



VOLUME 3

ECONOMIC IMPACT OF NEW ENGLAND'S FOOD SYSTEM

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Volume 1:
Estimating Resilient
Eating Patterns

Volume 2:
Estimating Production
for 30% Regional Self-
Reliance

» **Volume 3:**
**Economic Impact of New
England's Food System**

Volume 4:
Understanding Market
Channels and Food
Expenditures

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On the cover, clockwise from top left: barley harvest in Vermont (VAAFV); maple syrup production in New Hampshire (Ink + Light Creative); food manufacturing in Maine (Food Fork Lab); Black River Fish, Vermont (A Perry Heller); founders of Global Village Foods in Woodstock, Vermont (Erica Housekeeper); High Lawn Dairy in Massachusetts (Nicole Cardwell)

What would it take for 30% of the food consumed in New England to be regionally produced by 2030?

What will it really take to grow, raise, produce, harvest, and catch more regional food and move it through a complex supply chain to our homes and other places we eat? What do we need to do in the near term, by 2030, to make tangible progress towards this bold goal? How might the increasing and escalating impacts of climate change impact our ability to feed ourselves? What can we do as a region to make our food system more equitable and fair, resilient and reliable? To answer these questions, the **New England State Food System Planners Partnership**—a collaboration between six state-level food system organizations—and [Food Solutions New England](#)—who are mobilizing their networks to strengthen and grow the New England regional food system—convened four teams of researchers.

This research volume examines the question: **Do we have the right mix of industries to ramp up food production? What sectors are growing? What sectors are contracting?** Estimates of the number of people employed in New England's food system, the economic impact of food system activities, economic multipliers for each industry, and areas of growth or contraction were developed. **The economic contribution of New England's food system is significant, employing about 1 million people (more than 10% of all jobs) and generating \$190 billion in sales (11% of New England sales for all industries). However, agricultural and fisheries employment were essentially flat and sales were down during our period of analysis.**

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Table of Contents

1. Introduction.....	1		
New England Feeding New England.....	1		
What Does 2030 Resilient Eating Mean for New England Farm Production.....	7		
2. Measuring Key Indicators of the New England Food System...9	9		
Concepts and Definitions.....	9		
Industry Coverage.....	9		
Employment.....	10		
Sales(Output).....	15		
Value-Added.....	15		
3. Economic Summary for the Region.....	16		
Employment.....	16		
Sales.....	17		
Summary for the Six States.....	17		
4. The New England Food System by Detailed Industries.....	21		
Agriculture and Fisheries.....	21		
New England Employment.....	21		
New England Sales.....	23		
Agricultural and Fisheries Sales by State.....	24		
Food and Beverage Product Manufacturing.....	28		
New England Employment.....	28		
		New England Sales.....	30
		Food and Beverage Product Manufacturing Employment by State.....	32
		Food and Beverage Product Manufacturing Sales by State.....	34
		Food Distribution and Retail Trade.....	37
		New England Employment.....	37
		New England Sales.....	38
		Food Distribution and Retail Trade Employment by State.....	38
		Food Distribution and Retail Trade Sales by State.....	39
		Food Services.....	41
		New England Employment.....	41
		New England Sales.....	42
5. The Economic Impact of the New England Food System.....	43		
Input-Output Models.....	43		
Economic Multipliers by Region and State.....	45		
Economic Multipliers by Industry.....	47		
6. Next Steps.....	51		
7. Endnotes.....	54		

Appendices.....55
 A. State and Regional Data: Employment and Sales by Sector..56
 B. Sector Economic Multipliers by State and Sector.....71
 C. State and Sectoral Job and Value-Added Impact
 of Unit Changes in Sales.....86

FIGURES

Figure 1: New England Employment by Sector, 2007, 2012, 2017...4
Figure 2: New England Sales by Sector, 2007, 2012, 2017.....4
Figure 3: New England Food System Employment Multiplier.....6
Figure 4: Share of New England Population, Food System Jobs,
 and Sales by State, 2017.....18
Figure 5: New England Food System Employment
 and Sales by Industry, 2017.....19
Figure 6: Employment and Sales by State, 2017.....20
Figure 7: Agricultural and Fishery Employment, 2017.....23
Figure 8: Composition of Agricultural and Fishery Sales, 2017.....24
Figure 9: Top Product Categories by Sales, 2017.....24
Figure 10: Crop Production Sales Growth by State.....25
Figure 11: Animal Production Sales Growth by State.....26

Figure 12: Composition of Food and Beverage Product
 Manufacturing Employment, 2017.....29
Figure 13: Composition of Food and Beverage Product
 Manufacturing Sales, 2017.....30
Figure 14: Top Manufactured Food and Beverage Product
 Categories by Sales, 2017.....30
Figure 15: Manufactured Food and Beverage Products Sales Growth
 Rate, 5-Year Intervals by Sector.....31
Figure 16: Food Distribution and Retail Trade Employment, 2017.....38
Figure 17: Food Distribution and Retail Trade Sales, 2017.....39
Figure 18: Food Distribution and Retail Trade Employment
 Growth, 2007-2017.....39
Figure 19: Food Distribution and Retail Trade Sales Growth,
 2007-2017.....40

