods_web.pdf).

[23] While the majority of food-related lawsuits in the last several years have revolved around the proper use of the term "natural" on products, there have also been notable lawsuits regarding unsubstantiated health claims, as consumer advocacy

The increased prevalence of allergies has paved the way for allergen-free products (e.g. gluten-free, peanut-free). Meanwhile, vegetarianism and veganism are on the rise due to a mix of health, environmental and humane reasons, broadening the market for meat- and dairy-alternatives. Health concerns, along with environmental ones, also play a role for consumers seeking organic, "natural" and non-genetically modified foods (or GMOs – the O stands for organism).[24] Once hard-to-find specialty items, products labeled "vegan," "gluten-free," "GMO-free" or "organic" are becoming mainstream. Applying these labels comes at a cost, however – to gain certification by a trusted arbiter requires onsite inspection, paperwork and at least several hundred dollars in fees. This process can be daunting for companies, especially those doing it for the first time – "it's hard to know what to do" according to one small business going through the certification process. Increasingly, larger manufacturers are requiring their suppliers to obtain certain certifications, compelling firms to pursue endorsements that they may not have otherwise sought.

Chicagoland's food cluster has been slower to adapt to healthy food trends than its counterparts in other regions of the country, leaving room for significant expansion. This also provides an opening for smaller businesses to enter the market to provide specialized healthy options; while the largest companies do offer some products that align with the healthy-foods trend, they often lack credibility among those in the "good food" movement.

Convenience

Convenience is king for consumers, who want to eat quality meals with less effort, and thus will pay more for fresh prepared meals, chopped and washed vegetables, frozen foods and other convenience foods. As the economy continues its slow recovery, many consumers continue to replace restaurant meals with home cooking,[25] and they welcome solutions that save time on meal planning and preparation. At the same time, some consumers have negative associations with TV dinners or other ready-made meals, and feel better about their experience and the quality and health of their food if they play a more active role in the preparation.[26] Pre-made elements that the consumer can quickly assemble into a complete meal have seen considerable growth in recent years. For example, in 2013 alone, sales increased 26% for salad kits, 16% for vegetable side dishes and 9% for deli appetizers.[27] This growth creates opportunities for entrepreneurs and SMEs who can add value to simple products by making them more convenient.

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groups have filled a void in labeling regulation created by the FDA's inability to keep up with new food products and associated marketing. See Negowetti, Nicole E., "Food Labeling Litigation: Exposing Gaps in the FDA's Resources and Regulatory Authority," Brookings Institution, June 2014.

[24] Disagreement exists about whether GMOs negatively affect health, and whether organic foods provide more nutrition than their non-organic counterparts. This report does not presume to enter those debates, but merely to point out the market opportunity.

[25] http://www.foodbusinessnews.net/articles/news_home/Consumer_Trends/2014/06/Ten_food_trends_unveiled%20_at_IF.aspx?ID=%7BC8BEEAF6-9CD1-401B-9A19-972D66B243C4%7D&cck=1

[26] http://www.foodnavigator.com/Market-Trends/What-key-trends-will-be-driving-the-food-and-drink-industry-in-2014/(page)/2, http://www.nielsen.com/us/en/insights/news/2014/convenience-its-whats-for-dinner-tonight.html

[27] http://www.nielsen.com/us/en/insights/news/2014/convenience-its-whats-for-dinner-tonight.html

Consumer preference for convenience also impacts the packaging choices of the food industry. Customers, and the companies courting them, increasingly choose products with packaging that is easy to open, re-sealable for later use, portable and easy to hold and eat with one hand. As the size of the average household declines and the number of single-person households rises, single-serving packages have also become more popular. Packaging can also speed the cooking process, allowing frozen vegetables to be steamed in the microwave, causing meat to taste as if it's been grilled or broiled after a few minutes in the microwave,[28] and even heating or cooling foods on its own at the touch of a button.[29] These technologies, (and others detailed below), represent areas ripe for increased dialogue between manufacturers, packagers and retailers, to identify avenues for adding value to existing products and more fully utilizing new packaging advances.

Local, Sustainable, Humane, and Fair

Consumers today are more aware of where their food comes from and they increasingly seek foods that align with their values. Though the factors that motivate shoppers to seek local (supporting family-owned farms and the local economy, emitting less carbon during transportation), sustainable (less harmful to the environment and less wasteful of resources), humane (less cruel to animals) and fair (just compensation and treatment of workers) food products differ, they often overlap and lead to the same result. For example, values-oriented consumers may prefer cage-free eggs or free-range beef (or may abstain from animal products altogether) because of the environmental consequences of industrialized production of animal products or because of concern over the treatment of animals, but the outcome is the same – less consumption of traditional meat, dairy and egg products, and a growing market for alternatives.

