

# 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.

# Agriculture-Based Economic Development in NYS: Trends and Prospects 

T. M. Schmit and N. L. Bills

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

Executive Summary ..... vi
Introduction ..... 1
Defining the Agriculture and Food System ..... 2
Farm and Food Trends in NYS . ..... 7
Farm Numbers and Land in Farms ..... 7
Farm Commodity Sales ..... 8
Downstream Farm and Food Sectors ..... 12
Forward Linkages ..... 16
Backward Linkages. ..... 18
References ..... 23
Appendix A. Agriculture and Food System Contributions by Region in New York State ..... 24
Appendix B. Trend Data for New York State Farm and Food Sectors. ..... 45
List of Tables
Table 1. New York State Agriculture and Foods System Contributions by Industry Sector. ..... 6
Table A1. Agriculture and Food System Contributions by Industry Sector, Capital District Region ..... 25
Table A2. Agriculture and Food System Contributions by Industry Sector, Central New York Region ..... 27
Table A3. Agriculture and Food System Contributions by Industry Sector, Finger Lakes Region ..... 29
Table A4. Agriculture and Food System Contributions by Industry Sector, Long Island Region ..... 31
Table A5. Agriculture and Food System Contributions by Industry Sector, Mid-Hudson Region ..... 33
Table A6. Agriculture and Food System Contributions by Industry Sector, Mohawk Valley Region ..... 35
Table A7. Agriculture and Food System Contributions by Industry Sector, New York City Region ..... 37
Table A8. Agriculture and Food System Contributions by Industry Sector, North Country Region ..... 39
Table A9. Agriculture and Food System Contributions by Industry Sector, Southern Tier Region. ..... 41
Table A10. Agriculture and Food System Contributions by Industry Sector, Western New York Region 43
Table B1. Number of Farms and Land in Farms, Selected Years, New York State, 1950-2007 ..... 45
Table B2. Farm Cash Receipts from Commodity Sales in New York State, 1990-2010 ..... 46
Table B3. Total Farm Cash Receipts from Commodity Sales, New York State, 1990-2010 ..... 47
Table B4. Cash Receipts from Sales of Livestock and Livestock Products, New York State, 1990-2010. 48
Table B5. Cash Receipts from Crop Sales, New York State, 1990-2010 ..... 49
Table B6. Cash Receipts for Selected Commodity Groups, New York State, 1990-2010 ..... 50
Table B7. Full and Part-Time Employment in Food and Agriculture, New York State, 1990-2010 ..... 51
Table B8. Gross State Product (GSP) Originating in Food and Agriculture, New York State, 1990-2010 52
Table B9. Gross State Product (GSP) Originating in Food and Agriculture, Current and PricE-Adjusted,New York State, 1997-2010 .................................................................................................................. 53
Table B10. Earnings Originating in Food and Agriculture, New York State, 1990-2010 ..... 54

## List of Figures

Figure 1. Defining the agriculture and food system. ..... 2
Figure 2. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, New York State, 2010. ..... 3
Figure 3. Number of farms for New York, selected Census years, 1950-2007. ..... 7
Figure 4. Land in farms for New York, selected Census years, 1950-2007. ..... 8
Figure 5. Farm cash receipts from commodity sales in New York State, 1990-2010. ..... 8
Figure 6. Cash receipts from crops, livestock, and livestock products, New York State, 1990-2010. ..... 9
Figure 7. Cash receipts from dairy product sales, New York State, 1990-2010. ..... 9
Figure 8. Cash receipts from poultry and poultry product sales, New York State, 1990-2010. ..... 10
Figure 9. Cash receipts from meat animals and other livestock sales, New York State, 1990-2010 ..... 10
Figure 10. Cash receipts from oil and grain crop sales, New York State, 1990-2010 ..... 11
Figure 11. Cash receipts from fruit crop sales, New York State, 1990-2010. ..... 11
Figure 12. Cash receipts from vegetable crop sales, New York State, 1990-2010 ..... 12
Figure 13. Cash receipts from greenhouse and nursery crop sales, New York State, 1990-2010. ..... 12
Figure 14. Total full and part-time employment in food and agriculture, New York State, 1990-2010. ..... 13
Figure 15. Gross State Product (GSP) originating in food and agriculture production, New York State,1997-201014
Figure 16. Gross State Product (GSP) originating in crop and livestock production, New York State, 1997-2010 ..... 15
Figure 17. Gross State Product (GSP) originating in food and beverage manufacturing, New York State,
1997-2010 ..... 15
Figure 18. Earnings originating in food and agriculture, New York State, 1990-2010 ..... 16
Figure 19. Estimated destination of New York state livestock/livestock products, 2010 ..... 17
Figure 20. Estimated destination of New York state crop output, 2010 ..... 17
Figure 21. Output multipliers for selected farm and food sectors, New York State, 2010 ..... 19
Figure 22. Output multipliers for selected industrial sectors, New York State, 2010 ..... 19
Figure 23. Employment multipliers for selected farm and food sectors, New York State, 2010 ..... 20
Figure 24. Employment multipliers for selected industrial sectors, New York State, 2010 ..... 21
Figure 25. Disaggregated output and employment multipliers for selected farm and agricultural servicessectors, New York State, 2010.21
Figure 26. Disaggregated output and employment multipliers for selected food manufacturing sectors, New York State, 2010 ..... 22
Figure A1. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Capital District Region, New York State, 2010 ..... 26
Figure A2. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Central New York Region, New York State, 2010 ..... 28
Figure A3. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Finger Lakes Region, New York State, 2010. ..... 30
Figure A4. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Long Island Region, New York State, 2010. ..... 32
Figure A5. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Mid-Hudson Region, New York State, 2010 ..... 34
Figure A6. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Mohawk Valley Region, New York State, 2010. ..... 36
Figure A7. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, New York City Region, New York State, 2010 ..... 38
Figure A8. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, North Country Region, New York State, 2010 ..... 40
Figure A9. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Southern Tier Region, New York State, 2010. ..... 42Figure A10. Defining agriculture and food systems: employment, value of output, and value added byindustrial sector, Western New York Region, New York State, 2010.44

# Agriculture-Based Economic Development in NYS: Trends and Prospects 

## Executive Summary

Policymakers, industry leaders, planners and economic development professionals in New York State (NYS) face a set of fundamental questions about agriculture-based economic development (AED) and its potential to support and/or enhance the economic vitality of communities across the state. Agribusiness firms need to effectively and continuously adapt to changing economic conditions, consumer preferences, and technological advancements. To that end, firms are seeking innovative methods to attract new and growing markets for their commodities and products, vertically integrate their operations in both upstream and downstream markets, invest in value-added consumer-driven activities, and develop domestic and international joint ventures and strategic alliances.

Such activities suggest growing farm-to-food developments at the farm, as well as increased interaction and coordination with others in the agribusiness industry. Understanding the economic contributions and evolving linkages between agricultural production, agricultural service, food manufacturing, and distribution and marketing to consumer markets is essential in defining appropriate firm, industry, and public policy strategies to strengthen opportunities for economic development and improve the competitiveness of agribusiness industries.

This report is part of a larger ongoing effort to assist with these efforts. The focus is on up-to-date baseline economic information on the current status and trends of New York State agricultural and food system economic activity. By integrating multiple data sources, we are able to provide more detailed subindustry level estimates of total output, employment, and value added than previously published. Longer term trends in farm and food production are also summarized. In addition, forward and backward linkages between farm commodity production and the wider grow the economy are estimated and discussed to better inform priorities on development initiatives and industry performance.

Key findings are that:

- Farm commodity production, including all crop and livestock production sectors, was about $\$ 4.5$ billion in 2010. A wider definition, taking the broad industry category of agricultural and forestry services into account, increases total output to more than $\$ 4.9$ billion. Including the manufacture of food, beverage, and kindred products, as well as agricultural chemicals and equipment manufacturing, more than double total system dollar output to nearly $\$ 34.2$ billion in 2010.
- Wholesale trade sectors related to food and beverages, agricultural equipment and nursery supplies raises the cumulative output level to $\$ 46.7$ billion. Finally, glancing further down the food distribution chain to retail food and beverage stores and the services provided by eating and drinking establishments brings the total output value of the portfolio up to an estimated $\$ 96.3$ billion in NYS. Using this expansive definition, agricultural and food system activity represented an estimated $5.5 \%$ of total gross output in NYS in 2010.
- Considering value added, roughly $\$ 1.8$ billion through farm production expands to $\$ 48.6$ billion when considering contributions in all downstream agricultural and food system sectors, or $4.2 \%$ of the total value added generated statewide in 2010. The value added measure is important because it avoids double-counting the money value of production and corresponds to the definition of gross state product.
- Job making is a persistent economic issue for the State but onfarm employment is often overlooked in state and Federal job statistics. We estimate onfarm employment statewide at

45,000 in 2010, considering both full-time and part-time employees and farm operators with farming as their principal source of employment. Many New York farmers supplement family income with jobs off the farm and are counted elsewhere in employment statistics. Agriculture and forestry service workers add another 9,000 jobs to this total.

- More inclusive definitions of the agriculture and food system material increase the jobs picture. Including food, beverage, and agricultural chemicals and equipment manufacturing more than double total employment to 112,000 in 2010.
- Census data show that farm businesses continue to be consolidated into larger economic units, but smaller part-time farms have increased over the last decade. Today, more than 40 percent of all New York farms can be classified as residential farms because the operator has a full-time job off the farm. In addition, the number of farms selling direct to consumer in New York State is rapidly increasing but from a small base; Farms selling directly to consumers represent about $15 \%$ of all farms, but span $2 \%$ of annual commodity sales statewide.
- Farm consolidation, along with expanded competition for land from nonfarm uses, has resulted in continual decreases in farm acreage. Land in farms decreased from 16 million acres in 1950 to just over 7 million acres in 2007.
- Annual cash receipts in New York State are dominated by sales of livestock and livestock products. Using 1990 as a reference point, crops and livestock/livestock product sales were estimated at $\$ 0.9$ billion and $\$ 2.1$ billion, respectively. At this time, nearly $\$ 7$ of every $\$ 10$ in farm output was accounted for by livestock and livestock products. This ratio remained essentially stable until 2006 when higher crop prices, particularly led by higher grain and oilseed prices, increased the relative share for crop sales to about $40 \%$. As of 2010, crops and livestock/livestock product sales were estimated at $\$ 1.8$ billion and $\$ 2.7$ billion, respectively.
- Production agriculture is dominated by fluid milk production. The New York dairy industry accounts for more than half of total receipts from farm marketings. In current dollar terms, the dairy industry presently generates a dollar volume in the vicinity of $\$ 2.21$ billion. Production levels fluctuate from year to year, and milk prices have shown greater volatility in recent years. Shifts in these price and quantity relationships have resulted in fluctuations in total gross receipts that range from about $\$ 1.6$ billion to nearly $\$ 2.4$ billion over the past 5 years.
- Much of New York's crop acreage is used to produce feed and forage crops to support the livestock industries mentioned above. Hay crops are the largest block of New York crop acreage, but many New York farmers sell crops to generate cash for the farm business. Receipts from the sale of oil seed crops, field grains, and food grains totaled more than $\$ 452$ million in 2010, down from a peak of $\$ 508$ million in 2008.
- Cash receipts from the sale of fruit crops vary from year to year but remained stable in the $\$ 315$ million range during calendar 2009 and 2010. Sales of greenhouse and nursery products have ramped up steadily since the mid-1990s, but have remained in the neighborhood of $\$ 375$ million since 2007.
- Additional insight on recent trends can be gained by measuring movements in earnings generated in farming, agricultural services, and food manufacturing. Production agriculture presently generates earnings in the range of about $\$ 1.3$ billion. Agricultural services generate about $\$ 190$
million in earnings. In 2010, food manufacturing earnings stood at about $\$ 3.6$ billion, an amount nearly three times the amount realized from crop and livestock production.
- Farming, agricultural services, and food processing exert impacts on the New York economy through forward linkages to transportation, wholesaling, retailing, and food services. Turning first to dairy farm products, the study results suggest that $78 \%$ of total supply in New York's largest farm production sector is sold to in-state buyers -- almost exclusively to milk handlers and processors. As expected, offshore export sales of dairy farm products are extremely low and about $22 \%$ of the total production finds its way out of state to processors and handlers. A similar pattern is evident for New York's cattle and other livestock sectors with a preponderance of product sales to processors and handlers in-state. In contrast, New York state poultry and egg sectors appear to be moving a larger proportion of total product to markets outside the State.
- In-state sales predominate for grains, fruit, and vegetable commodities. The fraction of total supply accounted for by in-state sales ranges from 61 to 85 percent depending on the commodity sector considered. Oilseed producers-mainly soybeans- move most of their product to processors out of state $(48 \%)$ or for foreign export ( $32 \%$ ). Dependence upon out-of-state markets is also substantial for New York's greenhouse and nursery industries, with more than half (53\%) of total supply going to out of state sales.
- Backward linkages between food and agricultural production in New York and other sectors of the wider New York economy are analyzed through the calculation of economic multipliers. Output multipliers calculated for selected farm and food sectors in the New York State economy generally range between 1.7 and 2, suggesting each new dollar of farm and food output for the state brings additional production valued at something less than 1 dollar.
- Because of differences in relationships between output and employment, results arranged using employment as a measurement unit portrays different outcomes. The aggregate multiplier for food manufacturing amounts to 3.17 using employment as a unit of measurement. This finding suggests that for every additional new job created in food manufacturing in New York State, an additional 2.2 jobs are supported in industries and sectors structurally linked to the food manufacturing sector. Similarly, the employment multiplier for agricultural and forestry services approaches a relatively robust 2.0 , suggesting one additional job for every new job created in the sector.
- The conclusion that employment benefits associated with expanded food manufacturing output in New York State are relatively robust is sustained when the frame of reference is the entire macro New York economy. Our results suggest that food manufacturing exerts one of the highest employment multiplier effects of any industry in the State.
- These findings on backward linkages and economic multipliers add more perspective to New York's food and agriculture system. New York State's agriculture and food sectors account for a small percentage of the state's total gross output. However, the multiplier estimates in this study confirm the anecdotal evidence, which suggests that food and agriculture exerts a relatively large generative effect on the New York economy. Compared with other New York industries, farm and food firms make relatively large proportions of their cash business expenditures in-state. This means that efforts to enhance production in these sectors produce relatively large secondary and tertiary benefits for industries linked to farm and food production.


# Agriculture-Based Economic Development in NYS: Trends and Prospects 

T.M. Schmit and N.L. Bills ${ }^{1}$

## Introduction

Policymakers, industry leaders, planners and economic development professionals in New York State (NYS) are confronted with a set of fundamental questions about agriculture-based economic development and its potential to support and/or enhance the economic vitality of communities across the state. Some of these questions are: How might accelerated efforts to grow the state's food and farming industries play into mainstream economic development efforts in New York State? Are there unexploited opportunities to boost performance in agriculture and food sectors? What benefits might come to local economies from more emphasis on local farm and food systems, or from more aggressive efforts to target offshore markets? How can educators, community leaders, and public agencies intervene with farm and agribusiness firms in ways that lead to cumulative improvements in the economic and social climate for communities as well as farm and food production?

Answers to these questions are elusive. To remain successful, agricultural producers and associated agribusiness firms need to effectively and continuously adapt to changing economic conditions, consumer preferences, and technological advancements. To that end, firms are seeking innovative methods to attract new and growing markets for their commodities and products, vertically integrate their operations in both upstream and downstream markets, invest in value-added consumer-driven activities, and develop domestic and international joint ventures and strategic alliances. These activities suggest growing farm-to-food developments at the farm, as well as increased interaction and coordination with others in the agribusiness industry.

Understanding the economic contributions and evolving linkages between agricultural production, agricultural service, food manufacturing, and distribution and marketing to consumer markets is essential in defining appropriate firm, industry, and public policy strategies to strengthen opportunities for economic development and improve the competitiveness of agribusiness industries. The competitiveness of agribusiness firms in NYS relative to other regional or national firms is of growing concern. Common reasons for this sentiment include: (i) lack of government incentives and burdensome regulatory standards, (ii) high costs of capital relative to neighboring states and other areas of the country; (iii) high energy costs, labor costs, and property and income taxes, and (iv) limited availability of an adequate, motivated, and qualified labor force.

