



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

A Study of Food and Beverage Manufacturing in New York State

**Todd M. Schmit, Kristen S. Park, Brian M. Henehan,
and Jeffrey Hall**

**Charles H. Dyson School of Applied Economics and Management
College of Agriculture and Life Sciences
Cornell University
Ithaca, New York 14853-7801**

It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

TABLE OF CONTENTS

Project Summary.....	iv
Introduction	1
Section I. Industry Survey.....	7
Survey Development and Administration.....	7
Respondent Demographics	9
Supply Chain Characteristics: Sales Distributions and Input Procurement.....	12
Collaborative Activities	15
Plant Growth	18
Employee Staffing and Capital Spending.....	19
Business Environment Factors.....	20
Key Lessons from the Survey	24
Section II. Focus Groups	26
Process	26
Barriers	26
Opportunities	28
Strategies	30
Key Lessons from the Focus Groups	32
Section III. The Effects of Internal and External Business Factors on Firm Growth.....	34
Analytical Method	34
Results and Discussion	40
Implications and Conclusions.....	41
References	44
Appendix	

TABLES

Table 1.	Value of Receipts and Number Employed by Food and Beverage Manufacturers .	1
Table 2.	Food and Beverage Manufacturing Economic Activity, by subsector, New York State, 2007	4
Table 3.	Average Annual Percentage Changes in Establishments, Sales Output, and Employment, by Industry Sector, 2002 to 2007	5
Table 4.	Distribution of Plants by Industry Sector, Comparison of Surveyed Respondents to Census	9
Table 5.	The Effect of Various Business Environment Factors on Respondents' Business.....	22
Table 6.	Variables Grouped by Principal Components with Associated Interpretations.....	24
Table 7.	Barriers Rated by Regional Food and Beverage Manufacturing Focus Groups.....	27
Table 8.	Opportunities Rated by Regional Food and Beverage Manufacturing Focus Groups	29
Table 9.	Firm-Level Strategies Developed and Rated by Regional Food and Beverage Manufacturing Focus Groups	31
Table 10.	Policy-Level Strategies Developed and Rated by Regional Food and Beverage Manufacturing Focus Groups	32
Table 11.	Variable Descriptions.....	37
Table 12.	Ordered Logistic Regression Results of Plant Revenue Growth	40

FIGURES

Figure 1. Plant Locations of Surveyed Firms.....8

Figure 2. Plant Locations of Firms with Useable Returned Surveys8

Figure 3. Distribution of Plants by Number of Employees10

Figure 4. Distribution of Plants by Revenue Category10

Figure 5. Distribution of Respondents by Industry Category11

Figure 6. Average Number of Employees by Industry Category11

Figure 7. Distribution of Plants by Age of Operation12

Figure 8. Average Sales Distribution by Market Channel13

Figure 9. Distribution of Plant Sales by Market Channel and Industry Sector13

Figure 10. Location of Plant Sales by Upstate and Downstate Plants14

Figure 11. Location of Raw Product Purchases by Upstate and
Downstate Plants.....15

Figure 12. Plant Utilization of Firm Collaborative Activities, by Type.....16

Figure 13. Plant Utilization of Firm Collaborative Activities, by Industry Sector16

Figure 14. Percent of Respondents Participating in Collaborative Activities by Size; non-
employer, small, medium, large.....17

Figure 15. Distribution of Average Annual Revenue Growth for Past Three Years18

Figure 16. Average Annual Revenue Growth by Industry Sector for Past Three Years
and Next Three Years19

Figure 17. Expected Changes in Employee Staffing and Capital Spending over the Next
Three Years20

PROJECT SUMMARY

The competitiveness of food and beverage manufacturing establishments in New York relative to other areas of the United States is of growing concern, and policy makers are increasingly looking towards agriculturally based opportunities to better take advantage of the large and diverse agricultural production sectors. Between 1997 and 2007, U.S. food and beverage manufacturing sales grew 38.3% (in nominal terms), while over the same time period sales by New York food and beverage manufacturers grew by less than half of that amount .

While growth in food and beverage manufacturing in New York State has languished behind national growth rates, food and beverage manufacturing performance within the state has been particularly strong relative to other manufacturing sectors. In particular, sales for all manufacturing in New York grew by less than 11% between 1997 and 2007. Value added contributions increased by over 50% in food manufacturing in the state, compared with only 7% in all manufacturing combined.

A project assessing New York food and beverage manufacturers was conducted to better understand important firm and market factors affecting industry growth and competitiveness, identify strategic advantages and barriers to growth, and to inform firms and policymakers focused on improving the competitiveness of the industry. The project centered on three primary and inter-related components:

1. First, a plant-level survey was conducted to collect current information on food and beverage manufacturing operations in New York.
2. Second, focus groups were conducted in four regions within the state to engage survey respondents to more specifically identify and prioritize key barriers to and opportunities for improved growth and competitiveness.
3. Third, a firm growth model was estimated using survey and secondary data to directly measure the effect of various factors on firm revenue growth and provide a more detailed picture of growth factors affecting the industry.

Younger firms had higher annual revenue growth rates than older firms. Anecdotal evidence from follow up focus groups indicated that little incentives exist for established, older firms to maintain the size of their operations, relative to programs or incentives aimed at new start-ups or firm expansions to create new jobs. Lower growth rates estimated here may be a consequence of such policies (or lack thereof). Policies focused on employee seniority incentives could be considered when more moderated growth for established firms is insufficient for long-term viability.

Larger firms were estimated to have higher rates of growth, consistent with expected benefits of economies of scale. The result based on past growth rates is also consistent with additional survey data that indicated a lower proportion of smaller firms were expecting to increase employee staffing or capital spending in the future. This result may be highlighting difficulties faced by smaller firms looking to increase plant size, but may be limited in doing so

due to capital constraints or more limited access to larger downstream markets. As such, the result provides some evidence of a need for additional support mechanisms (public or private) for beginning/small firms to improve their potential for successful expansion.

Increased access to raw agricultural inputs and growing population centers were important market conditions associated with higher annual growth. Policy options that improve efficiencies of market access should improve industry growth. This might include investments in transportation infrastructure or programs that provide better communication and collaboration between food processors and agricultural producers.

Increased food manufacturing firm concentration in more rural areas was associated with lower firm growth rates, presumably from higher competition effects with local firms primarily serving more local markets. With growing interest in developing local and regional food systems within smaller, rural communities, community planners and plant management need to be aware of competition issues and consider the development of policies or operational procedures reinforcing holistic community food-systems planning and the availability of collaborative firm activities that can offset negative competition effects.

Agglomeration benefits in some industries require a dense location of firms; however, external economies of scale in food manufacturing can often be created through cooperation between firms located in opposite corners of the state, just as easily as firms on opposite sides of the street. Follow-up focus groups provided anecdotal evidence of the ways in which these firms have benefitted from collaborations with other firms, including purchasing inputs with other similar firms to negotiate lower prices and using group distribution and sales. State industry associations were also beneficial in providing marketing and branding for their members, lobbying activities, and sharing knowledge and operational information. Policies that promote intra- or cross-industry collaboration would likely benefit food manufacturers, but these policies would not necessarily require geographic proximity between firms.

INTRODUCTION

Food and beverage manufacturing is an important part of a connected system of agriculture and consumption, transforming raw commodities into edible form, enabling us to store seasonally produced items until such time as we need it, and transforming commodities into value-added products. According to the 2007 Economic Census, New York State food manufacturing firms employed over 54,000 people and had revenues in excess of \$19 billion (Table 1).¹ However, the competitiveness of food and beverage manufacturing establishments in New York relative to other areas of the United States is of growing concern. Between 1997 and 2007, U.S. food and beverage manufacturing sales grew 38.3% (in nominal terms), while over the same time period sales by New York food and beverage manufacturers grew by less than half of that amount (Table 1). While this difference is due, in part, to changes in the composition of products manufactured and relative product prices, a similar conclusion on relative competitiveness is reached when comparing changes in employment over time. Between 1997 and 2007, overall employment in U.S. food and beverage manufacturing dropped 1.5% compared to a reduction of 5.1% in New York.

Table 1. Value of Receipts and Number Employed by Food and Beverage Manufacturers

	Value of receipts (Billion \$)			No. of Employees		
	1997	2007	% change 97 - 07	1997	2007	% change 97 - 07
United States – Food & Beverage Manufacturing ¹	\$518.7	\$717.5	38.3%	1,642,667	1,618,583	-1.5%
New York – Food & Beverage Manufacturing ¹	\$16.5	\$19.3	17.5%	57,145	54,258	-5.1%
New York– All Manufacturing ¹	\$146.7	\$162.7	10.9%	785,891	533,835	-32.1%

¹ Establishments with at least 1 employee

Source: 1997 and 2007 Economic Census; excludes maple syrup product manufacturing.

While growth in food and beverage manufacturing in New York State has languished behind national growth rates, food and beverage manufacturing performance within the state has been particularly strong relative to other manufacturing sectors. In particular, sales for all manufacturing in New York grew by less than 11% between 1997 and 2007, and overall employment dropped a precipitous 32.1% (Table 1). When considering growth in value added

¹ 2007 Economic Census, establishments with employees only.

contributions, the results are even more striking.² From 2000 to 2009, value added contributions increased by over 50% in food manufacturing in the state, compared with only 7% in all manufacturing combined (Bureau of Economic Analysis, 2009).

By locating within New York, food manufacturing firms benefit from proximity to raw commodity inputs. Agricultural producers also benefit from proximity to processors. The food manufacturing industry not only provides jobs and tax income for local communities, but also has been shown to increase incomes for local farms through increases in local commodity demand (Henderson and McNamara, 2000). Policymakers with an interest in creating jobs in rural areas often view agribusiness as a preferred method for rural development because the proximity to agricultural inputs provides rural areas with an advantage over urban areas for these industries (Lambert, McNamara, and Beeler, 2007).

With renewed concern at the state and national levels towards creating jobs in manufacturing, it is an opportune time to re-examine the drivers influencing the growth and performance of food manufacturing firms and to offer recommendations that support industry growth to firms and to policymakers. For example, President Obama signed the U.S. Manufacturing Enhancement Act of 2010 (Public Law No. 111-227) to reduce costs, increase production, and create more jobs in manufacturing industries. At the state level, there is renewed interest in increasing the capacity and competitiveness of the food manufacturing sector (Cuomo, 2010). New York's strong agricultural production base and large nearby populations may benefit manufacturers located in the state; however, other aspects of the state's business environment may reduce competitiveness (e.g., high taxes, energy and regulatory costs).

New York Industry Overview

An overview of the New York food and beverage manufacturing sectors is displayed in Table 2. As of 2007, over 4,500 food processing establishments existed in the state, representing both employer and non-employer firms; i.e., plants with and without paid employees, respectively.³ The number of non-employer establishments slightly exceeds those of employer establishments, and they represent a growing segment of firms within the manufacturing industry; i.e., the number of non-employer establishments has increased by nearly 25% since 2002. Some of these establishments may be new or start-up firms looking to grow in the future, but they may also be established small firms without expectations of adding payroll to their operations. From an overall industry perspective, they represent a small fraction of total industry

² Value added is defined as the difference between an industry's total output and the cost of its intermediate inputs, and represents payments to profits, for indirect business taxes, and to households through wages and compensation. In other words, value added represents contributions firms make to the overall wealth of an economy; i.e., contributions to gross domestic product or GDP.

³ Establishments are generally defined here representing individual plants, where individual firms may operate and own multiple plants.

output. In comparison, the number of employer establishments has decreased approximately 6% since 2002, a reflection of both plant exits as well as consolidations of existing plant operations.

Given the relative size of the state's dairy and fruit and vegetable production sectors, it is not surprising that dairy products and fruit and vegetable processing are the largest in terms of economic activity, with employment levels of 7,603 and 6,682 persons, respectively. However, supply side influences are only one reason for manufacturing plants to locate in the state. Large urban populations within the state also support numbers of bakeries and tortilla manufacturers (including retail bakeries) and other food product manufacturing sectors.⁴ These operations rely less on the proximity to bulky commodity supplies for processing and more on consumer proximity. In addition, many urban areas have sufficient transportation infrastructure to receive long distance arrivals of commodity inputs, from both domestic and foreign locations, for processing. Beverage manufacturing also represents a large sector in the state, with more than 5,000 employees, about equally divided between nonalcoholic (soft drinks, water, and ice) and alcoholic beverage (breweries, wineries, and distilleries) establishments.

As discussed previously, overall growth in food and beverage manufacturing in the state has outperformed non-food manufacturing sectors recently. However, growth by individual sub-sector varies considerably. To illustrate this point, consider the average annual percentage changes in establishments, sales output, and employment for employer-only firms from 2002 to 2007 as shown Table 3.⁵

⁴ Other food manufacturing includes industries with different productive processes, such as snack food manufacturing; coffee and tea manufacturing; concentrate, syrup, condiment, and spice manufacturing; and, in general, an entire range of other miscellaneous food product manufacturing.

⁵ Animal and pet food manufacturing was excluded.

Table 2. Food and Beverage Manufacturing Economic Activity, by subsector, New York State, 2007.

NAICS	Category	Employers				Non-Employers		Total	
		Establish-ments (No.)	Value of receipts (\$ Mill.)	Annual payroll (\$ Mill.)	Employee s (No.)	Establish-ments (No.)	Value of receipts (\$ Mill.)	Establish-ments (No.)	Value of receipts (\$ Mill.)
311	Food manufacturing	1,940	16,420	1,706	48,815	2,310	84.1	4,250	16,503.6
3111	Animal food	50	1,293	81	1,813	69	2.4	119	1,295.5
3112	Grain and oilseed milling	21	1,115	52	949	16	0.8	37	1,115.7
3113	Sugar and confectionery	121	563	79	2,217	191	5.8	312	569.2
3114	Fruit and vegetable	86	2,814	257	6,682	195	7.1	281	2,821.4
3115	Dairy	113	4,597	309	7,603	101	3.5	214	4,600.6
3116	Animal slaughter and processing	137	1,123	127	3,926	104	5.0	241	1,127.7
3117	Seafood	15	92	20	397	68	3.5	83	95.1
3118	Bakeries and tortilla	1,182	2,304	482	17,344	943	33.4	2,125	2,337.6
3119	Other food	215	2,518	298	7,884	623	22.6	838	2,540.8
312	Beverage & tobacco	201	2,918	239	5,443	140	11.0	341	2,928.6
3121	Beverages all	195	D	D	5,386	N	N	N	N
31211	Soft drink, water, & ice	63	1,695	122	2,692	N	N	N	N
31212	Breweries	24	773	74	1,463	N	N	N	N
31213	Wineries	108	D	D	1,231	N	N	N	N

Source: 2007 Economic Census.

Note: D = data disclosure issue; N = data not available. Excludes maple syrup product manufacturing.

Table 3. Average Annual Percentage Changes in Establishments, Sales Output, and Employment, by Industry Sector, 2002 to 2007.

NAICS	Category	Establishments	Sales	
			Output	Employment
3112	Grain and oilseed milling	0.8%	4.4%	1.6%
3113	Sugar and confectionery	-1.3%	-8.2%	-6.0%
3114	Fruit and vegetable	-2.8%	-0.2%	-1.0%
3115	Dairy	0.1%	8.9%	1.9%
3116	Animal slaughter & processing	-1.8%	1.7%	-0.8%
3117	Seafood	-1.0%	2.9%	-6.8%
3118	Bakeries and tortilla	-1.7%	0.7%	-0.9%
3119	Other food	-0.9%	8.0%	2.5%
31211	Nonalcoholic beverages*	-2.7%	7.0%	-3.6%
31212-31214	Alcoholic beverages*	8.6%	13.6%	4.1%

Source: Economic Census, 2002 and 2007; MIG, Inc.

*Due to data disclosure issues, relative changes in output and employment for these sectors are estimated from MIG, Inc.

The alcoholic beverage sector showed the only strong positive change in all growth measures, influenced largely by the strong growth in the wine industry over this time period.⁶ Changes in output reflect both changes in the production volume and market prices over time. Changes in employment are influenced by both changes in worker productivity and volumes of product produced over time. The point is to illustrate the considerable heterogeneity that can exist across subsectors, and demonstrate the need to more rigorously disentangle the effects of various firm, industry, and market influences.