Locally sourced foods top many "Food Trends in 2014" lists[30] – no surprise given that 29% of consumers "find local claims to be very or extremely important when making a purchasing decision."[31] Local food products span the whole range of food types, from produce and meat to baked and specialty goods. Local processing capacity is needed in the Chicago region in order to meet demand for local foods.[32] Processing of local foods need not be drastically different from traditional processing, but it does tend to operate on a smaller scale and be more job-intensive. Food hubs are popping up around the country, helping local producers and processors reach larger customers (e.g., institutions, restaurants and even grocery stores) by

[28] Rick Lingle, "A Trio of Hot Innovation in Frozen Foods," October 11, 2010, www.foodandbeveragepackaging.com/Articles/Feature_Articles/BNP_GUID_9-5-2006_A_10000000000000918951.
[29] http://www.gizmag.com/hot-can-self-heating-beverages/25646/, http://www.gizmag.com/west-coast-chill-self-chilling-drink/21316/
[30] http://www.forbes.com/pictures/feki45edkig/1-locally-sourced-everything-2/, http://restaurants.about.com/od/WhatsHotSurvey/tp/Local-Food-and-Beverage-Trends-2014.htm,
[31] http://www.foodbusinessnews.net/articles/news_home/Consumer_Trends/2014/06/Ten_food_trends_unveiled_at_IF.aspx?ID=%7BC8BEEAF6-9CD1-401B-9A19-972D66B243C4%7D
[32] Jim Slama, Presentation at Good Foods Business Accelerator Reception, July 23, 2014

aggregating products from many local businesses and managing their distribution.[33] To date, only one private firm, Local Foods, appears to be operating in this space at a significant scale, with business strong enough that they are expanding to a new facility in 2015 that will include wholesale distribution and meat processing.[34] According to a consultant to local food entrepreneurs, "demand is enormous" for the processing of local foods.[35]

The rise in values-oriented customers concerned about the sustainability of their food choices increases the value companies can generate from reducing energy- and resource-use throughout all aspects of food production, processing and distribution. For instance, one factor behind the appeal of local foods is the reduction in vehicle-miles traveled to bring food products from their origin to their destination, making local foods more sustainable (at least on one metric). When food companies employ new processes and equipment to reduce waste and energy use (detailed further under Technology and Innovation trends below) they can create an alignment between the company's bottom line and its branding to environmentally-conscious consumers.

Ethnic, Spicy, Blended flavors, Indulgence

As America becomes more diverse, so do its residents' palates. Consumers from many different backgrounds increasingly favor "ethnic" foods; salsa sales surpassed those of ketchup in 2007.[36] Spiciness and other bold flavors associated with ethnic foods are making their way into the mainstream of American diets, and many brands are adjusting their product lines to profit from this trend. For example, Claussen Pickles, based in Woodstock, IL and part of Kraft Foods Group, added "Hot & Spicy Pickles" to their product line a few years ago. Companies are also creating blended or "fusion" flavors and unique flavor profiles, mixing sweet with salty, spicy with sweet, Mexican with Korean, and so on.

Paradoxically co-existing alongside the healthy foods trend discussed above is the desire for indulgent foods (e.g., bacon-in-everything, gourmet doughnuts and other "foodie" pleasures).[37] Often these involve top-quality ingredients (including from local, sustainable, fair and/or humane sources), justifying a high price and positioning the product as a special treat.

Changing Industry Dynamics

These emerging product areas, along with other dynamics such as a changing regulatory environment and an aging workforce, are prompting various responses from the industry as it

[33] http://www.familyfarmed.org/our-work/food-hubs/; http://www.foodmanufacturing.com/news/2014/07/middlemen-eliminated-local-foods-become-big-business;
[34] Parr, Jan, "Farm-to-market food hub expanding, opening retail outlet," Crain's Chicago Business, April 8, 2014, http://www.chicagobusiness.com/article/20140409/BLOGS09/140409741/farm-to-market-food-hub-expanding-opening-retail-outlet.
[35] *Ibid.*
[36] Nerac, "Food Trendlines: Nerac Food Science Analysts Look to the Coming Year."
[37] http://blog.euromonitor.com/2014/01/the-doughnut-paradox-indulgence-positioning-in-a-world-obsessed-with-health-and-wellness.html, http://www.foodprocessing.com/articles/2013/snack-trends/?show=all, http://blog.generalmills.com/2014/07/top-food-trends-inspire-new-products/

reacts to an evolving market. The sections below detail the implications for food firms of new demands in the market, be they from consumers, regulators or other sources.

Food Safety and Other Regulatory Changes

Due to the health risks of improperly handled food, food and beverage manufacturers face regulations and requirements beyond those of most other businesses, imposed by government and large customers (e.g., retailers, distributors) alike. The Food Safety Modernization Act (FSMA), passed in January 2011, has major repercussions for food and beverage processors, along with other companies in the supply chain that handle food. Aimed at preventing food-borne illnesses, the FSMA expands the regulatory powers of the FDA, requires companies to create food safety plans that identify and mitigate potential hazards, and alters procedures for documenting and verifying compliance with the law.

The FSMA has not yet been fully implemented, and exactly what actions it will require of food firms, and how it will impact the industry, is still unknown (the FDA has proposed rules which will not be finalized until 2015 and 2016). A 2013 survey of food and beverage manufacturers conducted by iRely revealed that 71% of respondents expected the new rules to impact their operations, but nearly half were unsure how. The same survey found that three-quarters of respondents did not expect to add resources (i.e., new employees or technologies) to facilitate implementation of the new guidelines, despite the FDA's prediction that the average establishment would need to spend $13,000 upgrading their systems to comply.[38] As implementation continues, businesses may find out the hard way that compliance necessitates more resources than expected. Firms interviewed for this project expressed a desire for assistance in understanding how best to fulfill the conditions laid out by the new law.

