

Agriculture-Based Economic Development in NYS: Trends and Prospects

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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 sub-industry 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

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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.

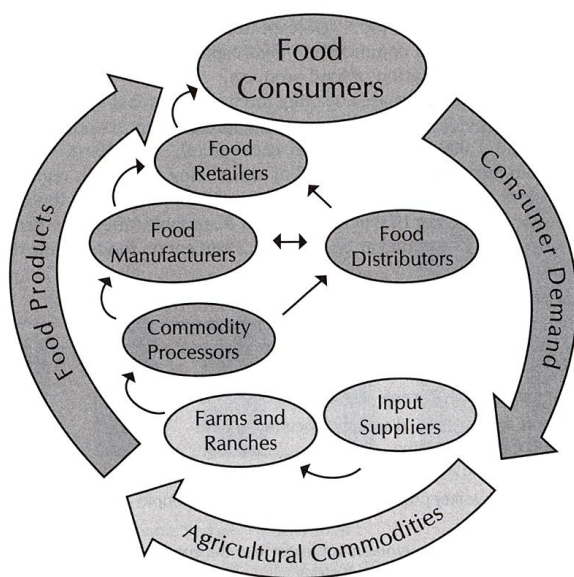
Part two of this series will focus on a closer inspection of inter-industry transactions to get a clearer picture of the structure of the NYS economy, and includes a comprehensive contribution analysis of the economic impact of agriculture and food systems to the NYS economy. Part three will consider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

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.

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.



Source: J.G. Beirlein, Schneeberger, and Osburn, 2003, p. 5.

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

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.

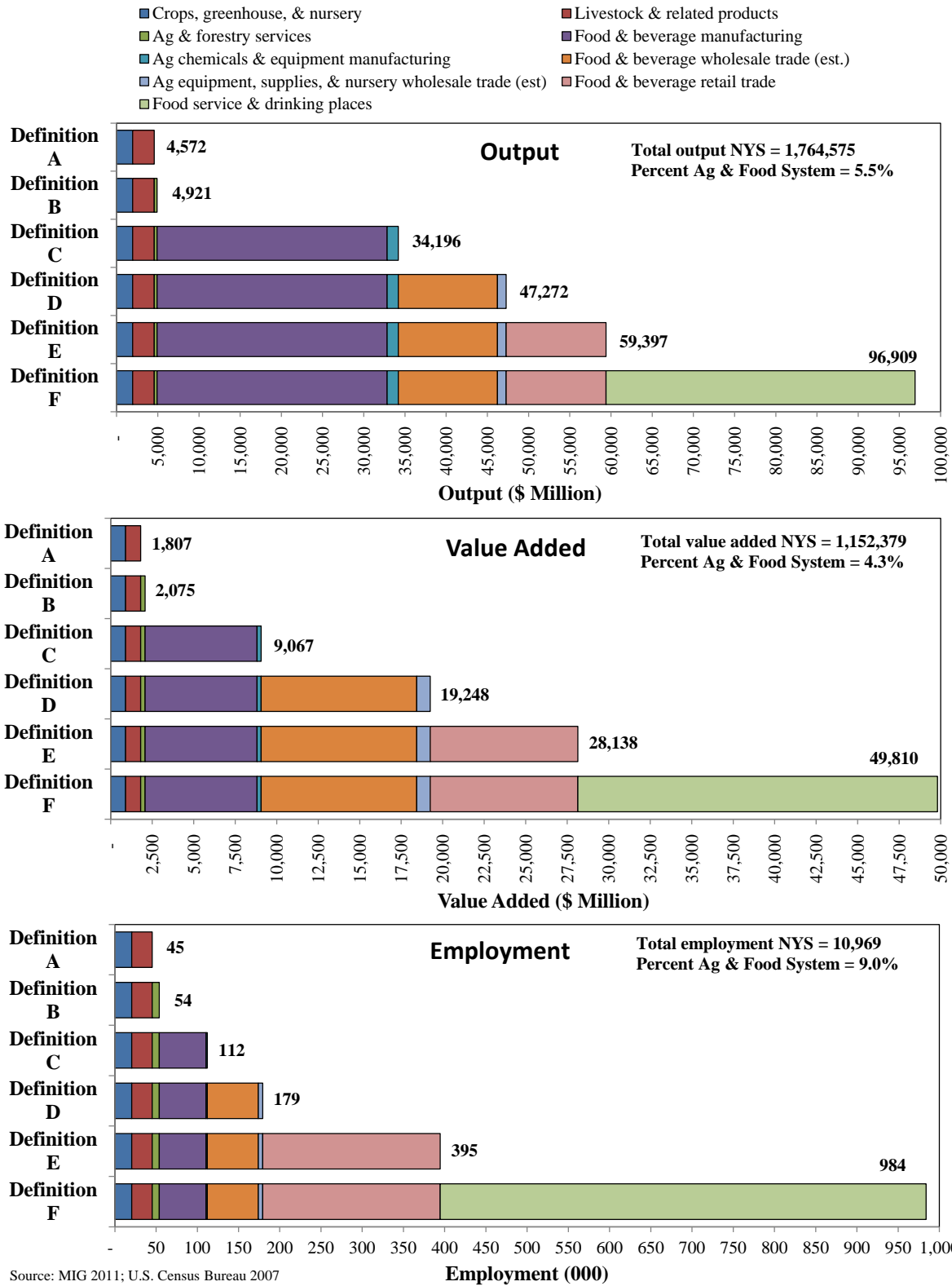


Figure 2. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, New York State, 2010.

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

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.

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 Agriculture and Food System Contributions by Industry Sector, 2010.

Industry	Employment	Income	Output	Value Added
	(No.)	----- \$ Million -----		
Agricultural Production				
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

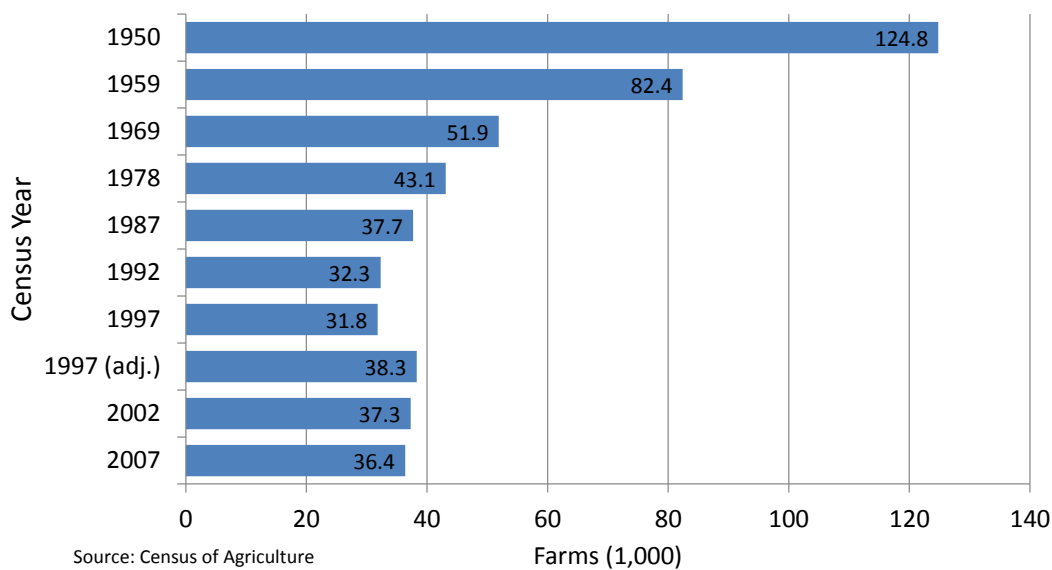


Figure 3. Number of farms for New York, selected Census years, 1950-2007.

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,

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.

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.

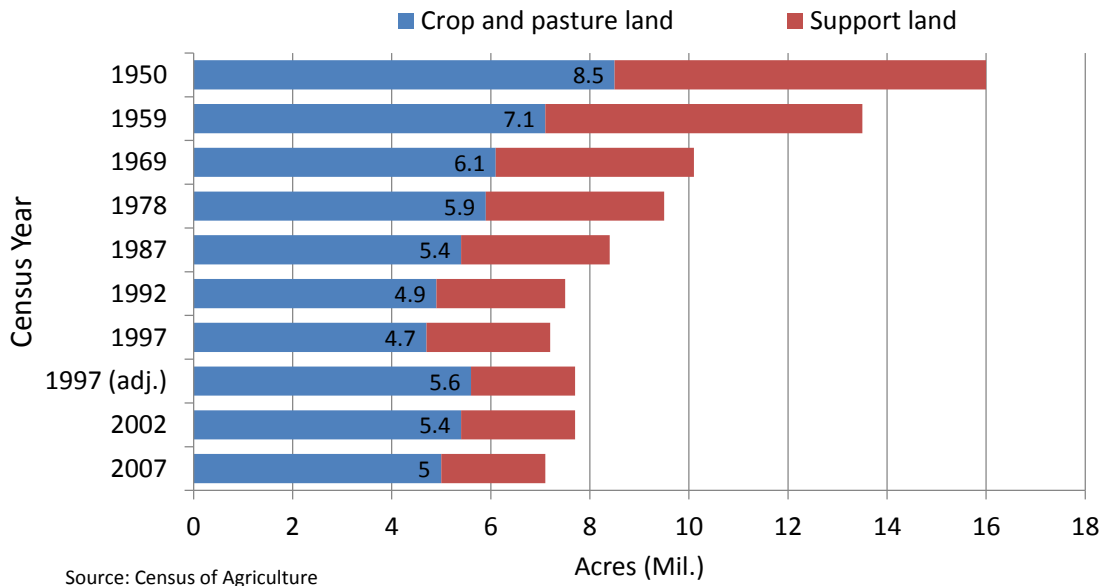


Figure 4. Land in farms for New York, selected Census years, 1950-2007.

Farm Commodity Sales

Cash receipts over time, either from the production of crops, livestock, or livestock products, are shown in Figure 5⁷. 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.

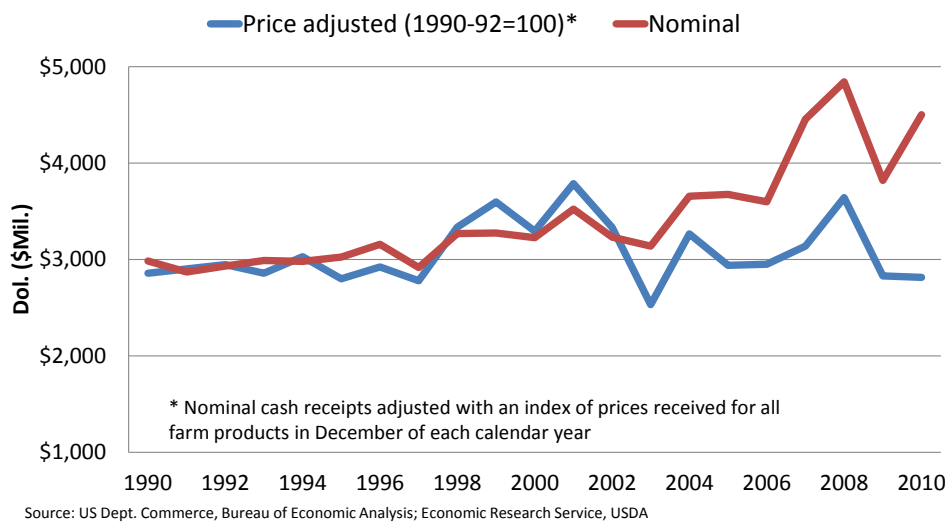


Figure 5. Farm cash receipts from commodity sales in New York State, 1990-2010.

⁷ Farm cash receipts for each of the Empire State Development Regions is included in Appendix B.

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.