TABLES

Table 1: Employment by Sector for the Region.....4
Table 2: Sales by Sector for the Region, 2007, 2012, 2017.....5
Table 3: Projected 2030 Farm Production and
 Employment Change.....7
Table 4: NAICS Codes Definitions.....11

Table 5: Employment by Sector for the Region.....17

Table 6: Sales by Sector for the Region.....18

Table 7: New England Agriculture and Fisheries: Detailed Industry Employment and Sales.....22

Table 8: Crop Production Sales, Farm Sales, and Support Activities Combined.....25

Table 9: Animal Product Sales, Farm Sales, and Support Activities Combined.....26

Table 10: Food and Beverage Product Manufacturing: Detailed Employment and Sales.....28

Table 11: Food and Beverage Product Manufacturing Employment, 2017.....32

Table 12: New England Population by State, 2007, 2012, and 2017.....32

Table 13: Top Three Sectors of Food and Beverage Product Manufacturing Employment, 2017.....33

Table 14: New England Food and Beverage Product Manufacturing Sales, 2017.....34

Table 15: Average Food and Beverage Product Manufacturing Sales Per Employee, 2007-2017.....35

Table 16: Top Three Sectors of Food and Beverage Product Manufacturing Sales, 2017.....36

Table 17: Food Distribution and Retail Trade: Detailed Industry Employment and Sales.....37

Table 18: Food Service and Drinking Places: Detailed Industry Employment and Sales.....41

Table 19: Economic Multipliers for New England States, 2017.....46

Table 20: Economic Multipliers by Food System Industry.....48

Table 21: Regional Impact of Sales Change on Employment and Value-Added.....50

APPENDIX A

Table A1: New England: Food System Employment and Sales, 2007-2017.....57

Table A2: Connecticut: Food System Employment and Sales, 2007-2017.....59

Table A3: Maine: Food System Employment and Sales, 2007-2017.....61

Table A4: Massachusetts: Food System Employment and Sales, 2007-2017.....63

Table A5: New Hampshire: Food System Employment and Sales, 2007-2017.....65

Table A6: Rhode Island: Food System Employment and Sales, 2007-2017.....67

Table A7: Vermont: Food System Employment and Sales, 2007-2017.....69

APPENDIX B

Table B1: New England Output Multipliers, 2017.....72

Table B2: New England Employment Multipliers, 2017.....72

Table B3: New England Value-Added Multipliers, 2017.....73

Table B4: Connecticut Output Multipliers, 2017.....74

Table B5: Connecticut Employment Multipliers, 2017.....74

Table B6: Connecticut Value-Added Multipliers, 2017.....75

Table B7: Maine Output Multipliers, 2017.....76

Table B8: Maine Employment Multipliers, 2017.....76

Table B9: Maine Value-Added Multipliers, 2017.....77

Table B10: Massachusetts Output Multipliers, 2017.....78

Table B11: Massachusetts Employment Multipliers, 2017.....78

Table B12: Massachusetts Value-Added Multipliers, 2017.....79

Table B13: New Hampshire Output Multipliers, 2017.....80

Table B14: New Hampshire Employment Multipliers, 2017.....80

Table B15: New Hampshire Value-Added Multipliers, 2017.....81

Table B16: Rhode Island Output Multipliers, 2017.....82

Table B17: Rhode Island Employment Multipliers, 2017.....82

Table B18: Rhode Island Value-Added Multipliers, 2017.....83

Table B19: Vermont Output Multipliers, 2017.....84

Table B20: Vermont Employment Multipliers, 2017.....84

Table B21: Vermont Value-Added Multipliers, 2017.....85

APPENDIX C

Table C1: New England Impact of Sales Change on Employment and Value Added, 2017.....87

Table C2: Connecticut Impact of Sales Change on Employment and Value Added, 2017.....88

Table C3: Maine Impact of Sales Change on Employment and Value Added, 2017.....	89
Table C4: Massachusetts Impact of Sales Change on Employment and Value Added, 2017.....	90
Table C5: New Hampshire Impact of Sales Change on Employment and Value Added, 2017.....	91
Table C6: Rhode Island Impact of Sales Change on Employment and Value Added, 2017.....	92
Table C7: Vermont Impact of Sales Change on Employment and Value Added, 2017.....	93



Introduction

Can the six New England states provide 30% of their food from regional farms and fisheries by 2030?