Food traceability, already a major trend in food safety, is an area that will present challenges for some manufacturers. The FSMA mandates traceability of all inputs (including raw materials, additives, packaging, etc.) back to their source, enabling rapid and targeted recalls when a safety issue emerges. The iRely survey found that nearly 45% of respondents still used "spreadsheets or other manual processes to manage traceability, quality and inventory issues." These firms will need to upgrade to more sophisticated tracking systems, which may burden their short-term financial outlook despite the potential long-term cost savings. Smaller firms in particular will likely seek outside expertise on implementing these new systems, and, if possible, means of sharing the cost of such expertise.

The FSMA will standardize the regulations faced by food and beverage manufacturers, but many companies have introduced similar procedures ahead of the official rules. Retailers have pushed food safety for years, developing the Global Food Safety Initiative (GFSI) in the early 2000s. Many retailers compel suppliers to obtain safety audits by GFSI-approved providers, such as Safe Quality Food (SQF). FSMA largely brings the rest of the market up to the same

[38] http://www.qualityassurancemag.com/irely-processing-companies-unsure-fsma-implications.aspx

standards as SQF, although it is less stringent in some respects (e.g., SQF demands verification of all vendors, while FSMA requires it only for foreign companies).[39]

Many forward-thinking companies are pursuing food safety strategies that go beyond compliance with FSMA, SQF or other third-party certifications. For example, tamper-evident packaging is gaining steam, utilizing seals, tapes, shrink bands and other materials to prevent damaged goods from reaching consumers.[40] Numerous other techniques and technologies are emerging to produce food and beverage products that are safe for consumption, from pathogen reduction technologies to aseptic processing and packaging (in which the food product and packaging are both stable and the result is a shelf stable product).[41]

Other federal regulations beyond the FSMA also affect food and beverage manufacturers. Like all businesses, they must contend with OSHA regulations, the Affordable Care Act, worker compensation laws, and so on. Food companies face additional hurdles around labeling requirements. The FDA and USDA require that labels include particular pieces of information and specify guidelines for its presentation, and in some cases, these labels must be pre-approved. As labeling guidelines change, firms must adapt: the FDA recently proposed the first changes to nutrition labels in approximately 20 years.

While most if not all of these regulations serve important public health purposes, they also place increased burdens on food firms. Complying with government and industry requirements could be particularly challenging for SMEs, who are more likely to lack the time or money to properly implement new systems. Many companies will be seeking guidance on the most efficient and effective ways to satisfy all relevant regulations, and entrepreneurs in particular are likely to require assistance in cataloging and navigating the various regulatory hurdles they must clear.

Technology and innovation

In addition to the packaging technologies mentioned above that improve food safety and enhance convenience, there are numerous advanced products and processes being developed by packaging manufacturers that are creating additional value for consumers. One example is "smart packaging," which communicates certain information to consumers, such as whether a food is ripe, done cooking,[42] or has gone bad.[43] These innovations, along with those mentioned above in relation to convenience (e.g., single servings, re-sealable packages) will reduce product waste by providing data on freshness and by delivering portions that consumers can better tailor to their household sizes. Given packaging's potential for adding new value to existing products, there would be clear benefits to increased collaboration among food and beverage manufacturers and packaging manufacturers.

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[39] http://www.foodprocessing.com/articles/2014/fsma-gfsi-turn-small-processors-into-competitors/
[40] http://www.foodprocessing.com/articles/2005/550/
[41] http://mycelsis.criver.com/learning-center/articles-and-publications/Top-Trends-to-Increase-Food-Safety
[42] For example, in 2011 General Mills introduced Green Giant steamers that microwave in the bag and print the word "DONE" across the packaging once the vegetables are optimally cooked.
[43] E.g., by changing color to alert the consumer/retailer of the presence of harmful bacteria.

In these and other food and beverage production innovations, "big data" is playing an increasingly important role. The amount of data available across the food supply chain expands daily, and businesses that learn to harness it will gain a competitive edge. Big data, when properly analyzed and acted upon, can improve decision-making, drive marketing strategies, inspire new product development, alter production processes and enhance distribution efficiency. One example of this in practice is IBM's Cognitive Cooking program.[44] Starting with text analysis of millions of recipes, IBM has developed algorithms that categorize flavor pairings, develop novel combinations, and assess new recipes based on molecular properties to create innovative recipes, which has drawn the interest of food manufacturing companies.[45]

According to a recent study by Deloitte and GMA (Grocery Manufacturers Association), the food industry is in the early stages of a major disruption based on data.[46] In this stage, innovations like mobile phones, sensors, crowd sourcing and gamification[47] are taking root.[48] In just a few years, additional advances that can provide or connect with Big Data – such as 3D printing, internet-connected products, artificial intelligence and robotics – could become major game-changers.[49] Given the rapid speed at which innovation now happens, developing a foundation for processing and extracting meaning from data will become even more critical as the "big data" disruption continues.

The majority of food and beverage companies are planning to increase investment in information technology (83%), equipment and machinery (72%) and to a lesser extent physical facilities and warehouses (56%).[50] More specifically, investments may include, in order of likelihood: mobility solutions, internet and web applications, business analytics, warehouse management systems, enterprise resource planning and customer-relationship management.