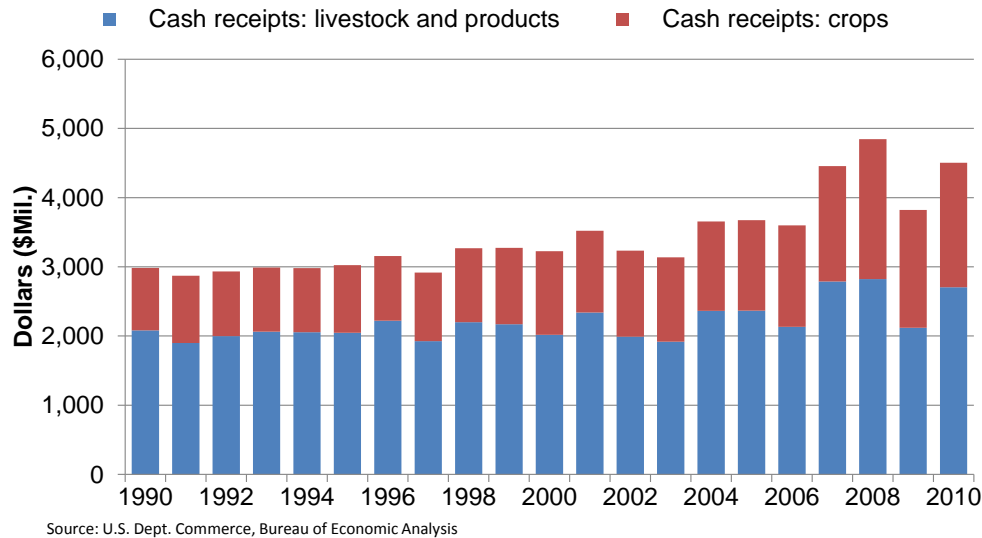


Figure 6. Cash receipts from crops, livestock, and livestock products, New York State, 1990-2010.

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.

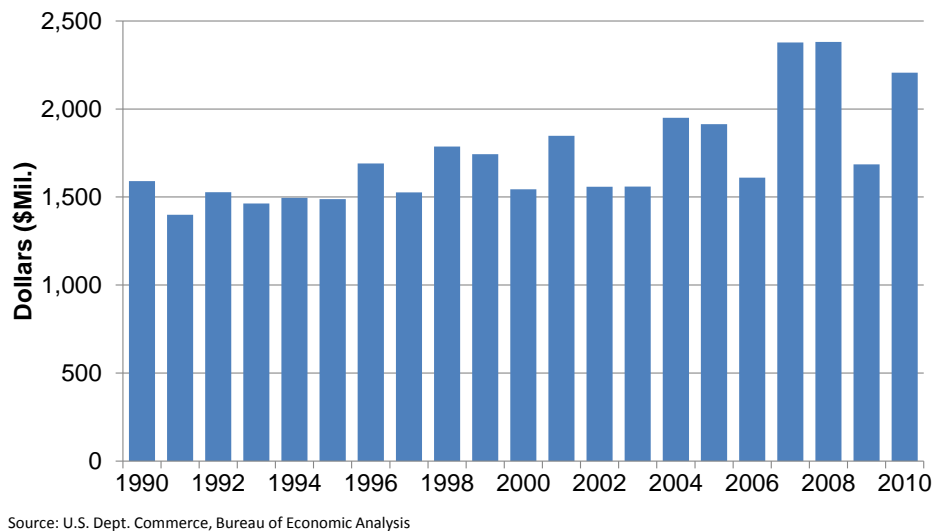


Figure 7. Cash receipts from dairy product sales, New York State, 1990-2010.

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.

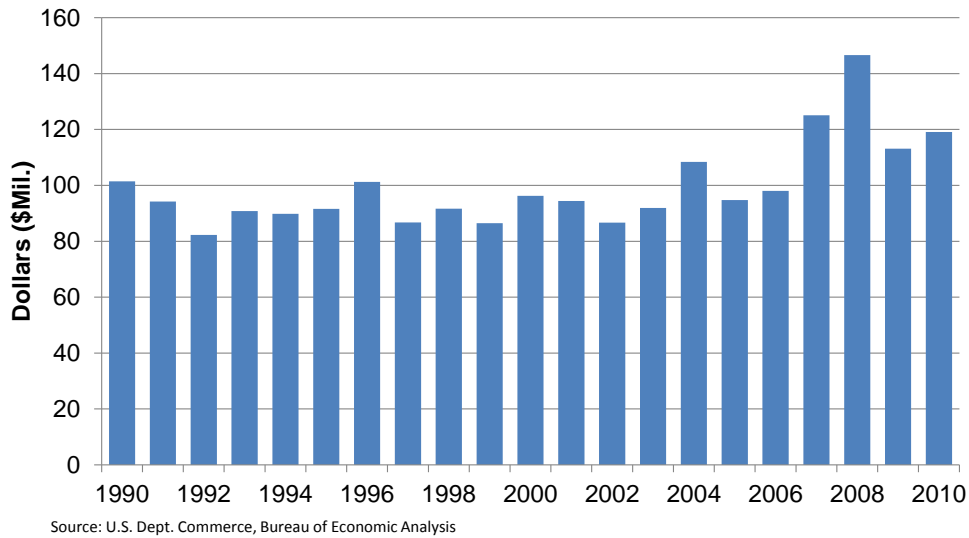


Figure 8. Cash receipts from poultry and poultry product sales, New York State, 1990-2010.

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.

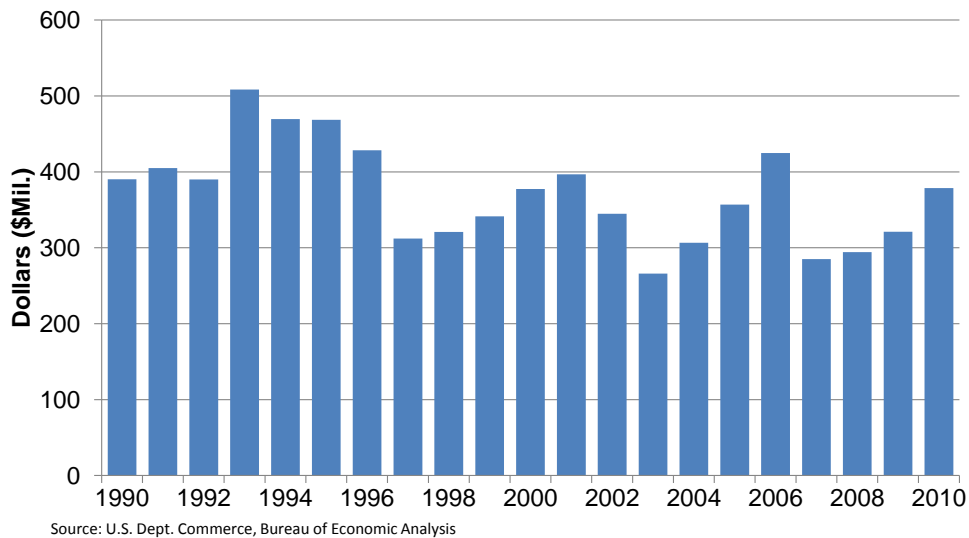
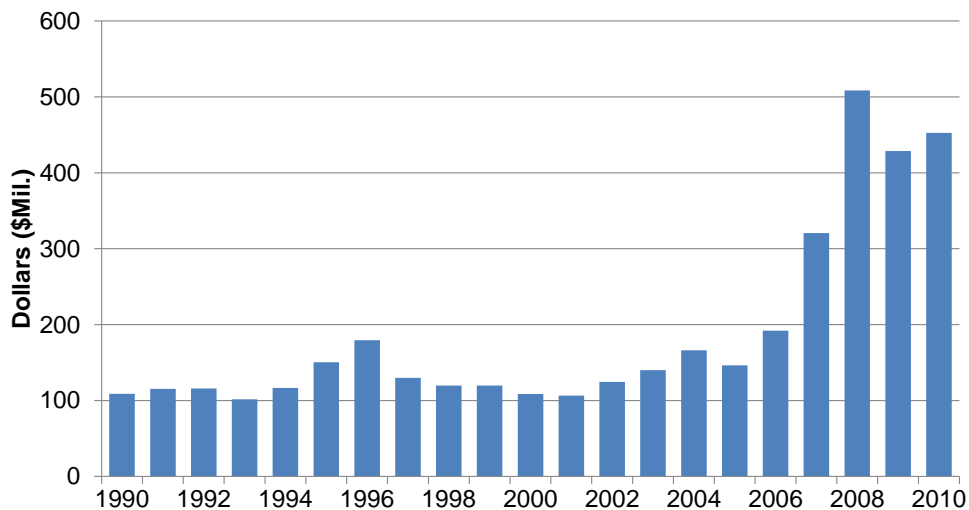


Figure 9. Cash receipts from meat animals and other livestock sales, New York State, 1990-2010.

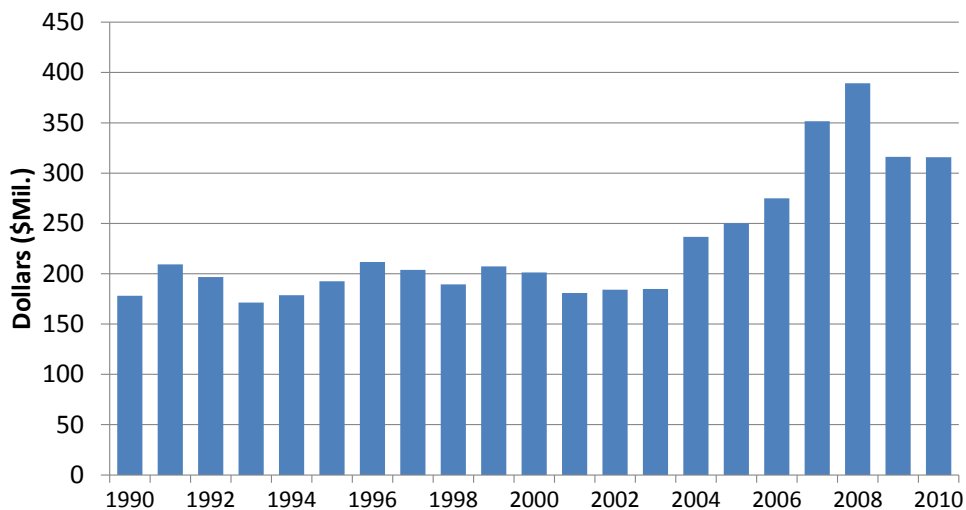
Much of New York's crop acreage is used to produce feed and forage crops to support the livestock industries mentioned above. Hay crops are the largest block of New York crop acreage, but many New York farmers sell crops to generate cash for the farm business. Receipts from the sale of oil seed crops (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



Source: U.S. Dept. Commerce, Bureau of Economic Analysis

Figure 10. Cash receipts from oil and grain crop sales, New York State, 1990-2010.

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.

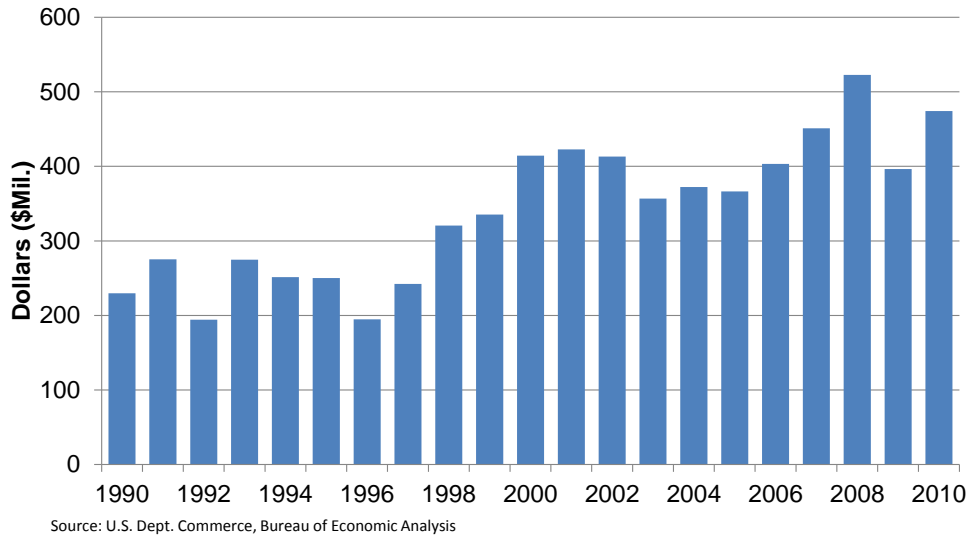


Figure 12. Cash receipts from vegetable crop sales, New York State, 1990-2010.