Project Objectives

A project assessing New York food and beverage manufacturers was conducted to better understand important firm and market factors affecting industry growth and competitiveness, identify strategic advantages and barriers to growth, and to inform firms and policymakers focused on improving the competitiveness of the industry. The project centered on three primary and inter-related components. First, a plant-level survey was conducted to collect current information on food and beverage manufacturing operations in New York. The survey gathered information about: (i) plant demographics, (ii) the effect of the business environment on firm operations, (iii) the use and importance of firm collaborations, and (iv) past, current, and future growth projections regarding revenue, employee staffing, and capital investments.

⁶ The Economic Census provides only establishment counts for the alcoholic and the nonalcoholic beverage processors. Relative changes in output and employment for these sectors are estimated from MIG, Inc.

Second, focus groups were conducted in four regions within the state to engage survey respondents to more specifically identify and prioritize key barriers to and opportunities for improved growth and competitiveness. The focus groups then prioritized the types of public- and firm-based strategies to address the barriers and opportunities.

Third, a firm growth model was estimated using survey and secondary data to directly measure the effect of various factors on firm revenue growth and provide a more detailed picture of growth factors affecting the industry. This component of the project assesses the relative importance of various internal (firm) and external (market) characteristics on firm growth over time.

SECTION I. INDUSTRY SURVEY

Survey Development and Administration

A plant-level survey was developed to collect information on food and beverage manufacturing operations in New York. The survey gathered information on primary industry sector identification, plant size (revenues, employees), sales channel distribution, input procurement regions, effect of business environment factors, firm collaborative strategies, and past, current, and future growth projections regarding revenue, employee staffing, and capital investments. The survey was pre-tested with a group of individuals representing various manufacturing sectors and agricultural development agencies to assess the clarity of questions and level of useful information. A copy of the final survey is included in Appendix A. Both written and online versions of the survey were made available, and firms could choose which to complete and return.

A mailing database of 4,302 current food and beverage manufacturing establishments (including establishments with and without employees) was assembled using several data sources. These included purchased databases from Manufacturers News⁷ and Harris Interactive⁸, and publicly-available datasets from the USDA Meat and Poultry Inspection Database, New York Cattle Health Assurance Program⁹, New York Department of Agriculture and Markets Food Safety Inspection Service and also Pride of New York, New York Wine and Grape Foundation¹⁰, and the New York Maple Producers Association¹¹. In addition to the processing sectors described above as manufacturers, we also include maple syrup product processors within the scope of this project. While considered an agricultural product in conventional data reporting, it is an important industry in New York with processing required to convert it into edible products.

The survey was mailed to plants in the database in February 2009 and responses collected through May 2009. After deleting firms who were no longer in operation, as well as those mailed but returned as “undeliverable”, the net database included 3,684 identified establishments. A total of 482 (13%) useable surveys were returned. Figures 1 and 2 provide maps with the locations of plants on the original mailing database and locations of the responding plants. While the response rate was relatively low, a wide distribution of surveys by firm size, location, and industry sector was received.

⁷ Manufacturers News Inc., Evanston, IL (<http://www.manufacturersnews.com>)

⁸ Harris Interactive, Inc, New York, NY (<http://www.harrisinteractive.com>)

⁹ New York State Cattle Health Assurance Program, New York State Department of Agriculture and Markets (<http://nyschap.vet.cornell.edu>)

¹⁰ New York Wine and Grape Foundation, Canandaigua, NY (<http://www.newyorkwines.org>)

¹¹ New York State Maple Producers Association, Syracuse, NY (<http://www.nysmaple.com>)

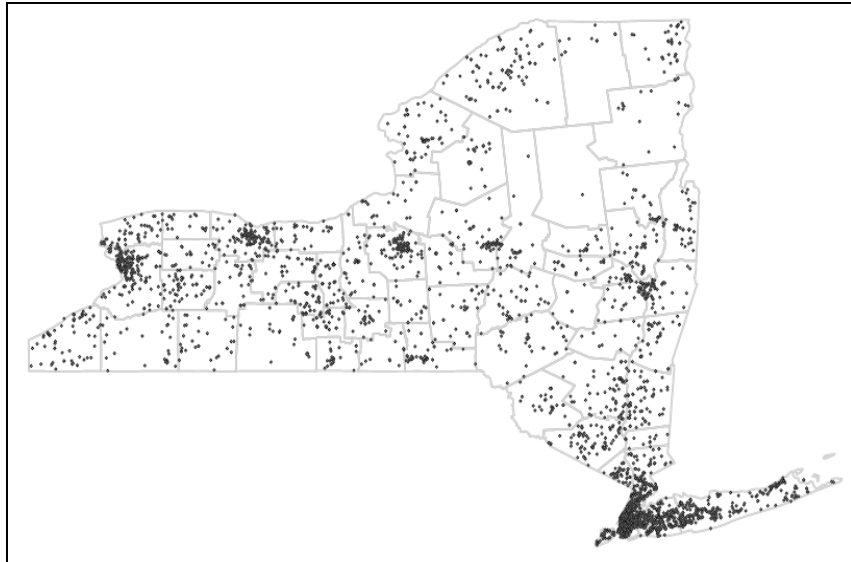


Figure 1. Plant Locations of Surveyed Firms (N=3,684)

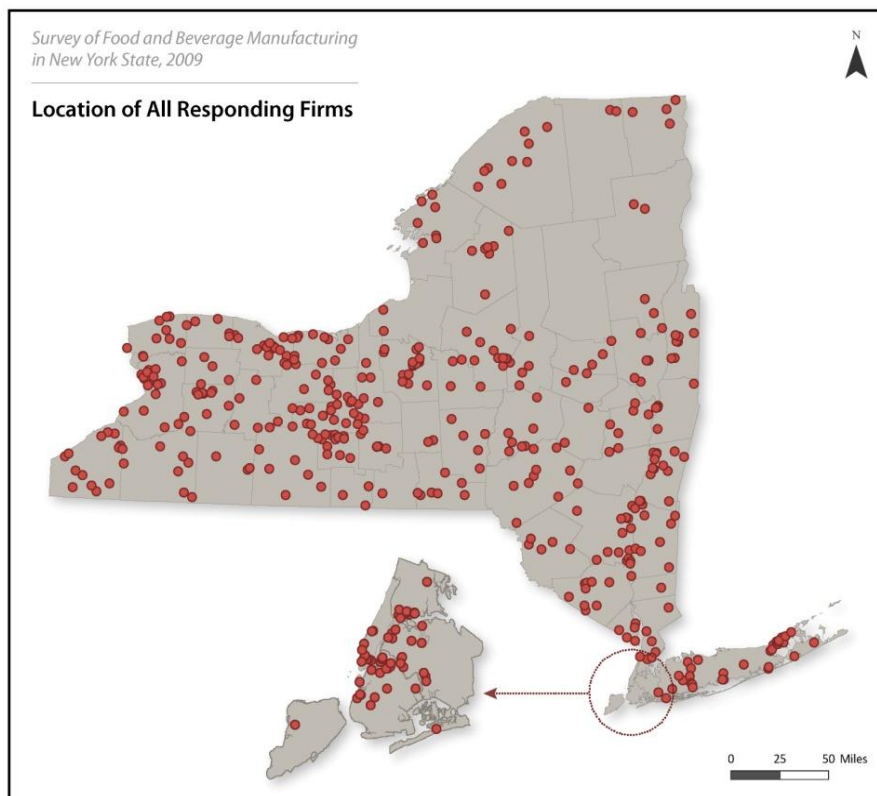


Figure 2. Plant Locations of Firms with Useable Returned Surveys (N=470¹²)

¹² Some returned surveys could not be located geo-spatially due to online anonymity or lack of a street address that has a physical location.

Survey responses were identified by industry subsector NAICs (North American Industrial Code) and the distribution of responses then compared to Census data in order to estimate the survey coverage by industry (Table 4). Using these calculations, the lowest rates of coverage were from bakery and tortilla (2.9%), other food (6.4%), maple (6.3%), and sugar and confectionary (7.1%) plants. The highest rates of coverage were from beverage (28.4%), meat (24.5 %), and dairy (20.6%) plants. Therefore, the survey responses would appear to under-represent bakeries and tortilla manufacturers and, to a lesser extent, maple producers and other food manufacturers.

Table 4. Distribution of Plants by Industry Sector, Comparison of Survey Respondents to Census

	No. of Census Establishments ¹	No. of Respondents	Respondents as a % of Census Establishments
Maple Syrup	1,313 ²	83	6.3%
Grain & Oilseed Milling	37	6	16.2%
Sugar & Confectionery	312	22	7.1%
Fruit & Vegetable Preservation	281	47	16.7%
Dairy Product	214	44	20.6%
Animal meat products	241	59	24.5%
Seafood Product	83	11	13.3%
Bakeries & Tortilla	2,125	61	2.9%
Other Food	838	54	6.4%
Beverages	335	95	28.4%
Total	5,779	482	8.3%

¹ U.S. Census Bureau, Economic Census, 2007

² USDA-National Agricultural Statistics Service, Census of Agriculture, 2007

Respondent Demographics

A large proportion of the survey respondents can be classified as small firms. Specifically, 17.7% of firms had no paid employees, either full- or part-time, and 61.8% of firms had less than ten (Figure 3).¹³ Even so, relative to Census estimates on the percentage of non-employer establishments (53%, see Table 2), this particular cohort group is under-represented by the survey respondents.¹⁴ However, when just employer establishments are examined, plant sizes are reasonable. The prevalence of smaller firms is also evident when comparing annual average revenues, where 63.5% of plants reported annual revenues of less than \$1 million (Figure 4).

¹³ The number of plants answering each question (N) is shown in each of the corresponding figures.

¹⁴ Maple processing data by number of employees is unavailable and maple surveys are excluded in these calculations.

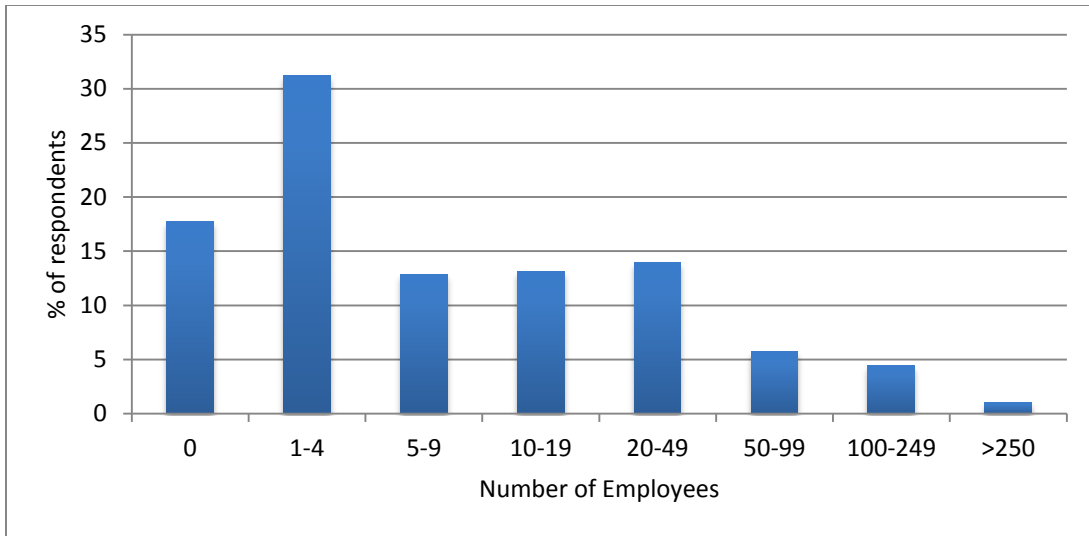


Figure 3. Distribution of Plants by Number of Employees (N=474)

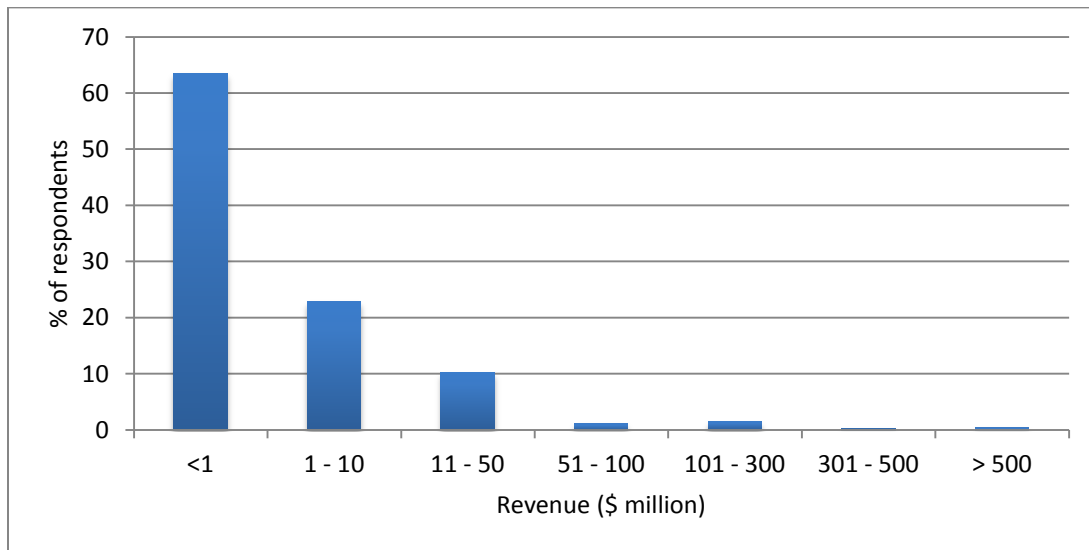


Figure 4. Distribution of Plants by Revenue Category (N=458)

Some industry sectors, by their nature, contain many small firms. From Figure 5, alcoholic beverage manufacturers (17.6%) and maple processors (17.2%) were the largest responding groups and contain a large proportion of small, entrepreneurial businesses. Maple producers had an average of 1.4 employees, the smallest average of all industry categories (Figure 6). Dairy processors showed the highest employment per establishment with an average of 65.0 employees. Non-alcoholic beverage respondents (e.g., carbonated soft drinks, bottled water) and sugar/confectionary operations had an average of about 42 employees.