Many of these more recent and expected innovations are being driven not by the major food companies that have dominated in the past but by outsiders in Silicon Valley and beyond that are capturing enormous amounts of consumer data.[51] Beyond the realm of data, outsiders, newcomers and small players are also playing a crucial role in innovation, "impacting future trends in a way they weren't before," according to Joanna Clifton of Innova Market Insights.[52]

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[44] http://www.research.ibm.com/software/IBMResearch/multimedia/Cognitive-Cooking-Fact-Sheet.pdf

[45] Bhatia, Aatish, "A New Kind of Food Science: How IBM Is Using Big Data to Invent Creative Recipes," Wired, Nov. 16, 2013, http://www.wired.com/2013/11/a-new-kind-of-food-science/.

[46] http://www.gmaonline.org/issues-policy/collaborating-with-retailers/big-data-analytics/recommendation-and-conclusion-3

[47] Gamification involves the introduction of game-like elements into novel contexts; in food, mobile applications are being developed that provide points to shoppers for certain store visits, providing app makers with opportunities to affect and collect data on shopping behavior.

[48] *Ibid.*

[49] *Ibid.*

[50] http://oma.popai.com/2014_monitor_food_beverage.pdf, based on survey of 102 food and beverage companies in the United States. The mean size of these companies was approximately 680 employees and $225 million in annual gross revenue, although the median size was lower, at 180 employees and $82.5 million in revenue.

[51] *Ibid.*

[52] http://www.foodbusinessnews.net/articles/news_home/Consumer_Trends/2014/06/Ten_food_trends_unveiled_at_IF.aspx?ID=%7BC8BEEAF6-9CD1-401B-9A19-972D66B243C4%7D

For example "new ingredients, concepts [and] preparations for more health benefits are emerging from this synergy between the big guys and the smaller ones," and large companies aim to capitalize by acquiring smaller players or their concepts.[53] On the other hand, certain processing technologies and equipment generally come on the market at a scale and expense beyond the reach of most small manufacturers, preventing them from adopting the technology early.[54]

Data and other processing innovations are enabling firms to pursue "mass-customization." Customization and personalization have become major trends in the food and beverage market, driven in part by heavy interest from the millennial generation.[55] Customization not only allows companies to respond to variation in taste preferences, but also to account for allergies and varying health needs. Companies like Chicago-based Element Bars allow customers to build their own energy/nutrition bar to provide the desired nutrients to get them through a hard workout or a long day at the office. Nestlé, one of the largest food companies in the world, is developing capsules with personalized nutrients for use in a machine similar to their popular Nespresso single-serve espresso maker.[56]

Food companies are also exploring innovative processes and technologies that will lead to more efficient and sustainable operations. Food waste has become a particularly hot topic in the food industry, and something businesses are beginning to tackle. Solutions include new processing technologies, such as Mouvex's "eccentric disc pump products" that maximize product recovery from piping,[57] as well as new packaging strategies, such as single-serve packs that ultimately result in less waste by consumers.[58] Food and beverage manufacturing companies can also increase their sustainability by using less packaging material overall and more environmentally-friendly materials, such as bioplastics. Reducing energy use is a salient issue for food and beverage manufacturing companies, given the large amount of power required to control temperatures, operate equipment and ship products. Businesses are becoming more cognizant of options for lowering energy use, which can provide cost savings as well as improve a company's appeal to consumers with preferences for more sustainable products (see Local, Sustainable, Humane, and Fair section above).

Along with new processes and technologies, food firms' decisions on facility locations present opportunities to drive innovation. As people and businesses increasingly return to urban areas, many cities are finding novel reuses for industrial land that promote collaboration among firms in ways that enhance economic activity and innovation. These spaces cover a range a sizes,

[53] *Ibid.*
[54] Interview with leader of institution supporting food processors.
[55] https://circleup.com/blog/2013/06/24/consumer-trends-matter-personalization/, https://www.thebalance.com/gobites-capitalizes-on-growing-snack-trends-1326003, http://www.inc.com/erik-sherman/mass-customization-let-your-customers-have-it-their-way.html,
[56] http://www.fooddive.com/news/four-recent-tech-innovations-with-implications-well-beyond-the-food-industr/280302/, http://www.bloomberg.com/news/2014-06-22/nestle-aiming-to-develop-a-nespresso-of-nutrients.html
[57] http://www.foodproductiondaily.com/Processing/Food-processing-pumps-combat-product-waste/
[58] http://www.foodbusinessnews.net/articles/news_home/Consumer_Trends/2014/06/Ten_food_trends_unveiled_at_IF.aspx?ID=%7BC8BEEAF6-9CD1-401B-9A19-972D66B243C4%7D

scopes and services provided, from incubators and accelerators to large-scale innovation districts. Building on these ideas, one can imagine a "food manufacturing innovation district," which might include a mix of food-related businesses involved in light processing and packaging, a shared kitchen or business incubator to support entrepreneurs and small businesses, food services (e.g., restaurants, food trucks and catering) or even urban agriculture or cultural and community activities centered on food, such as a food festival or farmers markets. An example of this type of integrated facility is currently in development in Bluffton, Indiana; the $5.5. million Bluffton Food Innovation Center will integrate programs in workforce development, safety training and technical assistance to food companies with incubation facilities that will enable the production and testing of new products by local food SMEs.[59]

Precise metrics are not available to track how well Chicagoland food firms have taken advantage of these emerging innovation opportunities. However, interviews with local firms reveal a mixed record on this front. Several companies indicated that their equipment and processing technologies had changed very little over time, though others have been able to incorporate more advanced techniques (e.g., Element Bars' customization processes). Firms' reasons for not adopting new technologies vary; some lack awareness of new innovations, some do not see the need to change established processes and recipes, and others have insufficient capital to invest in upgrades. Each obstacle calls for tailored technical and financial support that will allow firms to increase their productivity and develop higher-value product lines.