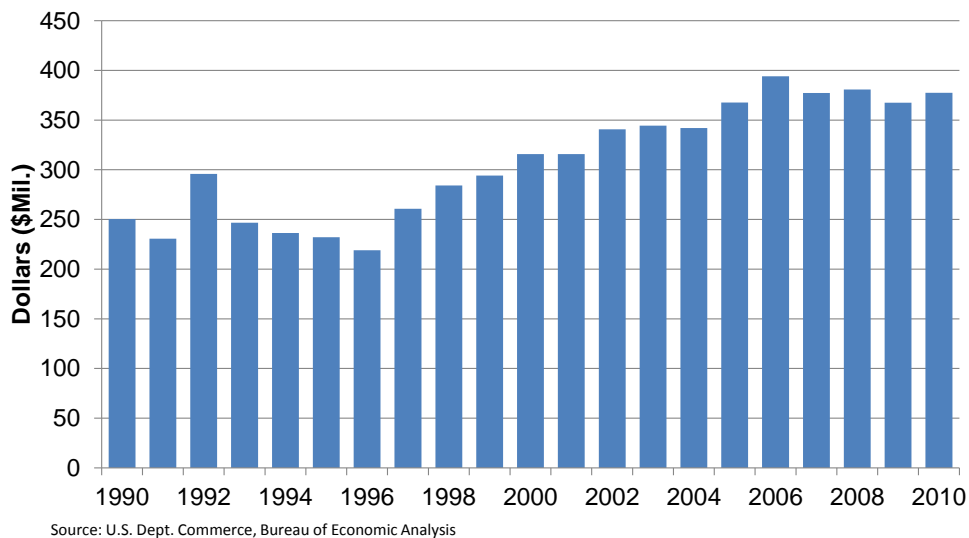


Figure 13. Cash receipts from greenhouse and nursery crop sales, New York State, 1990-2010.

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

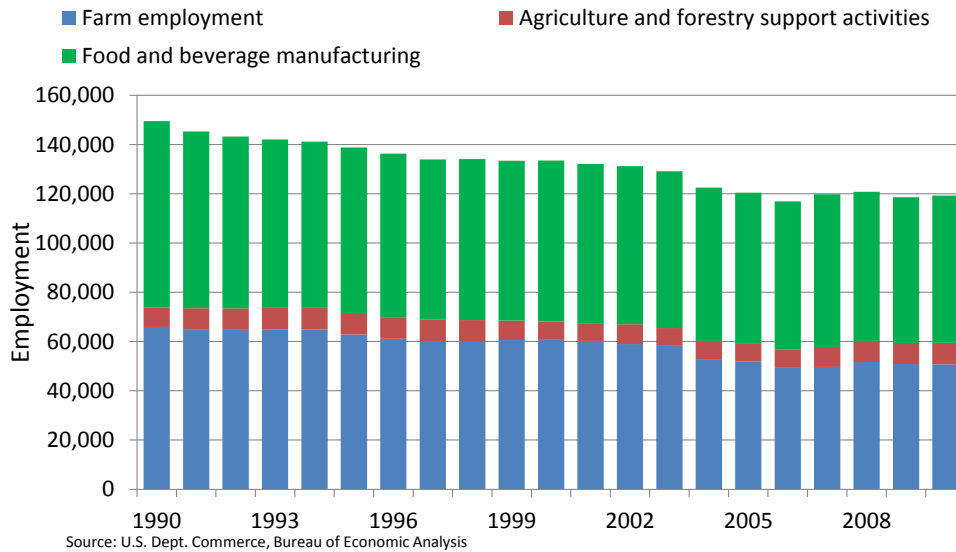


Figure 14. Total full and part-time employment in food and agriculture, New York State, 1990-2010.

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).

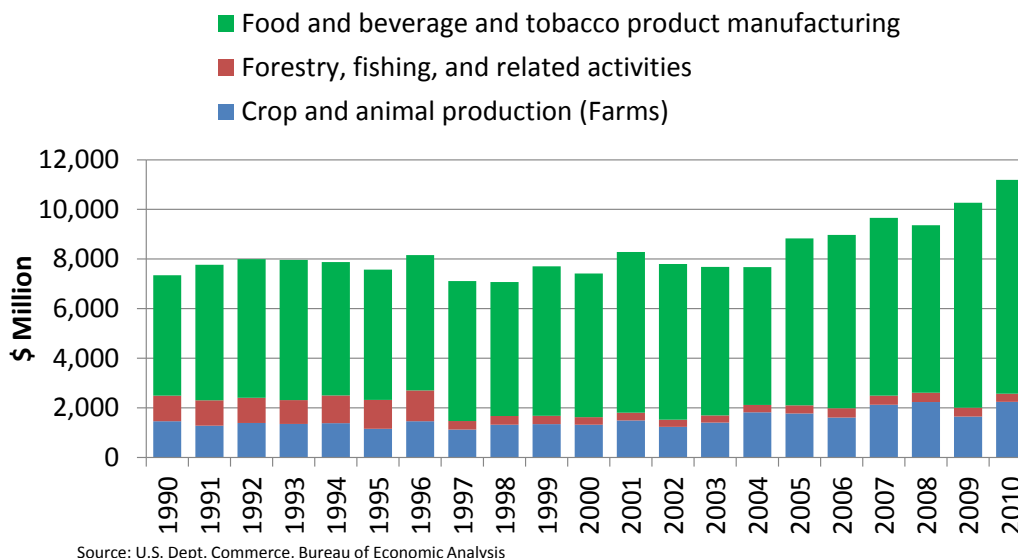
Employment in food manufacturing largely mirrors the steady job losses that characterized production agriculture throughout the 1990-2006 interval, but has been relatively constant since that time (Figure 14). Food manufacturing accounts for over 59,700 jobs, down from more than 75,600 jobs in the early 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

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.

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



Source: U.S. Dept. Commerce, Bureau of Economic Analysis

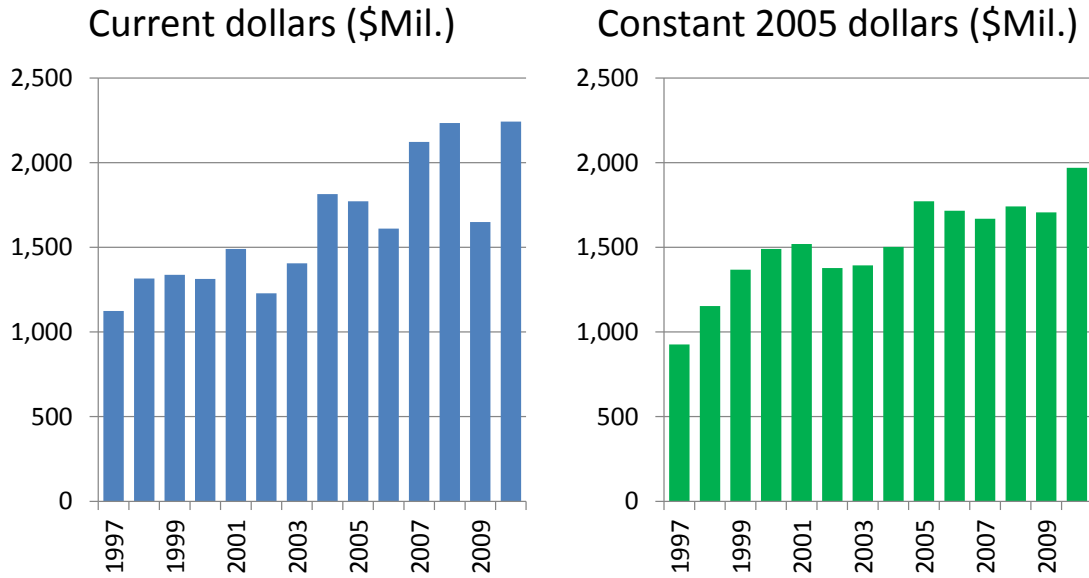
Figure 15. Gross State Product (GSP) originating in food and agriculture production, New York State, 1997- 2010.

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.

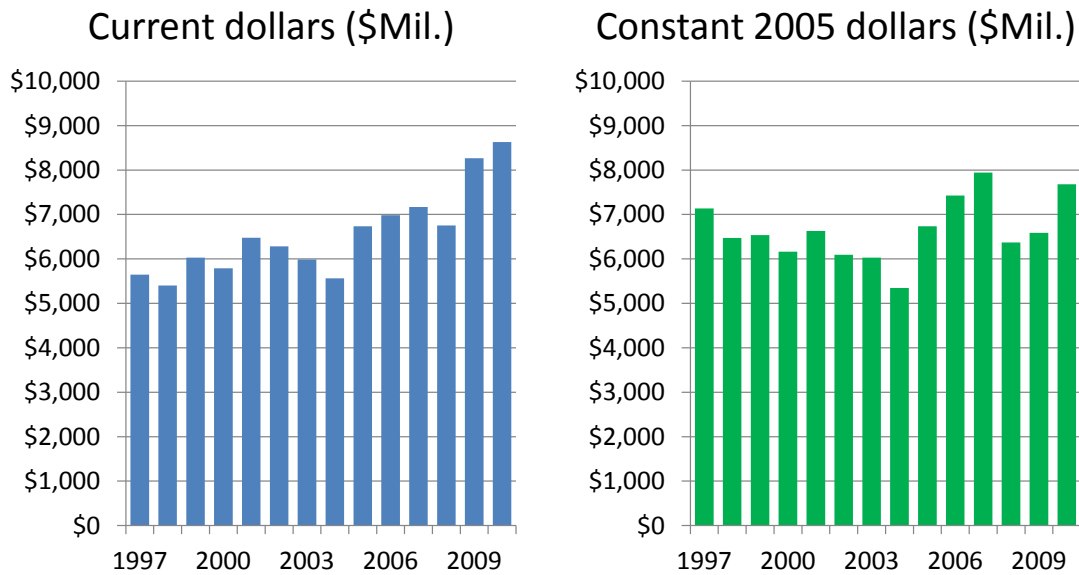
Taken together, the gross state product originating in New York farm production, agricultural services, and food and beverage manufacturing has increased dramatically during the last two decades. In current dollar terms, the value added in these three sectors has increased from more than \$7 billion 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.

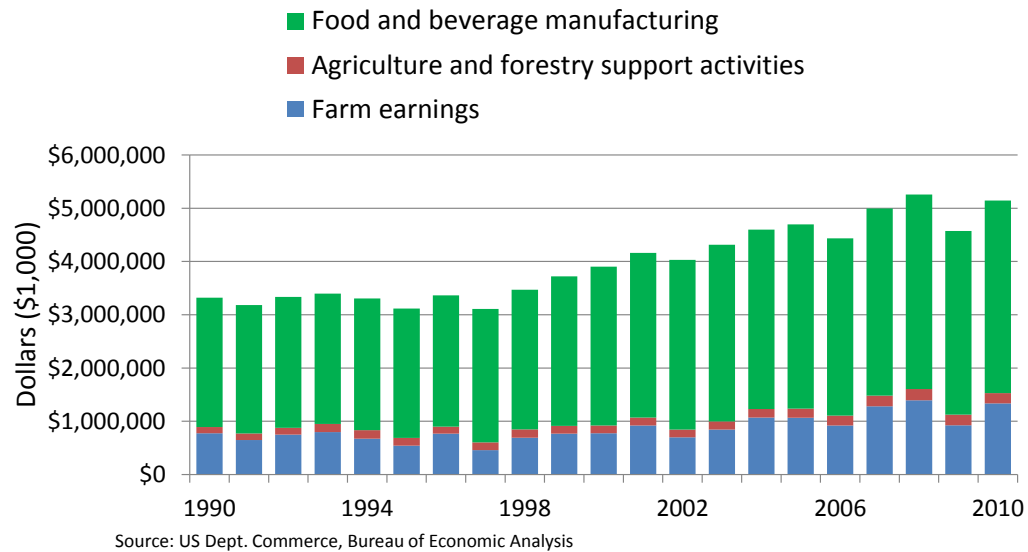


Figure 18. Earnings originating in food and agriculture, New York State, 1990-2010

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.