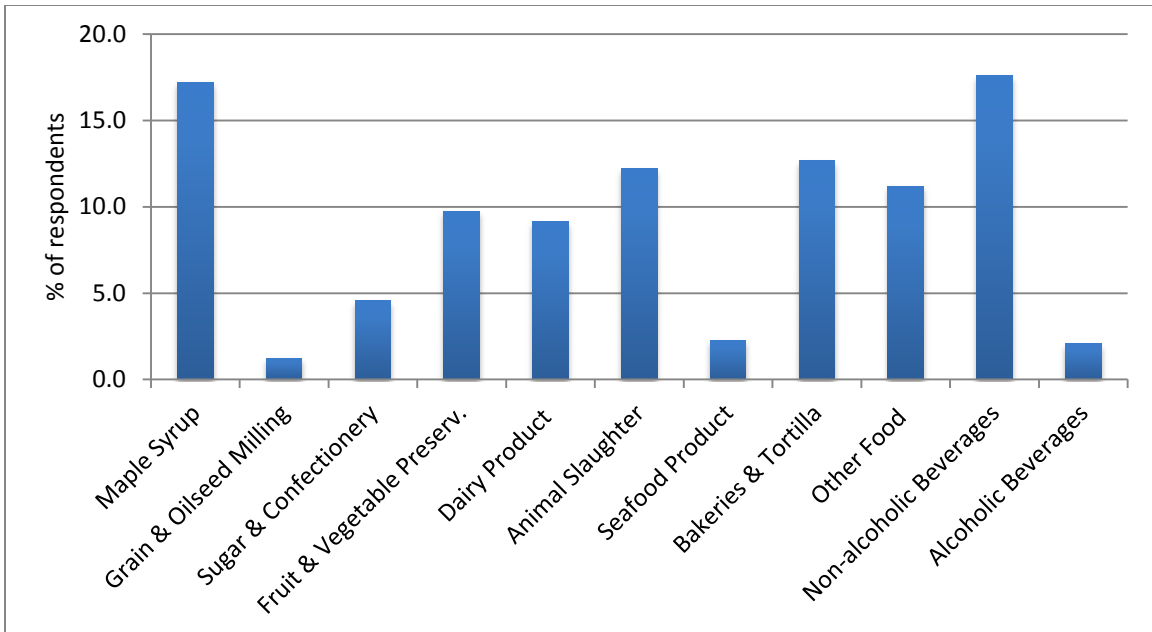


Figure 5. Distribution of Respondents by Industry Category (N=482)

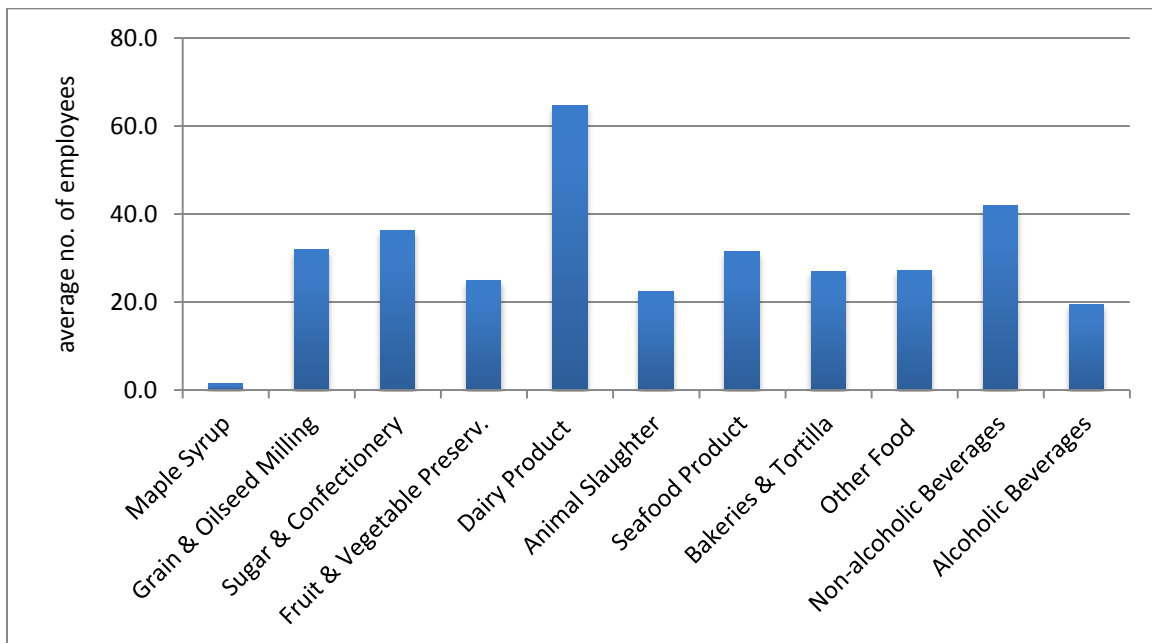


Figure 6. Average Number of Employees by Industry Category (N=474)

On average, responding plants have been in business for 29.6 years (Figure 7). Grain and oilseed milling plants have been in operation an average of 85 years, the longest of all industry categories, while the youngest plants were in the alcoholic beverage category, with an average age of 15.5 years. The younger age of alcoholic beverage manufacturers likely reflects the strong growth in the New York wine industry and entry of new wineries in recent years.

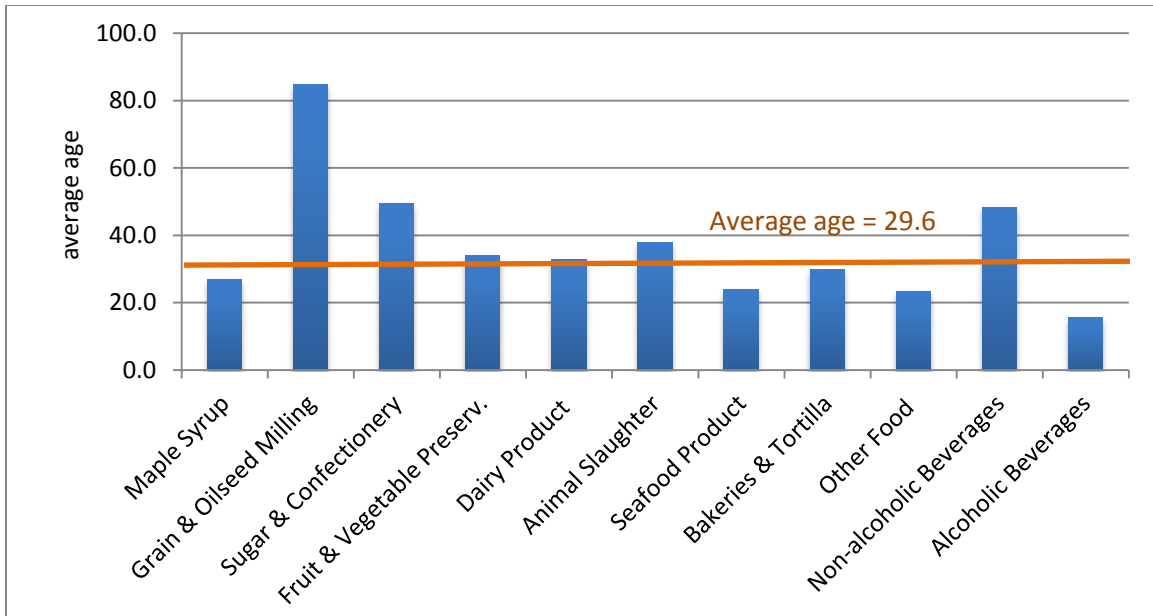


Figure 7. Distribution of Plants by Age of Operation (N=470)

The majority of responding plants belonged to single-plant firms; only 10.7% belonged to companies with multiple plants either in New York or elsewhere. Approximately 94.5% of responding plants were headquartered in New York. Of the plants located in upstate New York, 41.1% were either maple or alcoholic beverage processors. The largest numbers of downstate respondents were bakeries and the category “other food” processors, both making up 56.0% of downstate respondents.

Establishments were also asked about the production of organic products, and approximately 20.6% of respondents produced organic products as part or all of their processing activity. Of these firms, 51% viewed customer demand for their organic products as increasing, 34.4% believed customer demand as staying the same, and 2.1% expected a decrease consumer demand for their organic products.

Supply Chain Characteristics: Sales Distributions and Input Procurement

Manufacturing plants were asked to provide information on the distribution of product sales to various types of buyers (e.g., wholesalers, retailers, consumers, etc.). Across all respondents, 38.4% of sales were direct to consumers, and around 22.9% and 21.3% of sales were to wholesalers and retailers, respectively (Figure 8). Overall, only a small percentage of the respondents’ sales went to the foodservice industry (10.1%) or to other processors (5.9%). This sales distribution is strongly influenced by the high proportion of maple processors and wineries in the sample that sell primarily direct to consumer. Distribution of product sales by marketing channel for each industry category is shown in Figure 9. As one would expect, smaller respondents sold direct to consumers to a greater degree than did larger respondents. Firms with less than 10 employees sold an average of 50% of their sales directly to consumers.

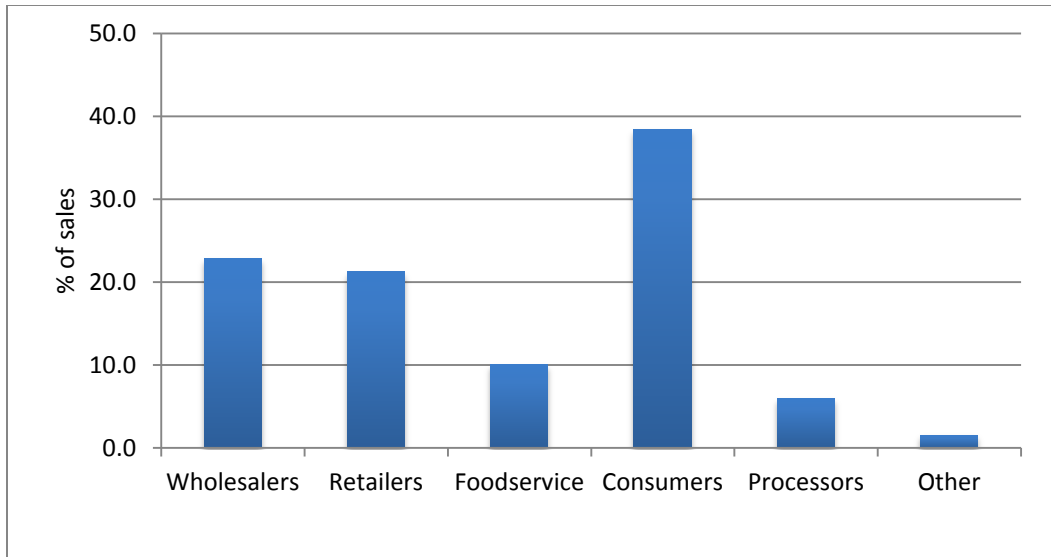


Figure 8. Average Sales Distribution by Market Channel (N=468)

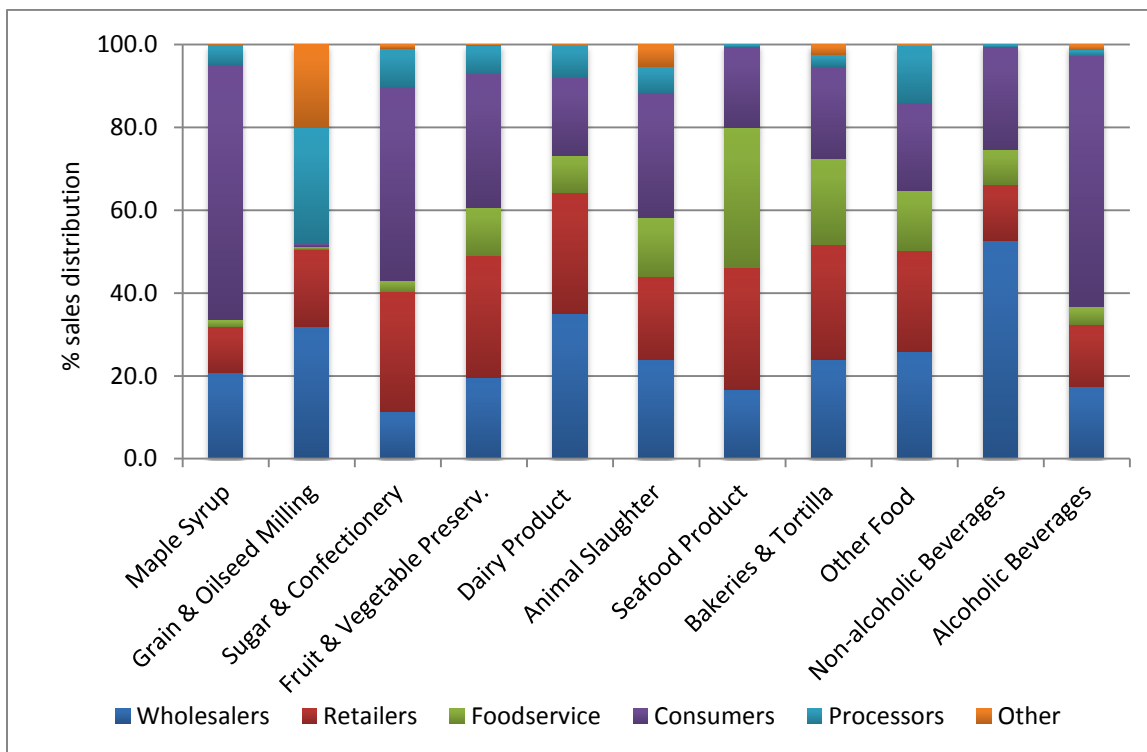


Figure 9. Distribution of Plant Sales by Market Channel and Industry Sector (N=468)

In addition to differentiating sales by customer type, plants were asked to estimate the proportions product sales by geographic region, specifically, the proportion of sales to buyers in downstate New York, upstate New York, elsewhere in the United States, or outside the United States. The majority of sales seemed to be near the location of the producer (Figure 10). Specifically, 71.3% of total sales for upstate plants went to upstate New York locations.

Likewise, downstate respondents sold, on average, 66.6% of total sales in the downstate area and 24.1% of total sales to other states. However, given their location, it is likely that much of these sales out-of-state are to the states surrounding the metropolitan downstate region such as New Jersey and Pennsylvania. These results are in line with the finding that 38.4% of respondents' sales are direct to consumers. Direct to consumer sales would tend to keep sales "local".

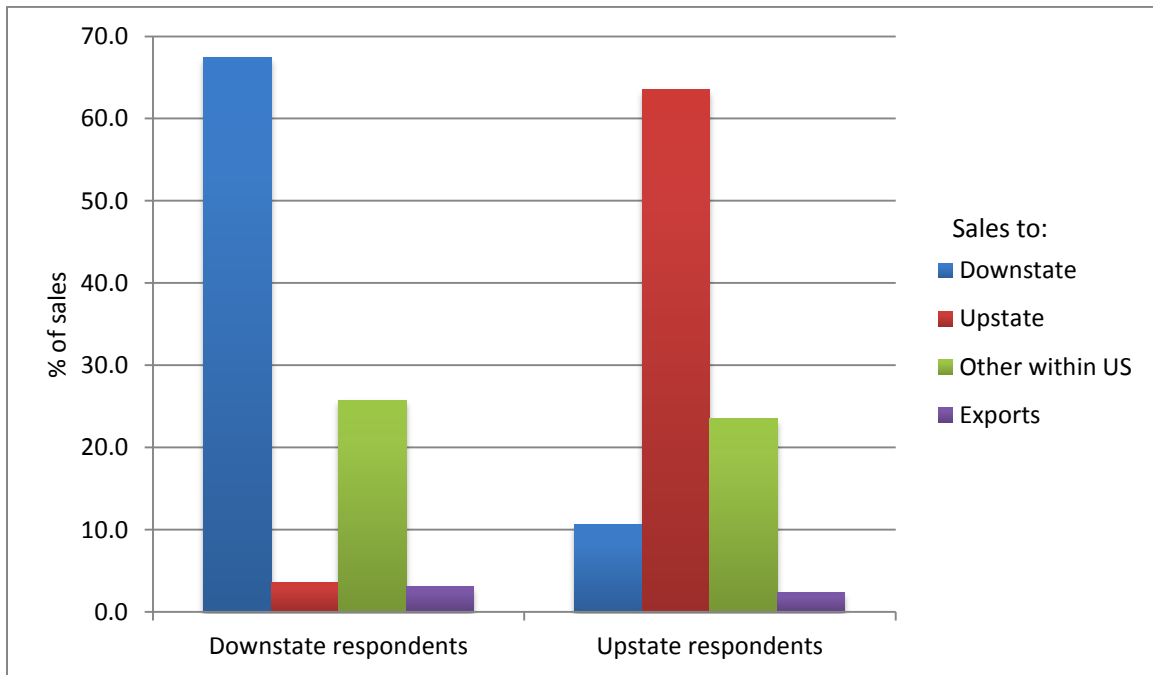


Figure 10. Location of Plant Sales by Upstate (N=333) and Downstate (N=83) Plants

Similarly, the location of respondents' commodity inputs tended to be near the location of the plants, with little interaction between upstate and downstate (Figure 11). Approximately 71.1% of upstate plants' raw inputs (on a cost basis) were sourced from upstate. Downstate food processors also tended to procure "locally" from the downstate area rather than upstate. About 51.6% of their input raw product costs came from downstate suppliers. In addition, 27.5% of raw input costs for downstate firms were sourced from other states, with much of that possibly from the more immediate tri-state area.