This question guided research conducted by the [New England State Food System Planners Partnership](#) to help policy-makers, funders, food system businesses and stakeholders, community groups, and consumers understand the relative resilience of New England's food system. Why does this question matter? After all, America's food and beverage production capacity—farms, fisheries, processors, and manufacturers—is enormous, abundant, and diverse. Food imports from around the world have also steadily increased. Our food distribution systems are timely and efficient. Our grocery stores and restaurants are stocked, affordable, and convenient. Even our waste disposal systems are a flush and weekly pickup away.

In most of our lived experiences, we have not had to answer the question—**Where does our food come from?**—with specificity, although our ancestors certainly could. And yet, accumulating evidence indicates that we are entering a new era of human experience. Due to linked challenges that are *simultaneously taking place everywhere across the planet*, Americans will no longer be able to reasonably expect that every food they want will be easily available for them to buy year-round.

New England Feeding New England

If where our food comes from suddenly mattered, would New England be prepared with a reliable, safe, and abundant food supply? What will it really take to grow, raise, produce, harvest, and catch more regional food and move it through supply chains to our homes and other places where we eat? There are very few examples of long-term planning for healthy, reliable food supplies. Unlike other systems that provide essential goods and services, like energy and water, *no one* is currently in charge of planning and preparing for healthy, reliable, and resilient long-term food supplies.

In 2014, Food Solutions New England published [A New England Food Vision](#), which imagined what it would take to produce 50% of New England's food supply from regional sources by 2060. It found that the region *could* theoretically supply 50% of its food by focusing production on fruits, vegetables, dairy products, and grass-finished meats, while importing the majority of food grains, feed grains, oilseeds, and sweeteners. Based on a target of 2,300 calories per person per day, 4 million additional acres of land in agriculture would be required to do this (about three times more than is currently in active production, although about 6.8 million acres were in cropland and pasture in New England in 1945).

New England Feeding New England updates the analysis from *A New England Food Vision* and explores opportunities at an intermediate and more easily imaginable range: **what would it take for 30% of the food consumed in New England to be regionally produced by 2030?** To explore key questions about our long-term food supply, four research teams were assembled across New England:

1. **Dietary Patterns Team:** How would food consumption patterns have to change in order to make the best use of what regional food producers can grow, harvest, and catch? This Team developed dietary scenarios for “Unchanged Eating”—a continuation of how we currently eat—and “Resilient Eating”—a dietary pattern much more closely in alignment with [U.S. Dietary Guidelines](#)—in 2030 (see [Volume 1](#)).
2. **Food Production Team:** How much food do we produce in New England compared to how much food we consume? The Food Production Team analyzed current regional food self-reliance and developed a model to explore New England’s potential to increase its self-reliance based on dietary scenarios prepared by the Dietary Patterns Team (see [Volume 2](#)).
3. **Economic Impact Team:** Do we have the right mix of industries to ramp up food production? The Economic Impact Team estimated the number of people employed in New England’s food system, the economic impact of food system activities, economic multipliers for each industry, and areas of growth or contraction (Volume 3).
4. **Market Demand Team:** What market channels offer the best opportunities for sourcing local and regional food products? The Market Demand Team analyzed market concentration trends, sales data from retail food market channels, consumer expenditures for the six states, and explored specific challenges within each market channel (see [Volume 4](#)).

Volume 3 estimates the economic impact of the New England food system and analyzes food system sectors that are growing or contracting. Our analyses are presented in four sections:

1. **Measuring the Dynamics of the New England Food System:** In the first section, we provide definitions for food system industry groups covered by official data sources and economic measures used in this report.
2. **Economic Summary for the Region:** In the second section, we present summaries of the food system economic data assembled for each New England state and the region.
3. **The New England Food System by Detailed Industry:** In the third section, we present detailed state and regional economic characteristics associated with activities in the various food system sectors—Agriculture and Fisheries, Food and Beverage Product Manufacturing, Food Distribution and Retail Trade, and Food Services.
4. **The Economic Impact of the New England Food System:** In the final section, we present the modeled performance of the food system viewed through the lens of a regional interindustry model, better known as an input-output model.

Detailed data for states and sectors are provided in three appendices. The first Appendix contains historical data by state and sector. Appendix Two summarizes the economic impact multipliers by state and sector. Appendix Three presents multipliers by state and sectors, showing the job and value-added growth associated with unit-changes in output in order to help assess the consequences of a changing mix of food system activity on the regional economy.

Volume 3 Research Summary



Do we have the right mix of industries to ramp up food production?

NEW ENGLAND'S

 FOOD SYSTEM

EMPLOYS

1,000,000
PEOPLE

=

10% OF ALL JOBS

AND GENERATES

\$190
BILLION IN SALES

=

11% OF ALL SALES

BUT

EMPLOYMENT AND SALES IN AGRICULTURE AND FISHERIES

ARE

~~FLAT~~
 OR
~~DECLINING~~

A food system encompasses a broad array of activities, including agricultural production, fisheries, food and beverage product manufacturing, distribution, retail trade (e.g., grocery stores), and food services (e.g., restaurants). Because of its breadth, the food system has wide-ranging influence on the regional economy in terms of **jobs**, **sales volume** (or “**output**”), and **value-added**.