The state and agribusiness community are working to address these issues, but a necessary condition to any policy or operational reform is a sound understanding of current economic conditions and past behavior. This report is part of a larger ongoing effort to update and understand agriculture's impact on state and regional economies. The focus of this report is on assembling and updating baseline economic information on the current status and trends of New York State agricultural and food system economic activity. By integrating multiple data sources, we are able to provide more detailed sub-industry level estimates of total output, employment, and value added than previously published. In addition, forward and backward linkages and inter-industry linkages are estimated and discussed to better inform priorities on development initiatives and industry performance.

Part two of this series will focus on a closer inspection of inter-industry transactions to get a clearer picture of the structure of the NYS economy, and includes a comprehensive contribution analysis of the economic impact of agriculture and food systems to the NYS economy. Part three will consider NYS

[^0]within a larger regional economy of the Northeastern United States where multi-regional input-output models will measure the economic impacts of agriculture and foods systems to NYS that extend beyond the state's borders

## Defining the Agriculture and Food System

Many, if not most, discussions of farm and food in New York take into account only crop and livestock production, cash receipts, and other farm income at the farm gate. However, this study adheres to the idea of an agriculture and food system. Such a construct is depicted in Figure 1, where economic activities ranging from behind-the-farm-gate to final consumption and all the steps in-between are taken under consideration. Farm and food business firms often cross the boundaries depicted in Figure 1 when they seek out opportunities to diversify and grow their businesses. Following business growth and diversification strategies can make relatively simple businesses into multiproduct firms that combine production of farm commodities with downstream provision of services, processing, and/or distribution to consumers. This adds another layer of difficulty to accurate descriptions of the New York farm and food sectors.


Figure 1. Defining the agriculture and food system.

Data difficulties aside, what list of industries can be used for an operational definition of the agriculture and food system in NYS? Component parts of the food system can be identified with alternate definitions, each turning on the inclusion or exclusion of major industrial sectors. A useful summary of the options is depicted in Figure 2 using data from MIG (2011).Three alternative metrics are considered -output, value added, and employment. ${ }^{2}$ While Federal agencies generate the core data for this exercise, we utilize MIG summaries to best integrate detailed sector data across the spectrum of industries included in our agriculture and food system definition.

Following MIG's data conventions, output represents the value of industry production in producer prices. Output can be generally defined as sales, however, for manufacturers, output includes changes in

[^1]

Figure 2. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, New York State, 2010.
inventories; to avoid double-counting, output for wholesale and retail sectors is a gross margin (sales less cost of goods sold) and not gross sales. Value added represents the difference between an industry's total output and the cost of its intermediate inputs; it is a measure of the contribution to gross domestic product (GDP). Value added consists of employee compensation, proprietor (self-employment) income, indirect business taxes, and other property-type income (i.e., dividends, interest, rent, corporate profits, and capital depreciation). Finally, employment is defined as the annual average of monthly jobs in an industry, either full- or part-time. Considering alternate measures can be important because they are not always well correlated with each other, giving varying impressions of the agricultural and food system sectors in some cases.

Using output as the unit of measure (top chart in Figure 2), a narrow definition (Definition A) would confine discussion to all farm commodity production, including all crop and livestock production sectors, or about $\$ 4.5$ billion in 2010. A wider definition, (Definition B) would take the broad industry category of agricultural and forestry services into account, and increase total output to more than $\$ 4.9$ billion. ${ }^{3}$ An even more inclusive definition of the agriculture and food system extends to manufacturing activity. This includes the manufacture of food, beverage, and kindred products, as well as agricultural chemicals and equipment manufacturing. These components, as reflected in Definition C, substantially increase total system dollar output to nearly $\$ 34.2$ billion in 2010.

Definition D includes wholesale trade sectors related to food and beverages and agricultural equipment supplies and nursery sectors, and raises the cumulative output level to $\$ 47.3$ billion. ${ }^{4}$ Finally, glancing further down the food distribution chain to retail food and beverage stores (Definition E) and the services provided by eating and drinking establishments (Definition F) brings the total output value of the portfolio up to an estimated $\$ 96.9$ billion in NYS. Recall that output measurements in wholesale and retail trade sectors are margined, eliminating the cost of goods sold from gross output calculations. Using this expansive definition, agricultural and food system activity represented an estimated $5.5 \%$ of total gross output in NYS in 2010 (Figure 2).

The same definitional structure is applied using metrics of value added and employment in the NYS economy (Figure 2). The roughly $\$ 1.8$ bil. in value added through farm production expands to $\$ 49.8$ billion when considering value added contributions in all downstream agricultural and food system sectors, or $4.3 \%$ of the total value added generated statewide in 2010. The value added measure is important because it avoids double-counting the money value of production and corresponds to the definition of gross state product (Figure 2).

The last panel in Figure 2 measures the New York State farm and food economy using an employment metric. Job making is a persistent economic issue for the State but onfarm employment is often overlooked in state and Federal job statistics. Following MIG’s data conventions, we estimate on-farm employment at 45,000 in 2010, considering both full-time and part-time employees and farm operators

[^2]with farming as their principal source of employment. Many New York farmers supplement family income with jobs off the farm and are counted elsewhere in employment statistics Agriculture and forestry service workers add another 9,000 jobs to this total. An even more inclusive definition of the agriculture and food system, extending to the manufacture of food, beverage, and kindred products as well as agricultural chemicals and equipment manufacturing (Definition C), more than double total employment to 112,000 in 2010. Definition D includes wholesale trade sectors related to food and beverages and agricultural equipment supplies and nursery sectors, and raises the cumulative employment level to 179,000 . Finally, adding retail food and beverage stores (Definition E) and the services provided by eating and drinking establishments (Definition F) brings the total employment value of the portfolio up to an estimated 984,000 in NYS. Using this most expansive definition, agricultural and food system jobs represented an estimated $9 \%$ of total employment in NYS in 2010 (Figure 2).

The definitional structure used here is useful in framing the direct contribution of agriculturally related industry activities to the total NYS economy; however, two summary points are worthwhile in discussing these contributions. First, the estimates consider only the direct effects from the various industry sectors. The indirect and induced effects (i.e., multiplier effects) of the direct activities are not considered. Second, the general definitional framework is inclusive of all agricultural and food system activity in the state, not necessarily only those activities derived directly from the use of (or reliance upon) agricultural commodities produced in the state. For example, we include the value of all bread and bakery product manufacturing in the state in the food manufacturing definition, although only a portion of this industry sector's input commodities are sourced locally (within the state).

For interested readers, a more detailed composition of our defined agriculture and food system is given in Table 1, with a further differentiation of parameters (employment, output, value added) for individual agricultural production and manufacturing industries. Our intent is not to describe the table here but to illustrate the extent and heterogeneous nature of agricultural production and food and beverage manufacturing in NYS. It is worth noting that agricultural (farm) employment by commodity sector is difficult to estimate as no employment and earnings data are consistently collected on a commodity basis. MIG has developed procedures to estimate employment and income by commodity and county and then use these estimates to distribute total farm employment given by BEAs' Regional Economic Accounts (REA) program.

Analogous constructions of the agriculture and food system by economic development region are included in Appendix A of this report. The regions are constructed to be consistent with those defined by the Empire State Development Corporation. This supplemental information should serve as useful baseline information for regional analyses and to highlight differences in activity across regions.

Table 1. New York State Agriculure and Food System Contributions by Industry Sector, 2010.

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) |  | \$ Million |  |
| Oilseed farming (1) | 2,067 | 10.4 | 133.5 | 54.4 |
| Grain farming (2) | 6,510 | 23.8 | 269.4 | 54.1 |
| Vegetable and melon farming (3) | 3,542 | 197.9 | 536.1 | 268.1 |
| Fruit and tree nut farming (4,5) | 2,528 | 118.3 | 315.9 | 163.8 |
| Greenhouse, nursery, and floriculture (6) | 3,985 | 264.9 | 398.7 | 261.8 |
| All other crop farming (10) | 1,778 | 60.2 | 289.8 | 88.6 |
| Cattle ranching and farming (11) | 1,808 | 17.3 | 177.9 | 29.6 |
| Dairy cattle and milk production (12) | 20,155 | 170.0 | 2,255.7 | 825.2 |
| Poultry and egg production (13) | 264 | 13.3 | 110.8 | 20.3 |
| Other animal production (14) | 2,660 | 17.3 | 84.1 | 41.2 |
| Subtotal | 45,298 | 893.4 | 4,572.0 | 1,807.2 |
| Support activities for agriculture and forestry (19) | 8,553 | 273.9 | 349.4 | 268.1 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 1,532 | 101.4 | 1,897.3 | 376.8 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | 865 | 77.4 | 1,127.2 | 183.0 |
| Oilseed processing, fats and oils refining ( 45,46 ) | 206 | 10.9 | 372.8 | 32.5 |
| Sugar mills and manufacturing (48,49) | 283 | 31.0 | 262.8 | 42.5 |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 2,471 | 106.7 | 912.4 | 246.5 |
| Fruit and vegetable manufacturing ( 53,54 ) | 6,957 | 400.8 | 3,136.5 | 766.6 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 8,073 | 520.1 | 5,407.9 | 835.0 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 3,817 | 183.4 | 1,544.9 | 212.0 |
| Seafood product preparation and packaging (61) | 381 | 29.1 | 144.9 | 35.1 |
| Bread and bakery product manufacturing (62) | 17,220 | 609.4 | 2,790.4 | 823.0 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | 2,234 | 91.1 | 927.7 | 200.5 |
| Snack food manufacturing (65) | 1,157 | 60.9 | 806.6 | 223.5 |
| Coffee and tea manufacturing (66) | 599 | 35.8 | 402.7 | 73.1 |
| Flavoring syrup and concentrate manufacturing (67) | 609 | 43.4 | 1,137.5 | 387.8 |
| Seasoning and dressing manufacturing (68) | 1,456 | 117.8 | 857.6 | 172.9 |
| All other food manufacturing (69) | 2,438 | 119.5 | 810.3 | 208.8 |
| Soft drink and ice manufacturing (70) | 2,577 | 225.7 | 1,901.6 | 302.4 |
| Breweries (71) | 1,465 | 169.9 | 1,762.7 | 777.8 |
| Wineries (72) | 2,059 | 82.3 | 767.3 | 143.6 |
| Distilleries (73) | 365 | 79.7 | 942.6 | 697.1 |
| Subtotal | 56,763 | 3,096.2 | 27,913.8 | 6,740.4 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | 366 | 22.1 | 467.8 | 39.3 |
| Pesticide and other agricultural chemical manufacturing (131) | 400 | 31.7 | 568.7 | 129.8 |
| Farm machinery and equipment manufacturing (203) | 677 | 35.8 | 310.4 | 78.8 |
| Lawn and garden equipment manufacturing (204) | 37 | 1.6 | 14.2 | 3.2 |
| Subtotal | 1,481 | 91.3 | 1,361.1 | 251.1 |
| Food and beverage wholesale trade (est. 319) | 61,924 | 5,266.1 | 12,026.9 | 9,364.7 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 5,400 | 459.2 | 1,048.8 | 816.6 |
| Retail Stores - Food and beverage (324) | 215,091 | 6,156.9 | 12,124.9 | 8,890.2 |
| Food services and drinking places (413) | 589,370 | 14,190.6 | 37,512.2 | 21,671.9 |
| Total Ag and Food System Cluster | 983,880 | 30,427.8 | 96,909.1 | 49,810.1 |

Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.
Note: Income includes employee compensation and proprietor income

## Farm and Food Trends in NYS

Important secondary or multiplier benefits are predicated on successful efforts to produce direct economic impact. That is, the conditions that warrant new production in any single farm or food sector must be fully understood. To further this understanding, long-term trends in farm and food production are examined in this section. These trends are important because much of the contemporary discussion about agriculturally based economic development is rooted in conditions and circumstances that have been operative in New York State for many years.

## Farm Numbers and Land in Farms

Farm consolidation has dominated the rural landscape as the farming industry has reacted to new cost/price relationships, economic opportunities on and off the farm, and shifting social realities. As a result, farm numbers have declined consistently over the last 50 years (Figure 3). ${ }^{5}$ Census data show that farm businesses continue to be consolidated into larger economic units, but smaller part-time farms have increased over the last decade. Today, more than 40 percent of all New York farms can be classified as residential farms because the operator has a full-time job off the farm. In addition, while the number of all farms fell by $2.4 \%$ from 2002 to 2007, the number of farms selling direct-to-consumer (D2C) in New York State grew by $14.8 \%$ over this same time period ( 2007 U.S. Census of Agriculture). Farms selling D2C represent about $15 \%$ of all farms, but garner a relatively small share of total sales per year (i.e., around $1.8 \%$ statewide in 2007). ${ }^{6}$


Figure 3. Number of farms for New York, selected Census years, 1950-2007.
Farm consolidation, along with expanded competition for land from nonfarm uses, has resulted in continual decreases in farm acreage (Figure 4). Land in farms decreased from 16 million acres in 1950 to just over 7 million acres in 2007. Acreage counted in the Census has remained relatively stable since the early 1990s. There are no comprehensive data on farmland conversion to developed residential,

[^3]commercial or industrial uses over this 50-year interval, but the circumstantial evidence suggests that only a fraction of this idled acreage met this fate. Instead, much of this acreage was idled and has reverted to natural forest cover when cropping and pasture operations were abandoned by farmers.


Figure 4. Land in farms for New York, selected Census years, 1950-2007.

## Farm Commodity Sales

Cash receipts over time, either from the production of crops, livestock, or livestock products, are shown in Figure $5^{7}$. To separate price effects from shifts in quantities of commodity production, nominal farm receipts over the 1990-2010 interval were adjusted using an index of prices received by farmers. After adjusting for price changes, the data show that, while production has been relatively volatile during the current decade, the value of farm receipts, price adjusted, has remained relatively steady at about $\$ 3$ billion per year.


Figure 5. Farm cash receipts from commodity sales in New York State, 1990-2010.

[^4]Annual cash receipts are differentiated between crop sales and livestock/livestock product sales in Figure 6. Using 1990 as a reference point, crops and livestock/livestock product sales were estimated at $\$ 0.9$ billion and $\$ 2.1$ billion, respectively. At this time, nearly $\$ 7$ of every $\$ 10$ in farm output was accounted for by livestock and livestock products. This ratio remained essentially stable until 2006 when higher crop prices, particularly led by higher grain and oilseed prices, increased the relative share for crop sales to about $40 \%$. As of 2010, crops and livestock/livestock product sales were estimated at $\$ 1.8$ billion and $\$ 2.7$ billion, respectively.


Source: U.S. Dept. Commerce, Bureau of Economic Analysis
Figure 6. Cash receipts from crops, livestock, and livestock products, New York State, 1990-2010.

Production agriculture is dominated by fluid milk production. The New York dairy industry accounts for more than half of total receipts from farm marketings. In current dollar terms, the dairy industry presently generates a dollar volume in the vicinity of $\$ 2.21$ billion (Figure 7). Production levels fluctuate from year to year, and milk prices have shown greater volatility in recent years. Shifts in these price and quantity relationships have resulted in fluctuations in total gross receipts that range from about $\$ 1.6$ billion to nearly $\$ 2.4$ billion over the past 5 years.


Source: U.S. Dept. Commerce, Bureau of Economic Analysis
Figure 7. Cash receipts from dairy product sales, New York State, 1990-2010.

The New York poultry and egg sector is substantially smaller than the dairy sector but has generated receipts ranging from $\$ 98$ million to nearly $\$ 147$ million in cash receipts in the last five years (Figure 8). Receipts from poultry production exhibited much more stability in the 1990s and the earlier parts of the 2000 decade, with fluctuations in cash receipts ranging between $\$ 82$ million and something in excess of $\$ 100$ million per year during those years.


Figure 8. Cash receipts from poultry and poultry product sales, New York State, 1990-2010.