Workforce

Though access to a strong workforce is often cited as a reason for locating in the Chicago area, many food and beverage companies also report that they struggle to hire and retain an appropriately skilled workforce. Reasons companies cited include competition from other industries, the perception (and sometimes reality) that food and beverage manufacturing jobs are undesirable, lack of knowledge about the industry and a lack of required skills among applicants. To find workers, food and beverage manufacturers use online job boards, including LinkedIn and CareerBuilder, and several firms mentioned relying on temporary staffing agencies. Temp agencies provide firms with the flexibility to adjust workers seasonally depending on demand, but firms also have workers from staffing agencies that work for long periods of time.

The qualities that employers seek in entry-level job applicants include soft skills, basic math skills, willingness to work and a desire to learn. Food firms generally like to hire at least high school graduates while preferring holders of associate's degrees or certificates. Increasingly, workers must also be able to operate automated technologies, requiring computer skills. Mechanics and engineers were mentioned by interviewees as particularly in demand. In addition to having difficulty finding appropriately skilled and ready to work individuals to hire, food firms sometimes struggle to provide the required training themselves. Robust, company-

[59] "'Game-Changing' Hub Proposed for Bluffton," Inside Indiana Business, Feb. 4, 2015, http://www.insideindianabusiness.com/story/29823082/game-changing-hub-proposed-for-bluffton.

driven training programs can help alleviate businesses' finding and training costs. If properly designed and administered, such training programs would provide companies with employees likely to be more productive and suitable for job advancement, which would help firms break the low-wage, low-skilled job model.[60]

Local training programs currently do not focus on food manufacturing – there are culinary programs that focus on food preparation and manufacturing programs that teach some transferable skills, but there is a local gap in food-specific manufacturing training. With no food-specific regional training programs, only a handful of food manufacturing firms engage directly with regional workforce development partners to improve curricula or place graduates. Other regions have addressed this scenario by designing shared workforce training programs tailored to food industry positions (e.g. FaB Wisconsin, detailed further in the Moving Forward section and Appendix C). Local educators and workforce training partners have shown the willingness to engage directly with employers in other industries to respond to employers' requests for training curricula (e.g., Instituto del Progreso Latino; CCC's College to Careers program), and these partners would likely be open to working with food firms as well.

The development of food-specific training programs does not need to be limited to entry-level positions, but could also target mid-career employees with manufacturing skills who would benefit from up-skilling and certification in the food sector, but who already have basic manufacturing skills. Additionally, current food employees can benefit from tailored training options, as changes in technology and regulations (see the Food Safety and Other Regulatory Changes section above) require regular on-the-job training for employees to stay up-to-date.

Starting and scaling up

While most small firms, regardless of industry, face challenges in scaling up, food firms encounter particular challenges. In addition to the heightened regulatory and other requirements discussed above, small firm interviewees described the financial difficulty associated with increasing production scale. To meet growing demand requires upfront investments in equipment and staffing, well ahead of payments for products, creating a need for working capital. Yet accessing financing can be a challenge for young food firms. Food is often a risky investment, with relatively modest returns. While food manufacturers have traditionally had difficulty obtaining financing for capital investments such as equipment, alternative lending sources are emerging that provide models for supporting SME food firm growth.[61] Chicagoland is seeing a rise in local investors (see "Chicagoland's Food Cluster Support Landscape," below), many of whom are focused especially on local and sustainable foods.

Another serious concern for early stage food manufacturers is securing a space to create their product. Some entrepreneurs begin in shared commercial kitchens, but these are limited in number and not geographically accessible to all parts of the region. Moreover, relying on these

[60] Mass Economics, et al., Linking Urban Economic Clusters with Targeted Urban Places, August 2014.
[61] ICIC and US Conference of Mayors, "Growing Healthy Economies: Leveraging America's Urban Food Cluster," 2013.

kitchens can increase the volatility of production costs, since entrepreneurs cannot predict demand and competition for the limited shared resources, which in turn complicates expansion efforts. An alternative strategy employed by many food and beverage companies in their early stages is the use of a co-manufacturer/co-packer. With trends favoring the development of small food firms, there are likely to be increased opportunities for the expansion of co-manufacturing/packing firms. Food firm interviews support the viability of this opportunity, as some companies noted that the Chicago region's current co-packing options do not currently meet the demand for these services from the region's start-up food community.

Finally, zoning and regulation hurdles (e.g., requirements that firms offering a product for wholesale operate in at least a class C-Manufacturing zone) constrain alternative expansion options, such as utilizing existing commercial kitchens during dormant hours (e.g., after a restaurant has closed). Frequently, the only options left for entrepreneurs are to build out a new facility at great cost, to move production out of state or to cease operations. Unfortunately, anecdotes indicate that a number of startup food businesses have resorted to the latter two options.