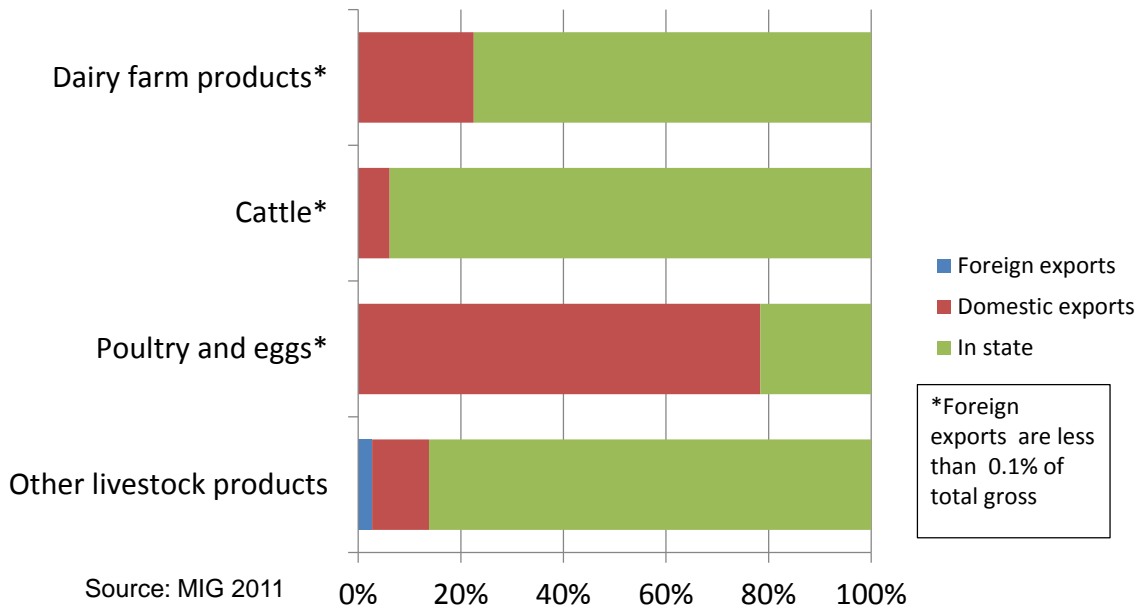


Figure 19. Estimated destination of New York state livestock/livestock products, 2010

The picture for New York crop production is equally varied, as shown in Figure 20. Upon inspection, 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.

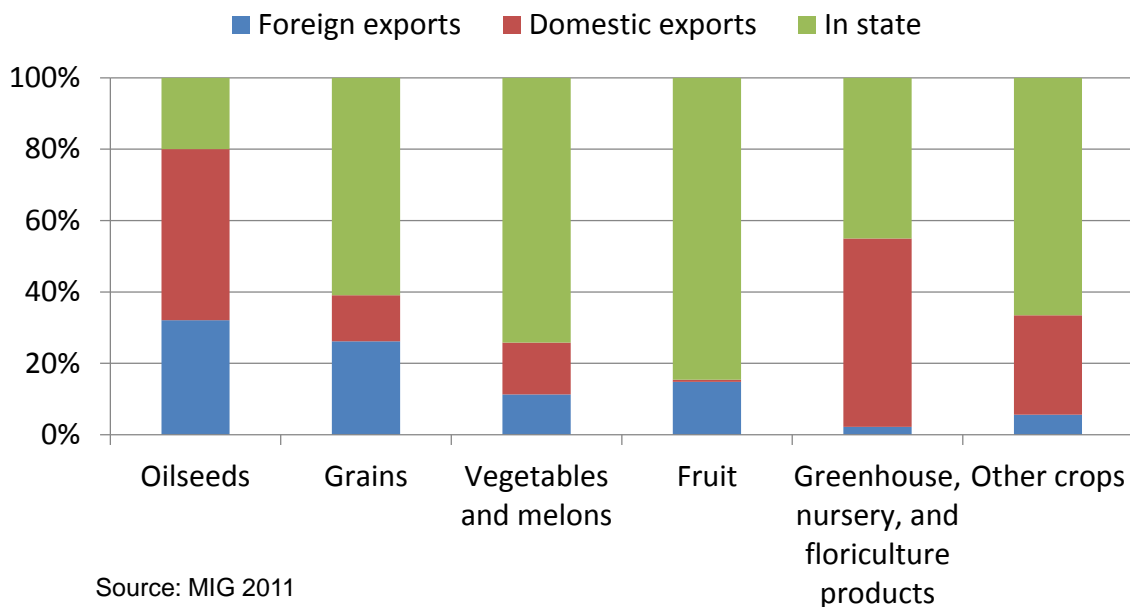


Figure 20. Estimated destination of New York state crop output, 2010

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.

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.

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.

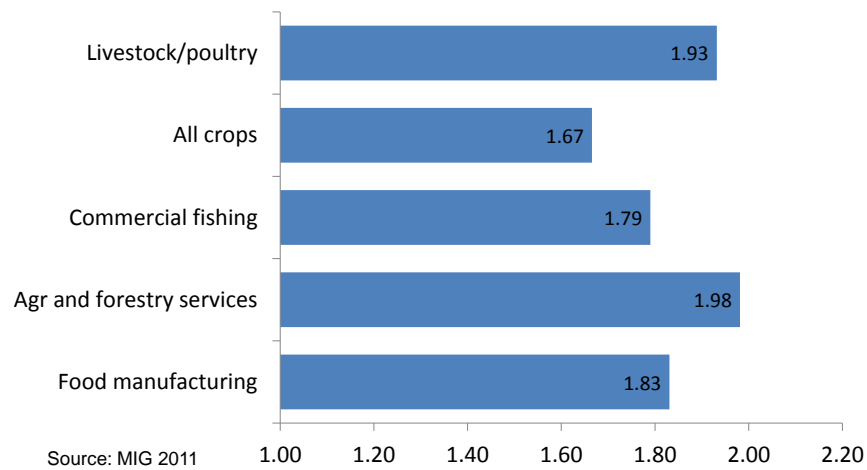


Figure 21. Output multipliers for selected farm and food sectors, New York State, 2010

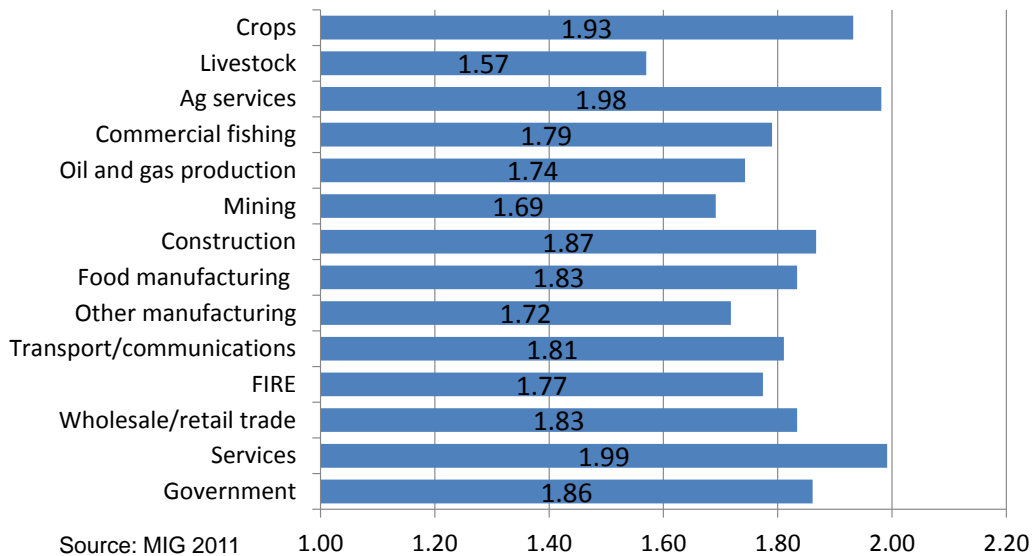


Figure 22. Output multipliers for selected industrial sectors, New York State, 2010

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.

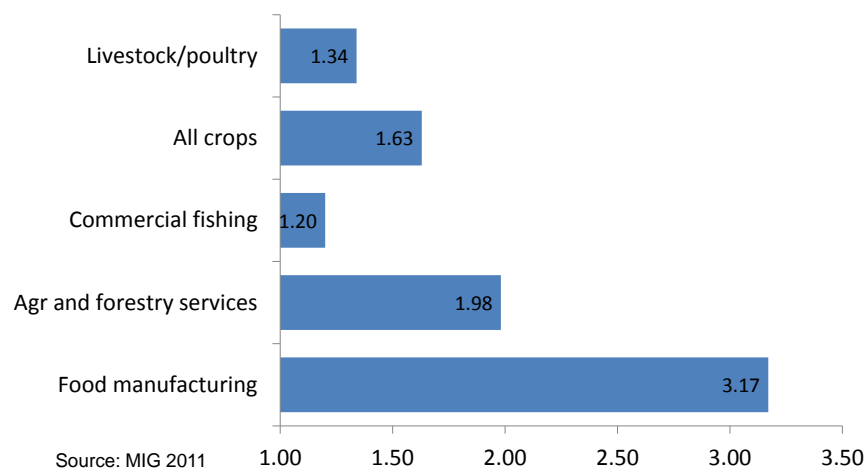


Figure 23. Employment multipliers for selected farm and food sectors, New York State, 2010

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.

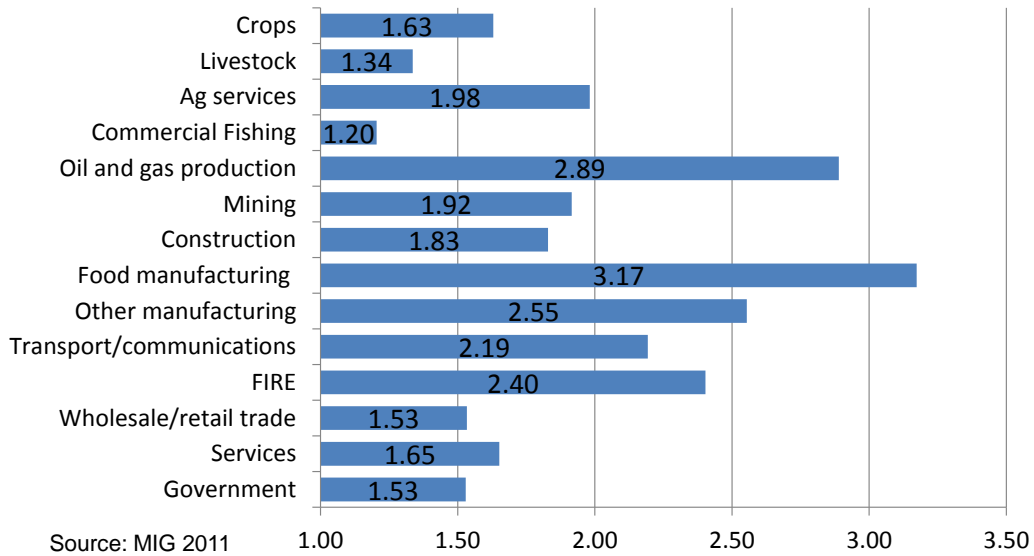


Figure 24. Employment multipliers for selected industrial sectors, New York State, 2010

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 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 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	Description	Output	Employment
Dog and cat food	1.52	4.66	Poultry processing	1.55	1.71
Other animal food	1.59	4.93	Seafood products	1.65	2.57
Flour milling	1.84	8.20	Bread and bakery products	1.91	1.87
Fats and oils	1.45	4.79	Cookie, cracker, and pasta manufacturing	1.79	2.70
Sugar fining	1.68	4.10	Snack foods	1.63	3.40
Confectionery -chocolate	1.65	2.19	Coffee and tea manufacturing	1.75	3.91
Nonchocolate confectionery	1.67	2.22	Flavoring syrup and concentrate	1.63	5.25
Frozen food	1.78	2.47	Seasoning and dressing manufacturing	1.84	3.39
Fruit and vegetable s	1.73	2.95	All other food manufacturing	1.80	2.51
Fluid milk and butter	2.18	5.67	Soft drink and ice manufacturing	1.79	3.34
Cheese	2.17	6.58	Breweries	1.53	4.14
Dry, condensed, and evaporated dairy products	2.05	7.86	Wineries	1.78	2.57
Ice cream and frozen dessert	1.96	3.01	Distilleries	1.32	5.31
Animal processing	1.66	3.10			

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.