We have assembled job and sales data for the thirty-four sectors that comprise the regional food system. While there is no standard definition as to what activities should be included, some of this is dictated by the availability of state data at a detailed industry level. For example, it is difficult to estimate the number of people employed in Nutrient Management activities (e.g., food waste collection, composting, and related activities), the number of people employed in food system support activities at nonprofit organizations, or professors and support personnel working on food system issues at colleges and universities. As a result, **our estimates likely undercount the total number of people employed in food system activities in New England.**

Regional time-series economic data are also often suppressed to protect producers’ confidentiality and identity. This is not always a problem at the state level, but because New England has small states, both physically and economically, data suppression occurs more

frequently here. We have attempted to estimate for these values by application of regional averages where necessary, calculated from unsuppressed data.

Our data are developed from the [U.S. Census Bureau’s Economic Census](#) for 2007, 2012, and 2017. For consistency, we limited used Agriculture, Manufacturing, Trade, and Food Services data from the Economic Census, as well as the [Department of Commerce’s National Oceanic and Marine Fisheries Services](#) data for the fishery sector. Data from the [U.S. Department of Agriculture’s Census of Agriculture](#) was also used. It is possible that, for some states, other locally sourced data could be used in the study but its use might raise comparability issues as to coverage or collection methodology.¹ For the data we have used, the sources and methods are consistent for the states and the region.

Total food system jobs numbered approximately 999,300 in 2017 (Table 1, Figure 1). With 9.9 million total jobs in the regional economy in 2017, the food system represents 10% of the New England total. Total sales amounted to \$190 billion (Table 2, Figure 2), which is equal to 11% of New England sales for all industries.

From our data, we see the regional food system as one with moderate growth over the ten-year period from 2007 to 2017. Regional job

TABLE 1: Employment by Sector for the Region, 2007, 2012, 2017

Sector	Employment (Jobs)			Annual Employment Growth Rate		
	2007	2012	2017	2007-2012	2012-2017	2007-2017
Agriculture and Fisheries	127,575	134,643	127,072	1.1%	-1.2%	0.0%
Food and Beverage Manufacturing	48,239	47,619	52,979	-0.3%	2.2%	0.9%
Food Distribution and Retail Trade	241,668	257,583	258,489	1.3%	0.1%	0.7%
Food Services	471,494	495,349	560,737	1.0%	2.5%	1.7%
TOTAL	888,976	935,194	999,277	1.0%	1.3%	1.1%