Other Trends and Challenges

Numerous factors in the global food landscape are converging to put pressure on food and beverage manufacturers. Increased competition from developing and developed countries, consolidation of retail and distribution channels and consumer price-sensitivity are pushing prices down, decreasing the already small margins faced by food and beverage processors. At the same time, some input costs are increasing. More frequent incidences of extreme weather are creating shortages of many commodities and ingredients, causing prices to rise, while the costs of waste management are also growing.

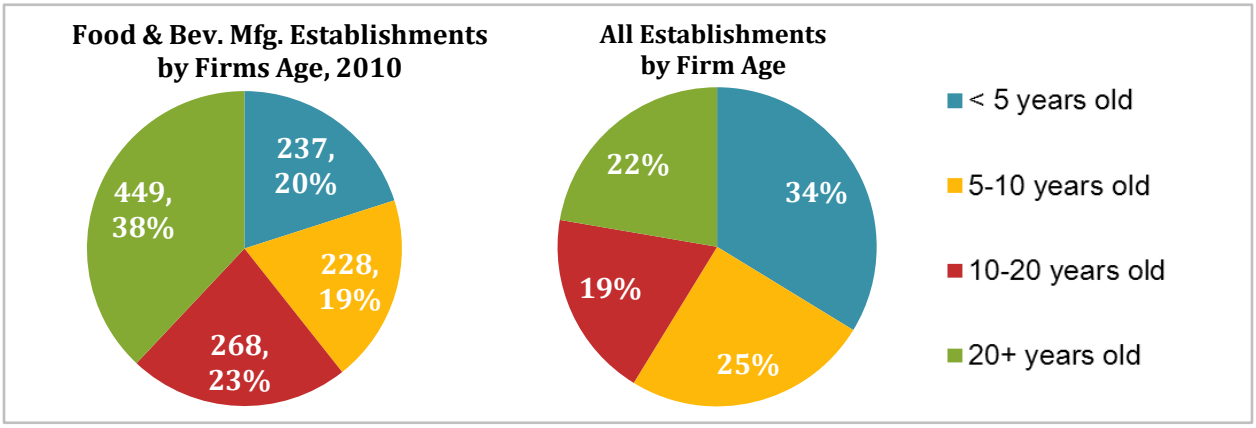
Both goods and information move faster in today's economy, affecting distribution strategies and approaches to risk management. With respect to goods, customers increasingly prefer to keep less inventory in stock, and instead receive products as needed or "just in time." This requires food and beverage manufacturers to operate with shorter lead times, resulting in more frequent but smaller, often "less than truckload" (LTL), shipments. Many food manufacturers are turning over their increasingly complex logistics management to dedicated third-party logistics firms who work to optimize truck space and delivery routes. Furthermore, increased access to global markets is opening up opportunities for firms to export their products, while many firms are not familiar with navigating export-related processes.

In the age of Twitter and Facebook, information, whether accurate or not, travels rapidly among consumers, creating potential risks to a company's reputation. For instance, if customers raise safety concerns on social media, alarm can spread quickly and can severely harm the company in question, with potential spillover to its suppliers and customers. Managing these risks, whether through food traceability systems mentioned above, a change in

ingredients/processes or other mechanisms, is more important than ever.[62] On the flip side, social media can benefit food companies by serving as a means to engage with consumers and better tailor products and marketing to their preferences.

While these changes in the movement of goods and information affect many industries, food and beverage manufacturing companies might be less nimble in their responses as they skew older than firms in other industries (see Figure 14). Nearly 40% of food and beverage establishments in the region are 20-years-old or older, compared to just over 20% of all establishments. In contrast, firms younger than 5-years-old account for only 20% of food and beverage establishments, while in all establishments the figure is 34%. Older firms may struggle with stagnation or in some cases leadership transition issues, as longstanding firm owners prepare to retire. The increase in smaller firms over the past two decades (see Analysis of Chicagoland's Food Cluster – Shifting to Smaller Firms section above) suggests that the imbalance of younger and older firms in the Chicago-area food industry might be shifting.

Figure 14. Age of Establishments, Food and Beverage and All Establishments in MSA



Source: RW Ventures analysis of Walls and Associates' National Establishment Time Series (NETS) 2010 Database

[62] Daniel Diermeier, "Managing Risk in the Global Food Supply Chain," Keynote Presentation, Feeding and Hungry World: Global Food Production and Sustainability, Global Midwest Alliance event.

Moving Forward: Strategies to Grow Chicagoland's Food Cluster

In several regions around the world, where the food cluster has been identified as key to regional growth, firms and institutions have come together to tackle their common challenges and help the cluster thrive amidst a changing landscape.[63] Companies are discovering that inter-firm collaboration can provide tangible benefits, such as network spillovers that spur innovation and cost-sharing for commonly sought-after services and resources (e.g., pre-competitive R&D, workforce training). In addition, companies and workers are increasingly attracted to places with organized clusters and cluster resources, and regions are beginning to compete with each other based on how appealing their respective clusters can be. By organizing and developing coordinated responses to industry trends, firms are jointly defining the ideal trajectory for their cluster and identifying concrete steps for achieving that progress. The activities in regions that have formally organized their food clusters generally fall into a handful of categories, detailed below (see Appendix C for further details on the services provided by several of the leading food cluster organizations in the US and abroad). This list has been supplemented with feedback provided by local food firms and other industry experts.