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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, Rensselaer, Saratoga, Schenectady, Warren, Washington,
A2	Central New York	Cayuga, Cortland, Madison, Onondaga, Oswego
A3	Finger Lakes	Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, Yates
A4	Long Island	Nassau, Suffolk
A5	Mid-Hudson	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester
A6	Mohawk Valley	Fulton, Hamilton, Herkimer, Montgomery, Oneida, Schoharie
A7	New York City	Bronx, Kings, New York, Queens, Richmond
A8	North Country	Columbia, Essex, Franklin, Jefferson, Lewis, St. Lawrence
A9	Southern Tier	Broome, Chemung, Chenango, Delaware, Otsego, Schuyler, Steuben, Tioga, Tompkins
A10	Western New York	Allegany, Cattaraugus, Chautauqua, Erie, Niagara,

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million -----	
Agricultural Production				
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

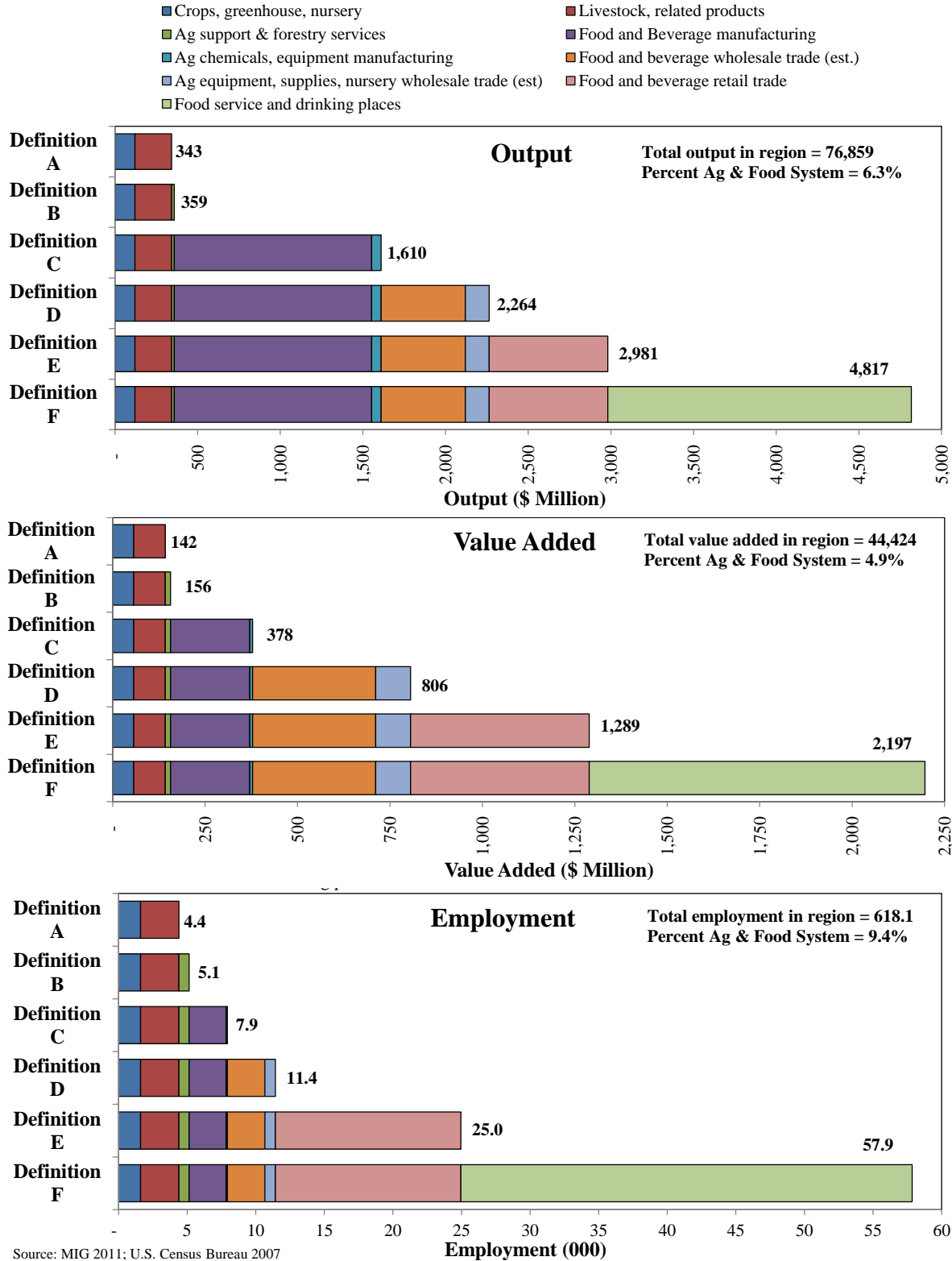


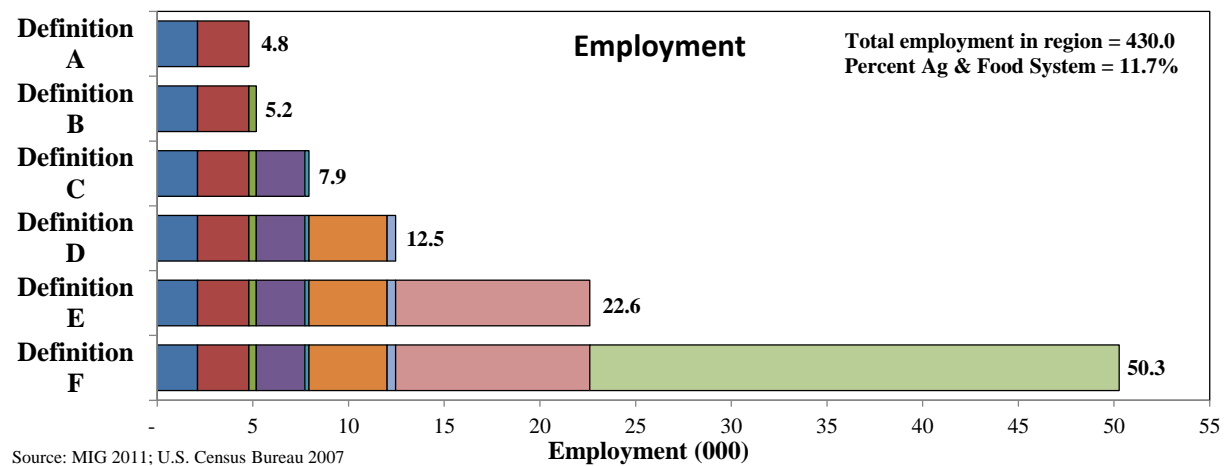
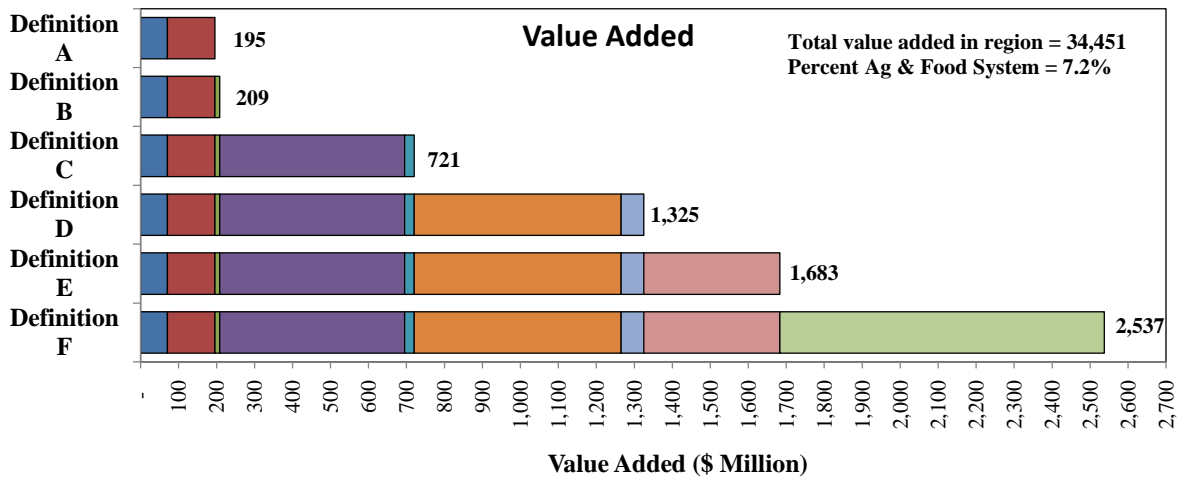
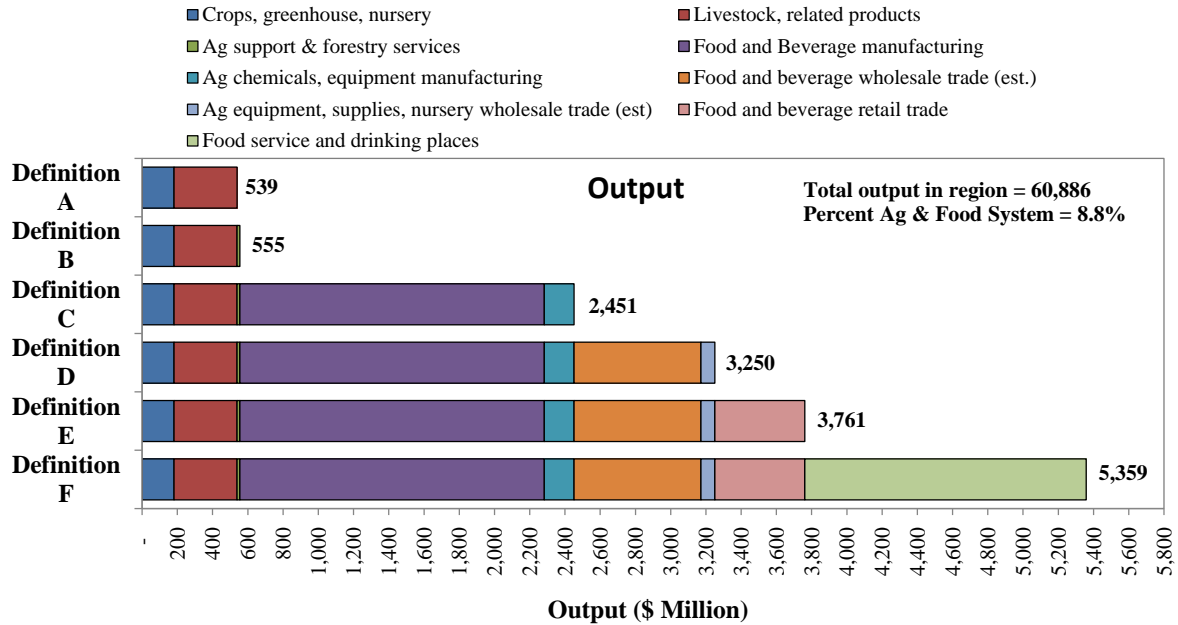
Figure A1. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Capital District Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

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

Note: Income includes employee compensation and proprietor income



Source: MIG 2011; U.S. Census Bureau 2007

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 Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

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

Note: Income includes employee compensation and proprietor income

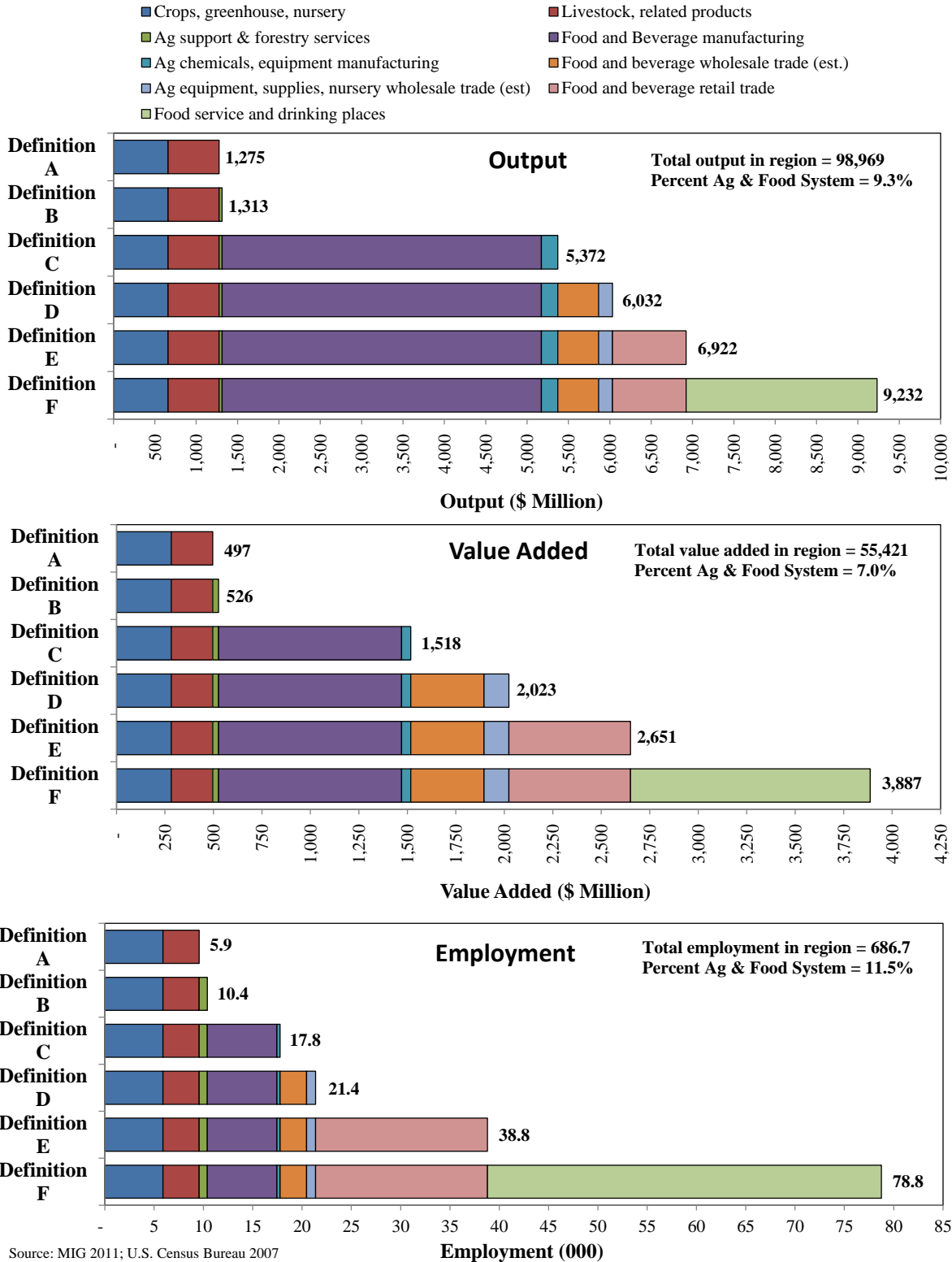


Figure A3. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Finger Lakes Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