Apart from dairy and poultry production, the New York farm sector generated about $\$ 378$ million per year from the sale of meat animals and other non-dairy livestock in 2010 (Figure 9). Production value in this sector has fluctuated between $\$ 285$ million and $\$ 425$ million since 2006.


Figure 9. Cash receipts from meat animals and other livestock sales, New York State, 1990-2010.

Much of New York's crop acreage is used to produce feed and forage crops to support the livestock industries mentioned above. Hay crops are the largest block of New York crop acreage, but many New York farmers sell crops to generate cash for the farm business. Receipts from the sale of oil seed crops (almost entirely soybeans), field grains (corn primarily), and food grains (wheat primarily) are shown in Figure 10. Cash receipts from this source totaled more than $\$ 452$ million in 2010, down from a peak of $\$ 508$ million in 2008. Production value has drifted sharply upward since the mid-2000s, reflecting robust increases in crop prices and favorable conditions for producing field and oil crops


Figure 10. Cash receipts from oil and grain crop sales, New York State, 19902010.

Because of similar yield and price interactions, cash receipts from the sale of fruit crops ranged between $\$ 171$ and $\$ 211$ million during the late 1990s and early 2000s. Receipts increased dramatically between 2004 and 2008, but remained stable in the $\$ 315$ million range during 2009 and 2010 (Figure 11). New York also has a vibrant vegetable crops industry. Cash receipts from the sale of vegetable crops crested at $\$ 502$ million in 2008 (Figure 12). Sales of greenhouse and nursery products have ramped up steadily since the mid-1990s, but have remained in the neighborhood of $\$ 375$ million since 2007 (Figure 13).


Source: U.S. Dept. Commerce, Bureau of Economic Analysis
Figure 11. Cash receipts from fruit crop sales, New York State, 1990-2010.


Figure 12. Cash receipts from vegetable crop sales, New York State, 19902010.


Figure 13. Cash receipts from greenhouse and nursery crop sales, New York State, 1990-2010.

## Downstream Farm and Food Sectors

Movement beyond production agriculture to a review of trends for downstream farm and food sectors shifts attention to agricultural services and food and beverage manufacturing. These sectors, along with commodity production, account for gross output estimated at nearly $\$ 33$ billion in 2010 (Table 1). We analyze the composite trends in industry activity using time series data collected from the US Department of Commerce, Bureau of Economic Analysis on three units of measure: employment, earnings, and value added. For interested readers, the time series data are shown in Appendix B.

Turning first to employment, Figure 14 shows year-to-year levels of employment in farm, agricultural services, and food manufacturing, respectively, over the 1990-2010 span. Farm employment, during a period of continued increases in labor productivity and growth in average farm size, decreased from nearly 66,000 jobs to about 51,000 jobs. However, farm employment has been relatively stable since
2006. ${ }^{8}$ As with the MIG estimates, data protocols used in Federal statistics make employment counts inclusive of both full-time and part-time employees. Labor use in farming is relatively difficult to measure because of dependence on family labor, use of seasonal workers in some commodity areas, and the predominance of smaller, part-time farms. Published data estimates do not distinguish between full and part-time work, nor is the seasonality of some farm employment taken into account. ${ }^{9}$


Figure 14. Total full and part-time employment in food and agriculture, New York State, 1990-2010.

Job making in agricultural services over the last two decades has been relatively stagnant, in part because of significant changes in data definitions over time. As discussed above, numerous categories of service, while often allied with farm commodity production, now fall outside the agricultural service category. For the reference year 2010, agricultural services employment is estimated at nearly 8,800 jobs, compared to about 8,000 jobs estimated in 1990 (Figure 14).

Employment in food manufacturing largely mirrors the steady job losses that characterized production agriculture throughout the 1990-2006 interval, but has been relatively constant since that time (Figure 14). Food manufacturing accounts for over 59,700 jobs, down from more than 75,600 jobs in the early 1990s. Food manufacturing by necessity is a very diverse collection of establishments involved in all phases of food processing and packaging. The broad category "food manufacturing" not only includes processing of food and beverages for human consumption, but also extends to the production of mixed and blended animal feeds and pet foods.

Moving away from employment as a unit of measure provides a distinctly different impression of trend in some cases. A useful measure is value added; the remaining component of total output after cash business expenses have been accounted for in any single industrial sector. Value added originating in farming, in contrast to farm employment, has remained relatively stable and exhibits a slight upward trend in current

[^5]dollar terms over the last two decades. In 2010, value added in the New York farm sector was about \$2.2 billion (Figure 15).


Figure 15. Gross State Product (GSP) originating in food and agriculture production, New York State, 1997-2010.

Value added in agricultural services, as one might expect, closely mirrors movements in employment. This is so because service sectors by definition are marked by high levels of labor input and are subject to relatively low rates of incremental change in labor productivity. For these reasons, employment and value added, dominated in this case by payments for labor services, are closely correlated as evidenced in Figures 14 and 15. Decreases in value added in the sector for the years 1997 forward was due to changes in data definitions discussed above.

Value added in food manufacturing has moved in directions counter to movements in employment over the past two decades. These counter movements are expected because of sharp increases in labor productivity over time. As Figure 15 shows, value added in food manufacturing has increased precipitously since the mid-2000s and presently stands at about $\$ 8.6$ billion, up from just over $\$ 4.8$ billion in 1990.

Taken together, the gross state product originating in New York farm production, agricultural services, and food and beverage manufacturing has increased dramatically during the last two decades. In current dollar terms, the value added in these three sectors has increased from more than $\$ 7$ billion per year to over $\$ 11$ billion over the 21-year interval (Figure 15).

These value added increases reflect movements in both quantity produced and relative prices. Separating these price and quantity effects is of interest, and such data are generated by the U.S. Department of Commerce, beginning in the mid to late 1990s. Results for the New York farm and food manufacturing sectors are shown in Figures 16 and 17 for calendar years 1997-2010. Calculations of current and real value added for the farm and food manufacturing sectors are indexed using calendar year 2005 as a base year. Real value added in the New York farm sector continues to show a longer-term upward trend since 1997. Real farm value added stands at about $\$ 2$ billion in 2005 dollars (Figure 16). In contrast, real value added in food manufacturing displays little trend between the late 1990s and 2010; albeit the 2010 estimate of $\$ 7.7$ billion is well above the 2004 estimate of $\$ 5.3$ billion (Figure 17).


Source: US Dept. Commerce, Bureau of Economic Analysis
Figure 16. Gross State Product (GSP) originating in crop and livestock production, New York State, 1997-2010


Source: US Dept. Commerce, Bureau of Economic Analysis
Figure 17. Gross State Product (GSP) originating in food and beverage manufacturing, New York State, 1997-2010

Additional insight on recent trends can be gained by measuring movements in earnings (personal income) generated in farming, agricultural services, and food manufacturing. According to Federal statistics, production agriculture presently generates earnings in the range of about $\$ 1.3$ billion (Figure 18). As expected, earnings in farming are highly erratic with often-abrupt year-to-year changes triggered by fluctuations in commodity prices and/or the vagaries of weather. Farm proprietors absorb most of the
volatility in farm earnings. Earnings include payments to hired farm labor, but proprietor's earnings are a relatively large proportion of the total and move with increases and decreases in net farm income. In contrast, earnings originating in agricultural services have systematically increased, even in the face of redefinitions that take much service income traditionally allocated to the farm sector (Figure 18). Presently, agricultural services generate about \$190 million in earnings, up from \$117 million in 1990 .


Figure 18. Earnings originating in food and agriculture, New York State, 1990-2010
Like agricultural services, earnings in food manufacturing have increased systematically, even in the face of declining employment for the last two decades. In 2010, food manufacturing earnings stood at about $\$ 3.6$ billion, an amount nearly three times the amount realized from crop and livestock production (Figure 18).

## Forward Linkages

Farming, agricultural services, and food processing exert impacts on the New York economy through forward linkages to transportation, wholesaling, retailing, and food services. Some of those links are achieved within New York State and some are achieved out of state. Unfortunately, relatively little information can be gleaned from published sources to fully understand these forward linkages.

To address this issue, at least in part, we use trade flow data from IMPLAN, an input/output model describing estimates of transactions between 440 industrial sectors in the New York economy. This model is based on structural relationships between industries found at the national level and reported by the U.S. Department of Commerce, Bureau of Economic Analysis. These data allow estimates of forward linkages to in-state buyers, shipments to foreign markets, and exports to other states in the U.S. Results are summarized in Figures 19 and 20 for major farm production sectors in the New York economy.

Turning first to dairy farm products, the IMPLAN estimates suggest that $78 \%$ of total supply in New York's largest farm production sector is sold to in-state buyers -- almost exclusively to milk handlers and processors. As expected, offshore export sales of dairy farm products are extremely low and estimated here at less than 0.1 percent. The remaining production, amounting to about $22 \%$ of the total, finds its way out of state to processors and handlers (Figure 19). A similar pattern is evident for New York's cattle and other livestock sectors with a preponderance of product sales to processors and handlers in-state. In contrast, New York state poultry and egg sectors appear to be moving a larger proportion of total product to markets outside the State.


Figure 19. Estimated destination of New York state livestock/livestock products, 2010

The picture for New York crop production is equally varied, as shown in Figure 20. Upon inspection, instate sales predominate for grains, fruit, and vegetable commodities. The fraction of total supply accounted for by in-state sales ranges from 61 to 85 percent depending on the commodity sector considered. Oilseed producers-mainly soybeans- move most of their product to processors out of state ( $48 \%$ ) or for foreign export ( $32 \%$ ). Dependence upon out-of-state markets is also substantial for New York's greenhouse and nursery industries, with more than half (53\%) of total supply going to out of state sales.


Figure 20. Estimated destination of New York state crop output, 2010

## Backward Linkages

Backward linkages between food and agricultural production in New York and other sectors of the wider New York economy are analyzed through the calculation of economic multipliers. The economic multiplier is an important tool in economic impact analysis. Formal study and our own practical experience indicate that industries are interdependent and that expansion or contraction in one industry is likely to have some far-reaching implications. As noted in this study, a substantial share of total gross output in the New York State economy is comprised of cash business expenses. To reiterate, these are transactions between businesses to acquire the inputs needed to deliver additional product or service to a final user. ${ }^{10}$ One aspect of this project has been to update information on these cash expenses and their generative impacts for the state. Assessment of such generative impacts is generally referred to as multiplier analysis. ${ }^{11}$

The object of multiplier analysis is to trace out the interrelationships between sectors and construct quantitative measures of the impact associated with increasing or decreasing a line of economic activity. The idea traces to economic base theory which classifies goods and services sold outside the region's boundaries as "exports", and hence, basic. Conversely, goods and services produced by the nonbasic sector are consumed within the region's boundaries. Expansion of the basic sector of the economy necessarily entails added production in these support industries, particularly in terms of intermediate inputs, all of which adds to the development of a regional economy. The economic multiplier summarizes the cumulative (direct, indirect, and induced) effect of an initial change in final demand plus the resulting series of successive rounds of spending within the local economy. It is the ratio between the total change in spending and the initial change in final demand (or the income or employment implied by it).

Multipliers are constructed based on a "snapshot" of a regional economy. That is, the economic multiplier is governed by the pattern of economic transactions between firms and the final users of their products for a single year. Lots of transactions between in-state business firms make for relatively large economic multipliers; relatively fewer transactions mean smaller multipliers. This means that multipliers can go out of date as structural relationships (patterns of transactions) between sectors change. Structural changes can emanate from technological developments, important shifts in relative prices, regional trade patterns, and several other sources.

Another, and closely related, concern with multipliers is that they best represent the effects of small or marginal changes in output in any one sector. Large shifts in a regional economic system require a more detailed analysis before their effect on total income or employment can be measured. Finally, multiplier estimates rest on models utilizing local secondary data combined with coefficients from a national model. This procedure avoids the prohibitively high costs of conducting an exhaustive survey of transactions in a regional economy. However, reliance on this procedure requires the assumption that differences between the structure of the local economy and the national economy can be accurately measured. The restrictiveness of these assumptions is less severe as one progresses from a county-level economy to a state-level economy.

Multipliers can be calculated using several units of measure. The measures used in this study are total output and employment. The former provides a useful reference point for analysis because it shows an estimate of the generative effects associated with business revenue expansion or contraction across New York food and farm industries. These data are often of interest to a variety of audiences concerned with the impacts of individual farm and food sectors.

[^6]Output multipliers for selected farm and food sectors in the New York State economy are shown in Figure 21. These estimates were calculated from the IMPLAN input/output model and provide an estimate of the total generated effects associated with one unit, that is, $\$ 1.00$ additional delivery of product to a final user. Because of structural interdependence between sectors, new production in a food or agricultural sector will generate successive rounds of transactions as firms backward linked to these industries also adjust output to meet the intermediate needs for farm and food production. These estimates take into account the first dollar of direct requirements along with the dollar value of additional production required to sustain the unit increase in farm and food production. These values, as shown in Figure 21, generally range between 1.6 and 2.0 , suggesting each new dollar of farm and food output for the state brings additional production valued at something less than 1 dollar. The estimates take into account both the indirect effects of new industrial production and the induced effects associated with added amounts of household consumption expenditures and additional output by state and local governments.


Figure 21. Output multipliers for selected farm and food sectors, New York State, 2010


Figure 22. Output multipliers for selected industrial sectors, New York State, 2010

To achieve additional perspective on the multiplier question, the model results for several aggregated sectors of the New York economy are presented in Figure 22. These results allow one to compare the generative effects of new farm or food production with those associated with new output in nonfarm sectors of the New York economy. Looking at aggregated sectors suggests that output multipliers for food and agricultural sectors compare reasonably well with those associated with expansions or contractions in nonfarm sectors.

Because of differences (often material differences) in relationships between output and employment, results arranged using employment as a measurement unit portray different outcomes (Figure 23). An immediate observation is that the picture for employment multipliers is mixed. Most notably, the aggregate multiplier for food manufacturing amounts to 3.17 using employment as a unit of measurement, considerably more robust than the output multiplier reported in Figure 21. This finding suggests that for every additional new job created in food manufacturing in New York State, an additional 2.2 jobs are supported in industries and sectors structurally linked to the food manufacturing sector. These structural linkages include relationships and transactions with production agriculture, but also extend to a variety of service industries that depend upon food manufacturing as a sales outlet for their products and services. Similarly, the employment multiplier for agricultural and forestry services approaches a relatively robust 2.0 , suggesting one additional job for every new job created in the sector.


Figure 23. Employment multipliers for selected farm and food sectors, New York State, 2010

The conclusion that employment benefits associated with expanded food manufacturing output in New York State are relatively robust is sustained when the frame of reference is the entire macro New York economy, as shown in Figure 24. Model results suggest that food manufacturing exerts one of the highest employment multiplier effects of any industry in the State.

IMPLAN model results were disaggregated to derive output and employment multipliers for selected industries in the farm, agricultural services, and food manufacturing sectors. Results are displayed in Figures 25 and 26. As expected, the disaggregated results show that the generative effects of new in-state production of farm and food products vary materially among individual industries, depending on the type of commodity or service. Turning first to farm commodity production, output multipliers vary within a relatively narrow range of about 1.7 to just under 2.0. Similarly, multiplier estimates for agricultural services approach 2.0 (Figure 25). Employment multipliers are more variable across farm sectors and range from about 1.1 to nearly 2.5 .


Figure 24. Employment multipliers for selected industrial sectors, New York State, 2010

| Description | Output | Employment |
| :--- | :---: | :---: |
| Oilseed farming | 1.70 | 1.30 |
| Grain farming | 1.99 | 1.26 |
| Vegetable and melon farming | 1.95 | 2.04 |
| Fruit farming | 1.96 | 1.95 |
| Greenhouse, nursery, and floriculture <br> production | 1.91 | 1.63 |
| All other crop farming | 1.97 | 2.09 |
| Cattle ranching and farming | 1.74 | 1.48 |
| Dairy cattle and milk production | 1.67 | 1.40 |
| Poultry and egg production | 1.71 | 2.44 |
| Animal production, except cattle and poultry <br> and eggs | 1.61 | 1.13 |
| Commercial Fishing | 1.79 | 1.20 |
| Support activities for agriculture and forestry | 1.98 | 1.25 |

Source: MIG 2011
Figure 25. Disaggregated output and employment multipliers for selected farm and agricultural services sectors, New York State, 2010.