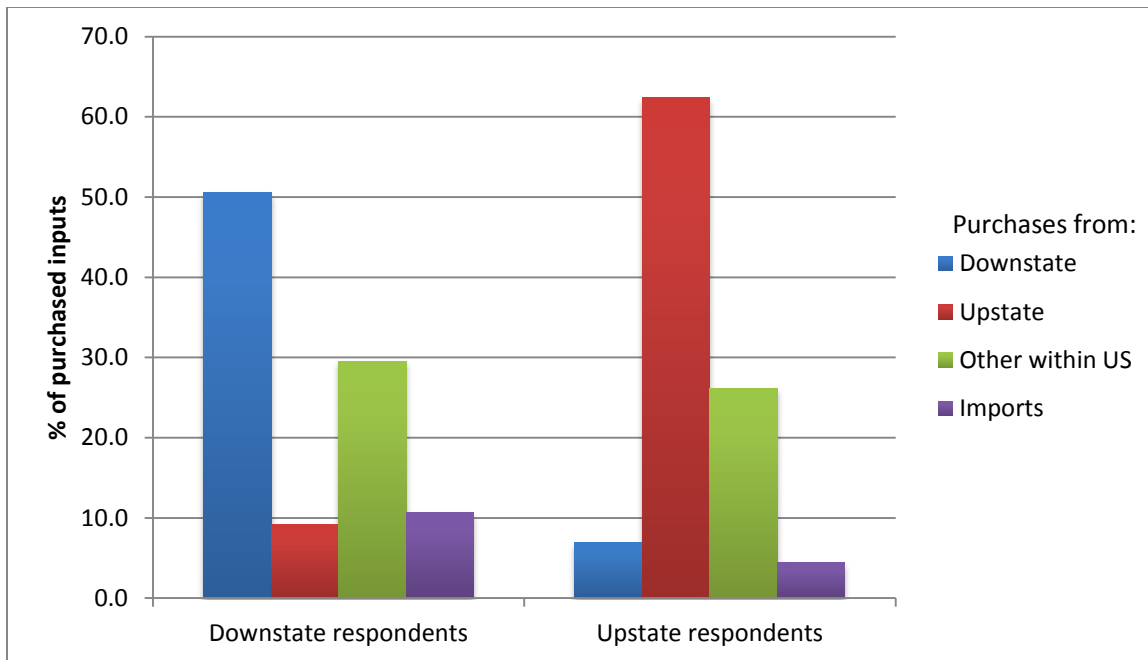


Figure 11. Location of Raw Product Purchases by Upstate (N=310) and Downstate (N=76) Plants

The results by input and output geographies have to be interpreted cautiously. Respondents' answers depended greatly on the structure of their supply chains. On the output side, sales by location may represent first-buyer locations, not necessarily where final distribution and/or consumption is made. For example, sales to wholesalers with locations proximate to a processing establishment, but with regional or national distribution networks will be reported as sales made within the region but actually results in national distribution. Similarly, calls fielded from coffee roasters, for instance, revealed that their definition of "raw product supplier" was their coffee supplier located in their area and not the country of origin of their bean producers. Further, for the majority of wineries and maple producers, roughly 35% of total respondents, raw product inputs are local vineyards and maple tree stands.

Collaborative Activities

Collaborative efforts, whether formal or informal, have the potential to streamline costs, eliminate redundancies, and create synergies among firms that help them remain competitive. Economies of scale created through collaborative efforts may be especially important in areas or industries that are smaller or more fragmented. The survey asked processors whether they currently participate in collaborative activities with other firms and asked how valuable those collaborations are. Types of collaborations presented in the survey for respondents to select included group purchasing, shared services, marketing and promotion, legislative affairs, workforce development, and distribution/transportation. The percentages of respondents who currently participate in each activity are shown in Figure 12. The most utilized collaborative activity was group marketing and promotion, followed by legislative affairs and group

purchasing. There was, however, considerable variation in utilization across industry categories, as shown in Figure 13.

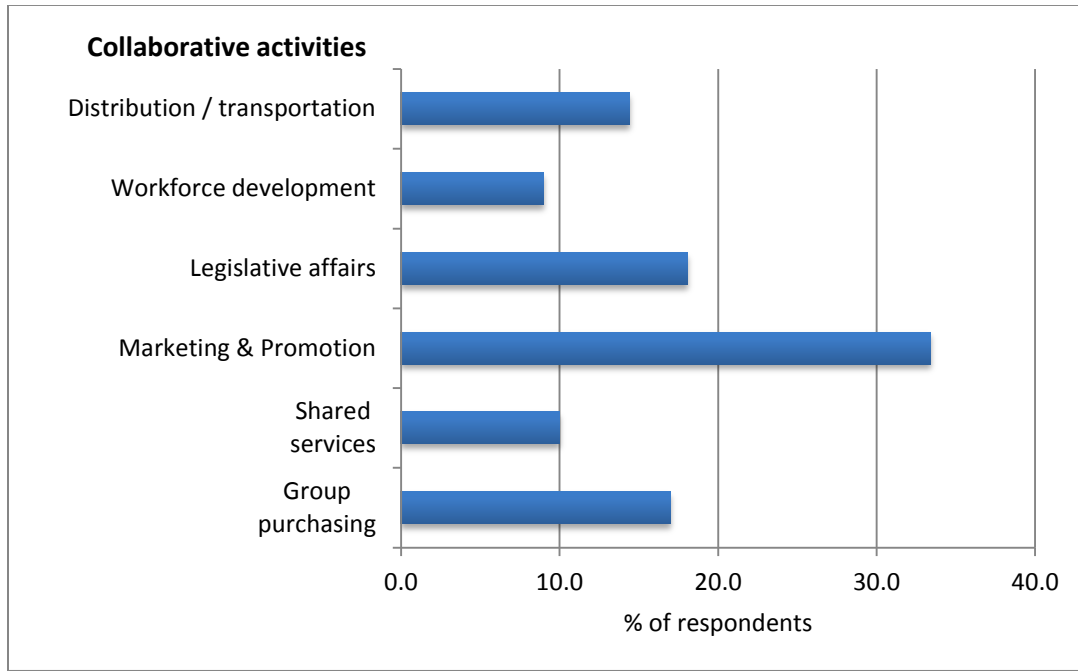


Figure 12. Plant Utilization of Firm Collaborative Activities, by Type (N=458)

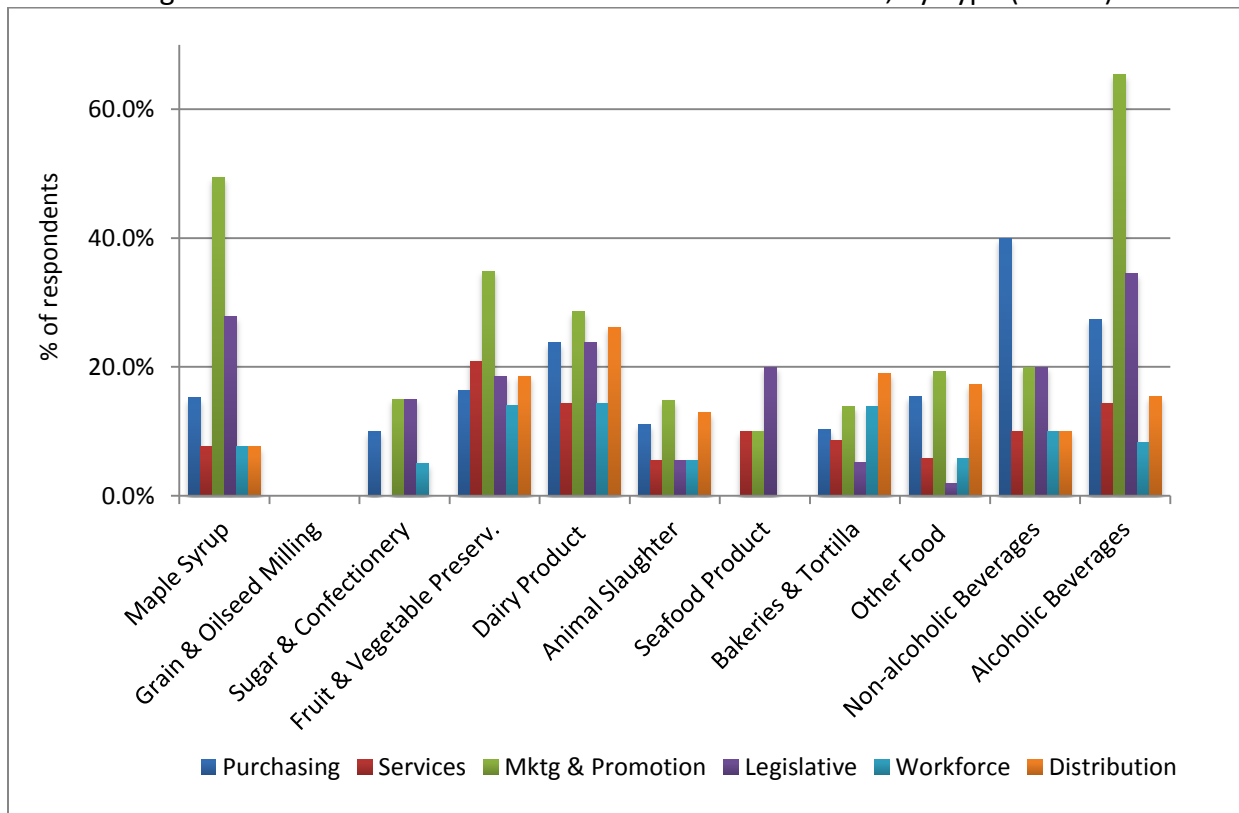


Figure 13. Plant Utilization of Firm Collaborative Activities, by Industry Sector (N=458)

Many of the industries have statewide industry marketing and/or lobbying organizations to assist their member businesses, such as the maple and winery industries. As a result, 49.4% of the responding maple producers participated in group marketing and promotion and 27.8% participated in group legislative affairs. Similarly, 65.5% of alcoholic beverage producers reported participating in group marketing and 34.5% participated in legislative affairs. Many fruit and vegetable processors and dairy processors appeared to utilize group marketing as well. Group purchasing was used most by the non-alcoholic beverage industry, with utilization of 40.0% by respondents.

As expected, a comparison of participation in collaborative activities by firm size shows different levels of utilization (Figure 14). Small firms and non-employer firms have the largest percentages of participation in group marketing and promotional activities, with 37.2% of non-employers and 38.6% of small plants participating in these activities. Large plants (over 50 employees) had the highest percent participation in group purchasing, legislative affairs, workforce development, and distribution and transportation activities.

Many collaborative activities that affect operations are not being used by processors with no employees. Collaborations in group purchasing and distribution/transportation would seem to be able to offer many benefits for owner-run businesses. From these results, two primary questions emerge. First, how can smaller firms develop better collaborative distribution strategies? And second, how can larger firms better access and develop an adequate workforce?

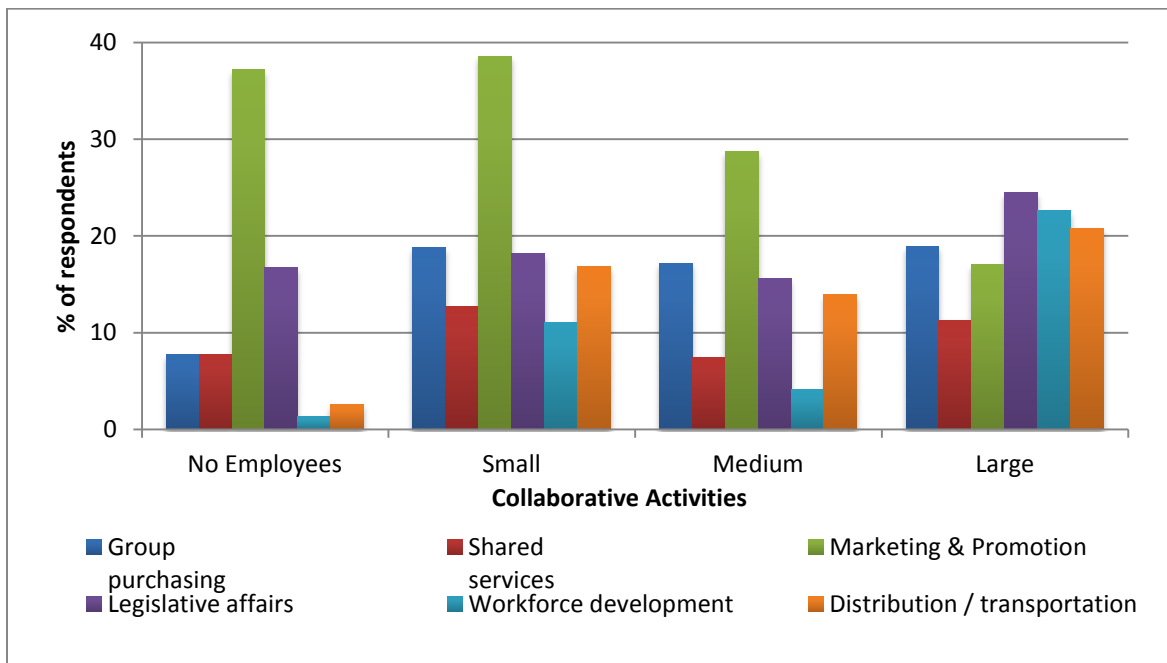


Figure 14. Percent of Respondents Participating in Collaborative Activities by Size; non-employer (N=78), small (N=197), medium (N=122), large (N=53)

Plant Growth

To gain information about respondents' economic performance they were asked to provide information on past performance (i.e., the past 3 years) and expected future performance (i.e., the next 3 years). Three different measurements of growth were surveyed, changes in annual revenues, employee staffing, and capital spending. In all cases, it was evident that there existed significant differences in the levels of reported growth across various plant demographics. A general description of the survey results are reported in this section, while a more comprehensive analysis delineating the importance of various firm and market factors is included in Section III on growth modeling.¹⁵

Revenue Growth

The majority of respondents reported positive past growth rates, with over 50% reporting at least 5% average annual revenue growth over the past three years (Figure 15).¹⁶ That said, there were a number of firms reporting negative growth, some quite substantial. Using mid-point values of the growth categories considered, average annual revenue growth for the past three years across all reporting firms was approximately 5.4%.

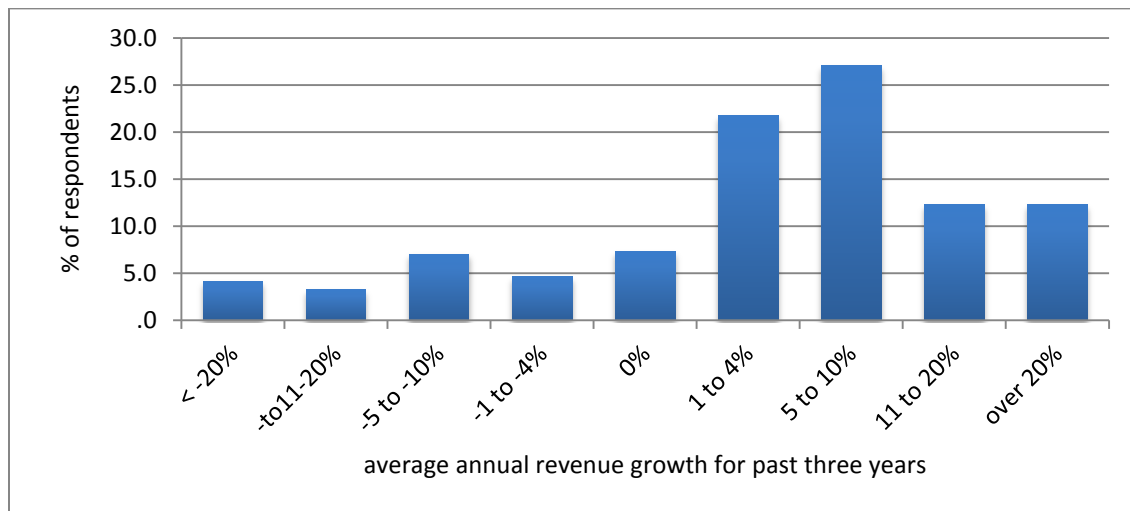


Figure 15. Distribution of Average Annual Revenue Growth for Past Three Years (N=454)

¹⁵ When administered in 2009, respondents were also asked for expectations of growth for the current operating year. Given the general economic downturn in 2009 (domestically and globally) that coincided with our survey, current-year growth estimates were expectedly more conservative. For brevity and ease of exposition, we focus our discussion on the past- and future-three-year estimates to focus on actual past performance and more general expectations about firm growth in the future.

¹⁶ In the survey, average annual revenue growth for the past three years was reported by food manufacturing firms using nine ordered and numerically assigned categories from -20% to +20%. A continuous growth value was assigned based on mid-point values of the ordered growth categories, and extreme categories were set at values corresponding to their minimum.

Average revenue growth estimates varied considerably by industry sector (Figure 16). Other food processors and alcoholic beverage processors reported the highest past and future revenue growth rates, while meat and sugar/confectionary sectors reported the lowest levels on average. Notably, fruit and vegetable processors reported a considerably higher expected rate of growth in the next three years compared to the recent past, while non-alcoholic beverage processors and milling operations had considerably more pessimistic expectations.