FIGURE 1: New England Employment by Sector, 2007, 2012, 2017

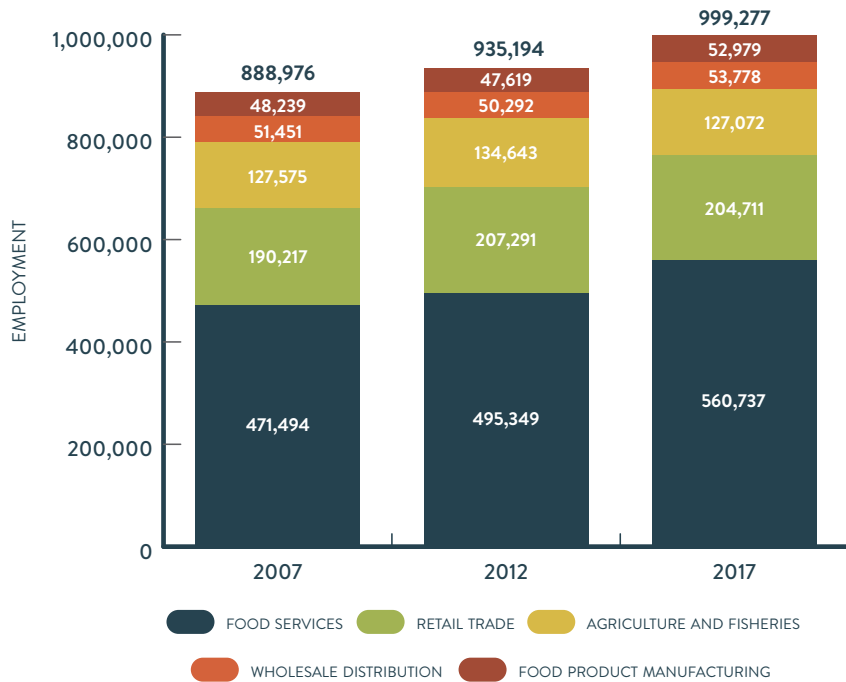


FIGURE 2: New England Sales by Sector, 2007, 2012, 2017

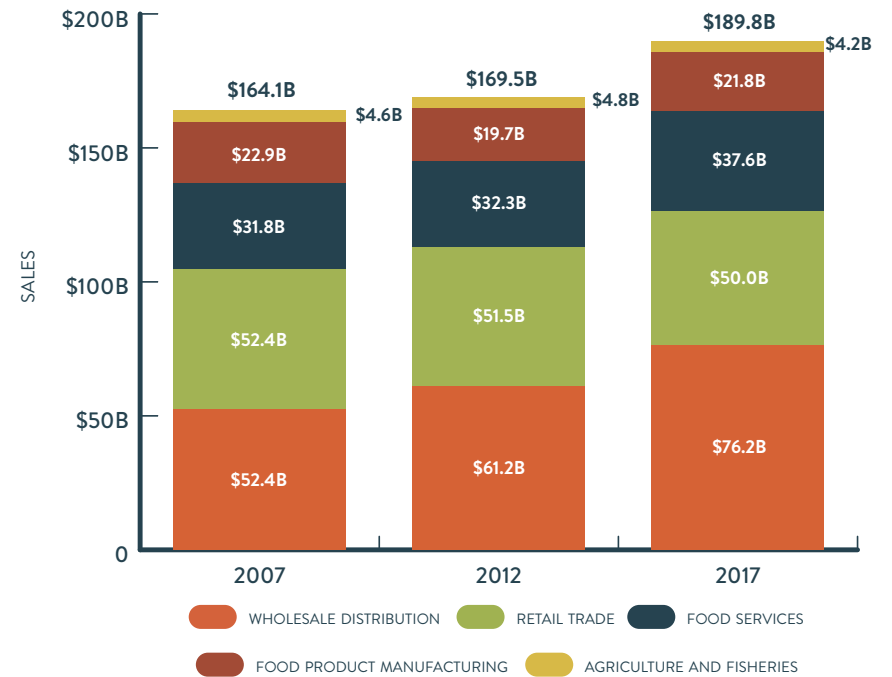


TABLE 2: Sales by Sector for the Region, 2007, 2012, 2017

Sector	Sales			Annual Sales Growth Rate		
	2007	2012	2017	2007-2012	2012-2017	2007-2017
Agriculture and Fisheries	\$4,475,799,000	\$4,773,349,000	\$4,213,547,000	1.3%	-2.5%	-0.6%
Food and Beverage Manufacturing	\$22,949,659,000	\$19,698,306,000	\$21,821,352,000	-3.0%	2.1%	-0.5%
Food Trade and Distribution	\$104,797,226,000	\$112,717,864,000	\$126,229,082,000	1.5%	2.3%	1.9%
Food Services	\$31,787,648,000	\$32,291,029,000	\$37,569,985,000	0.3%	3.1%	1.7%
TOTAL	\$164,125,400,000	\$169,092,163,000	\$189,734,780,000	0.7%	2.3%	1.3%

growth occurred at a 1.1% rate per year, computed as a compound annual rate. This is much faster than regional employment growth, which was 0.7% per year for all industries combined in the New England region. Sales growth, measured as value of sales in constant 2020 dollars, was 1.3% per year. This growth rate is significantly higher than that of the regional economy (for all industries), which was 0.8%/year for the the 2007-2017 period. These rates are also more than double the regional population growth rate which was steady at 0.5% per year.

Employment and sales growth was evident in many New England food system industries, including food and beverage product manufacturing, distribution, stores, and food services in New England from 2007 to 2017. **The exception was in farms and fisheries, where employment was essentially flat and sales were down during this period. This may present a significant challenge for meeting regional self-reliance goals.**

Levels of activity (i.e., employment and sales) and their *growth rates* are two measures by which we can gauge the importance of the different activities within the system. Another option is to analyze

the *economic multipliers* associated with each. **Economic multipliers are means of measuring each sector’s linkages with other sectors in the region.** They let us observe and estimate how changes in activity ripple throughout the entire economy, affecting total employment and income.

Economic multipliers are also a means by which we can estimate the contribution of each sector to the **gross regional product (GRP)**. GRP is often used as a measure of economic well-being—an imperfect one that misses the status of public goods provision, environmental quality, public health, and social order—but one regularly used for assessing productivity.

We have estimated the multipliers for the region, states, and industries using a regional input-output model, a commonly used method by which to examine the structure of economies at a point-in-time (It is not a forecasting method on its own, but is used as the basis for many forecasting models). The model we used—IMPLAN—provided detail for six states and 546 industries.