These multiplier relationships persist, but more dramatically, when attention turns to food manufacturing as shown in Figure 26. Disaggregated multipliers for food manufacturing using product output as the unit of measure range from 1.32 to 2.17 , with the highest multipliers garnered in New York dairy processing sectors. Robust multipliers for dairy processing carry over to the employment side as well, with estimated employment multipliers at well over 5.0. Similarly strong employment multipliers are noted for grain and oilseed milling sectors, animal food processing, and beverage sectors.

| Description | Output | Employment |
| :--- | :---: | :---: |
| Dog and cat food | 1.52 | 4.66 |
| Other animal food | 1.59 | 4.93 |
| Flour milling | 1.84 | 8.20 |
| Fats and oils | 1.45 | 4.79 |
| Sugar fining | 1.68 | 4.10 |
| Confectionery -chocolate | 1.65 | 2.19 |
| Nonchocolate confectionery | 1.67 | 2.22 |
| Frozen food | 1.78 | 2.47 |
| Fruit and vegetable s | 1.73 | 2.95 |
| Fluid milk and butter | 2.18 | 5.67 |
| Cheese | 2.17 | 6.58 |
| Dry, condensed, and <br> evaporated dairy products | 2.05 | 7.86 |
| Ice cream and frozen dessert | 1.96 | 3.01 |
| Animal processing | 1.66 | 3.10 |


| Description | Output | Employment |
| :--- | :---: | :---: |
| Poultry processing | 1.55 | 1.71 |
| Seafood products | 1.65 | 2.57 |
| Bread and bakery products |  |  |$\quad 1.91$. 1.87

Source: MIG 2011

Figure 26. Disaggregated output and employment multipliers for selected food manufacturing sectors, New York State, 2010

These findings on backward linkages and economic multipliers add more perspective to New York's food and agriculture system. As noted above, we found that, in 2010, New York's agriculture and food sectors -- farms, agricultural services, and food manufacturing -- generated an impressive $\$ 32.8$ billion (agricultural chemicals and equipment manufacturing, wholesale and retail trade, and food service/drinking places bring total output to an estimated $\$ 96.3$ billion). On a relative basis, this is a small percentage of the state's total gross output, but the multiplier estimates confirm the anecdotal evidence, which suggests that food and agriculture exerts a relatively large generative effect on the New York economy. Compared with other New York industries, farm and food firms make relatively large proportions of their cash business expenditures in state. This means that efforts to enhance production in these sectors produce relatively large secondary and tertiary benefits for industries linked to farm and food production.

## REFERENCES:

Beierlein, J.G., K.C. Schneeberger, and D.D Osburn. 2003. Principles of Agribusiness Management. $3^{\text {rd }}$ ed. Waveland Press: Long Grove, IL.

Bills, N.L. 2001. "Agriculture-Based Economic Development: Trends and Prospects for New York." E.B. 2001-18, Department of Applied Economics and Management, Cornell University, December.

Boisvert, R.N. and N.L. Bills. 1976. "A Non-Survey Technique for Regional I-O Models: Application to River Basin Planning." A.E. Res. 76-19, Department of Agricultural Economics, Cornell University, August.

Jack, K., N. Bills, and R. Boisvert. 1996a. "An Outline of the New York State Economy." Policy Issues in Rural Land Use, Department of Agricultural, Resource, and Managerial Economics, Cornell University, Vol. 9, No. 1, May.

Jack, K., N. Bills, and R. Boisvert. 1996b. "Economic Multipliers and the New York Economy." Policy Issues in Rural Land Use, Department of Agricultural, Resource, and Managerial Economics, Cornell University, Vol. 9, No. 2, December.

Minnesota Implan Group (MIG). 2011. New York 2010 Databases - State and Counties.
U.S. Census Bureau. 2007. 2007 Economic Census. U.S. Department of Commerce, Washington, D.C., http://www.census.gov/econ/census07/.
U.S. Department of Agriculture. 2007. Census of Agriculture. Selected years, http://www.agcensus.usda.gov.
U.S. Department of Agriculture. Agricultural Prices. Selected years, 1990-2010. http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1002
U.S. Department of Agriculture. 2012. Agricultural Outlook Statistical Indicators, Table 4 Indexes of Prices Received and Paid by Farmers. Economic Research Service, Washington., D.C., http://www.ers.usda.gov/data-products/agricultural-outlook-statistical-indicators.aspx.
U.S. Department of Commerce, Bureau of Economic Analysis. 2011. Regional Accounts Data, http://www.bea.doc.gov/regional.

## Appendix A. Agriculture and Food System Contributions by Region in New York State

Following Empire State Development, regional delineations are as follows:

| Appendix Code | Region Name | Counties Included |
| :--- | :--- | :--- |
| A1 | Capital District | Albany, Columbia, Greene, <br> Rensselaer, Saratoga, Schenectady, <br> Warren, Washington, |
| A2 | Central New York | Cayuga, Cortland, Madison, <br> Onondaga, Owego |
| A3 | Finger Lakes | Genesee, Livingston, Monroe, <br> Ontario, Orleans, Seneca, Wayne, <br> Wyoming, Yates |
| A4 | Long Island | Mid-Hudson |
| A5 | Mohssau, Suffolk |  |
| A6 | New York City | Rutchess, Orange, Putnam, <br> Rockland, Sullivan, Ulster, <br> Westchester |
| A7 | North Country | Fulton, Hamilton, Herkimer, <br> Montgomery, Oneida, Schoharie |
| A8 | Southern Tier | Bronx, Kings, New York, Queens, <br> Richmond |
| A9 | Clilnton, Essex, Franklin, Jefferson, <br> Lewis, St. Lawrence |  |
| A10 | Western New York | Broome, Chemung, Chenango, <br> Delaware, Otsego, Schyler, <br> Steuben, Tioga, Tompkins |

Table A1. Agriculture and Food System Contributions by Industry Sector, Capital District Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) | ----- | \$ Million |  |
| Oilseed farming (1) | 38 | 0.2 | 1.8 | 0.8 |
| Grain farming (2) | 331 | 1.8 | 11.4 | 4.1 |
| Vegetable and melon farming (3) | 259 | 9.8 | 27.6 | 14.2 |
| Fruit and tree nut farming (4,5) | 332 | 8.8 | 20.7 | 9.5 |
| Greenhouse, nursery, and floriculture (6) | 386 | 12.8 | 29.6 | 17.9 |
| All other crop farming (10) | 255 | 7.1 | 30.3 | 10.4 |
| Cattle ranching and farming (11) | 115 | 0.8 | 8.8 | 1.6 |
| Dairy cattle and milk production (12) | 2,168 | 12.7 | 181.0 | 73.2 |
| Poultry and egg production (13) | 57 | 2.3 | 18.2 | 3.5 |
| Other animal production (14) | 463 | 2.7 | 13.8 | 7.4 |
| Subtotal | 4,405 | 59.2 | 343.2 | 142.4 |
| Support activities for agriculture and forestry (19) | 739 | 16.2 | 16.3 | 13.9 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 52 | 2.7 | 40.7 | 4.1 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | 106 | 5.9 | 86.5 | 8.0 |
| Oilseed processing, fats and oils refining (45,46) | - | - | - | - |
| Sugar mills and manufacturing (48,49) | - | - | - | - |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 46 | 1.3 | 15.3 | 2.3 |
| Fruit and vegetable manufacturing ( 53,54 ) | 142 | 8.4 | 69.2 | 13.2 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 457 | 29.6 | 289.3 | 40.3 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 192 | 8.6 | 74.0 | 9.1 |
| Seafood product preparation and packaging (61) | - | - | - | - |
| Bread and bakery product manufacturing (62) | 987 | 40.5 | 151.0 | 45.0 |
| Cookie, cracker, pasta and tortilla manufacturing (63,64) | 51 | 2.6 | 19.1 | 3.9 |
| Snack food manufacturing (65) | - | - | - | - |
| Coffee and tea manufacturing (66) | 3 | 0.2 | 1.7 | 0.2 |
| Flavoring syrup and concentrate manufacturing (67) | - | - | - | - |
| Seasoning and dressing manufacturing (68) | 11 | 0.4 | 4.5 | 0.4 |
| All other food manufacturing (69) | 38 | 1.0 | 9.4 | 1.2 |
| Soft drink and ice manufacturing (70) | 578 | 65.8 | 389.8 | 69.2 |
| Breweries (71) | 32 | 6.5 | 42.4 | 17.7 |
| Wineries (72) | - | - | - | - |
| Distilleries (73) | - | - | - | - |
| Subtotal | 2,694 | 173.4 | 1,193.0 | 214.5 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | 53 | 2.4 | 48.5 | 3.6 |
| Pesticide and other agricultural chemical manufacturing (131) | - | - | - | - |
| Farm machinery and equipment manufacturing (203) | 42 | 2.2 | 9.2 | 3.9 |
| Lawn and garden equipment manufacturing (204) | - | - | - | - |
| Subtotal | 95 | 4.7 | 57.6 | 7.6 |
| Food and beverage wholesale trade (est. 319) | 2,727 | 196.9 | 509.6 | 333.0 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 771 | 55.7 | 144.1 | 94.1 |
| Retail Stores - Food and beverage (324) | 13,520 | 331.6 | 717.2 | 483.2 |
| Food services and drinking places (413) | 32,899 | 643.3 | 1,835.9 | 908.2 |
| Total Ag and Food System Cluster | 57,852 | 1,480.9 | 4,816.9 | 2,197.0 |

Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.
Note: Income includes employee compensation and proprietor income


Figure A1. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Capital District Region, New York State, 2010.

Table A2. Agriculture and Food System Contributions by Industry Sector, Central New York Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) | ------ | \$ Million |  |
| Oilseed farming (1) | 376 | 2.2 | 27.1 | 11.1 |
| Grain farming (2) | 926 | 4.3 | 45.2 | 9.1 |
| Vegetable and melon farming (3) | 438 | 20.5 | 53.3 | 26.6 |
| Fruit and tree nut farming (4,5) | 62 | 3.1 | 8.1 | 4.2 |
| Greenhouse, nursery, and floriculture (6) | 137 | 10.8 | 13.7 | 9.0 |
| All other crop farming (10) | 172 | 7.2 | 33.8 | 10.3 |
| Cattle ranching and farming (11) | 184 | 2.4 | 22.4 | 3.7 |
| Dairy cattle and milk production (12) | 2,345 | 26.0 | 318.4 | 116.5 |
| Poultry and egg production (13) | 20 | 1.2 | 10.6 | 1.9 |
| Other animal production (14) | 134 | 1.2 | 6.0 | 3.0 |
| Subtotal | 4,795 | 79.0 | 538.8 | 195.5 |
| Support activities for agriculture and forestry (19) | 380 | 13.3 | 16.6 | 13.0 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 138 | 8.1 | 166.4 | 23.4 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | 26 | 1.7 | 33.0 | 4.8 |
| Oilseed processing, fats and oils refining ( 45,46 ) | - | - | - | - |
| Sugar mills and manufacturing ( 48,49 ) | - | - | - | - |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 45 | 2.1 | 17.7 | 4.2 |
| Fruit and vegetable manufacturing ( 53,54 ) | 314 | 14.7 | 114.1 | 25.4 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 602 | 42.2 | 372.2 | 70.6 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 182 | 12.5 | 83.7 | 13.9 |
| Seafood product preparation and packaging (61) | - | - | - | - |
| Bread and bakery product manufacturing (62) | 279 | 7.5 | 42.8 | 10.9 |
| Cookie, cracker, pasta and tortilla manufacturing (63,64) | 15 | 0.6 | 6.3 | 1.4 |
| Snack food manufacturing (65) | 27 | 1.0 | 18.3 | 4.8 |
| Coffee and tea manufacturing (66) | 43 | 1.8 | 28.1 | 4.4 |
| Flavoring syrup and concentrate manufacturing (67) | - | - | - | - |
| Seasoning and dressing manufacturing (68) | 15 | 1.0 | 8.4 | 1.5 |
| All other food manufacturing (69) | 49 | 2.1 | 16.1 | 3.9 |
| Soft drink and ice manufacturing (70) | 158 | 11.3 | 114.2 | 16.0 |
| Breweries (71) | 567 | 59.1 | 675.5 | 294.4 |
| Wineries (72) | 79 | 4.6 | 30.7 | 6.8 |
| Distilleries (73) | - | - | - | - |
| Subtotal | 2,539 | 170.2 | 1,727.5 | 486.6 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | 86 | 6.9 | 111.7 | 10.9 |
| Pesticide and other agricultural chemical manufacturing (131) | - | - | - | - |
| Farm machinery and equipment manufacturing (203) | 93 | 5.6 | 43.2 | 11.5 |
| Lawn and garden equipment manufacturing (204) | 35 | 1.6 | 13.4 | 3.0 |
| Subtotal | 214 | 14.1 | 168.3 | 25.4 |
| Food and beverage wholesale trade (est. 319) | 4,083 | 274.5 | 720.3 | 544.7 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 448 | 30.1 | 79.0 | 59.7 |
| Retail Stores - Food and beverage (324) | 10,142 | 229.2 | 510.6 | 358.1 |
| Food services and drinking places (413) | 27,661 | 503.4 | 1,597.9 | 854.5 |
| Total Ag and Food System Cluster | 50,262 | 1,313.7 | 5,359.0 | 2,537.6 |

[^7]Note: Income includes employee compensation and proprietor income


Figure A2. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Central New York Region, New York State, 2010.

Table A3. Agriculture and Food System Contributions by Industry Sector, Finger Lakes Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) |  | \$ Million |  |
| Oilseed farming (1) | 1,126 | 6.1 | 79.9 | 32.6 |
| Grain farming (2) | 2,388 | 10.5 | 123.8 | 24.9 |
| Vegetable and melon farming (3) | 1,070 | 82.0 | 232.6 | 116.3 |
| Fruit and tree nut farming (4,5) | 776 | 43.6 | 126.2 | 65.5 |
| Greenhouse, nursery, and floriculture (6) | 304 | 25.0 | 37.1 | 24.3 |
| All other crop farming (10) | 227 | 12.3 | 60.7 | 18.6 |
| Cattle ranching and farming (11) | 304 | 4.1 | 46.4 | 7.7 |
| Dairy cattle and milk production (12) | 3,109 | 38.1 | 539.1 | 197.2 |
| Poultry and egg production (13) | 23 | 1.7 | 16.5 | 3.0 |
| Other animal production (14) | 245 | 2.0 | 13.1 | 6.4 |
| Subtotal | 9,572 | 225.3 | 1,275.3 | 496.5 |
| Support activities for agriculture and forestry (19) | 824 | 30.5 | 37.8 | 30.0 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 198 | 12.0 | 238.8 | 31.5 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | 97 | 4.9 | 123.1 | 16.8 |
| Oilseed processing, fats and oils refining ( 45,46 ) | 9 | 0.3 | 15.0 | 1.3 |
| Sugar mills and manufacturing (48,49) | - | - | - | - |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 99 | 3.9 | 35.3 | 9.8 |
| Fruit and vegetable manufacturing ( 53,54 ) | 2,119 | 116.3 | 953.7 | 228.7 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 627 | 43.0 | 531.5 | 77.5 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 250 | 14.0 | 114.9 | 15.9 |
| Seafood product preparation and packaging (61) | 17 | 1.2 | 6.4 | 1.5 |
| Bread and bakery product manufacturing (62) | 1,178 | 53.5 | 202.7 | 68.1 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | 183 | 9.5 | 79.6 | 18.6 |
| Snack food manufacturing (65) | 69 | 4.1 | 48.6 | 13.8 |
| Coffee and tea manufacturing (66) | 37 | 1.9 | 24.5 | 4.2 |
| Flavoring syrup and concentrate manufacturing (67) | 96 | 7.9 | 179.4 | 61.9 |
| Seasoning and dressing manufacturing (68) | 402 | 24.3 | 228.5 | 39.5 |
| All other food manufacturing (69) | 87 | 3.1 | 27.6 | 6.2 |
| Soft drink and ice manufacturing (70) | 101 | 4.7 | 70.3 | 7.7 |
| Breweries (71) | 516 | 66.5 | 627.1 | 280.4 |
| Wineries (72) | 968 | 31.4 | 353.5 | 60.3 |
| Distilleries (73) | - | - | - | - |
| Subtotal | 7,051 | 402.4 | 3,860.2 | 943.9 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | 9 | 0.4 | 11.5 | 0.8 |
| Pesticide and other agricultural chemical manufacturing (131) | 45 | 3.6 | 63.8 | 14.6 |
| Farm machinery and equipment manufacturing (203) | 266 | 15.3 | 123.2 | 32.2 |
| Lawn and garden equipment manufacturing (204) | - | - | - | - |
| Subtotal | 320 | 19.3 | 198.5 | 47.6 |
| Food and beverage wholesale trade (est. 319) | 2,690 | 198.9 | 492.7 | 377.0 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 915 | 67.7 | 167.6 | 128.3 |
| Retail Stores - Food and beverage (324) | 17,438 | 405.8 | 889.7 | 627.4 |
| Food services and drinking places (413) | 39,936 | 729.5 | 2,309.7 | 1,236.4 |
| Total Ag and Food System Cluster | 78,746 | 2,079.4 | 9,231.6 | 3,887.1 |

[^8]Note: Income includes employee compensation and proprietor income


Figure A3. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Finger Lakes Region, New York State, 2010.