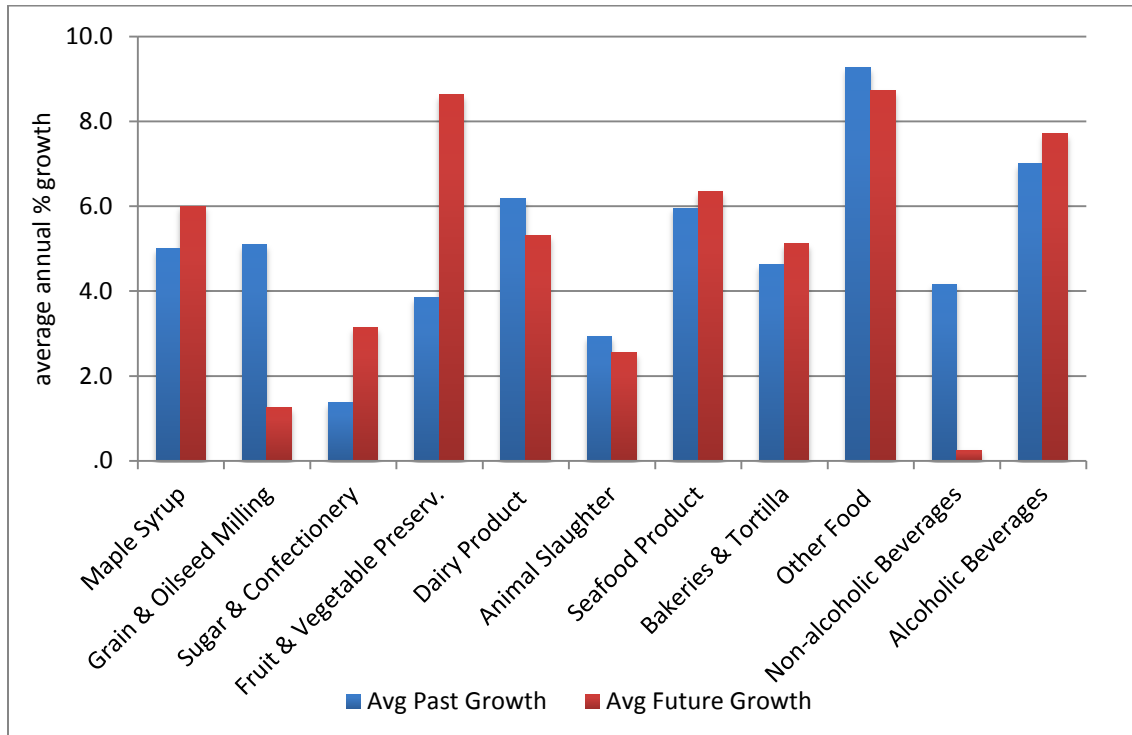


Figure 16. Average Annual Revenue Growth by Industry Sector for Past Three Years (N=454) and Next Three Years (N=435)

There is no clear correlation between firm size and revenue growth, and distinguishing revenue growth based on firm size in isolation is likely inadequate without also considering other factors such as age of establishment, industry sector, location, etc. More results on growth are presented in Section III.

Employee Staffing and Capital Spending

Employee staffing and capital spending projections offer insights into industry health and competitiveness. In particular, 37.4% of respondents expected to increase employee staffing over the next three years, while 4.3% expected to reduce staffing levels (Figure 17). Similarly, 35.2% of respondents expected to increase capital spending over the next three years, while 14.1% expected to decrease spending over the same time period. The higher proportion of firms

expecting to reduce capital spending is likely due, in part, to the general economic downturn at the time of the survey that may more greatly impact capital investment spending.

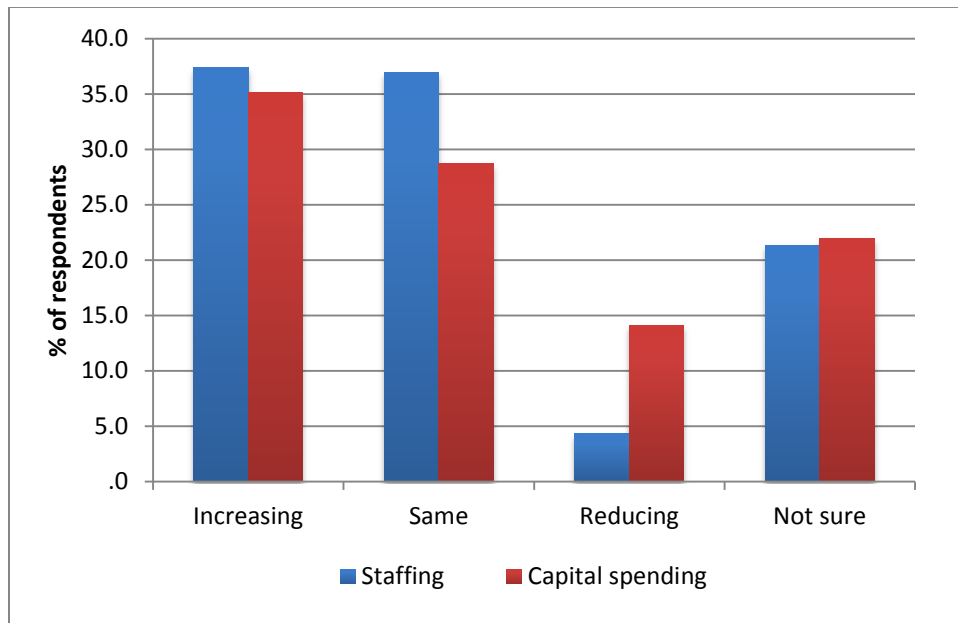


Figure 17. Expected Changes in Employee Staffing and Capital Spending over the Next Three Years (N=417)

In general, increased employee staffing and capital spending expectations were positively related to firm size, where a greater portion of large respondents expected to increase spending than did non-employer, small, or medium sized firms. The “other food” processors, alcoholic beverage processors, and dairy respondents appear to have the highest capital spending expectations.

In comparing future growth projections across industries, the “other food” sector showed consistently stronger growth expectations across all metrics (revenue, employees, and capital spending). This may be due, in part, to the more ‘specialty’ or ‘niche’ nature of the industries represented in this sector. Dairy, alcoholic beverages, and fruit and vegetable sectors followed in relative strength, with meat and nonalcoholic beverage sectors ranking at or near the bottom in all three categories.

Business Environment Factors

A general assessment of New York’s business climate was made by asking respondents to identify their level of agreement with the statement “New York State is a great place to do business”. Overall, 41.1% of responding plants either agreed or strongly agreed with this statement, while 33.7% disagreed or strongly disagreed (25.1% neither agreed nor disagreed). Maple and seafood had the most positive opinions of doing business in the state. Alternatively, “other food”, beverage, and meat processors had the most negative opinions. Interestingly, some

of the industry categories with the lowest opinions of doing business in New York had the highest growth rates (e.g., alcoholic beverage processors and other food manufacturers). Put differently, the level of current business growth does not define perceptions of the business climate in the state.

Firm retention is a concern for economic development in New York. To better understand the current climate surrounding plant closures and exodus in New York, respondents were asked if they were considering moving out of the state. The large majority was not considering moving out of state; specifically, 79.6% of respondents were not considering moving out of state at all, and only 1.3% reported aggressively considering moving out of state. While this is obviously skewed by the fact that the sample contains perennial crop producers who are tied to the real estate, such as wineries and maple processors, the results remain similar when looking at more traditional “bricks and mortar” firms that could more easily move operations elsewhere. Considerations of access to input and output markets may well play a role. While attention to firm retention should not be disregarded in food manufacturing sectors, it is perhaps more salient to consider the development of strategies and policy that keep existing firms economically viable and that aid in the creation of new establishments. To this end, we will focus our attention on a more detailed analysis of the business factors affecting the performance of existing firms in the state.

Factor Analysis

The state’s business environment was rated by respondents who were asked to assess the impact of various external business factors on their plant. Respondents ranked the ‘business factors’ on a five-point Likert scale, ranging from 1 (very harmful to your business) to 5 (very beneficial to your business). Table 5 lists the 23 business factors and their mean score in rank order.

Table 5. The Effect of Various Business Environment Factors
on Respondents' Business

Factor Description	Average Score
Quality of State college and university research, outreach, and assistance	3.87
Proximity of customer markets	3.83
Quality of communication infrastructure	3.80
Your region's overall quality of life	3.70
State branding, promotional and marketing campaigns	3.68
Regional or local branding activities and efforts	3.59
Quality of transportation infrastructure	3.58
Availability of trucking services	3.54
Proximity of input suppliers	3.54
Availability of product distribution services	3.50
Availability of alliances and collaborations with other firms	3.48
State support for energy efficiency and renewables	3.37
Level of State initiatives & growth incentives to support business growth	3.24
Availability of management and other professional staff	3.23
Availability of workers with the skills your business requires	3.23
State support for improved environmental practices	3.21
Ability to enter into Public-Private partnerships	3.18
Availability of workforce training opportunities	3.13
Labor force wage rates	2.87
The cost of living for your employees	2.66
State- and local-level governmental regulations and permitting procedures	2.47
Other costs of doing business	2.17
State-level costs of doing business	1.98

Note: Factors were rated on a five category Likert scale; 1=very harmful to business, 2=harmful to business, 3=neither harmful nor beneficial to business, 4=beneficial to business, 5=very beneficial to business.

The most beneficial business environment factors scored by respondents were university assistance, market access, and infrastructure availability. The most harmful of the New York business environment factors included state and local government regulations and state-level costs of doing business. All but five factors had an average score over 3; however none of them averaged four, “beneficial to business”.

Factors rated as beneficial could be considered competitive advantages. Firm and economic development strategies should be assessed to take full advantage of potential benefits. Factors rated as harmful on average could be considered barriers, to be overcome by crafting and implementing targeted strategies.

Since there were many different business factors scored by respondents, it can be difficult to establish general conclusions by analyzing each business factor in isolation. Moreover, many of the factors are closely related to each other, i.e. the state-level costs of doing business and

state government regulations, or availability of workers and availability of management. Strategies may be developed more effectively by grouping business factors that are closely related to each other. To establish possible groupings, we use a Principal Component Analysis (PCA) to reduce the large number of factors by finding correlations that will group them into a smaller number of unique components.¹⁷

Ultimately, the ratings of the 23 business environment factors were grouped into 5 principal categories or components, and average factor scores were computed. The aggregate factor categories listed in ranked order of perceived benefit included: (1) collaboration, marketing, and technical assistance, (2) infrastructure and market access, (3) state business incentive programs, (4) workforce availability and development, and (5) state business costs and regulations (Table 6).

The results, in general, are a compliment to New York activities that support collaborations, technical programs and infrastructure and access to markets. Considerations of state business costs and regulations are clearly seen as the least beneficial (or most harmful) and highlights a continued priority area of concern. To gain more insights on the survey responses, researchers conducted focus group sessions that are discussed in Section II.

¹⁷ A detailed description of the Principal Component Analysis used is available in Hall (2010).

Table 6. Variables Grouped by Principal Components with Associated Interpretations

Variable	Variable Description	PC Description	PC Mean
<i>l</i>	Quality of State college and university research and assistance	collaboration, mktg. and technical assistance	3.65
<i>q</i>	State branding, promotional and marketing campaigns		
<i>r</i>	Regional or local branding activities and efforts		
<i>s</i>	Availability of alliances and collaborations with other firms		
<i>a</i>	Quality of transportation infrastructure	infrastructure and market access	3.64
<i>b</i>	Quality of communication infrastructure		
<i>k</i>	Your region's overall quality of life		
<i>t</i>	Availability of trucking services		
<i>u</i>	Availability of product distribution services		
<i>v</i>	Proximity of customer markets		
<i>w</i>	Proximity of input suppliers		
<i>c</i>	Level of State initiatives for business growth	state business incentive programs	3.25
<i>d</i>	State support for improved environmental practices		
<i>e</i>	State support for energy efficiency and renewables		
<i>f</i>	Ability to enter into Public-Private partnerships		
<i>m</i>	Availability of workers with the skills your business requires	workforce availability and development	3.20
<i>n</i>	Availability of management and other professional staff		
<i>p</i>	Availability of workforce training opportunities		
<i>g</i>	State-level costs of doing business	state business costs and regulations	2.43
<i>h</i>	Other costs of doing business		
<i>i</i>	State- and local-level governmental regulations and permitting		
<i>j</i>	The cost of living for your employees		
<i>o</i>	Labor force wage rates		

Key Lessons from the Survey

The food and beverage manufacturing industries in New York State have exhibited modest growth in sales from 2002 to 2007, sales that have outgrown other manufacturing industries in the state. New York State has agricultural inputs for food manufacturers and also has a large consumer demand base. For these reasons, food and beverage manufacturing in the state should be competitive with those from other states. In addition, the food and beverage manufacturing base can support the New York economy, providing food, employment, and taxes.

Despite any advantages to being close to input supplies or a large consumer base, food manufacturers located in the two rather distinct regions of the state, termed upstate and downstate by those living in the state, do not appear to cross trade between the regions. Instead respondents do most of their business with “local” firms. For example, respondents located in upstate New York purchased on average 71% of their input supplies from firms in upstate New York. And respondents located in downstate New York, closely corresponding to everything within the metropolitan New York region and Long Island, purchase 52% of their supplies from downstate suppliers. This same invisible barrier exists with sales. Upstate respondents sold 71% of their sales to upstate customers, and downstate respondents sold 67% of their sales to downstate customers.

This study does not shed light as to whether the barrier is physical due to the difficulties of navigating trucks over the Hudson River bridges and in and around the tight metro region, or whether the barrier is cultural. It could be that most of these respondents are, by the nature of their industry supply chains and markets, local or regional companies, such as wineries and maple respondents.

Despite the poor economy when the survey was administered, more respondents than not were planning capital investments and/or increased hires in the next 3 years.

Average scores for most of the business factors external to the firm that were tested with the survey were not high. No factor had an average score of 4 or higher, 4 labeled as “beneficial to the business” and 5 labeled as “very beneficial to the business”. A general malaise with the state business environment was mostly expressed with low scores for items such as labor wage rates, cost of living for employees, state and local governmental regulations and state-level costs of doing business.

Collaborations in the form of cooperatives or alliances or even in the form of clubs or share groups are frequently used by business to generate economies of scale or to share information. Respondents appear to use collaborative efforts unevenly and yet they can become a major tactic in a firm’s long term strategy. In order to effect changes in New York’s business environment firms will need to act collaboratively. No one player will be able to accomplish changes in any factor mentioned above.

Many small respondents collaborate on marketing and promotion efforts but not for many other functions. Small- and mid-sized firms may be able to benefit greatly from researching other collaborations to reduce transportation and distribution costs, train workers, share services, and share best practices. More companies of any size could benefit by finding economies of scale in group purchasing and distribution and learning from share groups.

A harder look at these factors to parse out strategies to create a better environment for food and beverage manufacturers was conducted through regional focus groups across the state. These results are described under Section II below.

SECTION II. FOCUS GROUPS

The purpose of the regional focus groups was to solicit industry feedback about the survey results. The feedback helped researchers interpret the survey and further probe issues raised. The outcomes, and maybe the most relevant for industry action, is a prioritized list of business barriers and opportunities as well as potential firm and policy strategies that could leverage industry strengths and overcome obstacles.

Process

Focus groups were conducted in four regions throughout the state - Western, Central, North Central, and New York City. Every group refined and prioritized their own set of barriers, opportunities, and firm-level and policy-level strategies after seeing a brief presentation of survey results. Although each group was allowed to develop their own list of factors, they were presented an initial list of factors to start discussions. This method allowed for continuity across groups while at the same time allowing each group the freedom to include unique factors impacting their competitive status.

After a comprehensive list of barriers and opportunities were developed by the focus groups, members rated each factor on a scale of 1 to 5 where 1 was least important and 5 was most important. Member ratings were recorded via an e-clicker, a wireless data collection device used to register the input instantly. Votes were anonymous and a tally of all votes was displayed and discussed in real time during the sessions. A similar process was used in identifying and prioritizing firm and public strategies to improve the competitiveness of manufacturing firms in the state.

In order to represent many diverse industries located in the State, researchers composed focus groups that had broad representation by company size and type of manufacturer. Most of the participants had completed the written survey although some additional participants were personally invited to improve overall attendance. Although many industries present in New York were represented in the focus groups, some industries were not, including milling, confectioneries, and seafood. On average, 6 firms were present at each focus group, with a total of twenty-four enterprises participating.

Voting results were aggregated across all groups. No attempt was made to interpret results by individual industry, size, or geography, as the sample size was too small to allow disaggregation. That said, a broad range of participants were included based on firm age and size. Ratings were aggregated across all focus groups to determine how important each factor was to the focus group participants.