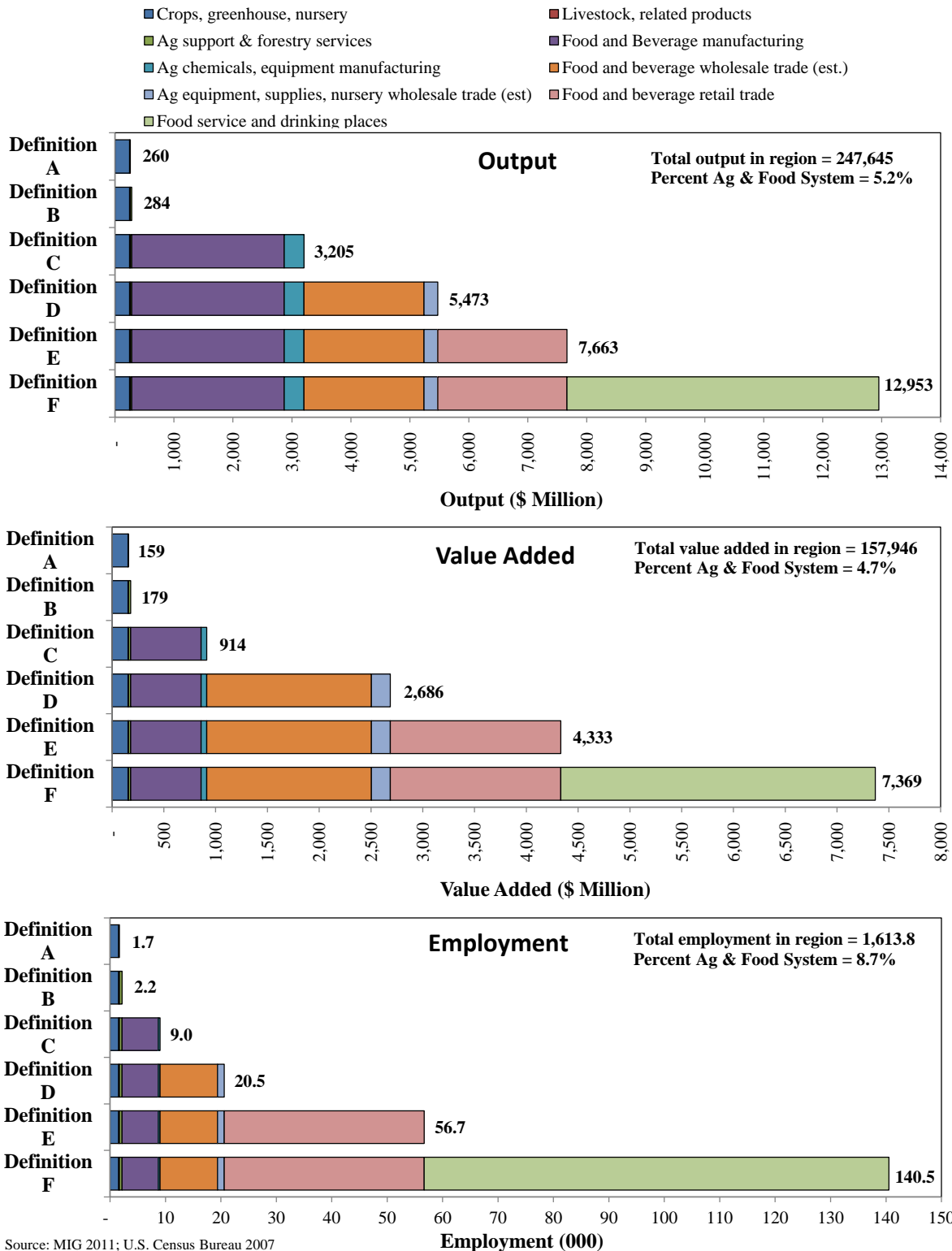


Figure A4. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Long Island Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

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

Note: Income includes employee compensation and proprietor income

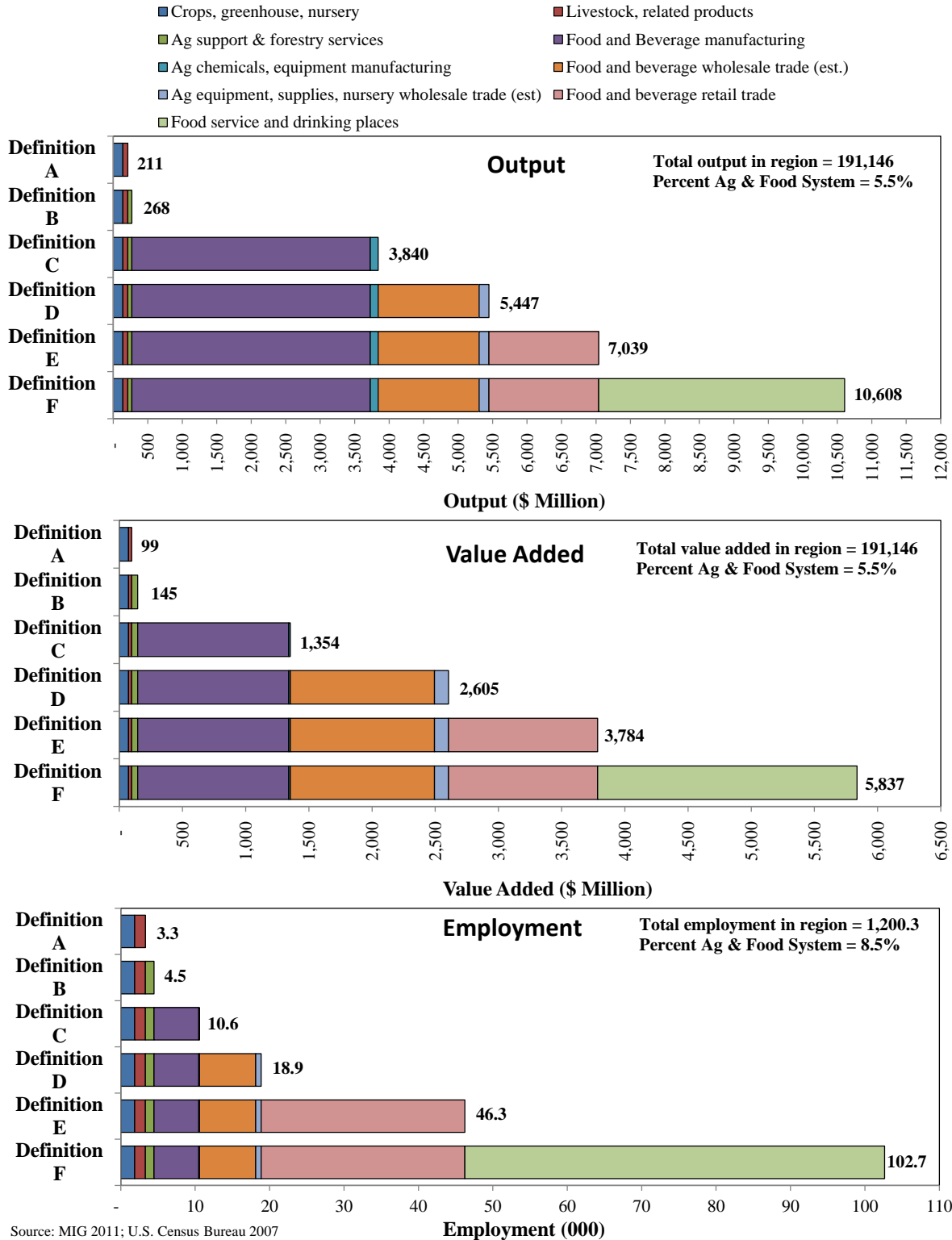


Figure A5. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Mid-Hudson Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

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

Note: Income includes employee compensation and proprietor income

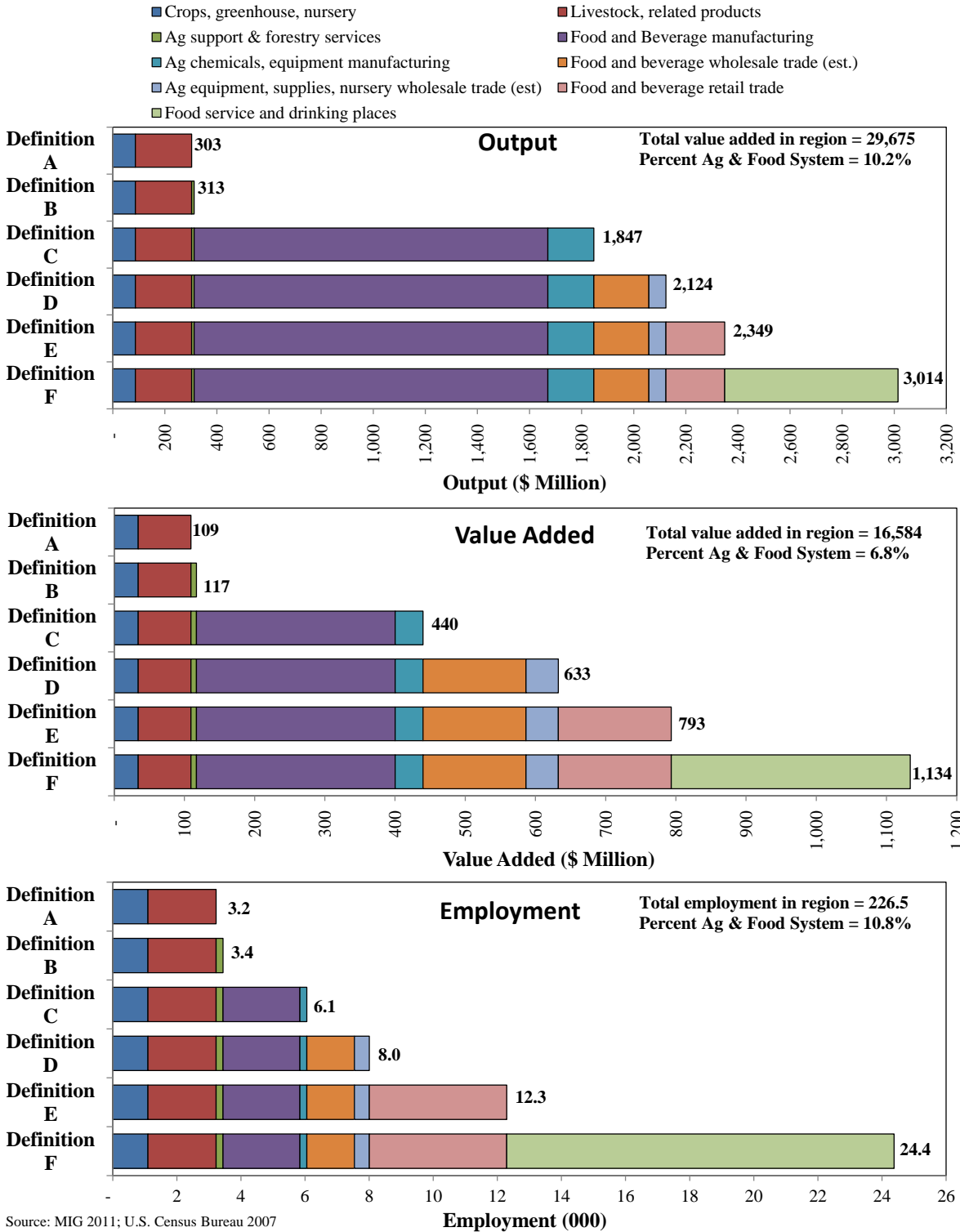


Figure A6. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Mohawk Valley Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