Table A4. Agriculture and Food System Contributions by Industry Sector, Long Island Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) | ------- | \$ Million -- |  |
| Oilseed farming (1) | 1 | 0.0 | 0.1 | 0.0 |
| Grain farming (2) | 13 | 0.1 | 0.8 | 0.2 |
| Vegetable and melon farming (3) | 177 | 13.2 | 43.0 | 21.5 |
| Fruit and tree nut farming (4,5) | 42 | 3.1 | 9.8 | 5.1 |
| Greenhouse, nursery, and floriculture (6) | 1,312 | 113.8 | 195.0 | 127.9 |
| All other crop farming (10) | 0 | 0.0 | 0.1 | 0.0 |
| Cattle ranching and farming (11) | 0 | 0.0 | 0.1 | 0.0 |
| Dairy cattle and milk production (12) | 8 | 0.1 | 1.2 | 0.4 |
| Poultry and egg production (13) | 3 | 0.2 | 2.2 | 0.4 |
| Other animal production (14) | 129 | 1.0 | 7.5 | 3.7 |
| Subtotal | 1,686 | 131.5 | 259.8 | 159.2 |
| Support activities for agriculture and forestry (19) | 470 | 20.5 | 24.7 | 20.2 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 111 | 8.3 | 135.1 | 19.2 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | 24 | 2.4 | 31.1 | 5.3 |
| Oilseed processing, fats and oils refining ( 45,46 ) | 2 | 0.1 | 3.0 | 0.3 |
| Sugar mills and manufacturing (48,49) | 5 | 0.3 | 2.6 | 0.4 |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 478 | 25.0 | 192.9 | 52.3 |
| Fruit and vegetable manufacturing ( 53,54 ) | 459 | 23.1 | 183.2 | 42.3 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 305 | 16.2 | 198.4 | 27.8 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 370 | 15.9 | 141.1 | 18.6 |
| Seafood product preparation and packaging (61) | 20 | 0.6 | 6.7 | 0.9 |
| Bread and bakery product manufacturing (62) | 2,948 | 122.1 | 495.5 | 158.6 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | 394 | 15.5 | 166.0 | 35.2 |
| Snack food manufacturing (65) | 5 | 0.3 | 3.4 | 0.9 |
| Coffee and tea manufacturing (66) | - | - | - | - |
| Flavoring syrup and concentrate manufacturing (67) | 260 | 16.2 | 483.3 | 163.2 |
| Seasoning and dressing manufacturing (68) | 83 | 7.4 | 49.4 | 10.5 |
| All other food manufacturing (69) | 566 | 37.5 | 197.8 | 58.2 |
| Soft drink and ice manufacturing (70) | 120 | 13.4 | 91.7 | 17.0 |
| Breweries (71) | 20 | 3.4 | 24.6 | 11.5 |
| Wineries (72) | 366 | 16.8 | 138.7 | 27.7 |
| Distilleries (73) | 16 | 2.9 | 40.0 | 29.4 |
| Subtotal | 6,550 | 327.1 | 2,584.6 | 679.4 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | 116 | 4.9 | 146.4 | 10.4 |
| Pesticide and other agricultural chemical manufacturing (131) | 99 | 9.6 | 142.3 | 33.8 |
| Farm machinery and equipment manufacturing (203) | 104 | 4.8 | 46.8 | 11.4 |
| Lawn and garden equipment manufacturing (204) | 0 | 0.0 | 0.1 | 0.0 |
| Subtotal | 319 | 19.3 | 335.6 | 55.6 |
| Food and beverage wholesale trade (est. 319) | 10,371 | 903.1 | 2,035.4 | 1,589.5 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 1,189 | 103.5 | 233.4 | 182.3 |
| Retail Stores - Food and beverage (324) | 36,093 | 1,188.1 | 2,189.6 | 1,646.8 |
| Food services and drinking places (413) | 83,849 | 1,972.0 | 5,289.9 | 3,036.3 |
| Total Ag and Food System Cluster | 140,527 | 4,665.1 | 12,952.9 | 7,369.3 |

Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.
Note: Income includes employee compensation and proprietor income


Figure A4. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Long Island Region, New York State, 2010.

Table A5. Agriculture and Food System Contributions by Industry Sector, Mid-Hudson Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) | ---- | \$ Million |  |
| Oilseed farming (1) | 27 | 0.1 | 0.8 | 0.3 |
| Grain farming (2) | 194 | 0.5 | 4.3 | 0.9 |
| Vegetable and melon farming (3) | 640 | 27.0 | 62.0 | 31.0 |
| Fruit and tree nut farming (4,5) | 316 | 12.6 | 22.3 | 11.5 |
| Greenhouse, nursery, and floriculture (6) | 597 | 34.4 | 41.5 | 27.3 |
| All other crop farming (10) | 88 | 2.7 | 8.5 | 2.6 |
| Cattle ranching and farming (11) | 86 | 0.9 | 4.6 | 0.8 |
| Dairy cattle and milk production (12) | 585 | 5.1 | 38.3 | 14.0 |
| Poultry and egg production (13) | 42 | 2.7 | 11.9 | 2.2 |
| Other animal production (14) | 736 | 5.4 | 16.8 | 8.2 |
| Subtotal | 3,312 | 91.5 | 210.9 | 98.8 |
| Support activities for agriculture and forestry (19) | 1,164 | 47.3 | 57.6 | 46.5 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 107 | 11.6 | 136.3 | 28.8 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | - | - | - | - |
| Oilseed processing, fats and oils refining ( 45,46 ) | - | - | - | - |
| Sugar mills and manufacturing ( 48,49 ) | 259 | 29.8 | 244.1 | 40.4 |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 246 | 10.9 | 88.7 | 23.8 |
| Fruit and vegetable manufacturing ( 53,54 ) | 365 | 31.1 | 177.4 | 51.0 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 448 | 46.8 | 328.4 | 64.5 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 472 | 13.7 | 112.9 | 16.8 |
| Seafood product preparation and packaging (61) | 19 | 2.7 | 8.6 | 3.0 |
| Bread and bakery product manufacturing (62) | 1,986 | 78.4 | 330.0 | 103.1 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | 131 | 7.5 | 47.4 | 12.6 |
| Snack food manufacturing (65) | 300 | 10.9 | 204.0 | 53.0 |
| Coffee and tea manufacturing (66) | 55 | 4.3 | 38.2 | 7.7 |
| Flavoring syrup and concentrate manufacturing (67) | 160 | 13.0 | 299.7 | 103.3 |
| Seasoning and dressing manufacturing (68) | 89 | 10.8 | 56.2 | 14.2 |
| All other food manufacturing (69) | 390 | 18.9 | 129.5 | 33.2 |
| Soft drink and ice manufacturing (70) | 632 | 45.5 | 456.7 | 64.4 |
| Breweries (71) | 29 | 4.8 | 36.3 | 16.8 |
| Wineries (72) | 38 | 1.1 | 13.7 | 2.2 |
| Distilleries (73) | 287 | 71.0 | 749.6 | 556.6 |
| Subtotal | 6,014 | 412.8 | 3,457.8 | 1,195.4 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | 76 | 6.0 | 97.9 | 9.5 |
| Pesticide and other agricultural chemical manufacturing (131) | 12 | 0.7 | 16.1 | 3.5 |
| Farm machinery and equipment manufacturing (203) | - | - | - | - |
| Lawn and garden equipment manufacturing (204) | - | - | - | - |
| Subtotal | 87 | 6.7 | 114.0 | 13.0 |
| Food and beverage wholesale trade (est. 319) | 7,551 | 640.9 | 1,465.2 | 1,140.6 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 731 | 62.0 | 141.8 | 110.4 |
| Retail Stores - Food and beverage (324) | 27,389 | 831.4 | 1,591.3 | 1,179.4 |
| Food services and drinking places (413) | 56,406 | 1,337.0 | 3,569.0 | 2,053.0 |
| Total Ag and Food System Cluster | 102,654 | 3,429.6 | 10,607.8 | 5,837.2 |

[^9]Note: Income includes employee compensation and proprietor income

| $\square$ Crops, greenhouse, nursery | $\square$ Livestock, related products |
| :--- | :--- |
| $\square$ Ag support \& forestry services | $\square$ Food and Beverage manufacturing |
| $\square$ Ag chemicals, equipment manufacturing | $\square$ Food and beverage wholesale trade (est.) |
| $\square$ Ag equipment, supplies, nursery wholesale trade (est) | $\square$ Food and beverage retail trade |
| $\square$ Food service and drinking places |  |


Output (\$ Million)

Value Added (\$ Million)


Figure A5. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Mid-Hudson Region, New York State, 2010.

Table A6. Agriculture and Food System Contributions by Industry Sector, Mohawk Valley Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) | ------- | \$ Million |  |
| Oilseed farming (1) | 96 | 0.4 | 5.0 | 2.0 |
| Grain farming (2) | 497 | 1.3 | 17.5 | 3.5 |
| Vegetable and melon farming (3) | 132 | 5.5 | 17.7 | 8.9 |
| Fruit and tree nut farming (4,5) | 44 | 1.5 | 5.4 | 2.8 |
| Greenhouse, nursery, and floriculture (6) | 143 | 6.2 | 12.4 | 8.1 |
| All other crop farming (10) | 187 | 4.9 | 29.0 | 8.9 |
| Cattle ranching and farming (11) | 141 | 0.9 | 13.1 | 2.2 |
| Dairy cattle and milk production (12) | 1,848 | 10.2 | 189.2 | 69.2 |
| Poultry and egg production (13) | 20 | 0.8 | 9.5 | 1.7 |
| Other animal production (14) | 116 | 0.5 | 4.0 | 2.0 |
| Subtotal | 3,224 | 32.1 | 302.8 | 109.3 |
| Support activities for agriculture and forestry (19) | 216 | 8.0 | 9.9 | 7.8 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 66 | 3.6 | 80.2 | 14.3 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | - | - | - | - |
| Oilseed processing, fats and oils refining ( 45,46 ) | 119 | 7.3 | 192.2 | 20.5 |
| Sugar mills and manufacturing (48,49) | - | - | - | - |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 83 | 4.7 | 31.0 | 9.1 |
| Fruit and vegetable manufacturing ( 53,54 ) | 661 | 40.7 | 356.0 | 88.7 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 484 | 32.6 | 305.6 | 50.9 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 214 | 8.0 | 94.4 | 9.7 |
| Seafood product preparation and packaging (61) | - | - | - | - |
| Bread and bakery product manufacturing (62) | 536 | 19.3 | 87.2 | 25.9 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | 5 | 0.1 | 2.1 | 0.3 |
| Snack food manufacturing (65) | - | - | - | - |
| Coffee and tea manufacturing (66) | 45 | 2.7 | 30.5 | 5.5 |
| Flavoring syrup and concentrate manufacturing (67) | - | - | - | - |
| Seasoning and dressing manufacturing (68) | 0 | 0.0 | 0.2 | 0.0 |
| All other food manufacturing (69) | - | - | - | - |
| Soft drink and ice manufacturing (70) | 89 | 6.2 | 63.9 | 8.8 |
| Breweries (71) | 97 | 8.9 | 114.2 | 49.1 |
| Wineries (72) | - | - | - | - |
| Distilleries (73) | - | - | - | - |
| Subtotal | 2,400 | 134.1 | 1,357.4 | 282.9 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | - | - | - | - |
| Pesticide and other agricultural chemical manufacturing (131) | 85 | 4.9 | 119.0 | 25.7 |
| Farm machinery and equipment manufacturing (203) | 129 | 5.9 | 58.1 | 14.1 |
| Lawn and garden equipment manufacturing (204) | - | - | - | - |
| Subtotal | 214 | 10.8 | 177.1 | 39.8 |
| Food and beverage wholesale trade (est. 319) | 1,487 | 48.3 | 210.7 | 146.8 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 465 | 15.1 | 65.9 | 45.9 |
| Retail Stores - Food and beverage (324) | 4,287 | 106.3 | 225.3 | 160.8 |
| Food services and drinking places (413) | 12,081 | 187.0 | 665.0 | 340.3 |
| Total Ag and Food System Cluster | 24,376 | 541.7 | 3,014.2 | 1,133.7 |

[^10]Note: Income includes employee compensation and proprietor income


Figure A6. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Mohawk Valley Region, New York State, 2010.

Table A7. Agriculture and Food System Contributions by Industry Sector, New York City Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) |  | \$ Million |  |
| Oilseed farming (1) | - | - | - | - |
| Grain farming (2) | 2 | 0.0 | 0.1 | 0.0 |
| Vegetable and melon farming (3) | 16 | 0.5 | 0.5 | 0.3 |
| Fruit and tree nut farming (4,5) | 1 | 0.1 | 0.1 | 0.1 |
| Greenhouse, nursery, and floriculture (6) | 94 | 5.3 | 5.7 | 3.7 |
| All other crop farming (10) | - | - | - | - |
| Cattle ranching and farming (11) | - | - | - | - |
| Dairy cattle and milk production (12) | - |  | - |  |
| Poultry and egg production (13) | 0 | 0.0 | 0.1 | 0.0 |
| Other animal production (14) | 6 | 0.0 | 0.1 | 0.1 |
| Subtotal | 120 | 6.0 | 6.5 | 4.1 |
| Support activities for agriculture and forestry (19) | 3,362 | 78.3 | 108.0 | 76.0 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 1 | 0.0 | 1.7 | 0.4 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | - | - | - | - |
| Oilseed processing, fats and oils refining ( 45,46 ) | 74 | 3.2 | 159.3 | 10.3 |
| Sugar mills and manufacturing ( 48,49 ) | 18 | 0.9 | 16.1 | 1.7 |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 902 | 35.9 | 326.0 | 87.2 |
| Fruit and vegetable manufacturing ( 53,54 ) | 985 | 44.5 | 368.8 | 81.2 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 455 | 32.0 | 277.0 | 52.3 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 1,337 | 70.2 | 559.3 | 80.3 |
| Seafood product preparation and packaging (61) | 323 | 24.5 | 122.8 | 29.6 |
| Bread and bakery product manufacturing (62) | 8,309 | 255.2 | 1,307.6 | 358.3 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | 1,097 | 39.5 | 450.4 | 93.2 |
| Snack food manufacturing (65) | 94 | 7.0 | 67.4 | 20.2 |
| Coffee and tea manufacturing (66) | 270 | 18.4 | 183.8 | 35.3 |
| Flavoring syrup and concentrate manufacturing (67) | 66 | 4.8 | 123.9 | 42.3 |
| Seasoning and dressing manufacturing (68) | 487 | 50.9 | 298.1 | 69.3 |
| All other food manufacturing (69) | 1,132 | 49.5 | 370.2 | 90.9 |
| Soft drink and ice manufacturing (70) | 377 | 37.5 | 282.8 | 48.7 |
| Breweries (71) | 31 | 2.7 | 36.3 | 15.5 |
| Wineries (72) | 62 | 3.0 | 23.5 | 4.8 |
| Distilleries (73) | 32 | 2.7 | 78.3 | 56.8 |
| Subtotal | 16,052 | 682.4 | 5,053.6 | 1,178.3 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | - | - | - | - |
| Pesticide and other agricultural chemical manufacturing (131) | 109 | 8.8 | 155.5 | 35.6 |
| Farm machinery and equipment manufacturing (203) | - | - | - | - |
| Lawn and garden equipment manufacturing (204) | - | - | - | - |
| Subtotal | 109 | 8.8 | 155.5 | 35.6 |
| Food and beverage wholesale trade (est. 319) | 27,377 | 2,717.2 | 5,706.2 | 4,529.2 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 887 | 88.1 | 184.9 | 146.8 |
| Retail Stores - Food and beverage (324) | 74,802 | 2,322.5 | 4,398.0 | 3,273.1 |
| Food services and drinking places (413) | 244,199 | 7,206.7 | 16,869.8 | 10,306.5 |
| Total Ag and Food System Cluster | 366,909 | 13,110.0 | 32,482.5 | 19,549.7 |

[^11]Note: Income includes employee compensation and proprietor income


Figure A7. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, New York City Region, New York State, 2010.