Barriers

Focus group participants and the advisory council raised and expounded on twenty-two barriers. Every member in each focus group then voted as to how important these barriers were to their firm. A summary of the top 10 is presented below in Table 7. The discussions of the

barriers listed below give voice to the industry’s frustrations with certain factors in the business environment.

Table 7. Barriers Rated by Regional Food and Beverage Manufacturing Focus Groups

Barrier	Average Rating
High state taxes <i>taxes overall, including property, income, workers comp taxes. shrinking tax base, non-competitive with out of state plants</i>	4.75
Insurance <i>Disproportionate increasing insurance costs; liability, product liability, health</i>	4.57
Increasing state licensing fees/inspection fees	4.16
Potential labor regulations regarding overtime, minimum wage	4.14
Availability & retention of younger, entry-level laborers <i>poor work ethic, w/less incentive to stay employed, new generation ‘expectations’</i>	3.80
Ban of trans-fats in foods not packaged (bakery) <i>targeted regulation relation to nutrition and health</i>	3.60
Raw material supply availability	3.50
High energy & utility costs <i>including costs to install new equipment to address efficiencies, multiple sellers/options</i>	3.25
State regulations outdated, inconsistent agency application <i>poorly trained agency employees,</i>	3.19
Unreasonable agency reporting requirements <i>duplicative, time consuming</i>	3.17

Many participants believe that New York State has more regulations than most other states and that these incur large costs and hinder the business community’s ability to successfully compete against out-of-state firms. Even state agency workers on the advisory council sometimes expressed interest in better relations and collaborations with other state government agencies.

In particular, high taxes was rated the most important barrier. Property taxes and income taxes were cited as being deterrents in the ability to attract quality labor from out of state and as contributing to high wage rates. This burdens plants in New York and compromises their ability to be competitive with out-of-state plants. Increased insurance costs of all sorts, including product liability, were rated second highest. Some manufacturers are frustrated being in an industry labeled as high-risk by insurers and yet not housing hazardous equipment or processes. Increases in insurance for worker benefits were also included as increasing costs of doing business.

At the time of this report, New York State, as well as the nation, is still deep in the recession which started in 2008. The State has increased many fees, such as licensing fees for food inspection and even fees for personal items such as vehicle registration. An increase in the establishment inspections licensing fee has inhibited further processing by small producers as some may not renew their license as a result. Shared-use kitchens and community kitchens may be a solution for some.

As well as state licensing fees, companies expressed frustration with multiple certification requirements. While the state inspects facilities, many buyers require specific third-party, food safety certification. A company might need to have 3-4 certificates, each of which has their own fees and their own inspection procedures.

Two of the top 10 barriers were associated with labor issues. Although labor issues were ranked of only moderate import, they elicited a lot of discussion. Companies expressed concern over the lack of available, younger, entry-level laborers. They also stated that even when they could find entry-level employees, they had a poor work ethic and were unmotivated to stay employed. One person wondered if the recent increase in the length of unemployment benefits provided even less incentive to remain employed. Another concern was that welfare recipients with young children or other responsibilities might not be able to move out of welfare into the workforce due to lack of support systems, such as affordable childcare.

Company comments on their ability to recruit skilled workers and managerial employees were divided. Whether the ability to recruit skilled workers and management was related to the industry sector, the recruitment practices of the company, or any other factor is unknown. Some companies expressed dissatisfaction with the high cost of living in the state and said that it impaired their ability to recruit managers from out-of-state. Others were satisfied with the number and skills of management-level employees in the state.

The remaining barriers were rated less important and did not generate the amount and vigor of discussion as did the top five. Even so, some may be relatively easy to resolve, such as poorly trained government employees who provide incorrect or inadequate information to companies, state regulations that are outdated, regulations that are inconsistent across agencies, unreasonable agency reporting or licensing requirements or those that are duplicative across different state agencies.

Opportunities

The focus groups discussed and scored a total of 17 opportunities for growth, and the leading 10 are presented in Table 8. Consumer trends for “local”, green, healthy products resonated with many participants. One company observed that “local” foods are not commodities.

The “local” consumer movement has benefited the wine trails in New York State according to winery participants. However, penetration into restaurants is extremely difficult. Even restaurants that cite all-locally sourced product, maintain wine lists that almost exclusively carry European and Californian wines.

Participants discussed increased consumer interest for products with health benefits and heritage and ethnic foods. Some locations in New York State have a surprising number of immigrants moving into the area, including Chautauqua County south of Buffalo. Supplying ethnic foods to immigrant populations was an opportunity for focus group participants.

New York City with the East Coast is seen as being a hotbed of food trends to rival California. Heritage foods were on the upswing in these trendy markets.

Table 8. Opportunities Rated by Regional Food and Beverage Manufacturing Focus Groups

Opportunity	Weighted Average Rating
Growing demand for local, green, environmentally-friendly products	4.13
Growing demand for functional foods, foods promoting healthy lifestyle	3.93
Supply chain innovations with distributors, etc.	3.75
Trends in consumer demand for heritage, ethnic foods	3.67
Growth opportunities in current product line, expandable per capita consumption	3.55
Sector partnering, across products, retail events, transportation/delivery	3.45
East coast momentum of food, gourmet location, chefs	3.43
Own energy production	3.25
New product development, new products demanded by consumers	3.15
Expanded industry-university collaborations	3.05

Some businesses felt an opportunity yet exists for increased per capita consumption of their products while others felt current accessibility to the sheer volume of consumers in the various markets in New York City, the Northeast, and the East Coast was an opportunity.

Supply chain development opportunities were also cited by the focus groups. Opportunities were specifically described as partnering with distributors and retailers in supply chain innovation. Continued pressure on distribution patterns due to increasing fuel costs and continued fear of high diesel prices will continue to drive innovations in distribution and supply chain.

Opportunities in partnering with other food processing sectors as well as cooperative marketing were discussed extensively. Opportunities that were discussed included direct marketing events, along with cooperative distribution and operations. Some partnering is occurring naturally in product combinations such as wine, cheese, and chocolates as these are frequently consumed together. A small creamery stated that she is packed with customers during events hosted by local wine trails. As a matter of fact, one weekend of wine sales during a wine trail event can generate \$0.25 to \$0.5 million in sales for wineries on the trail during the two days. Opportunities in conjunction with wine trail events can include listings and ads in promotional brochures and listings in other promotions. Products can also be offered through participating winery shops.

When fuel costs rose in 2007, one company became a transportation service provider and started picking up other products for a key retail account. They are looking for opportunities to partner with even more products for this and other accounts. Assembly, hauling, and other services may be activities where partnering or cooperation can provide needed economies of scale. One participant mentioned partnering would be needed by his industry to service retail accounts such as Wegmans or Walmart as his industry sector is fragmented and made up of small, independent processors.

Marketing opportunities at the New York City farmers' markets and farmers' markets in general were discussed. Some confusion existed over who is able to sell at the NYC farmers' markets, what radius the markets will accept as local, and the real sales volume opportunities to selling there. Consensus for most upstate groups was that NYC was not an opportunity for direct marketing efforts.

Surprisingly, although opportunities in consumer demands for local, green, healthy, products were scored as most important by focus group participants, new product development was not important to any company or focus group. One participant stated that new product development can be a long 3-5 year process with no guarantee of success. Another, a cheese maker, said their customers say they want new products but, in fact, do not buy new products when available.

Strategies

In addition to serving as a forum for discussing issues, the focus groups provided an opportunity for participants to talk about solutions. Focus group participants identified strategies which could be implemented to overcome stated barriers and leverage stated opportunities. They then rated how important these strategies would be to affect firm-level barriers and opportunities as well as public policy barriers and opportunities.

In general, groups struggled to come up with strategies that would be affective and ones they could rate as very important. The issues that were under discussion are those that firms struggle with on a daily basis. If they haven't been able to develop strategies yet to solve them, remedies must be elusive or difficult to implement. The strategies that the groups themselves discussed were not rated as important as the barriers or even the opportunities were.

Firm-level Strategies

Focus groups were asked to brainstorm achievable strategies that act at the firm level and then assess those strategies. Ten firm-level strategies emerged from discussions (Table 9). The one rated most important was a strategy to better engage and make use of services offered by existing agencies and vendors. Some participants have used service vendors to provide multiple services. For example, one firm who uses Cintas to provide safety supplies found out that they also provide mandatory defibrillator training. Companies like these can provide 1-stop shopping. The one-stop shopping can offer a huge savings in management time for some companies.

Another service provider, Paycheck, was also used to develop a safety audit and safety program. A different participant also used Paycheck to develop a premium human resources program and had them develop a new human resources manual/handbook containing all the legal requirements and develop a customized human resources program and benefits, outlining vacations and insurance benefits.

In addition to marketing or lobbying services, trade associations may also provide other services for members. The New York State Wine and Grape Foundation recently spent \$100,000 to develop a training curriculum for winery tasting room employees. The curriculum was developed by the Rochester Institute of Technology and it will also be offer to liquor stores to help train liquor store employees.

Table 9. Firm-Level Strategies Developed and Rated by Regional Food and Beverage Manufacturing Focus Groups

Firm-level Strategies	Weighted average
Utilize service agency vendors more for multiple services and training (safety, medical, HR, payroll, staffing)	3.83
Stronger industry association activities for consumer education and product promotion, loyalty programs	3.74
Develop firm networks for operational activities (distribution, bulk buying/shipping, waste management)	3.21
Industry investment/grants for workforce development training programs	2.79
Industry check-off programs to fund research and promotion	2.82
Cross-industry and cross-commodity promotions and special events	3.30
Sharing financial information to establish industry benchmarks	2.68
Shared use/community kitchens for small processors	1.50
Attendance at trade shows, food shows, etc. for S/D firm connections	3.29
Own/group energy production	3.25

The power of cooperation emerged in the strategy discussions. Focus groups discussed ways to cooperatively enhance promotions and marketing. Some participants were members of a distribution cooperative for refrigerated and frozen foods that also coordinates marketing, demonstration, promotion, and merchandising activities. One firm was interested in finding a purchasing network with internet clearinghouse for supplies and another is currently a member of a consortium for buying natural gas in bulk. Dairy industry members have a number of group purchasing efforts for supplies.

Policy-level Strategies

Policy-level strategies that involve changes to state agencies and programs may have a low success rate or may be extremely difficult for an individual firm to implement. Eleven

policy-level strategies were reviewed, and these were, on the most part, rated more important than the firm-level strategies discussed above (Table 10).

The most important strategy rated by the focus groups is to increase the awareness of the food and beverage industry in the state and to place a priority on improving the climate for the industry. These industries do, in fact, provide important jobs, products, and welfare to the state, and a priority on helping the industries could benefit the state and its consumers. One group stated that nothing can really be improved and implemented unless there was a strategy in place to address the overall fiscal problem of the state.

All focus groups felt it would be important to have a comprehensive review of the regulatory state agencies to review and assess agency reports, inspections, and fees. The review would look for areas to reduce redundancies, streamline paperwork and reporting, and repeal outdated regulations.

Table 10. Policy-Level Strategies Developed and Rated by Regional Food and Beverage Manufacturing Focus Groups

Policy-Level Strategies	Weighted average
Prioritize improvement in food and beverage manufacturing	4.25
Address overall New York fiscal problem	4.25
Comprehensive regulatory review - duplicate agency reporting, inspections, licensing fees/rates, business taxes	4.08
State promotions/advertising for local-ism, sustainability, health, public awareness	3.86
Increase College/University technical assistance & research programs (energy savings/choices)	3.36
ESD program expansion with Minority of women-owned businesses for food and beverage manufacturing	3.29
Institutional/school curricula development, and food service for "local" products	3.14
More focus on job retention programs rather than job creation programs	3.04
Export assistance programs	3.00
Increase Cornell Cooperative Extension Economic Development staff and programs	2.98

Key Lessons from the Focus Groups

New York food and beverage manufacturer respondents indicate that the most important barriers tend to be those imposed by government. Examples include taxes, inspection and licensing fees, labor regulations, and outdated regulations.

The industries are enthusiastic about some significant consumer trends, but they may need to make investments in marketing and customer development and new product development to take full advantage of these.

Strategies – Firm-level strategies, in general, were not rated as important as policy-level strategies, and discussions to generate firm-level strategies lagged. The strategies that did offer benefits to focus group participants included proactive strategies that the firm can implement directly or in collaboration with other firms. These collaborative and networking efforts appear to be reasonable, doable, and can have an impact on competitive health:

- work with and learn from others:
 - collaborations and networks for marketing, research, promotions
 - streamlining management efforts by using multiple services offered by existing providers

In general, government spending is currently shrinking and traditional economic development programs may not be reliable or may not be reliably available. In addition, changes in policies may be too difficult to achieve with too little impact on efficiencies and operations to offer a quick return on investment. Because of this and because making governmental changes are difficult, changes at the policy level may be long-term strategies:

- Inform policy makers about the economic contributions of the food and beverage industries to the State and to the well-being of its citizens. Contributions by the food and beverage industry include employment, income taxes, real estate taxes, support of agricultural suppliers, and support of inputs industries.
- Conduct a regulatory review to determine redundancies in paperwork or licensing and ways to streamline government reports.

SECTION III. THE EFFECTS OF INTERNAL AND EXTERNAL BUSINESS FACTORS ON FIRM GROWTH

With renewed concern at the state and national levels towards creating jobs in manufacturing, it is an opportune time to re-examine the drivers influencing the growth and performance of food manufacturing firms. Given recent structural changes occurring in the food production and processing sectors (e.g., increased vertical integration, expansion of private-label products, and growing demands for ‘local’ foods), it is also important to consider changes in the impacts of agglomeration activities or external scale economies derived from the clustering of similar and related industry firms on manufacturing firm performance.

Marshall (1920) defined three primary sources where changes in transport costs arise – location near suppliers and/or customers, labor market pooling and intellectual spillovers. While changes in technology and competition have diminished traditional roles of firm location (e.g., resources and capital can be efficiently sourced from more distant markets), new influences of clusters on innovation, competition, and cooperation have taken on growing importance (Porter 2000).

Clusters can be defined and developed in numerous ways (e.g., co-location of similar firms, vertically integrated firms, or firms reliant on similar input or output markets); however, their commonality for our purposes is that the external scale economies generated provide benefits to members of the clusters that can enhance the competitiveness and rate of growth of firms contained within them. While benefits are possible, identifying preferred cluster strategies and developing the appropriate institutional environments are difficult, particularly in rural areas with more limited resources (Barkley and Henry, 1997).

Our objectives are to identify the importance of various firm, market, and agglomeration factors affecting more recent growth in food manufacturing and to inform recommendations for firms and policymakers that support industry growth. Knowledge of the factors associated with food manufacturing establishment growth can also assist local governments and community leaders in evaluating prospects for increasing value added opportunities and markets for local agricultural products. A renewed examination of firm- and market-related factors influencing firm growth in food manufacturing can importantly inform policy efforts.

Analytical Method

Using the survey data described above, our focus is on changes in individual firm revenue growth from 2006 – 2009.¹⁸ A firm’s output growth is assumed to be dependent on a set of firm-specific factors and influences that arise from the firm’s environment. These additional

¹⁸ Many maple producers in the survey expressed that they produced maple products primarily as a hobby. Because they may not be operating in the manner of a profit-maximizing firm, maple producers were excluded from this analysis.

influences include external socioeconomic factors in the firm's local economy and agglomeration factors relating to similar- and related-firm clustering and/or production activities.

Firm-specific effects accounted for include the firm's age, size, and industry sector. Our empirical approach also estimates the impacts to firm revenue growth for food and beverage manufacturing firms from the agglomeration of both similar and related firms within the food value chain. Specifically, we model same sector (i.e., food manufacturing), upstream sector (agricultural production) and downstream sector (food wholesalers, retailers, and service providers) firm agglomeration influences simultaneously to better examine the ways in which food manufacturing firms may benefit from alternative food industry levels of firm clustering.

Urbanization economies and other market-based effects are accounted for with variables reflecting consumer population parameters. The quality and cost dimensions of local labor markets are accounted by including county-level manufacturing wage rates.

To account for the heterogeneous nature of the data, food manufacturing firm agglomeration effects are allowed to vary with the level of local urbanization. In a policy context, this differentiation is important when addressing competitive disadvantages faced by rural areas; e.g., the importance of positive feedback and proper institutional environments arising from establishment co-location (Shonkwiler and Harris, 1996; Barkley and Henry, 1997; Davis and Schluter, 2005). Clusters are present in both rural and urban areas and their effectiveness is likely differ at different locations based on the segments in which the member companies compete and the strategies they employ (Porter, 2000).