FaB Wisconsin

Food and Beverage (FaB) Wisconsin (originally focused in Milwaukee but recently expanded) is Wisconsin's food and beverage cluster organization, designed to support industry growth and awareness in the region.

FaB Wisconsin offers a career portal to match talented workers with firms in the cluster, and is developing career pathways in concert with local technical colleges. Their member directory facilitates enhanced supply chain connections and enables startups to find co-packers with excess capacity. FaB's committee structure builds relationships among regional food firms, while advancing strategies related to career development and innovation. The organization also connects firms to other supportive resources in the region.

Started in 2012 as an offshoot of Milwaukee 7's Food Advisory Council, FaB Wisconsin began fee-based membership in July of 2013, and one year later had over 100 employer members, covering a wide range of firm sizes and product types.

Workforce Development

- Assistance identifying and preparing talent for jobs in food manufacturing
- Training and scholarship programs, often in collaboration with local high schools, universities and community colleges
- Public awareness campaigns and recruitment efforts to encourage entry into food sector careers
- Online and on-site technical workshops and training
- Job fairs, virtual job boards

[63] See Appendix C for more detail on models of food cluster organizations around the world.

Illustrative Program: *Finger Lakes Food Processing Cluster Initiative (FLFPCI) Training Program, Finger Lakes Region, NY*

In partnership with local universities, community colleges, workforce development agencies and regional food firms, FLFPCI has developed a 24-credit curriculum to enable under/unemployed workers to access career pathways in the food manufacturing cluster. The curriculum has been designed through direct feedback from regional food firms on their workforce needs, and is projected to provide training to nearly 800 adult and youth workers seeking food industry employment. Funding for the program was secured via a $1.15 million U.S. Department of Labor grant.

Technology and Innovation Assistance

- On-site, customized process improvement and technical training
- New product and market development assistance (e.g., responding to trends in health, convenience, local, etc.), often through shared R & D centers
- A manufacturing trial plant that would allow firms to produce test runs of new recipes and products without shutting down their existing product lines[64]
- Energy efficiency + waste reduction assistance
- Online "knowledge centers" including toolkits and how-to guides
- Virtual peer-to-peer forums and "expert directories"

Illustrative Program: *Guelph Food Technology Centre (NSF-GFTC), Ontario, Canada*

The NSF-GFTC is an independent facility that operates in the context of Ontario's food cluster, the 3rd largest in North America. NSF-GFTC offers food safety audits of manufacturing facilities, food safety and other tailored training programs for food firms, and targeted product and process R&D support on a contract basis. These services include a patented packaging evaluation system that identifies specific locations on a package where oxygen permeates the contents. NSF-GFTC serves approximately 1,500 companies a year in a 45,000 square foot facility, with expansion plans for a new 25,000 square foot facility that breaks ground this year.

Incubators & Accelerators

- Incubators, including shared kitchens for early stage production and product development
- Innovation districts or manufacturing parks for targeted food and packaging firms benefiting from co-location, shared infrastructure and services
- Pitch events for potential investors/buyers

[64] Maintaining the confidentiality of firms' proprietary recipes would be critical in the design of this type of plant

Illustrative Program: *CropCircle Kitchen (CCK), Boston, MA*

CropCircle Kitchen is a food incubator that caters to food entrepreneurs in both the retail and manufacturing spaces. With 40,000 square feet across two facilities that include industrial kitchen and storage spaces, CCK allows food SMEs to produce small batches of manufactured products in a shared space. The goal is to graduate food firms to their own facilities, and from 2010 to 2013, 16 firms that now employ 260 workers have moved from CCK to their own spaces. Thanks to a recent expansion, CCK will soon be able to serve 90 companies a year.

Business Assistance (including Exports and Trade, Financing and Investment)

- Trainings and seminars on particular subjects, such as extruding technology, cash flow management, business expansion, food safety, personnel safety, labeling requirements, new federal government regulations, etc.
- Assistance with quality control and quality assurance
- Export promotion, including technical assistance, seminars, regional branding and promotion
- Business assistance: one-on-one consulting, training
- Referrals to financial incentives and programs

Illustrative Program: *The Good Food Business Accelerator, Chicago*

The Good Food Business Accelerator was established in 2014 by FamilyFarmed and is currently housed at 1871. Through a competitive application process, the Accelerator selects food firms into a fellows program, matches them with mentors, and provides them with a 6-month training curriculum to improve their business plans and sales pitches.[65]

Networking Opportunities/Collaboration Facilitation

- Shared purchasing, especially for small companies who lack scale for big discounts
- Shared trucking as a solution to transportation costs
- Expanded co-packing options to address local demand for such facilities
- Connecting ingredient manufacturers to later stage processors, allowing ingredient companies access to customers, and later stage processors access to knowledge that could improve their products
- Factory tours of other firms, which can be “invaluable” even when looking at a completely different kind of product
- Matching firms with complementary products that could create a joint product (e.g., one product’s waste becomes input for second product)
- Mentorship programs
- Membership directories and online forums to encourage peer-to-peer assistance and sourcing