Table A8. Agriculture and Food System Contributions by Industry Sector, North Country Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) | ------- | \$ Million | -- |
| Oilseed farming (1) | 81 | 0.4 | 4.7 | 1.9 |
| Grain farming (2) | 441 | 1.8 | 18.9 | 3.8 |
| Vegetable and melon farming (3) | 172 | 10.5 | 24.0 | 12.0 |
| Fruit and tree nut farming (4,5) | 55 | 3.4 | 8.2 | 4.2 |
| Greenhouse, nursery, and floriculture (6) | 79 | 6.4 | 8.5 | 5.6 |
| All other crop farming (10) | 293 | 12.5 | 56.4 | 17.3 |
| Cattle ranching and farming (11) | 249 | 3.1 | 28.0 | 4.7 |
| Dairy cattle and milk production (12) | 3,554 | 37.1 | 444.0 | 162.4 |
| Poultry and egg production (13) | 19 | 1.4 | 10.4 | 1.9 |
| Other animal production (14) | 101 | 0.7 | 3.4 | 1.7 |
| Subtotal | 5,044 | 77.2 | 606.6 | 215.5 |
| Support activities for agriculture and forestry (19) | 262 | 14.9 | 17.2 | 14.7 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 46 | 2.1 | 54.5 | 6.6 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | 3 | 0.2 | 4.1 | 0.6 |
| Oilseed processing, fats and oils refining ( 45,46 ) | 1 | 0.1 | 3.2 | 0.1 |
| Sugar mills and manufacturing (48,49) | - | - | - | - |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 12 | 0.4 | 4.4 | 1.0 |
| Fruit and vegetable manufacturing ( 53,54 ) | - | - | - | - |
| Dairy product manufacturing ( $55,56,57,58$ ) | 1,003 | 46.8 | 711.7 | 74.0 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 37 | 1.1 | 15.8 | 1.3 |
| Seafood product preparation and packaging (61) | - | - | - | - |
| Bread and bakery product manufacturing (62) | 75 | 1.7 | 11.2 | 2.6 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | - | - | - | - |
| Snack food manufacturing (65) | 54 | 2.6 | 37.4 | 10.2 |
| Coffee and tea manufacturing (66) | - | - | - | - |
| Flavoring syrup and concentrate manufacturing (67) | - | - | - | - |
| Seasoning and dressing manufacturing (68) | - | - | - | - |
| All other food manufacturing (69) | 32 | 0.7 | 9.8 | 1.8 |
| Soft drink and ice manufacturing (70) | 5 | 0.4 | 3.5 | 0.5 |
| Breweries (71) | 10 | 1.3 | 12.3 | 5.5 |
| Wineries (72) | 29 | 0.9 | 10.4 | 1.8 |
| Distilleries (73) | - | - | - | - |
| Subtotal | 1,307 | 58.1 | 878.5 | 105.9 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | - | - | - | - |
| Pesticide and other agricultural chemical manufacturing (131) | - | - | - | - |
| Farm machinery and equipment manufacturing (203) | 46 | 2.4 | 20.9 | 5.3 |
| Lawn and garden equipment manufacturing (204) | - | - | - | - |
| Subtotal | 46 | 2.4 | 20.9 | 5.3 |
| Food and beverage wholesale trade (est. 319) | 1,044 | 50.6 | 164.6 | 119.7 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 339 | 16.4 | 53.5 | 38.9 |
| Retail Stores - Food and beverage (324) | 4,174 | 97.7 | 213.5 | 150.8 |
| Food services and drinking places (413) | 12,336 | 205.4 | 693.6 | 362.0 |
| Total Ag and Food System Cluster | 24,551 | 522.7 | 2,648.4 | 1,012.7 |

[^12]Note: Income includes employee compensation and proprietor income


Figure A8. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, North Country Region, New York State, 2010.

Table A9. Agriculture and Food System Contributions by Industry Sector, Southern Tier Region, 2010

| Industry | Employment | Income | Output | Added |
| :--- | ---: | ---: | ---: | ---: |
| Agricultural Production | (No.) | ------ | \$ Million ------- |  |
| Oilseed farming (1) | 100 | 0.3 | 4.0 | 1.6 |
| Grain farming (2) | 903 | 2.3 | 25.5 | 5.1 |
| Vegetable and melon farming (3) | 246 | 10.5 | 29.5 | 14.8 |
| Fruit and tree nut farming (4,5) | 256 | 10.8 | 27.0 | 14.0 |
| Greenhouse, nursery, and floriculture (6) | 269 | 14.0 | 19.0 | 12.5 |
| All other crop farming (10) | 371 | 9.0 | 46.5 | 14.2 |
| Cattle ranching and farming (11) | 399 | 2.6 | 29.9 | 5.0 |
| Dairy cattle and milk production (12) | 4,024 | 22.6 | 324.0 | 118.5 |
| Poultry and egg production (13) | 49 | 1.9 | 19.0 | 3.5 |
| Other animal production (14) | 458 | 2.1 | 12.9 | 6.3 |
| Subtotal | $\mathbf{7 , 0 7 4}$ | $\mathbf{7 6 . 0}$ | $\mathbf{5 3 7 . 3}$ | $\mathbf{1 9 5 . 6}$ |
| Support activities for agriculture and forestry (19) | $\mathbf{3 5 5}$ | $\mathbf{2 6 . 2}$ | $\mathbf{2 9 . 3}$ | $\mathbf{2 6 . 0}$ |

## Food and Beverage Manufacturing

$\begin{array}{llllll}\text { Animal food manufacturing }(41,42) & 294 & 16.5 & 364.8 & 81.6\end{array}$
Milling, malt and cereal manufacturing $(43,44,47)$
Oilseed processing, fats and oils refining $(45,46)$

| - | - | 364.8 | - |
| :---: | :---: | :---: | :---: |
| - | - | - | - |
| - | - | - | - |
| 1 | 0.0 | 0.5 | 0.1 |
| - | - | - | - |
| 1,295 | 73.2 | 922.7 | 118.5 |
| 77 | 3.7 | 34.7 | 4.3 |
| - | - | - | - |
| 284 | 6.9 | 42.8 | 10.4 |
| 56 | 1.3 | 23.0 | 4.2 |
| 546 | 32.4 | 384.2 | 109.1 |
| 14 | 0.6 | 9.2 | 1.4 |
| - | - | - | - |
| 183 | 12.3 | 105.1 | 19.2 |
| 136 | 6.7 | 45.2 | 11.7 |
| 42 | 3.1 | 30.3 | 4.4 |
| 143 | 7.8 | 163.4 | 67.2 |
| 288 | 14.6 | 110.4 | 23.2 |
| 30 | 3.1 | 74.6 | 54.3 |
| $\mathbf{3 , 3 8 8}$ | $\mathbf{1 8 2 . 3}$ | $\mathbf{2 , 3 1 1 . 0}$ | 509.4 |

Sugar mills and manufacturing $(48,49)$
Chocolate and confectionery manufacturing $(50,51,52)$
Fruit and vegetable manufacturing $(53,54)$
Dairy product manufacturing $(55,56,57,58)$
Animal slaughtering, rendering, and processing $(59,60)$
Seafood product preparation and packaging (61)
Bread and bakery product manufacturing (62)
Cookie, cracker, pasta and tortilla manufacturing $(63,64)$
Snack food manufacturing (65)
Coffee and tea manufacturing (66)
Flavoring syrup and concentrate manufacturing (67)
Seasoning and dressing manufacturing (68)
All other food manufacturing (69)
Soft drink and ice manufacturing (70)
Breweries (71)
Wineries (72)
Distilleries (73)

## Subtotal

Ag Chemical and Equipment Manufacturing
Fertilizer manufacturing (130)
Pesticide and other agricultural chemical manufacturing (131)

| - | - | - | - |
| ---: | ---: | ---: | ---: |
| 17 | 1.3 | 24.6 | 5.6 |
| 33 | 1.5 | 15.1 | 3.6 |
| 0 | 0.0 | 0.1 | 0.0 |
| $\mathbf{5 1}$ | $\mathbf{2 . 8}$ | $\mathbf{3 9 . 7}$ | $\mathbf{9 . 2}$ |
| $\mathbf{2 , 7 5 6}$ | $\mathbf{1 3 8 . 4}$ | $\mathbf{4 3 9 . 4}$ | $\mathbf{3 2 0 . 9}$ |
| $\mathbf{4 8 7}$ | $\mathbf{2 4 . 4}$ | $\mathbf{7 7 . 6}$ | 56.7 |
| $\mathbf{8 , 4 8 6}$ | $\mathbf{1 9 4 . 6}$ | $\mathbf{4 3 0 . 0}$ | $\mathbf{3 0 2 . 4}$ |
| $\mathbf{2 2 , 8 1 0}$ | $\mathbf{4 1 5 . 0}$ | $\mathbf{1 , 3 1 7 . 6}$ | $\mathbf{7 0 4 . 5}$ |
| $\mathbf{4 5 , 4 0 7}$ | $\mathbf{1 , 0 5 9 . 8}$ | $\mathbf{5 , 1 8 1 . 9}$ | $\mathbf{2 , 1 2 4 . 6}$ |

Farm machinery and equipment manufacturing (203)
Lawn and garden equipment manufacturing (204) Subtotal

Food and beverage wholesale trade (est. 319)
Ag equipment, supplies, nursery wholesale trade (est. 319)
Retail Stores - Food and beverage (324)
Food services and drinking places (413)
45,407 1,059.8 5,181.
Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.
Note: Income includes employee compensation and proprietor income


Figure A9. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Southern Tier Region, New York State, 2010.

Table A10. Agriculture and Food System Contributions by Industry Sector, Western New York Region, 2010

| Industry | Employment | Income | Output | Value <br> Added |
| :---: | :---: | :---: | :---: | :---: |
| Agricultural Production | (No.) |  | \$ Million |  |
| Oilseed farming (1) | 221 | 0.8 | 10.0 | 4.1 |
| Grain farming (2) | 743 | 1.8 | 21.8 | 4.4 |
| Vegetable and melon farming (3) | 370 | 16.1 | 45.9 | 22.9 |
| Fruit and tree nut farming (4,5) | 823 | 31.9 | 91.9 | 47.7 |
| Greenhouse, nursery, and floriculture (6) | 535 | 26.9 | 39.4 | 25.9 |
| All other crop farming (10) | 226 | 5.3 | 28.3 | 8.7 |
| Cattle ranching and farming (11) | 262 | 1.6 | 19.5 | 3.2 |
| Dairy cattle and milk production (12) | 2,894 | 15.0 | 237.5 | 86.9 |
| Poultry and egg production (13) | 39 | 1.5 | 15.8 | 2.9 |
| Other animal production (14) | 272 | 1.1 | 7.5 | 3.7 |
| Subtotal | 6,386 | 101.9 | 517.6 | 210.3 |
| Support activities for agriculture and forestry (19) | 680 | 18.7 | 24.7 | 18.2 |
| Food and Beverage Manufacturing |  |  |  |  |
| Animal food manufacturing ( 41,42 ) | 488 | 34.2 | 616.3 | 156.4 |
| Milling, malt and cereal manufacturing ( $43,44,47$ ) | 545 | 57.9 | 719.2 | 124.5 |
| Oilseed processing, fats and oils refining ( 45,46 ) | - | - | - | - |
| Sugar mills and manufacturing ( 48,49 ) | - | - | - | - |
| Chocolate and confectionery manufacturing ( $50,51,52$ ) | 574 | 22.3 | 204.7 | 55.7 |
| Fruit and vegetable manufacturing ( 53,54 ) | 1,916 | 122.6 | 914.7 | 232.6 |
| Dairy product manufacturing ( $55,56,57,58$ ) | 2,472 | 160.2 | 1,510.8 | 255.8 |
| Animal slaughtering, rendering, and processing ( 59,60 ) | 680 | 35.4 | 309.5 | 40.7 |
| Seafood product preparation and packaging (61) | 1 | 0.1 | 0.5 | 0.1 |
| Bread and bakery product manufacturing (62) | 805 | 29.4 | 131.4 | 39.4 |
| Cookie, cracker, pasta and tortilla manufacturing ( 63,64 ) | 336 | 16.2 | 145.2 | 33.1 |
| Snack food manufacturing (65) | 63 | 2.6 | 43.2 | 11.4 |
| Coffee and tea manufacturing (66) | 114 | 5.3 | 75.1 | 12.4 |
| Flavoring syrup and concentrate manufacturing (67) | 28 | 1.5 | 51.1 | 17.1 |
| Seasoning and dressing manufacturing (68) | 182 | 10.8 | 103.4 | 17.7 |
| All other food manufacturing (69) | 45 | 1.1 | 13.8 | 2.7 |
| Soft drink and ice manufacturing (70) | 506 | 39.4 | 368.5 | 54.5 |
| Breweries (71) | 7 | 0.3 | 7.7 | 3.1 |
| Wineries (72) | 225 | 9.6 | 84.6 | 16.3 |
| Distilleries (73) | - | - | - | - |
| Subtotal | 8,989 | 548.8 | 5,299.6 | 1,073.5 |
| Ag Chemical and Equipment Manufacturing |  |  |  |  |
| Fertilizer manufacturing (130) | 26 | 0.9 | 32.9 | 2.1 |
| Pesticide and other agricultural chemical manufacturing (131) | 33 | 2.9 | 47.2 | 11.0 |
| Farm machinery and equipment manufacturing (203) | 7 | 0.3 | 3.2 | 0.8 |
| Lawn and garden equipment manufacturing (204) | 2 | 0.1 | 0.7 | 0.2 |
| Subtotal | 68 | 4.3 | 83.9 | 14.1 |
| Food and beverage wholesale trade (est. 319) | 3,557 | 222.2 | 610.5 | 457.6 |
| Ag equipment, supplies, nursery wholesale trade (est. 319) | 444 | 27.7 | 76.2 | 57.1 |
| Retail Stores - Food and beverage (324) | 18,879 | 428.5 | 952.3 | 668.4 |
| Food services and drinking places (413) | 54,074 | 931.6 | 3,071.4 | 1,618.0 |
| Total Ag and Food System Cluster | 93,076 | 2,283.7 | 10,636.2 | 4,117.3 |

Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.
Note: Income includes employee compensation and proprietor income

| $\square$ Crops, greenhouse, nursery | $\square$ Livestock, related products |
| :--- | :--- |
| $\square$ Ag support \& forestry services | $\square$ Food and Beverage manufacturing |
| $\square$ Ag chemicals, equipment manufacturing | $\square$ Food and beverage wholesale trade (est.) |
| $\square$ Ag equipment, supplies, nursery wholesale trade (est) | $\square$ Food and beverage retail trade |
| $\square$ Food service and drinking places |  |


Output (\$ Million)

Value Added (\$ Million)

Source: MIG 2011; U.S. Census Bureau 2007
Employment (000)

Figure A10. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Western New York Region, New York State, 2010.