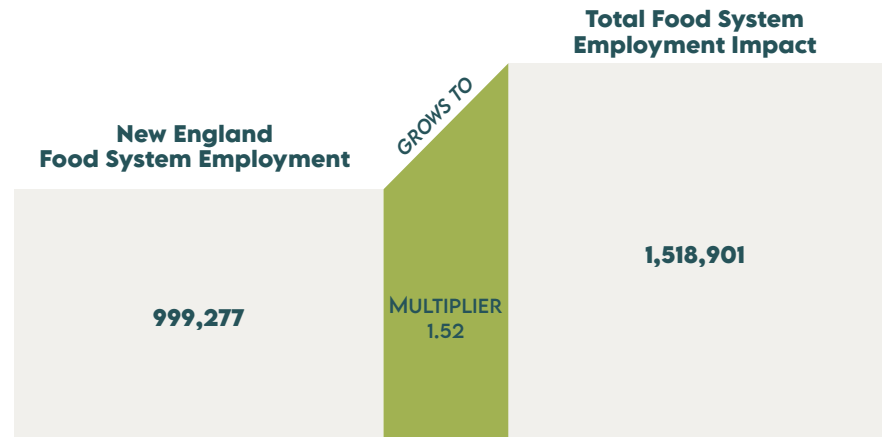
The IMPLAN model was calibrated for 2017 to make it consistent with the latest available Economic Census data. From this model, we see that **for each additional job created in the region’s food system, total employment in the regional economy will increase by 1.5 jobs** (i.e., to the 1 one additional food system job, we will have 0.5 jobs spun-off those; Figure 3). The additional one-half job (in aggregate) is actually a set of fractional jobs spread over the entire economy, the result of linked activity in other food system and nonfood system sectors. These include jobs in transportation, utilities, finance, trade, and government.

In fact, interindustry linkages originating in food system transactions ultimately reach 470 industries with measurable transactions, many via consumption expenditures arising from income created either in the food system directly, or in an industry supplying it with goods and services.

The multipliers also show that for every \$1 of value-added “created” in the food system, total value-added in the entire region grows to \$2.01. This multiplier value is close to the average (unweighted) for all U.S. industries of \$2.10. The highest value-added multipliers are found in the Food Product Manufacturing sector, and the lowest in Farm and Fishery Products.

Some of the difference between the two is an artifact of the way value-added is measured, since it is the sum of wage, proprietors’ income, dividends, interest, and rent. The value-added estimate from farm labor is poorly measured because the usual channels for collecting this information, payroll tax collections, are not applicable to most farms. Further, uncompensated labor by farmer operators, farm family members, and seasonal workers is not measured accurately, if at all. As a result, we present these results with the caution that sectoral comparisons of value-added are best made within similar sector groupings such as the Farm and Fishery Products, Food and Beverage Product Manufacturing, Wholesale Distribution, Retail Trade, and Food Services sectors.

FIGURE 3: New England Food System Employment Multiplier, 2017



COVID-19 Pandemic

The economic data analyzed in this volume was from 2017, several years before the COVID-19 pandemic spread around the world. Globally, [more than 6.8 million people](#) have died from COVID-19 as of February, 2023, including over 1.1 million Americans, and more than 46,000 New Englanders. Public health protection measures taken to mitigate the pandemic in 2020 led to a rapid spike in unemployment across the country, particularly among leisure and hospitality workers, including *food services* (e.g., restaurants). We estimate that over 100,000 food system workers—mostly restaurant workers—in New England lost their jobs in 2020. Employment trends have increased upward in 2021 and 2022 but are not depicted in this Volume.

What Does 2030 Resilient Eating Mean for New England Farm Production?

In Volume 2, we presented local production estimates for the region and states based on our assumption that the region can supply 30% of its food needs under the Resilient Eating option. These estimates were limited to farm production and do not include manufactured or processed products beyond observed local farm sales to all consumers (both final and intermediate ones). We can use the data assembled in Volume 3 on New England’s farm production to quantify the

effect the Resilient Eating dietary pattern would have on local output and employment. Using the change in production acreage and assuming no change in productivity, we can estimate a change in output assuming both Unchanged Eating and Resilient Eating dietary patterns (Table 3).

Under the Unchanged Eating dietary pattern, total farm production, measured as sales (or output in the case of support for crop and animal production), is projected to rise to \$4.1 billion in 2030 from \$2.1 billion in 2017. This is an increase (at a compound annual rate) of 5.3% per year, reversing the declining performance of the region over the 2007 to 2017 period shown in Table A1 (page 57). With