We use county-level data from government sources as well as the data from the survey to describe the business environment factors of interest. Table 11 lists each variable in the analytical model as well as a brief description and the source for the data. In our survey, average annual revenue growth for the past three years was reported by food manufacturing firms using nine ordered and numerically assigned categories.¹⁹ However, since independently characterizing nine discrete levels of growth may be problematic statistically and intuitively difficult to distinguish, growth categories were aggregated to five: (i) strongly negative, less than -10%, (ii) moderately negative, -1% to -10%, (iii) zero, (iv) moderately positive, 1% to 10%, and (v) strongly positive, more than 10%. Given the categorical nature of the data, we estimate an ordered logit regression model where the probability effects of each independent variable on the categorical placement were determined.

¹⁹ The nine survey categories were: less than -20%, -11% to -20%, -5% to -10%, -1% to -4%, 0%, 1% to 4%, 5% to 10%, 11% to 20%, and more than 20%.

Model Variables

Plant age and size variables, along with industry sector dummy variables are included to account for plant-specific variation. A sufficient number of alcoholic beverage (AlcBev), bakery and tortilla (Bakery), meat processing (Meat), dairy product (Dairy), fruit and vegetable (FruitVeg), and sugar and confectionary (Sugar) plants permitted the assessment of sector-specific effects. The remaining plants were included in the Other category.²⁰

Since many firms in our sample had only a few or no paid employees, we use the percent of all establishments in a county in food and beverage manufacturing (FBEst) to represent firm clustering of similar manufacturing establishments. Given that food manufacturing occurs across a spectrum of spatial rurality or level of urbanization, we examine whether food manufacturing cluster effects vary with the level of urbanization. Firms located in more urban areas likely have different cost structures than firms located in more rural areas and, therefore, may have differential benefits from clustering. Additionally, smaller populations in more rural counties may make processors more sensitive to competition effects from other processors in the area or be more limited in labor resources and other institutional endowments. Accordingly, we interact FBEst with a measure of urbanization; specifically, the percentage of all households in the county located in urbanized areas.

Following our approach for defining food manufacturing firm clustering (FBEst), we account for potential downstream firm clustering effects by including the percent of establishments classified as food wholesalers, food retailers, and food service providers (WRSEst). It was hypothesized that firm clustering of downstream food system sectors will have a positive effect on firm growth as a demand-pull component. Within New York, WRSEst is greatest in counties near metropolitan areas, but low within the counties containing the metropolitan areas themselves.

About 38% of all plant sales from our sample were direct to consumers (Hall, 2010). As such, downstream effects may also be captured by spatial differences in consumer populations. Population variables are commonly included in similar studies to more fully incorporate urbanization economies. Accordingly, we include variables representing county-level population density (Density) and population growth rate (PopnGrow) (Table 11).

As discussed above, we also consider the level of upstream food industry agglomeration activities associated with agricultural production. Rather than using establishment (farm) count data as with FBEst and WRSEst, we follow previous studies and include cash receipts from crops and livestock marketings per capita (AgMktgs). The measure should better reflect the concentration of agricultural production and serves as a proxy for the availability of raw materials to be processed into manufactured foods (Goetz, 1997).

²⁰ Grain and oilseed millers, seafood processors, and non-alcoholic beverage manufacturers were included in the Other category along with other food manufacturers.

Food manufacturing firms' wage rates will be influenced by local wage rates for all manufacturing employees. As such, attributes of the local labor conditions were proxied by county-level manufacturing wage rates (Wage). Given labor requirements may differ across industry sectors, wage rate and industry sector interaction effects are initially specified.

Table 11. Variable Descriptions (N=348)

Variable	Description	Source
FIRM LEVEL:		
Dependent variable:		
Growth Category	Category of average annual revenue growth, past three years: Strongly negative (< -10%), Moderately negative (-1% to -10%), (13%), No change (0%), Moderately positive (1% to 10%), Strongly positive (> 10%)	survey
Independent variables:		
Years	Number of years plant has been operating	survey
Employees	Number of full- and part-time employees	survey
Sugar	Sugar and confectionary product manufacturing (NAICS 3113)	survey
Fruit_veg	Fruit and vegetable preserving and specialty food manufacturing (NAICS 3114)	survey
Dairy	Dairy product manufacturing (NAICS 3115)	survey
Meat	Animal slaughtering and processing (NAICS 3116)	survey
Bakery	Bakeries and tortilla manufacturing (NAICS 3118)	survey
Alc_BEV	Alcoholic beverage manufacturing (NAICS 31212-31214)	survey
Other	Grain and oilseed milling (NAICS 3112), seafood processing (NAICS 3117), non-alcoholic beverage manufacturing (NAICS 31211), other food manufacturing (NAICS 3119)	survey
COUNTY LEVEL:		
Wages	Average annual pay for manufacturing employees (\$000)	U.S. Bureau of Labor Statistics, 2008
FBEst	Percent of establishments in food and beverage manufacturing (NAICS = 3112-3119, 3121)	U.S. Census 2009a
AgMktgs	Cash receipts from farm marketings (crops and livestock) per capita	USDA 2009, U.S. Census 2009a
WRSEst	Percent of establishments per capita in food and beverage wholesale, retail, and service (NAICS = 4245, 4248, 445, 722)	U.S. Census 2009a, 2009b
Urban	Percent of households in urbanized areas	U.S. Census 2009b
Density	Population (000) per square mile	U.S. Census 2009b
Popn_growth	Percent change in population from April 2000 to July 2008	U.S. Census 2009b

Source: New York Food and Beverage Manufacturing Survey (excluding maple firms)

Results and Discussion

The growth model results are shown in Table 12. The resulting coefficients measure the change in the predicted logged odds of a firm's growth category for a unit change in the independent variables. It is easier to interpret the odds ratios computed from the estimated coefficients (last column of Table 12). The odds ratios are interpreted as the odds of being in a higher user category when that factor is increased by one unit. An odds ratio greater than one implies that the odds of being in a higher category increase with a higher value of the variable, while an odds ratio between zero and one implies that the odds of being in a higher category decrease when that variable increases.

Firm and Labor Measures

If not capital constrained, younger firms have been shown to grow at a more rapid pace and the growth rates of smaller firms are higher and more variable (Wijewardena & Tibbits, 1999; Heshmati, 2001; Davidsson et al., 2002). For this sample of firms, older firms were associated with lower rates of growth, although the effect diminishes as firms' age. When evaluated at sample means, the odds ratio indicates that for each one-year increase in age of plant, the odds of being in a higher growth category decrease by about 1%.

In contrast, larger plants in the sample were associated with higher growth rates; a one-person increase in the number of employees increases the odds of being in a higher growth category by about 1%. While small at the unit level, changes in employee numbers are often associated with relatively large adjustments; i.e., the cumulative effects could be sizable. Smaller firms were expected to exhibit higher rates of growth; however, additional survey data revealed that many smaller plants in the sample reported they had little intention of increasing size in the future. Specifically, 52% of large plants (over 50 employees) expected to increase employee staffing in the next three years, compared to only 34% of small plants (one to nine employees) and 17% of non-employer firms (Hall, 2010).

When other factors were accounted for, few differences in revenue growth existed across industry sectors. One clear exception is in alcoholic beverages, although the sector fixed effect is strongly influenced by local wage rates (i.e., the interaction effect with wages is negative and significant). While the change in odds for alcoholic beverage firms being in a higher growth category is not statistically different from zero at mean wage levels, for every \$1,000 increase in mean wages, the odds of being in a higher growth category for alcoholic beverage firms drop by 4.6% (1-0.954). Excluding alcoholic beverage processors, average county manufacturing wages (Wages) did not significantly influence revenue growth of the firms in our sample. This may be due to the characteristics of our sample, primarily small establishments, many with no or few paid employees.

Food Manufacturing Firm Clustering

Food manufacturing clustering effects (FB_{Est}) were found to have important effects on firm revenue growth, with significant differences by the level of local urbanization. In particular, a one-percentage point increase in the concentration of local (county) food manufacturers, at

mean urbanization levels, decreases the odds of being in a higher revenue growth category by 23.8% (1-0.762). Furthermore, the interaction term (FBEst*Urban) suggests that the benefits of food manufacturing firm clustering increase significantly with the level of urbanization. For example, the computed odds ratios for FBEst when evaluated at the minimum (13.6%) and maximum (100%) levels of urbanization are 0.235 and 1.565, respectively. Part of the reason for the negative agglomeration effects in more rural areas in our sample may be because of a higher reliance on direct-to-consumer (D2C) sales for these firms, and it is likely that much of these sales go to consumers living near their location. These firms will face more direct competition from collocated food processors than firms selling primarily to other downstream firms.

Agricultural Production Concentration

As expected, the concentration of local agricultural production (AgMktgs) was strongly associated with revenue growth; for a one unit increase in cash receipts per capita, the odds of being in a higher growth category increases by 60.2%. Measures of county agricultural production may also be an indicator of rurality and the associated qualities of rural areas, such as availability of land (Goetz, 1997). Most likely, some of our sample firms from rural areas benefit from close access to agricultural inputs (e.g., milk processors, grain millers), while other types of firms may benefit from other aspects of rural areas (e.g., wineries).

Food Wholesale, Retail, Service Clustering and Population Effects

Clustering of food wholesalers, food retailers, and food service providers (WRSEst) did not have a significant effect on revenue growth, likely due, in part, to the makeup of our sample wherein a relatively large share of product sales is D2C. The benefits of locating near a cluster of foodservice and/or food wholesale and retail firms may accrue to a smaller percentage of our sample that access and utilize these sales channels.

Somewhat surprisingly, population density (Density) was negatively associated with revenue growth; i.e., for a one-unit increase in population per square mile, the odds of being in a higher growth category decreases by about 12% (1-0.980). This may be due, in part, to more limited infrastructural or operational capacities and/or congestion issues in highly residential areas. Although no previous studies included population growth, we expect that growing local populations would be important. The empirical results support this hypothesis; for a one-percentage point increase in population growth rate (PopnGrow), the odds of being in a higher growth category increases by 7.6% (Table 12). A possibility for why we see mixed results is that urban areas, in general, tend to have the highest rates of population growth. In New York, recent population growth has been highest in the Mid-Hudson, Long Island, Capital, and New York City regions, all areas close to New York City. As such, if county population growth rates were not controlled for, we would expect to see signs of revenue growth in these more dense urban and urban-fringe areas. When population growth rates are included, we see negative effects on growth from urbanization as proxied for by Density.

Table 12. Ordered Logistic Regression Results of Plant Revenue Growth^a

Variable	Coefficient (std error)	Odds Ratio ^b
<i>Years</i>	-0.018*** (0.007)	0.991**
<i>Years</i> ²	0.0002* (0.0001)	
<i>Employees</i>	0.009** (0.005)	1.009**
<i>Employees</i> ²	-0.00003 (0.00002)	
<i>Sugar</i>	-0.589 (0.496)	0.555
<i>Fruit_Veg</i>	-0.273 (0.478)	0.761
<i>Dairy</i>	-0.113 (0.425)	0.894
<i>Meat</i>	-0.395 (0.372)	0.673
<i>Bakery</i>	-0.322 (0.370)	0.724
<i>Alc_Bev</i> ^c	3.073*** (0.967)	0.946
<i>Wages</i>	0.014 (0.009)	1.014
<i>Wages*Alc_Bev</i> ^d	-0.061*** (0.018)	0.954***
<i>Density</i>	-0.021** (0.011)	0.980*
<i>Popn_Growth</i>	0.073** (0.035)	1.076**
<i>FBEst</i> ^e	-1.742*** (0.595)	0.762*
<i>FBEst*Urban</i> ^f	0.022*** (0.009)	1.013
<i>AgMktgs</i>	0.471* (0.268)	1.602**
<i>WRSEst</i>	0.076 (0.091)	1.078
Observations	348	
Log Likelihood	-452.682	
Overid (LR test, <i>p</i> -val)	0.261	

^a Estimated intercept terms for threshold points are excluded. Annual plant revenue growth categories include: (1) strongly negative (less than -10%), (2) modestly negative (-1% to -10%), (3) zero (0%), (4) modestly positive (1% to 10%), and (5) strongly positive (more than 10%).

***, **, * represent significance at the 1, 5, and 10 percent significance level, respectively.

^b Odds ratios for variables with quadratic terms are computed at sample means.

^c Odds ratio for alcoholic beverage industry computed at sample mean wages.

^d Odds ratio for wages in the alcoholic beverage industry only.

^e Odds ratio for food and beverage manufacturing clustering at mean urban household percentage.

^f Odds ratio for urban household percentage at mean food and beverage manufacturing clustering.

Implications and Conclusions

The viability of the manufacturing sector in NY relative to other areas of the U.S. is of growing concern, and policy makers are increasingly looking towards agriculturally based opportunities to better take advantage of the large and diverse agricultural production sectors. With considerable changes in technology and competition over time, the effects of agglomeration economies and firm clustering on firm performance deserves renewed attention.

As expected, younger firms had higher annual revenue growth rates than older firms. However, this result has additional implications. Anecdotal evidence from follow up focus groups indicated that little incentives exist for established, older firms to maintain the size of their operations, relative to programs aimed at new start-ups or expansions of firms to create new jobs. Lower growth rates estimated here may be a consequence of such policies (or lack thereof). Policies focused on employee seniority incentives could be considered when more moderated growth for established firms is insufficient for long-term viability.

Larger firms were estimated to have higher rates of growth, consistent with expected benefits of economies of scale. The result based on past growth rates is also consistent with additional survey data that indicated a lower proportion of smaller firms were expecting to increase employee staffing or capital spending in the future. This result may be highlighting difficulties faced by smaller firms looking to increase plant size, but may be limited in doing so due to capital constraints or more limited access to larger downstream markets. As such, the result provides some evidence of a need for additional support mechanisms (public or private) for beginning/small firms to improve their potential for successful expansion.

Increased access to raw agricultural inputs and growing population centers were important market conditions to improving growth. Policy options that improve efficiencies of market access should improve industry growth. This might include investments in transportation infrastructure or programs that provide better communication and collaboration between food processors and agricultural producers. New York City is the largest source of consumption in the region and upstate food manufacturers may not be accessing this market as much as they could be (i.e., on average, only 9.2% of upstate food manufacturing output in the sample was sold to downstate buyers (Hall, 2010)). Additional programs that bring upstate food products to New York City area markets may be a source of potential growth.

Increased food manufacturing firm concentration in more rural areas was associated with lower firm growth rates, presumably from higher competition effects with local firms primarily serving more local markets. With growing interest in developing local and regional food systems within smaller, rural communities, community planners and plant management need to be aware of competition issues and consider the development of policies or operational procedures reinforcing holistic community food-systems planning and the availability of collaborative firm activities that can offset negative competition effects.

Agglomeration benefits in some industries require a dense location of firms; e.g., firms in a technology cluster need to be located in the same area so that the specialized labor pool can be

shared. However, external economies of scale in food manufacturing can often be created through cooperation between firms located in opposite corners of the state, just as easily as firms on opposite sides of the street. Follow-up focus groups provided anecdotal evidence of the ways in which these firms have benefitted from collaborations with other firms, including purchasing inputs with other similar firms to negotiate lower prices and using group distribution and sales. State industry associations were also beneficial in providing marketing and branding for their members, lobbying activities, and sharing knowledge and operational information. Statewide trade associations could also explain why Goetz (1997) found positive agglomeration effects at the state-level but negative effects at the county-level. A large concentration of food manufacturers at the state-level could provide benefits to those firms through well-funded state trade associations, while a large concentration of firms in a single county would not benefit those firms in the same way.

Policies that promote intra- or cross-industry collaboration would likely benefit food manufacturers and fall in line with Porter's cluster upgrading concepts (1990), but these policies would not necessarily require geographic proximity between firms. Barkley & Henry (1997) argue that in order for industry clusters to be successful, changes must be made in political, economic, and institutional conditions to discourage competition between firms and encourage collective activities. It is simply not enough for firms to locate close to one another and expect to see benefits from this location. Firms located close to other related firms must actively try to create collaborative actions to attain beneficial outcomes and improved firm performance.