## Appendix B. Trend data for New York State farm and food sectors

Table B1. Number of Farms and Land in Farms, Selected Years, New York State, 1950-2007

|  |  | Land in farms |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Year | Farms | Total | Crop and <br> pasture land | Support <br> land |
|  | No. $(1,000)$ | Mil. Acres |  |  |
|  |  |  |  |  |
| $\mathbf{1 9 5 0}$ | 124.8 | 16.0 | 8.5 | 7.5 |
| $\mathbf{1 9 5 9}$ | 82.4 | 13.5 | 7.1 | 6.4 |
|  |  |  |  |  |
| $\mathbf{1 9 6 9}$ | 51.9 | 10.1 | 6.1 | 4.0 |
| $\mathbf{1 9 7 8}$ | 43.1 | 9.5 | 5.9 | 3.6 |
|  |  |  |  |  |
| $\mathbf{1 9 8 7}$ | 37.7 | 8.4 | 5.4 | 3.0 |
| $\mathbf{1 9 9 2}$ | 32.3 | 7.5 | 4.9 | 2.6 |
|  |  |  |  |  |
| $\mathbf{1 9 9 7}$ | 31.8 | 7.2 | 4.7 | 2.5 |
| $\mathbf{1 9 9 7}$ (adj.) | 38.3 | 7.7 | 5.6 | 2.1 |
|  |  |  |  |  |
| $\mathbf{2 0 0 2}$ | 37.3 | 7.7 | 5.4 | 2.3 |
| $\mathbf{2 0 0 7}$ | 36.4 | 7.1 | 5.0 | 2.1 |

Source: Census of Agriculture, selected years

Table B2. Farm Cash Receipts from Commodity Sales in New York State, 1990-2010

|  | Cash receipts <br> from <br> marketings | Price index <br> (1990-92=100) | Price adjusted <br> cash receipts |
| :---: | :---: | :---: | :---: |
|  | $\underline{\text { Dol. }(1,000)}$ | $\underline{\text { No. }}$ | Dol. (1,000) |
| $\mathbf{1 9 9 0}$ | $2,984,133$ | 104 | $2,857,325$ |
| $\mathbf{1 9 9 1}$ | $2,870,832$ | 99 | $2,902,528$ |
| $\mathbf{1 9 9 2}$ | $2,932,622$ | 100 | $2,946,174$ |
| $\mathbf{1 9 9 3}$ | $2,989,201$ | 105 | $2,857,854$ |
| $\mathbf{1 9 9 4}$ | $2,980,856$ | 98 | $3,028,279$ |
|  |  |  |  |
| $\mathbf{1 9 9 5}$ | $3,024,504$ | 108 | $2,800,467$ |
| $\mathbf{1 9 9 6}$ | $3,156,847$ | 108 | $2,923,006$ |
| $\mathbf{1 9 9 7}$ | $2,917,576$ | 105 | $2,778,644$ |
| $\mathbf{1 9 9 8}$ | $3,269,714$ | 98 | $3,336,443$ |
| $\mathbf{1 9 9 9}$ | $3,273,790$ | 91 | $3,597,571$ |
|  |  |  |  |
| $\mathbf{2 0 0 0}$ | $3,226,676$ | 98 | $3,292,527$ |
| $\mathbf{2 0 0 1}$ | $3,522,133$ | 93 | $3,787,240$ |
| $\mathbf{2 0 0 2}$ | $3,232,574$ | 97 | $3,332,551$ |
| $\mathbf{2 0 0 3}$ | $3,137,802$ | 124 | $2,530,485$ |
| $\mathbf{2 0 0 4}$ | $3,656,271$ | 112 | $3,264,528$ |
|  |  |  |  |
| $\mathbf{2 0 0 5}$ | $3,674,791$ | 125 | $2,939,833$ |
| $\mathbf{2 0 0 6}$ | $3,598,587$ | 122 | $2,949,661$ |
| $\mathbf{2 0 0 7}$ | $4,456,508$ | 142 | $3,138,386$ |
| $\mathbf{2 0 0 8}$ | $4,843,231$ | 133 | $3,641,527$ |
| $\mathbf{2 0 0 9}$ | $3,820,540$ | 135 | $2,830,030$ |
| $\mathbf{2 0 1 0}$ | $4,502,703$ | 160 | $2,814,189$ |

Source: U.S. Department of Commerce, Bureau of Economic Analysis; U.S. Department of Agriculture. Selected years, 1990-2010.

Table B3. Total Farm Cash Receipts from Commodity Sales, New York State, 1990-2010

| Year | New York <br> State total | Empire State Development Region (Estimates allocated to counties outside New York City) |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mid- <br> Hudson | Capital | North Country | Mohawk Valley | Southern Tier | Central | Finger <br> Lakes | Western | Long Island |
|  | Dollars (\$1,000) |  |  |  |  |  |  |  |  |  |
| 1990 | 2,984,133 | 229,647 | 252,712 | 386,815 | 243,003 | 437,906 | 336,085 | 599,488 | 334,554 | 163,923 |
| 1991 | 2,870,832 | 233,797 | 242,040 | 358,700 | 223,872 | 408,936 | 323,969 | 600,007 | 319,675 | 159,836 |
| 1992 | 2,932,622 | 217,477 | 255,751 | 378,804 | 237,069 | 422,184 | 325,265 | 594,988 | 327,393 | 173,691 |
| 1993 | 2,989,201 | 247,712 | 260,863 | 370,393 | 231,694 | 434,050 | 337,295 | 620,585 | 323,761 | 162,848 |
| 1994 | 2,980,856 | 226,671 | 256,827 | 373,189 | 232,138 | 430,186 | 342,797 | 637,459 | 329,254 | 152,335 |
| 1995 | 3,024,504 | 228,706 | 271,131 | 372,660 | 226,453 | 425,335 | 340,716 | 674,274 | 331,522 | 153,707 |
| 1996 | 3,156,847 | 215,347 | 293,749 | 401,880 | 239,096 | 451,248 | 358,986 | 707,891 | 348,008 | 140,642 |
| 1997 | 2,917,576 | 193,901 | 251,386 | 363,178 | 211,075 | 367,932 | 328,871 | 715,433 | 321,848 | 163,952 |
| 1998 | 3,269,714 | 218,430 | 294,070 | 405,238 | 245,740 | 410,691 | 375,971 | 785,770 | 355,682 | 178,122 |
| 1999 | 3,273,790 | 224,087 | 287,264 | 404,558 | 243,507 | 405,842 | 373,527 | 797,253 | 359,221 | 178,531 |
| 2000 | 3,226,676 | 234,775 | 279,701 | 380,539 | 229,909 | 389,064 | 361,139 | 807,961 | 350,787 | 192,801 |
| 2001 | 3,522,133 | 236,889 | 303,398 | 439,165 | 262,873 | 438,265 | 403,468 | 867,139 | 381,924 | 189,012 |
| 2002 | 3,232,574 | 200,152 | 250,927 | 412,976 | 224,441 | 378,499 | 349,412 | 824,967 | 364,218 | 226,982 |
| 2003 | 3,137,802 | 186,341 | 240,202 | 416,489 | 222,331 | 375,905 | 345,170 | 790,450 | 354,192 | 206,722 |
| 2004 | 3,656,271 | 206,682 | 278,094 | 501,969 | 262,212 | 445,272 | 409,876 | 924,397 | 415,070 | 212,699 |
| 2005 | 3,674,791 | 209,551 | 280,782 | 500,391 | 261,756 | 449,037 | 406,078 | 921,043 | 418,707 | 227,446 |
| 2006 | 3,598,587 | 219,621 | 272,456 | 463,333 | 246,251 | 427,972 | 386,551 | 922,401 | 412,073 | 247,929 |
| 2007 | 4,456,508 | 245,777 | 319,495 | 598,879 | 275,317 | 480,242 | 542,284 | 1,253,478 | 481,512 | 259,524 |
| 2008 | 4,843,231 | 270,572 | 340,735 | 629,812 | 294,638 | 511,365 | 592,293 | 1,414,308 | 520,107 | 269,401 |
| 2009 | 3,820,540 | 223,006 | 268,962 | 476,977 | 226,073 | 399,023 | 455,809 | 1,112,002 | 410,062 | 248,626 |
| 2010 | 4,502,703 | 242,819 | 316,693 | 589,324 | 274,749 | 482,371 | 551,401 | 1,305,528 | 479,903 | 259,915 |

Source: US Department of Commerce, Bureau of Economic Analysis

Table B4. Cash Receipts from Sales of Livestock and Livestock Products, New York State, 1990-2010

| Year | New York state total | Empire State Development Region (Estimates allocated to counties outside New York City) |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mid- <br> Hudson | Capital | North Country | Mohawk Valley | Southern Tier | Central | Finger <br> Lakes | Western | Long Island |
|  | Dollars (\$1,000) |  |  |  |  |  |  |  |  |  |
| 1990 | 2,082,118 | 106,769 | 189,927 | 349,350 | 211,248 | 380,680 | 261,842 | 338,581 | 223,744 | 19,977 |
| 1991 | 1,898,395 | 97,515 | 173,038 | 316,205 | 190,230 | 347,408 | 237,752 | 314,301 | 204,050 | 17,896 |
| 1992 | 1,999,636 | 94,312 | 177,935 | 339,087 | 203,450 | 364,900 | 252,704 | 336,558 | 215,665 | 14,984 |
| 1993 | 2,062,692 | 111,539 | 193,465 | 330,803 | 200,459 | 379,687 | 255,974 | 350,063 | 221,133 | 19,526 |
| 1994 | 2,055,167 | 101,553 | 185,377 | 331,490 | 198,773 | 370,376 | 261,488 | 361,109 | 227,149 | 17,819 |
| 1995 | 2,047,726 | 102,168 | 196,023 | 328,446 | 191,066 | 360,609 | 254,444 | 372,721 | 223,318 | 18,908 |
| 1996 | 2,220,171 | 99,884 | 217,580 | 358,200 | 203,560 | 389,548 | 277,273 | 415,632 | 238,182 | 20,302 |
| 1997 | 1,924,953 | 77,650 | 189,163 | 320,360 | 177,312 | 308,236 | 243,409 | 388,022 | 207,729 | 13,072 |
| 1998 | 2,199,303 | 87,885 | 229,333 | 362,230 | 209,693 | 348,964 | 281,917 | 429,315 | 237,188 | 12,743 |
| 1999 | 2,170,945 | 85,118 | 222,094 | 361,108 | 207,579 | 345,414 | 277,701 | 424,131 | 234,991 | 12,809 |
| 2000 | 2,017,589 | 83,911 | 208,473 | 332,251 | 188,927 | 321,078 | 254,374 | 395,391 | 217,231 | 15,953 |
| 2001 | 2,338,992 | 90,290 | 233,724 | 391,702 | 222,177 | 371,748 | 297,606 | 460,946 | 252,840 | 17,959 |
| 2002 | 1,989,424 | 82,292 | 172,212 | 348,482 | 167,025 | 291,694 | 253,904 | 423,094 | 209,714 | 41,007 |
| 2003 | 1,917,364 | 74,487 | 159,853 | 342,252 | 162,584 | 283,316 | 248,667 | 416,325 | 204,209 | 25,671 |
| 2004 | 2,365,032 | 87,060 | 194,058 | 426,517 | 202,092 | 350,711 | 308,680 | 518,083 | 252,925 | 24,906 |
| 2005 | 2,365,343 | 84,632 | 194,089 | 425,160 | 201,686 | 352,928 | 307,409 | 522,742 | 253,362 | 23,335 |
| 2006 | 2,132,507 | 81,630 | 175,446 | 378,897 | 178,221 | 319,329 | 273,918 | 473,111 | 228,886 | 23,069 |
| 2007 | 2,788,274 | 90,571 | 222,306 | 513,759 | 212,497 | 367,367 | 395,785 | 674,773 | 292,218 | 18,998 |
| 2008 | 2,821,707 | 96,113 | 225,368 | 520,331 | 214,194 | 370,075 | 400,371 | 678,876 | 296,036 | 20,343 |
| 2009 | 2,119,462 | 77,666 | 170,785 | 384,901 | 157,902 | 279,444 | 296,696 | 511,055 | 222,265 | 18,748 |
| 2010 | 2,704,148 | 87,944 | 214,581 | 496,049 | 203,888 | 358,494 | 381,747 | 659,008 | 283,597 | 18,840 |

Source: US Department of Commerce, Bureau of Economic Analysis

Table B5. Cash Receipts from Crop Sales, New York State, 1990-2010

| Year | New York state total | Empire State Development Region (Estimates allocated to counties outside New York City) |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mid- <br> Hudson | Capital | North Country | Mohawk Valley | Southern Tier | Central | Finger <br> Lakes | Western | Long Island |
|  | Dollars (\$1,000) |  |  |  |  |  |  |  |  |  |
| 1990 | 902,015 | 122,878 | 62,785 | 37,465 | 31,755 | 57,226 | 74,243 | 260,907 | 110,810 | 143,946 |
| 1991 | 972,437 | 136,282 | 69,002 | 42,495 | 33,642 | 61,528 | 86,217 | 285,706 | 115,625 | 141,940 |
| 1992 | 932,986 | 123,124 | 77,816 | 39,717 | 33,619 | 57,284 | 72,561 | 258,430 | 111,728 | 158,707 |
| 1993 | 926,509 | 136,130 | 67,398 | 39,590 | 31,235 | 54,363 | 81,321 | 270,522 | 102,628 | 143,322 |
| 1994 | 925,689 | 125,085 | 71,450 | 41,699 | 33,365 | 59,810 | 81,309 | 276,350 | 102,105 | 134,516 |
| 1995 | 976,778 | 126,515 | 75,108 | 44,214 | 35,387 | 64,726 | 86,272 | 301,553 | 108,204 | 134,799 |
| 1996 | 936,676 | 115,453 | 76,169 | 43,680 | 35,536 | 61,700 | 81,713 | 292,259 | 109,826 | 120,340 |
| 1997 | 992,623 | 116,251 | 62,223 | 42,818 | 33,763 | 59,696 | 85,462 | 327,411 | 114,119 | 150,880 |
| 1998 | 1,070,411 | 130,510 | 64,737 | 43,008 | 36,047 | 61,727 | 94,054 | 356,455 | 118,494 | 165,379 |
| 1999 | 1,102,845 | 138,969 | 65,170 | 43,450 | 35,928 | 60,428 | 95,826 | 373,122 | 124,230 | 165,722 |
| 2000 | 1,209,087 | 150,864 | 71,228 | 48,288 | 40,982 | 67,986 | 106,765 | 412,570 | 133,556 | 176,848 |
| 2001 | 1,183,141 | 146,599 | 69,674 | 47,463 | 40,696 | 66,517 | 105,862 | 406,193 | 129,084 | 171,053 |
| 2002 | 1,243,150 | 117,860 | 78,715 | 64,494 | 57,416 | 86,805 | 95,508 | 401,873 | 154,504 | 185,975 |
| 2003 | 1,220,438 | 111,854 | 80,349 | 74,237 | 59,747 | 92,589 | 96,503 | 374,125 | 149,983 | 181,051 |
| 2004 | 1,291,239 | 119,622 | 84,036 | 75,452 | 60,120 | 94,561 | 101,196 | 406,314 | 162,145 | 187,793 |
| 2005 | 1,309,448 | 124,919 | 86,693 | 75,231 | 60,070 | 96,109 | 98,669 | 398,301 | 165,345 | 204,111 |
| 2006 | 1,466,080 | 137,991 | 97,010 | 84,436 | 68,030 | 108,643 | 112,633 | 449,290 | 183,187 | 224,860 |
| 2007 | 1,668,234 | 155,206 | 97,189 | 85,120 | 62,820 | 112,875 | 146,499 | 578,705 | 189,294 | 240,526 |
| 2008 | 2,021,524 | 174,459 | 115,367 | 109,481 | 80,444 | 141,290 | 191,922 | 735,432 | 224,071 | 249,058 |
| 2009 | 1,701,078 | 145,340 | 98,177 | 92,076 | 68,171 | 119,579 | 159,113 | 600,947 | 187,797 | 229,878 |
| 2010 | 1,798,555 | 154,875 | 102,112 | 93,275 | 70,861 | 123,877 | 169,654 | 646,520 | 196,306 | 241,075 |