TABLE 3: Projected 2030 Farm Production and Employment Change

Sector	2017 Farm Production Sales*	2030 Projected Farm Production Sales		2030 Projected Change in Farm Sales		2030 Projected Change in Employment (Jobs)**	
		Unchanged Eating	Resilient Eating	Unchanged Eating	Resilient Eating	Unchanged Eating	Resilient Eating
Grain and Oilseed Farming	\$59,395,000	\$255,046,000	\$265,036,000	454%	472%	607	631
Vegetable and Melon Farming	\$464,390,411	\$820,789,000	\$1,131,506,000	175%	242%	348	480
Fruit Farming	\$214,368,000	\$316,914,000	\$542,276,000	149%	255%	415	710
All Other Crop Farming	\$250,245,813	\$277,709,000	\$290,948,000	119%	125%	964	1,010
Cattle Ranching	\$113,886,595	\$593,300,000	\$649,170,000	538%	588%	1,007	1,102
Dairy Cattle and Milk Production	\$659,851,780	\$676,882,000	\$682,224,000	104%	105%	83	84
All Other Animal Production	\$202,283,815	\$607,977,000	\$864,806,000	305%	435%	677	962
Poultry and Egg Production	\$62,596,881	\$358,467,000	\$519,524,000	498%	722%	278	403
Support for Crop Production	\$50,693,000	\$87,286,000	\$200,615,000	172%	396%	685	1,574
Support for Animal Production	\$68,345,000	\$147,881,000	\$388,516,000	216%	568%	861	2,262
TOTAL	\$1,967,682,690	\$4,142,252,000	\$5,534,621,000	195%	261%	5,924	9,217

* Table A1, page 57.

** Table 7, page 22.

the exception of dairy and milk production, which remains largely unchanged, other farming sectors are projected to grow at moderate or strong rates. In particular, grain/oilseed farming, cattle ranching, and poultry/egg production would see increases by a factor of 4 to 5 times the 2017 values.

Under the assumptions of the Resilient Eating dietary pattern, total output of all farming and support activities would rise to \$5.5 billion, about one-third greater than under the Unchanged Eating assumption, and with a growth rate of nearly 8% per year over the 2017 values. Dairy and milk production will see little change (largely because the region is already self-sufficient in this production and is, in fact, a net exporter of these products), and with sizeable growth in grain/oilseeds and among all the animal production sectors.

We have estimated the effect on local employment from increased output of these sectors. These are shown as projected employment changes in Table 3.ⁱⁱ Based on the projected output changes linked to

an Unchanged Eating dietary pattern, regional employment would rise by nearly 6,000 from 115,000 in 2017 to 121,000 in 2030, an increase of 5% from 2017 to 2030.

This figure represents employment among not only on farms, but in linked activities on which farms rely, such as energy, farm supplies, equipment sales and repair, financial services, and other utilities. Under the assumed local output growth of Resilient Eating, total employment would rise by 9,200 jobs to reach approximately 124,700 jobs in 2030, a gain of nearly 8% over the 13 years.

Measured over 13 years, such growth is not so strong as to strain local labor markets if we assume the immediate post-COVID labor market recovers from the drastically lower labor force participation seen since 2020. For this reason, we do not anticipate that local farm production levels will be constrained under the Resilient Eating dietary pattern and the growth that is envisioned is not unrealistically large.

-
- i We have not assessed the composition of manufactured and/or processed foods with respect to the proportion of local farm inputs used in their production. For this reason, we do not estimate the effect of increasing local supply used in local production and how this might affect regional output, income, and employment. Substitution of local for imported agricultural imports will certainly have a positive effect on local demand for these products, but will cause changes in levels of activity for other industry inputs, such as transportation, storage, warehousing, and energy. Some local activity in these linked activities may be reduced through efficiency improvements, offsetting some of the gains achieved through local farm production.
 - ii We have only shown employment change in Table 3. As we note in this Volume, farm employment is poorly measured, with farm operator and family member activity not counted as employment in the standard employment statistics of the U.S. Bureau of Labor Statistics. We have applied employment factors for farm sectors taken from the IMPLAN model, which let us convert changes in output to employment. IMPLAN prepares their own estimates of sectoral employment by allocating operator and family members to sectors, but it is unclear how multi-sector farming establishments have their employment apportioned. While the estimates for individual sectors may not be accurate, they are likely to be good in total.



Measuring Key Indicators of the New England Food System

Concepts and Definitions

A “food system” refers to all the people, resources, and processes—food production, processing, packaging, distributing, selling, preparing, and disposing—that move food from farm and ocean to our plates. It incorporates individuals as producers and consumers, as well as for-profit businesses, nonprofit organizations, government agencies, and other public bodies that promote production and distribution. As such, it spans a very broad range of the industry classifications used to collect and report economic data by federal and state agencies.

These industries include primary production activities in agriculture and fishing, manufacturing activities for processing raw or preparing semi-finished food products for sale, as well as a range of wholesaling, retailing, and storage activities. Together, they support the production and distribution of the wide-variety of food products to final consumers. All of these food system activities are linked together and linked to the non-food economy by means of telecommunications, transportation, and other services. Furthermore, all of the industries involved in production and distribution are linked to other non-food system industries that provide financial and business services.

Even viewed at highly aggregated industry levels, such as crop production, animal production, food product manufacturing, food wholesaling, and so on, we note that food systems, even in a relatively small geographic area like New England, are complex in structure and diverse in economic function. Beyond production and distribution, the regional food-system has significant connections with the broader social and environmental context in which it operates, some of which is measurable through economic models, but many which are less easily quantified.