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

Note: Income includes employee compensation and proprietor income

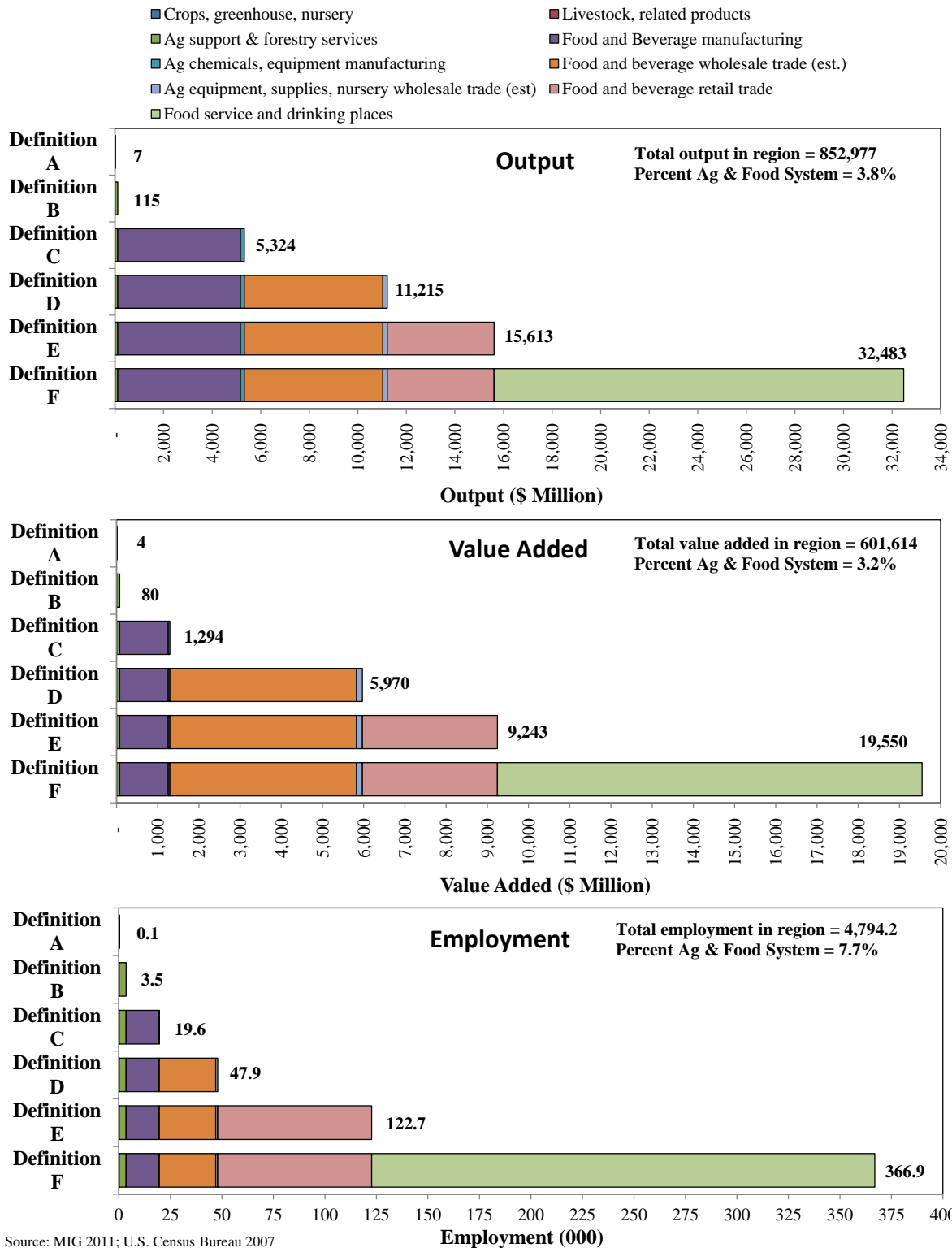


Figure A7. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, New York City Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

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

Note: Income includes employee compensation and proprietor income

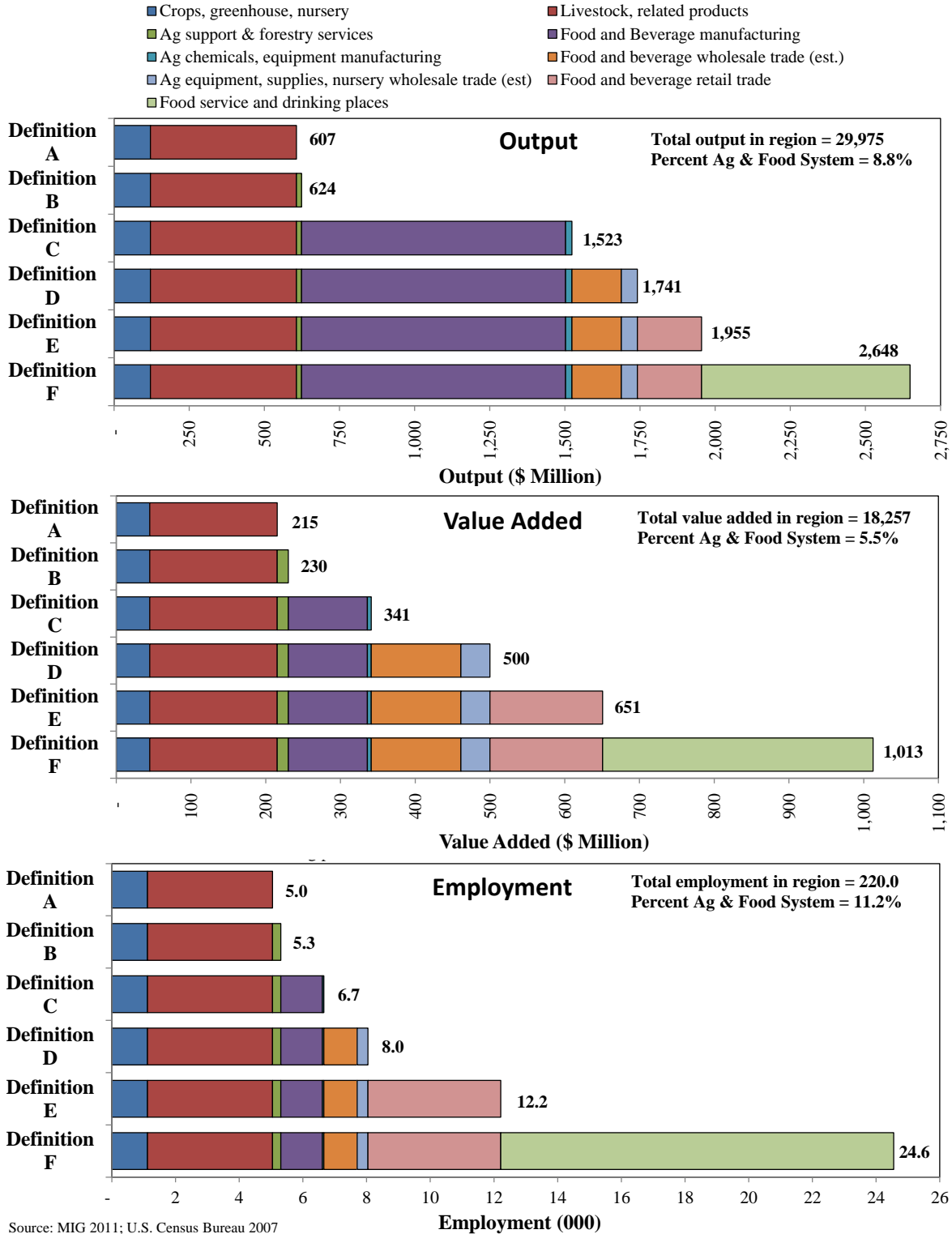


Figure A8. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, North Country Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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	7,074	76.0	537.3	195.6
Support activities for agriculture and forestry (19)	355	26.2	29.3	26.0
Food and Beverage Manufacturing				
Animal food manufacturing (41,42)	294	16.5	364.8	81.6
Milling, malt and cereal manufacturing (43,44,47)	-	-	-	-
Oilseed processing, fats and oils refining (45,46)	-	-	-	-
Sugar mills and manufacturing (48,49)	-	-	-	-
Chocolate and confectionery manufacturing (50,51,52)	1	0.0	0.5	0.1
Fruit and vegetable manufacturing (53,54)	-	-	-	-
Dairy product manufacturing (55,56,57,58)	1,295	73.2	922.7	118.5
Animal slaughtering, rendering, and processing (59,60)	77	3.7	34.7	4.3
Seafood product preparation and packaging (61)	-	-	-	-
Bread and bakery product manufacturing (62)	284	6.9	42.8	10.4
Cookie, cracker, pasta and tortilla manufacturing (63,64)	56	1.3	23.0	4.2
Snack food manufacturing (65)	546	32.4	384.2	109.1
Coffee and tea manufacturing (66)	14	0.6	9.2	1.4
Flavoring syrup and concentrate manufacturing (67)	-	-	-	-
Seasoning and dressing manufacturing (68)	183	12.3	105.1	19.2
All other food manufacturing (69)	136	6.7	45.2	11.7
Soft drink and ice manufacturing (70)	42	3.1	30.3	4.4
Breweries (71)	143	7.8	163.4	67.2
Wineries (72)	288	14.6	110.4	23.2
Distilleries (73)	30	3.1	74.6	54.3
Subtotal	3,388	182.3	2,311.0	509.4
Ag Chemical and Equipment Manufacturing				
Fertilizer manufacturing (130)	-	-	-	-
Pesticide and other agricultural chemical manufacturing (131)	17	1.3	24.6	5.6
Farm machinery and equipment manufacturing (203)	33	1.5	15.1	3.6
Lawn and garden equipment manufacturing (204)	0	0.0	0.1	0.0
Subtotal	51	2.8	39.7	9.2
Food and beverage wholesale trade (est. 319)	2,756	138.4	439.4	320.9
Ag equipment, supplies, nursery wholesale trade (est. 319)	487	24.4	77.6	56.7
Retail Stores - Food and beverage (324)	8,486	194.6	430.0	302.4
Food services and drinking places (413)	22,810	415.0	1,317.6	704.5
Total Ag and Food System Cluster	45,407	1,059.8	5,181.9	2,124.6