Source: US Department of Commerce, Bureau of Economic Analysis

Table B6. Cash Receipts for Selected Commodity Groups, New York State, 1990-2010

| Year | Dairy products | Poultry and <br> poultry <br> products | Meat <br> animals and <br> other <br> livestock | Grain and <br> oil crops | Vegetables | Fruit | Greenhouse <br> and nursery <br> products |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |


|  |  | Dollars $(\$ 1,000)$ |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 9 9 0}$ | $1,590,542$ | 101,462 | 390,114 | 108,878 | 229,612 | 178,036 | 250,454 |
| $\mathbf{1 9 9 1}$ | $1,399,140$ | 94,236 | 405,019 | 115,396 | 275,320 | 209,250 | 230,551 |
| $\mathbf{1 9 9 2}$ | $1,527,273$ | 82,280 | 390,083 | 115,898 | 194,315 | 196,640 | 295,881 |
| $\mathbf{1 9 9 3}$ | $1,463,554$ | 90,799 | 508,339 | 101,698 | 274,817 | 171,397 | 246,748 |
| $\mathbf{1 9 9 4}$ | $1,495,702$ | 89,844 | 469,621 | 116,622 | 251,294 | 178,696 | 236,279 |
| $\mathbf{1 9 9 5}$ | $1,487,696$ | 91,601 | 468,429 | 150,436 | 250,213 | 192,580 | 232,092 |
| $\mathbf{1 9 9 6}$ | $1,690,419$ | 101,213 | 428,539 | 179,485 | 194,700 | 211,685 | 218,923 |
| $\mathbf{1 9 9 7}$ | $1,526,158$ | 86,704 | 312,091 | 129,797 | 242,216 | 203,802 | 260,694 |
| $\mathbf{1 9 9 8}$ | $1,786,862$ | 91,655 | 320,786 | 119,786 | 320,488 | 189,466 | 284,120 |
| $\mathbf{1 9 9 9}$ | $1,743,094$ | 86,474 | 341,377 | 119,668 | 335,377 | 207,308 | 294,105 |
| $\mathbf{2 0 0 0}$ | $1,543,966$ | 96,264 | 377,359 | 108,725 | 414,418 | 201,253 | 315,797 |
| $\mathbf{2 0 0 1}$ | $1,847,810$ | 94,382 | 396,800 | 106,364 | 422,714 | 180,893 | 315,834 |
| $\mathbf{2 0 0 2}$ | $1,557,888$ | 86,673 | 344,863 | 124,667 | 413,048 | 184,209 | 340,644 |
| $\mathbf{2 0 0 3}$ | $1,559,555$ | 91,888 | 265,921 | 140,012 | 356,867 | 184,780 | 344,442 |
| $\mathbf{2 0 0 4}$ | $1,950,144$ | 108,399 | 306,489 | 166,082 | 372,182 | 236,578 | 341,982 |
| $\mathbf{2 0 0 5}$ | $1,913,724$ | 94,749 | 356,870 | 146,444 | 366,340 | 250,063 | 367,676 |
| $\mathbf{2 0 0 6}$ | $1,609,742$ | 98,024 | 424,741 | 191,932 | 403,310 | 274,914 | 394,157 |
| $\mathbf{2 0 0 7}$ | $2,377,987$ | 125,091 | 285,196 | 320,662 | 451,131 | 351,612 | 377,176 |
| $\mathbf{2 0 0 8}$ | $2,380,800$ | 146,600 | 294,307 | 508,381 | 522,604 | 389,327 | 380,817 |
| $\mathbf{2 0 0 9}$ | $1,685,312$ | 113,118 | 321,032 | 428,653 | 396,433 | 316,238 | 367,518 |
| $\mathbf{2 0 1 0}$ | $2,206,494$ | 119,094 | 378,560 | 452,624 | 474,118 | 315,833 | 377,460 |

Source: US Department of Commerce, Bureau of Economic Analysis

Table B7. Full and Part-Time Employment in Food and Agriculture, New York State, 1990-2010

| Year | Total | Farms <br> Farm proprietors | Hired farm workers | Agriculture and forestry support activities | Total | Manufacturing <br> Food manufacturing | Beverage and tobacco products |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Number employed |  |  |  |  |  |  |  |
| 1990 | 65,891 | 39,972 | 25,919 | 7,960 | 75,621 | 63,709 | 11,912 |
| 1991 | 65,037 | 39,288 | 25,749 | 8,510 | 71,772 | 61,469 | 10,303 |
| 1992 | 64,777 | 39,407 | 25,370 | 8,649 | 69,801 | 60,486 | 9,315 |
| 1993 | 64,847 | 39,737 | 25,110 | 8,813 | 68,423 | 58,848 | 9,575 |
| 1994 | 64,955 | 39,400 | 25,555 | 8,709 | 67,528 | 58,081 | 9,447 |
| 1995 | 62,804 | 38,898 | 23,906 | 8,766 | 67,271 | 57,578 | 9,693 |
| 1996 | 61,118 | 38,475 | 22,643 | 8,820 | 66,354 | 56,455 | 9,899 |
| 1997 | 60,108 | 38,676 | 21,432 | 8,882 | 64,942 | 55,872 | 9,070 |
| 1998 | 59,991 | 38,991 | 21,000 | 8,762 | 65,325 | 56,491 | 8,834 |
| 1999 | 60,574 | 39,735 | 20,839 | 7,914 | 64,939 | 56,467 | 8,472 |
| 2000 | 60,709 | 38,963 | 21,746 | 7,476 | 65,331 | 57,152 | 8,179 |
| 2001 | 60,224 | 38,249 | 21,975 | 7,214 | 64,641 | 57,440 | 7,201 |
| 2002 | 58,970 | 37,087 | 21,883 | 8,049 | 64,191 | 56,703 | 7,488 |
| 2003 | 58,285 | 35,404 | 22,881 | 7,212 | 63,665 | 56,404 | 7,261 |
| 2004 | 52,887 | 33,587 | 19,300 | 7,326 | 62,267 | 55,376 | 6,891 |
| 2005 | 51,963 | 32,944 | 19,019 | 7,420 | 61,028 | 54,132 | 6,896 |
| 2006 | 49,355 | 31,639 | 17,716 | 7,470 | 60,096 | 53,551 | 6,545 |
| 2007 | 49,698 | 32,261 | 17,437 | 8,134 | 61,930 | 55,024 | 6,906 |
| 2008 | 51,699 | 32,676 | 19,023 | 8,553 | 60,561 | 53,402 | 7,159 |
| 2009 | 50,883 | 32,508 | 18,375 | 8,541 | 59,162 | 52,024 | 7,138 |
| 2010 | 50,720 | 32,320 | 18,400 | 8,769 | 59,767 | 52,571 | 7,196 |

Source: US Department of Commerce, Bureau of Economic Analysis

Table B8. Gross State Product (GSP) Originating in Food and Agriculture, New York State, 1990-2010

| Year | Farms | Agricultural services, forestry, and fishing | Food and beverage and tobacco product manufacturing |
| :---: | :---: | :---: | :---: |
|  |  | Dollars (Mil.) |  |
| 1990 | 1,456 | 1,036 | 5,178 |
| 1991 | 1,275 | 1,025 | 5,941 |
| 1992 | 1,389 | 1,019 | 6,090 |
| 1993 | 1,352 | 958 | 6,237 |
| 1994 | 1,380 | 1,115 | 6,041 |
| 1995 | 1,150 | 1,169 | 6,052 |
| 1996 | 1,456 | 1,248 | 6,401 |
| 1997 | 1,124 | 340 | 6,991 |
| 1998 | 1,316 | 354 | 6,924 |
| 1999 | 1,338 | 343 | 7,327 |
| 2000 | 1,314 | 311 | 7,161 |
| 2001 | 1,490 | 312 | 7,783 |
| 2002 | 1,228 | 290 | 7,482 |
| 2003 | 1,406 | 290 | 6,853 |
| 2004 | 1,815 | 298 | 6,622 |
| 2005 | 1,772 | 326 | 7,549 |
| 2006 | 1,611 | 374 | 7,674 |
| 2007 | 2,123 | 369 | 7,947 |
| 2008 | 2,234 | 377 | 7,607 |
| 2009 | 1,649 | 357 | 8,969 |
| 2010 | 2,243 | 323 | 9,263 |

Source: US Department of Commerce, Bureau of Economic Analysis

Table B9. Gross State Product (GSP) Originating in Food and Agriculture, Current and Price-Adjusted, New York State, 1997-2010

|  | Crop and <br> animal <br> production <br> (Farms) | Forestry, <br> fishing, <br> and <br> related <br> activities | Food, beverage <br> and tobacco <br> product <br> manufacturing | Curren and <br> animal <br> production <br> (Farms) | Forestry, <br> fishing, <br> and <br> related <br> activities | Food, beverage <br> and tobacco <br> product <br> manufacturing |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | CMil.) |  |  |  |  |  |

Source: US Department of Commerce, Bureau of Economic Analysis

Table B10. Earnings Originating in Food and Agriculture, New York State, 1990-2010

| Year | Total earnings | Farms <br> Farm proprietors' income | Payrolls | Agriculture and forestry support activities | Food, be <br> Total earnings | erage and tobac manufacturing Food manufacturing | product <br> Beverage and tobacco manufacturing |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Dollars (\$1,000) |  |  |  |
| 1990 | 775,275 | 405,398 | 369,877 | 117,162 | 2,427,223 | 1,975,405 | 451,818 |
| 1991 | 647,216 | 280,794 | 366,422 | 121,849 | 2,414,093 | 1,956,513 | 457,580 |
| 1992 | 750,347 | 391,597 | 358,750 | 126,105 | 2,458,496 | 2,025,178 | 433,318 |
| 1993 | 795,061 | 401,771 | 393,290 | 154,616 | 2,448,126 | 1,971,007 | 477,119 |
| 1994 | 673,085 | 286,155 | 386,930 | 160,489 | 2,472,582 | 1,992,665 | 479,917 |
| 1995 | 540,730 | 110,625 | 430,105 | 146,012 | 2,428,788 | 1,933,442 | 495,346 |
| 1996 | 766,983 | 328,017 | 438,966 | 129,369 | 2,467,990 | 1,925,399 | 542,591 |
| 1997 | 458,906 | 1,900 | 457,006 | 144,537 | 2,506,761 | 1,957,397 | 549,364 |
| 1998 | 690,186 | 226,870 | 463,316 | 156,277 | 2,624,465 | 2,049,945 | 574,520 |
| 1999 | 767,935 | 340,732 | 427,203 | 146,362 | 2,806,168 | 2,120,920 | 685,248 |
| 2000 | 773,839 | 276,587 | 497,252 | 144,410 | 2,986,123 | 2,203,085 | 783,038 |
| 2001 | 919,176 | 398,270 | 520,906 | 150,777 | 3,092,550 | 2,277,417 | 815,133 |
| 2002 | 698,982 | 63,664 | 635,318 | 145,622 | 3,187,670 | 2,376,738 | 810,932 |
| 2003 | 844,600 | 262,175 | 582,425 | 152,983 | 3,316,860 | 2,446,831 | 870,029 |
| 2004 | 1,071,067 | 490,432 | 580,635 | 159,277 | 3,368,054 | 2,471,465 | 896,589 |
| 2005 | 1,065,528 | 574,018 | 491,510 | 171,131 | 3,459,953 | 2,435,475 | 1,024,478 |
| 2006 | 920,099 | 352,264 | 567,835 | 186,920 | 3,327,470 | 2,460,171 | 867,299 |
| 2007 | 1,281,298 | 588,965 | 692,333 | 199,678 | 3,513,978 | 2,528,183 | 985,795 |
| 2008 | 1,395,116 | 725,806 | 669,310 | 208,259 | 3,655,636 | 2,608,478 | 1,047,158 |
| 2009 | 923,476 | 284,267 | 639,209 | 201,344 | 3,447,172 | 2,525,758 | 921,414 |
| 2010 | 1,333,604 | 638,145 | 695,459 | 193,324 | 3,617,468 | 2,553,079 | 1,064,389 |

Source: US Department of Commerce, Bureau of Economic Analysis


[^0]:    ${ }^{1}$ Associate Professor and Professor Emeritus, respectively, in the Charles H. Dyson School of Applied Economics and Management at Cornell University. This publication was supported by funds provided by the New York Farm Viability Institute, Inc.

[^1]:    ${ }^{2}$ MIG collects data from numerous federal and state sources that are used within their IMPLAN (Impact Analysis for Planning) software program. The program includes data for 440 industrial sectors, with data available for states, counties, and ZIP code areas within the US.

[^2]:    ${ }^{3}$ The Federal definition of "agricultural services" is comprehensive but probably excludes many lines of economic activity generally thought of in terms of "service" to agriculture: marketing and processing of raw farm commodities, their transport from the farm, financial and credit services, machinery repair, and so on. For purposes here, the more narrow definition of agricultural services is adopted in order to preserve access to published statistics. Important components of the service sector are focused on crop production, but also include animal services for livestock producers, including equine (non-race horsing) services. Veterinary services are excluded, and instead are identified as a separate general service category given significant inclusion of companion animal and pet services. Support activities for forestry (e.g., management planning, pest control, timber valuation) are included.
    ${ }^{4}$ Individual wholesale sector data are not available in IMPLAN databases, but were estimated using total wholesale trade sector values in IMPLAN and relative shares computed using detailed agricultural and food system-related wholesale sector data in the 2007 Economic Census. Food and beverage wholesale trade included farm product, grocery, and alcoholic beverage merchant wholesalers, agents and brokers. Agricultural equipment, suppliers, and nursery wholesale trade included farm and garden equipment, food-processing equipment, farm supplies, and flower, nursery stock, and florists' supplies merchant wholesalers.

[^3]:    ${ }^{5}$ Some farm loss over this span is due to a 1974 change in farm definition that increased the volume of sales needed to qualify as a farm. In earlier years the definition turned on both acreage and value of farm production thresholds. An adjustment in farm estimates by the USDA for the 1997 Census also resulted in increased numbers.
    ${ }^{6}$ Value of agricultural products sold directly to individuals for human consumption represents the value of agricultural products produced and sold directly to individuals for human consumption from roadside stands, farmers markets, pick-your-own sites, etc. It excludes non-edible products such as nursery crops, cut flowers, and wool, but includes livestock sales. Sales of agricultural products by vertically integrated operations through their own processing and marketing operations are excluded.

[^4]:    ${ }^{7}$ Farm cash receipts for each of the Empire State Development Regions is included in Appendix B.

[^5]:    ${ }^{8}$ Note that 2010 employment estimates reported here are above those estimated by MIG (Table 1). IMPLAN generally reports lower employment than other federal data sources. The importance in this section is not on the differences in data conventions across data sources, but to use a consistent measurement convention across the years considered.
    ${ }^{9}$ While these data problems are substantial for farming, all of them are probably endemic and plague our efforts to understand job making in small businesses outside the farm sector as well. Clearly, similar problems can prevail in the service sectors where businesses often operate on a small scale and/or provide numerous jobs on a part-time basis.

[^6]:    ${ }^{10}$ Final use in regional economic models makes allowances for inventory adjustments, expenditures on capital accounts, and deliveries of goods and services to local households and governments or to buyers out of state (exports).
    ${ }^{11}$ For earlier work on input output analysis and the New York State economy, see Boisvert and Bills, 1976; Jack, Bills, and Boisvert, 1996a; Jack, Bills, and Boisvert, 1996b; Bills, 2001.

[^7]:    Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.

[^8]:    Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.

[^9]:    Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.

[^10]:    Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.

[^11]:    Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.

[^12]:    Source: MIG (2011), U.S. Census Bureau (2007). Numbers in parentheses are Implan sector numbers.