[65] http://www.goodfoodaccelerator.org/about-the-accelerator/

- Competitive RFP's providing funding to support establishing of new collaborations around product development, supply chain, and sustainable production innovations
- Networking events and conferences
- Working committees on specific topics of interest

Policy/Advocacy/Awareness

- Increasing awareness of the industry in Chicagoland, "Made in Chicago" branding
- Reports studying and summarizing the state of the cluster
- Cluster awareness campaigns, including websites, brochures, etc.
- Firm recruitment
- Policy and regulatory issue analysis and lobbying

Chicagoland's Food Cluster Support Landscape

While the core of the food cluster is its businesses, a cluster by definition also includes the associations, research organizations, workforce training providers and other institutions that support the firms. Many Chicago area organizations offer some of the services detailed above, providing a network of resources that firms can access to support their growth. Most of these initiatives are not coordinated with each another and there is no single regional clearinghouse that directs firms to the appropriate forms of assistance.

Figure 15 details the landscape of organizations supporting the food cluster and the general services they provide (see Appendix B for further detail on most of these organizations). This list is illustrative, not definitive, as new organizations and initiatives continue to emerge. Figure 15 is focused on regional, food-specific efforts; national organizations and regional organizations involved in economic development or manufacturing are key partners in Chicagoland's food cluster, but are not detailed below. The same can be said for local programs with an agricultural focus (e.g., The Fresh Taste Foundation; CCT's Food:Land:Opportunity initiative; FARM Illinois) that may have an indirect effect on regional food manufacturers.

Figure 15. Organizations and Initiatives in Chicagoland's Food Cluster

Target Audience	Workforce and Education	Technology and Innovation	Incubators & Accelerators	Business Assistance (incl. Exports & Trade, Financing and Investment)	Networking Opportunities/ Collaboration Facilitation	Policy, Advocacy, Awareness
All/Not specified	CCC College to Career Program (Culinary Arts and Adv. Mfg.) Chicago High School for Agricultural Sciences Chicago Cook Workforce Partnership Kendall College – Culinary Arts Program	Chicago Section - Institute of Food Technologists IIT's Institute for Food Safety and Health (IFSH)	Industrial Council of Neareast Chicago (ICNC)	Illinois Manufacturing Excellence Center Global Midwest Alliance IL Dept. of Agriculture Trade and Marketing Programs Food Export Association of the Midwest USA	Global Midwest Alliance Midwest Food Processors Association	Midwest Food Processors Association
Small/early stage businesses		Connect Food Food Safety Innovation Center (forthcoming, at IFSH)	Kitchen Chicago Now We're Cooking Global Midwest Alliance – AIM + Face2Face	Small Manufacturing Alliance (SMALL) The Angel Food Network	Rising Tide	Kitchen Chicago Small Manufacturing Alliance (SMALL)
"Good Food" Businesses			Family Farmed – Good Food Business Accelerator The Plant GROW-Food	Good Food Festival and Financing and Innovation Conference Whole Foods Local Producer Loan Program SLoFIG	Family Farmed USDA Good Greens Midwest Chicago Dept. of Cultural Affairs Creative Industries Program	Family Farmed Fresh Taste Chicago Dept. of Cultural Affairs Creative Industries Program

Conclusions and Next Steps

As this report has illustrated, the food cluster is a major part of the Chicago region's economy, and these firms are facing a time of tremendous opportunity and challenge. While the resources diagramed above offer an ecosystem of support to assist firms with shifting market conditions, Chicagoland food businesses and institutions are not organized or actively working together to increase their collective competitiveness.

Developing more inter-firm collaboration is not simply a good idea given the interest of local firms – the realities of the next economy are making it increasingly essential that firms work together to develop their region's cluster. Increased competition from globalization, more rapidly changing technologies and market conditions, the concentration of assets in metropolitan regions and the positive spillover effects this generates, the proliferation of SMEs and niche producers – these trends and more are heightening the need for companies to work together on shared opportunities in ways that complement their competitive interests and, when applicable, distribute the costs of adapting to new market realities. Traditional industries, such as food, with longer histories of inter-firm competition and more ingrained processes, face an even stronger imperative to actively seek ways to collaborate.

Interviews with companies and organizations in the region indicate that there are several promising initiatives underway that help firms overcome the obstacles they face and explore emerging opportunities. There is also growing interest by food firms and other industry stakeholders in exploring more robust and strategic inter-firm collaboration. Leaders from the industry, food-related organizations and institutions and government agencies have begun discussions on what programs and processes can be designed to align development efforts. Other region's food cluster organizations (detailed in Appendix C) and academic literature on cluster formation (detailed in Appendix D) can serve as background to inform discussions on how the Chicagoland food cluster can organize collaborative efforts.

Building on the Chicago region's considerable assets in the food cluster will require a concerted effort. Given the notable opportunity and interest by firms in the region, supporting organizations and other stakeholders, there is palpable momentum around linking industry actors to create a stronger, more productive cluster. The next steps will require convening food industry leadership to establish a food cluster association, selecting high impact initial opportunities for inter-firm collaboration, and engaging firms and partners across the region to take advantage of the many opportunities for the region's food firms identified in this report. If done right, this process will build a Chicagoland food cluster for the next economy and beyond.