Our results support the contention that market access is one of the most influential location factors on the performance of food manufacturers, yet firm growth near large population centers is explained more by growth in population than by the absolute size of the population itself. More analysis of these factors is needed to better understand and differentiate dynamic population effects. Additionally, we failed to find significant agglomeration economies from the presence of retail, wholesale, and foodservice firms, yet the market access created by close location to these firms is likely to be beneficial to food manufacturers in general. The pathways through which food manufacturing firms create market access are somewhat ambiguous in previous research. Further study on sales channel effectiveness and preferential supply chains to markets is needed.

It also remains somewhat unclear as to the source of agglomeration benefits accrued to food manufacturers in close location to one another. While our analysis finds a negative effect on firm growth in more rural areas, past research has mixed effects, and different effects have been found by size and industry sectors within food manufacturing. Part of this may be explained by our relatively low response rate overall and a likely over-response from firms selling at least of portion of their manufactured goods directly to consumers. Further research is needed with expanded firm-level response to provide more robust implications of agglomeration benefits to the broader industry as a whole, and to better understand the dynamics of urbanization and localization economies for food manufacturing firms that are likely to be highly dependent on the distributional choices made by firms to alternative market channels.

REFERENCES

- Barkley, D.L. and M.S. Henry. 1997. "Rural Industrial Development: To Cluster or Not to Cluster?" *Review of Agricultural Economics* 19(2):308-325.
- Bureau of Economic Analysis (BEA), U.S. Department of Commerce. 2008. *Gross Domestic Product by State*. Washington, D.C. Available at: <http://www.bea.gov/regional>, accessed 01 February 2011.
- Bureau of Labor Statistics (BLS), U.S. Department of Labor. 2008. *Quarterly Census of Employment and Wages*. Washington, D.C. Available at: <http://www.bls.gov/cew/>; accessed 6 April 2010.
- Cuomo, A. 2010. "Farm NY: Growth through Innovation." *The New NY Agenda Series*, No. 7.
- Davidsson, P., B. Kirchhoff, A. Hatemi-J, and H. Gustavsson. 2002. "Empirical Analysis of Growth Factors Using Swedish Data." *Journal of Small Business Management* 40(4):332-349.
- Davis, D.E. and G.E. Schluter. 2005. "Labor-Force Heterogeneity as a Source of Agglomeration Economies in an Empirical Analysis of County-Level Determinants of Food Plant Entry." *Journal of Agricultural and Resource Economics* 30(3):480-501.
- Goetz, S. J. 1997. "State- and County-Level Determinants of Food Manufacturing Establishment Growth: 1987-93." *American Journal of Agricultural Economics* 79(3):838-850.
- Hall, J.S. 2010. "The Impacts of Agglomeration Economies and Market Access on Firm Growth: an Empirical Assessment of Food and Beverage Manufacturers in New York State." MS thesis, Cornell University.
- Harrison, B., M.R. Kelley, and J. Gant. 1996. "Innovative Firm Behavior and Local Milieu: Exploring the Intersection of Agglomeration Firm Effects, and Technological Change." *Economic Geography* 72(3):233-258.
- Henderson, J.R. and K.T. McNamara. 2000. "The Location of Food Manufacturing Plant Investments in Corn Belt Counties." *Journal of Agricultural and Resource Economics* 25(2):680-697.
- Heshmati, A. 2001. "On the Growth of Micro and Small Firms: Evidence from Sweden." *Small Business Economics* 17(3):213-228.
- Lambert, D.M., K.T. McNamara, and M.I. Beeler. 2007. "Location Determinants of Food Manufacturing Investment: Are Non-metropolitan Counties Competitive?" Selected Paper, American Agricultural Economics Association Annual Meeting, Portland, OR.
- Marshall, A. 1920. *Principles of Economics*. London: MacMillan.
- MIG, Inc. 2011. *IMPLAN System (data and software)*, Hudson, WI. Various years. Available at: <http://www.implan.com>; accessed 01 February 2011.
- Porter, M.E. 1990. *The Competitive Advantage of Nations*. New York: Free Press.
- Rainey, D.V. and K.T. McNamara. 1999. "Taxes and the Location Decisions of Manufacturing Establishments." *Review of Agricultural Economics* 21(1):86-98.

- Rainey, D.V. and O.I. Murova. 2002. "Economic Growth with Limited Agglomeration Economies." Selected Paper, American Agricultural Economics Association Annual Meeting, Long Beach, CA.
- Shonkwiler, J.S. & Harris, T.R. 1996. "Rural Retail Business Thresholds and Interdependencies." *Journal of Regional Science*, 36, 617-630.
- U.S. Census Bureau. *Economic Census*. Washington, D.C. Available at <http://www.census.gov/econ>.
- U.S. Department of Agriculture. *Census of Agriculture, 2007*. Washington, D.C. Available at: <http://www.agcensus.usda.gov/Publications/2007/index.php>.
- Wijewardena, H. and G.E. Tibbits. 1999. "Factors Contributing to the Growth of Small Manufacturing Firms: Data from Australia." *Journal of Small Business Management* 37(2):88-95.



Assessing the Future of Food and Beverage Manufacturing In New York State

A survey of food and beverage manufacturers and processors

If you prefer, an online version of the survey may be found at:
<http://agribusiness.aem.cornell.edu/foodmanuf.html>

Purpose: To identify and address business challenges and opportunities for food and beverage manufacturing firms in New York State. We are committed to working with you and with agencies around the State to discover solutions to enhance the success of the industry.

Directions: Please answer the survey questions as they relate to your **specific plant only**. All responses will remain confidential. Results will be reported in aggregate form only.

Please return by March 1, 2009

If you have any questions, contact:

Kristen Park, Cornell University, 116 Warren Hall, Ithaca, NY 14853; (607) 255-7215 or ksp3@cornell.edu.

I. Business Characteristics

In this section we are interested in learning about your plant's activities in New York State.

1. Does your plant manufacture or process food, beverages, or food ingredients in New York State? (*check one*)

- Yes
- No (You do not need to complete this survey, but please return to us. Thank you!)

2. Which industry category below best describes your plant's PRIMARY food manufacturing activity? (*check ONLY ONE*)

- Grain and Oilseed Milling** – includes flour, malt, rice, starch and vegetable fats and oils, wet corn, soybean and other oilseed, & breakfast cereals
- Sugar and Confectionery Product Manufacturing** – includes sugarcane and beet sugar, chocolates & non-chocolate confectioneries
- Fruit and Vegetable Preserving and Specialty Food Manufacturing** – includes fruit and vegetable juices, freezing, canning, pickling, drying, dried & dehydration products
- Dairy Product Manufacturing** – includes fluid milk, creamery butter, cheese, dry condensed, evaporated, & frozen desserts
- Animal Slaughtering and Processing** – includes animal slaughter & meat further processing
- Seafood Product Preparation and Packaging** – includes preparation, packaging, canning, freezing
- Bakeries and Tortilla Manufacturing** – includes retail and commercial bakeries, bread, frozen cakes, pies, pastries, cookie, cracker, pasta, flour mixes and dough, & tortillas
- Other Food Manufacturing** – includes snack food, roasted nuts, peanut butter, coffee and tea, flavorings, seasonings and dressings, & other perishable prepared food
- Non-alcoholic Beverage Manufacturing** – includes soft drinks, bottled water, and ice.
- Alcoholic Beverage Manufacturing** – includes breweries, wineries, & distilleries

If you could not find an example of your primary activity, please briefly describe it:

3. How long has your plant been doing business in New York? ___ years
4. Does your plant belong to a company that operates other plants?
 Yes If Yes, where? (check **all applicable locations**)
 in New York State elsewhere in the US in other countries
 No
5. Where are your company's headquarters located? (check one)
 at this site elsewhere in New York elsewhere in the US
 in another country

6. What were your plant's gross revenues in your most recent fiscal year? (check one)
 <\$1 million \$51 - \$100 million \$301 - 500 million
 \$1 - \$10 million \$101 - \$300 million over \$500 m million
 \$11 - \$50 million

7. What is the **average** number of full- and part-time employees, including contract and seasonal workers, currently working at your plant? (check one)
 0 employees 10 - 19 100 - 249
 1 - 4 20 - 49 250 - 499
 5 - 9 50 - 99 500 or over

8. Approximately what percent of your sales in the last fiscal year were to each customer type? (Please use 0% if you did not sell directly to a particular customer type)

Customer Type	Percent of Sales
Wholesalers/Distributors	_____
Retailers	_____
Foodservice (restaurants, fast food, schools, etc)	_____
Individual consumers	_____
Other food processors or manufacturers	_____
Other, please describe: _____	_____
Total Plant Sales	100%

9. To better understand the movement of product within and outside of the State, approximately what percent of your raw ingredient AND what percent of your sales in the last fiscal year were from and delivered to the following areas?

	Percent of Raw Product Input Costs	Percent of Sales
Downstate New York*	_____	_____
Upstate New York (all other)	_____	_____
Elsewhere in the US	_____	_____
Outside the US	_____	_____
Total	100%	100%

*Downstate NY includes Rockland, Putnam, Westchester Counties, the NYC Burroughs, and Long Island

10. Does your plant process or manufacture any organic products?

- Yes _No

If Yes, do you see this segment of your business:

- decreasing staying the same increasing don't know

II. Your Business Environment

11. In this section, we are interested in learning about how each of the following factors affects your business. Please rate the current performance level for each factor in New York State.

New York business environment factors	Very harmful to your business	Harmful to your business	Neither harmful nor beneficial to your business	Beneficial to your business	Very beneficial to your business	Not Applicable
<i>check one in each row</i>						
a. Quality of transportation infrastructure (roads, airports, rail, ports)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Quality of communication infrastructure (telephone, cell coverage, wireless, broad band)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Level of State initiatives & growth incentives to support business growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. State support for improved environmental practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. State support for energy efficiency and renewables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Ability to enter into Public-Private sector partnerships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. State-level costs of doing business (workers' compensation, New York taxes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Other costs of doing business (real estate, utilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. State- and local-level governmental regulations and permitting procedures (environmental, zoning, health)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. The cost of living for your employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Your region's overall quality of life (climate, cultural, and recreational opportunities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Quality of State college and university research, outreach, and technical assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Availability of workers with the skills your business requires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

New York business environment factors	Very harmful to your business	Harmful to your business	Neither harmful nor beneficial to your business	Beneficial to your business	Very beneficial to your business	Not Applicable
n. Availability of management and other professional staff with the qualifications your business requires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Labor force wage rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Availability of workforce training opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. State branding, promotional and marketing campaigns (Pride of New York)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. Regional or local branding activities and efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Availability of alliances and collaborations with other firms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. Availability of trucking services (short & long haul)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
u. Availability of product distribution services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Proximity to customer markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
w. Proximity of input suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. What do you feel are the most effective programs or initiatives in New York State that improve the competitiveness of your business? *Please list the top 2.*

- a. _____
- b. _____

13. Please rate how the following consumer trends affect your business.

Consumer Trends	Very harmful to your business	Harmful to your business	Neither harmful nor beneficial to your business	Beneficial to your business	Very beneficial to your business	Not Applicable
a. Increased demand for locally produced food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Increased demand for safe, nutritious, and quality food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Increasing interest in sustainability issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Below are some alliances or collaborations sometimes used strategically by businesses. Please check whether or not you currently participate in any collaborative venture in these areas **AND** rate how *valuable* each venture may be in relation to your own business. **Please rate each collaboration even if you currently do not participate in it.**

Currently participate (check all that apply)	Collaborative Effort	Not at all valuable	Somewhat valuable	Valuable	Extremely valuable
<input type="checkbox"/>	Group purchasing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Shared services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Marketing & promotion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Legislative affairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Workforce development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Distribution/transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

III. Economic Vitality

Please fill out the following information surrounding your past and expected outlook in business operations for your plant as it operates in New York State.

15. Please estimate your plant's *average* annual revenue growth over the past 3 years **AND** for the next 1 and 3 years: *(place a check in the appropriate box in each column)*

	Annual revenue growth for PAST 3 YEARS	Expected annual revenue growth for NEXT 1 YEAR	Expected annual revenue growth for NEXT 3 YEARS
over -20%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-11 to -20%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-5 to -10%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-1 to -4%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 to 4%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 to 10%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 to 20%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
over 20%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Outlook for employee staffing	<u>Next 1 Year</u>	<u>Next 3 Years</u>
a) We will be hiring additional employees	<input type="checkbox"/>	<input type="checkbox"/>
b) Staying at about the same level of employees	<input type="checkbox"/>	<input type="checkbox"/>
c) We will be reducing our workforce	<input type="checkbox"/>	<input type="checkbox"/>
d) Not sure	<input type="checkbox"/>	<input type="checkbox"/>

17. Outlook for capital spending relative to current year	<u>Next 1 Year</u>	<u>Next 3 Years</u>
a) Increased spending	<input type="checkbox"/>	<input type="checkbox"/>
b) Level spending	<input type="checkbox"/>	<input type="checkbox"/>
c) Decreased spending	<input type="checkbox"/>	<input type="checkbox"/>
d) Not sure	<input type="checkbox"/>	<input type="checkbox"/>

18. New York State is a great place for our plant to do business *(please check the most appropriate one)*

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

19. We are currently considering moving our plant out of New York State: *(please check the most appropriate one)*

- Aggressively
- Moderately
- Somewhat
- Not at all

(The end)

Thank you for your time!

Please mail us your completed survey in the envelope provided.

You may also fax the survey to: (607) 255-4776

We will be compiling the information quickly and holding several focus groups across the State to discuss and extend the results. Please let us know if you would be interested in participating in a regional focus group, and we can send details as they develop. Also, please leave your contact information so we can to send you a report of the survey results.

I am interested in learning more about the focus groups you will be holding across the State.

Name _____
Company and Title _____
Address _____
Email _____
Phone _____

OTHER A.E.M. EXTENSION BULLETINS

EB No	Title	Fee (if applicable)	Author(s)
2012-06	Beginning or Expanding Maple Syrup Operations as a Profitable Business!	(\$12.00)	Perry, J. and S. Childs
2012-05	Dairy Farm Business Summary, Hudson and Central New York Region, 2011	(\$12.00)	Knoblauch, W., Conneman, G., Putnam, L., Karszes, J., Buxton, S., Kiraly, M., Shoen, K., Overton, R. and C. Dymond
2012-04	Dairy Farm Business Summary, New York Small Herd Farms, 120 Cows or Fewer, 2011	(\$16.00)	Knoblauch, W., Putnam, L., Karszes, J., Kiraly, M. and C. Dymond
2012-03	Dairy Farm Business Summary, Western New York Region, 2011	(\$12.00)	Wayne A. Knoblauch, Linda D. Putnam, Jason Karszes, John Hanchar, James Grace, Virginia Carlberg, Joan Petzen, Richard Overton and Cathryn Dymond
2012-02	Dairy Farm Business Summary, New York Large Herd Farms, 300 Cows or Larger, 2011	(\$16.00)	Karszes, J., Knoblauch, W., and L. Putnam
2012-01	Dairy Farm Business Summary, New York Organic Dairy Farms, 2010	(\$16.00)	Knoblauch, W., Overton, R., Putnam, L. and C. Dymond
2011-10	Examining the Costs of Producing Processing Snap Beans and Green Peas in New York State		Ho, S., Rickard, B., Kikkert, J., Klotzbach, K., Reiners, S. and M. Smith
2011-09	Dairy Farm Business Summary, New York Dairy Farm Renters, 2010	(\$16.00)	Knoblauch, W., Putnam, D. and C. Dymon
2011-08	New York Economic Outlook, 2012		Extension Staff
2011-07	Dairy Farm Business Summary, Northern New York Region, 2010		Knoblauch, W., Putnam, L., Karszes, J., Murray, P., Vokey, F., Hayes, C., Deming, A., Balbian, D., Buxton, S., Manning, J., Collins, B., Overton, R. and C. Dymond
2011-06	Dairy Farm Business Summary, Intensive Grazing Farms, New York, 2010		Conneman, G., Karszes, J., Grace, J., Murray, P., Carlberg, V., Benson, A., Staehr, A., Glazier, N., Overton, R., Dymond, C. and L. Putnam
2011-05	Dairy Farm Business Summary, Hudson and Central NY Region, 2010	(\$12.00)	Knoblauch, W., Conneman, G., Putnam, L., Karszes, J., Buxton, S., Kiraly, M., Shoen, K., Westenbroek, P., Walsh, J., Overton, R. and C. Dymond

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