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

Note: Income includes employee compensation and proprietor income

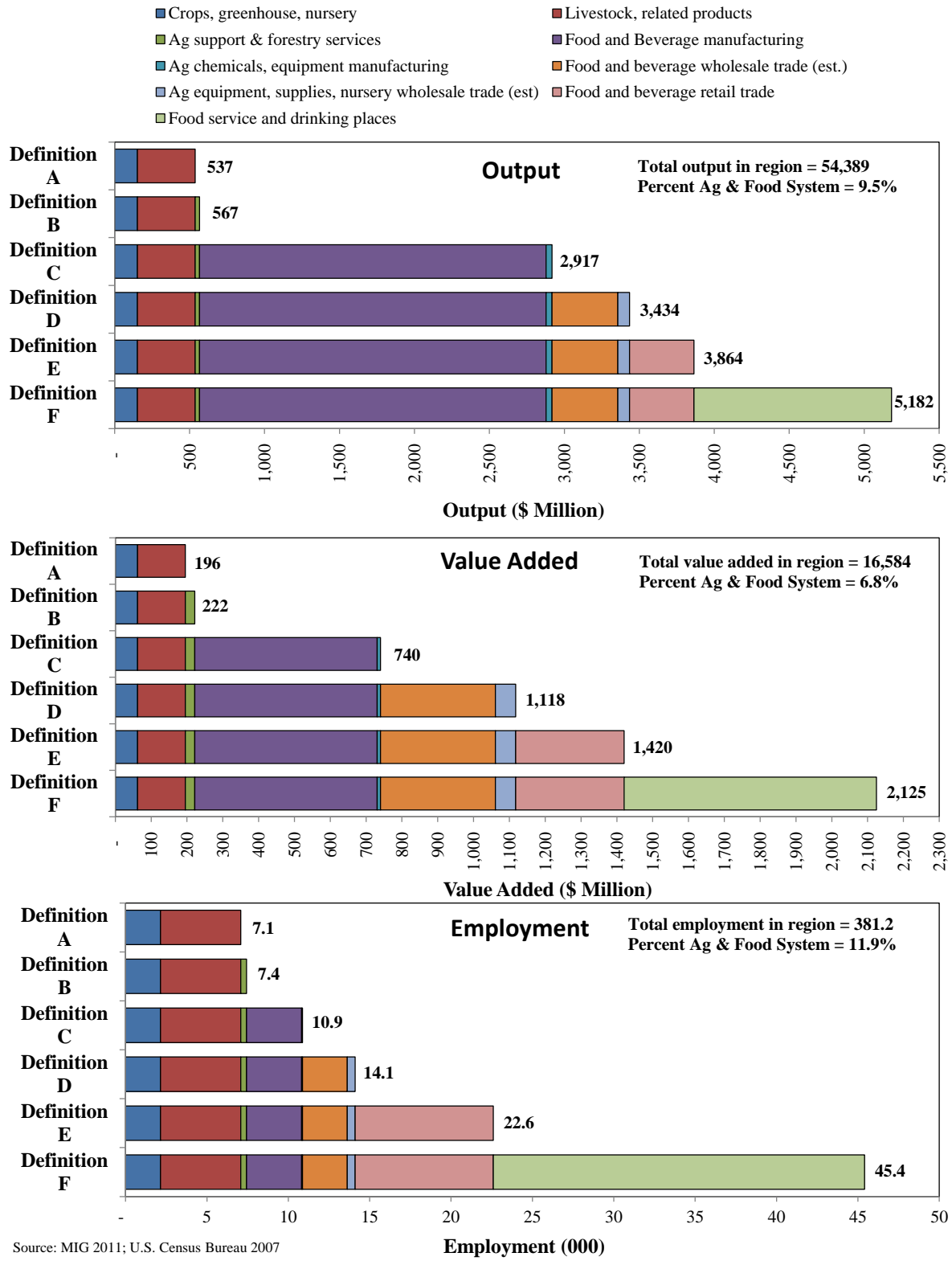


Figure A9. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Southern Tier Region, New York State, 2010.

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

Industry	Employment	Income	Output	Value Added
	(No.)	-----	\$ Million	-----
Agricultural Production				
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

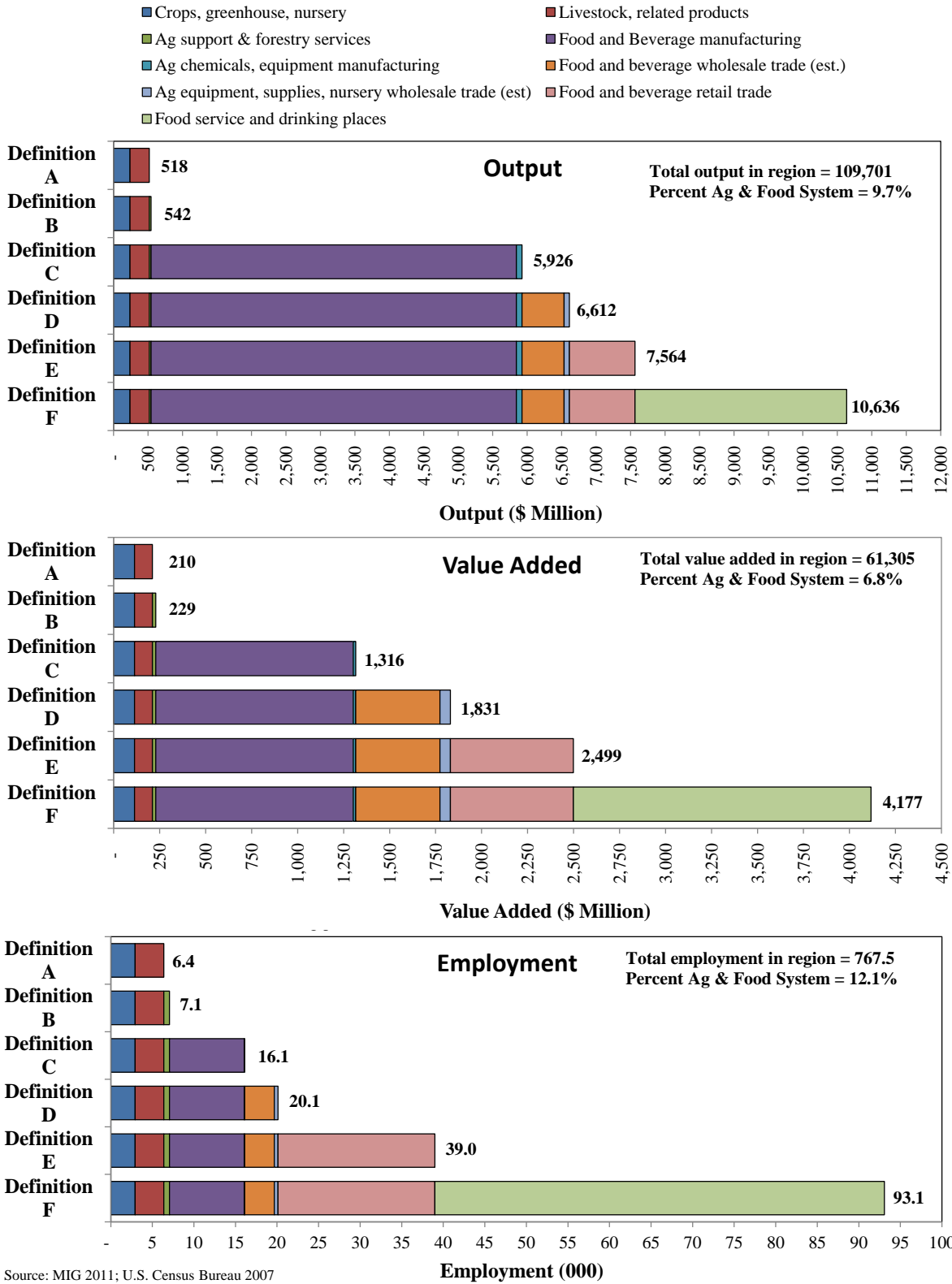


Figure A10. Defining agriculture and food systems: employment, value of output, and value added by industrial sector, Western New York Region, New York State, 2010.

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

Year	Farms	Land in farms		
		Total	Crop and pasture land	Support land
	<u>No. (1,000)</u>	<u>Mil. Acres</u>		
1950	124.8	16.0	8.5	7.5
1959	82.4	13.5	7.1	6.4
1969	51.9	10.1	6.1	4.0
1978	43.1	9.5	5.9	3.6
1987	37.7	8.4	5.4	3.0
1992	32.3	7.5	4.9	2.6
1997	31.8	7.2	4.7	2.5
1997 (adj.)	38.3	7.7	5.6	2.1
2002	37.3	7.7	5.4	2.3
2007	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

Year	Cash receipts from marketings	Price index (1990-92=100)	Price adjusted cash receipts
	<u>Dol. (1,000)</u>	<u>No.</u>	<u>Dol. (1,000)</u>
1990	2,984,133	104	2,857,325
1991	2,870,832	99	2,902,528
1992	2,932,622	100	2,946,174
1993	2,989,201	105	2,857,854
1994	2,980,856	98	3,028,279
1995	3,024,504	108	2,800,467
1996	3,156,847	108	2,923,006
1997	2,917,576	105	2,778,644
1998	3,269,714	98	3,336,443
1999	3,273,790	91	3,597,571
2000	3,226,676	98	3,292,527
2001	3,522,133	93	3,787,240
2002	3,232,574	97	3,332,551
2003	3,137,802	124	2,530,485
2004	3,656,271	112	3,264,528
2005	3,674,791	125	2,939,833
2006	3,598,587	122	2,949,661
2007	4,456,508	142	3,138,386
2008	4,843,231	133	3,641,527
2009	3,820,540	135	2,830,030
2010	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 B4. Cash Receipts from Sales of Livestock and Livestock Products, New York State, 1990-2010

Year	New York state total	Mid-Hudson	Empire State Development Region (Estimates allocated to counties outside New York City)							Long Island
			Capital	North Country	Mohawk Valley	Southern Tier	Central	Finger Lakes	Western	
<u>Dollars (\$1,000)</u>										
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 B6. Cash Receipts for Selected Commodity Groups, New York State, 1990-2010

Year	Dairy products	Poultry and poultry products	Meat animals and other livestock	Grain and oil crops	Vegetables	Fruit	Greenhouse and nursery products
<u>Dollars (\$1,000)</u>							
1990	1,590,542	101,462	390,114	108,878	229,612	178,036	250,454
1991	1,399,140	94,236	405,019	115,396	275,320	209,250	230,551
1992	1,527,273	82,280	390,083	115,898	194,315	196,640	295,881
1993	1,463,554	90,799	508,339	101,698	274,817	171,397	246,748
1994	1,495,702	89,844	469,621	116,622	251,294	178,696	236,279
1995	1,487,696	91,601	468,429	150,436	250,213	192,580	232,092
1996	1,690,419	101,213	428,539	179,485	194,700	211,685	218,923
1997	1,526,158	86,704	312,091	129,797	242,216	203,802	260,694
1998	1,786,862	91,655	320,786	119,786	320,488	189,466	284,120
1999	1,743,094	86,474	341,377	119,668	335,377	207,308	294,105
2000	1,543,966	96,264	377,359	108,725	414,418	201,253	315,797
2001	1,847,810	94,382	396,800	106,364	422,714	180,893	315,834
2002	1,557,888	86,673	344,863	124,667	413,048	184,209	340,644
2003	1,559,555	91,888	265,921	140,012	356,867	184,780	344,442
2004	1,950,144	108,399	306,489	166,082	372,182	236,578	341,982
2005	1,913,724	94,749	356,870	146,444	366,340	250,063	367,676
2006	1,609,742	98,024	424,741	191,932	403,310	274,914	394,157
2007	2,377,987	125,091	285,196	320,662	451,131	351,612	377,176
2008	2,380,800	146,600	294,307	508,381	522,604	389,327	380,817
2009	1,685,312	113,118	321,032	428,653	396,433	316,238	367,518
2010	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		Agriculture and forestry support activities	Total	Manufacturing	
		Farm proprietors	Hired farm workers			Food manufacturing	Beverage and tobacco products
<u>Number employed</u>							
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
<u>Dollars (Mil.)</u>			
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

Year	Crop and animal production (Farms)	Forestry, fishing, and related activities	Food, beverage and tobacco product manufacturing	Crop and animal production (Farms)	Forestry, fishing, and related activities	Food, beverage and tobacco product manufacturing
	Current dollars (\$Mil.)			Constant dollars (\$Mil.)		
1997	1,124	340	5,646	926	306	7,138
1998	1,316	354	5,402	1,153	326	6,472
1999	1,338	343	6,027	1,368	319	6,535
2000	1,314	311	5,787	1,491	291	6,165
2001	1,490	312	6,478	1,520	314	6,628
2002	1,228	290	6,281	1,378	304	6,095
2003	1,406	290	5,986	1,393	298	6,031
2004	1,815	298	5,563	1,503	302	5,345
2005	1,772	326	6,734	1,772	326	6,734
2006	1,611	374	6,986	1,716	366	7,426
2007	2,123	369	7,166	1,669	347	7,944
2008	2,234	377	6,752	1,742	342	6,369
2009	1,649	357	8,264	1,707	330	6,585
2010	2,243	323	8,629	1,970	281	7,682

Source: US Department of Commerce, Bureau of Economic Analysis

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

Year	Farms				Food, beverage and tobacco product manufacturing		
	Total earnings	Farm proprietors' income	Payrolls	Agriculture and forestry support activities	Total earnings	Food manufacturing	Beverage and tobacco manufacturing
<u>Dollars (\$1,000)</u>							
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