Industry Coverage

It is useful to examine the regional food system in a disaggregated fashion to see which industries are most prominent, least prominent, fastest growing, slowest growing, and so on. The question becomes, “How much detail should be analyzed?” It is a significant challenge to take a complex mechanism like a regional food-system and segment it into major components. Each state has unique activities that are easily missed through aggregation. In view of the manner in which economic statistics are collected and disseminated, a logical starting point is to rely on the U.S. Census Bureau’s industry classification system known as the [North American Industry Classification System](#) (NAICS). NAICS is a framework within which we can select a

common set of industries and activities to present the economic importance of the different food system activities.

We identify four major top-level industry groups that can be used as a starting point. These are:

1. **Agricultural production and fisheries**, including crops, animal-based production, fishing, and aquaculture.
2. **Food and beverage product manufacturing**, including processing, packaging, and preparation.
3. **Distribution and trade**, including wholesale and retail trade of both unprocessed agricultural products and manufactured goods.
4. **Food services**, including eating and drinking-place activities, and agritourism. The latter may be unfamiliar to some, being comprised of educational and recreational services that are centered on agricultural production, including farm-stay bed and breakfast lodging, and social gatherings such as weddings and banquets.

This activity grouping roughly corresponds to selected industry sectors defined at a “two-digit” NAICS code level. For example, Sector 11 is titled “Agriculture, Forestry, Fishing and Hunting.” Food and Beverage Product Manufacturing is part of Sectors 31 through 33 which falls under “Manufacturing.” Distribution and Trade falls under Sector 42, “Wholesale Trade,” or Sectors 44-45, “Retail Trade.” Food services are within Sector 72, “Accommodation and Food Services.”

These categories are useful for broad characterization of the food system, but for useful policy analysis and economic development promotion, greater detail is needed. We expand the sectoring to the

3-, 4-, and 5-digit subsectors to the four listed above. For each of the aggregate sectors, we list the detailed industries included in this analysis (Table 4, page 11).

At this detailed level, the choice of data sources that are consistent across all the sectors for U.S. states is limited to the quinquennial [Economic Census](#) conducted by the U.S. Census Bureau. These data are collected and reported for years ending in 2 and 7 starting in 1967 and normally released with a lag-time of several years.² For our analysis, we cover the 2007, 2012, and 2017 periods, the latest available at the time this report was prepared.

Economic activity data used for gauging economic performance and impact largely center around those concepts covered via readily available regional economic models that rely on Census and/or Bureau of Labor Statistics data in the form of annual time-series. For geographic areas that are defined by counties or defined by county aggregations, such as metropolitan area and states, these measures include employment, labor income, sales (output), and value-added. Several important points to remember in regards to these measures as used in this study are covered below:

Employment

There are a number of employment databases for U.S. regions. We use the employment concepts of the [U.S. Bureau of Economic Analysis](#) (BEA) and [U.S. Census Bureau](#). These are comprehensive for both industry coverage and for measuring workers classified by industry of business establishment, including the self-employed. Other regional employment series that are commonly used, such as those from the Bureau of Labor Statistics or Census’ “[County Business Patterns](#)” are limited in one or more aspects, such as covering only business with a payroll (i.e., not self-employed or “family” businesses), or which do not include railroad or government employment. The BEA employment data are consistent with the

TABLE 4: NAICS Codes Definitions

NAICS Code	Industry Group	Definition
Agricultural Production and Fisheries		
1111	Oilseed Farming	Comprises establishments primarily engaged in (1) growing oilseed crops and/or (2) producing oilseeds. These crops have an annual life cycle and are typically grown in open fields.
1111	Grain Farming	Comprises establishments primarily engaged in (1) growing grain crops and/or (2) producing grain seeds. These crops have an annual life cycle and are typically grown in open fields.
11121	Vegetable and Melon Farming	Comprises establishments primarily engaged in one or more of the following: (1) growing vegetable and/or melon crops; (2) producing vegetable and/or melon seeds; and (3) growing vegetable and/or melon bedding plants. The crops included in this industry have an annual growth cycle and are grown in open fields.
1113	Fruit and Tree Nut Farming	Comprises establishments primarily engaged in growing fruit and/or tree nut crops. The crops included in this industry group are generally not grown from seeds and have a perennial life cycle.
1114	Greenhouse, Nursery, and Floriculture Production	Comprises establishments primarily engaged in growing crops of any kind under cover and/or growing nursery stock and flowers. "Under cover" is generally defined as greenhouses.
11199	All Other Crop Farming (including Maple Syrup)	Comprises establishments primarily engaged in growing crops (except oilseeds and/or grains; vegetables and/or melons; fruits and/or tree nuts; greenhouse, nursery, and/or floriculture products; tobacco; cotton; sugar-cane; or hay) or growing a combination of crops with no one crop or family of crops accounting for one-half of the establishment's agricultural production.
11211	Beef Cattle Ranching and Farming	Comprises establishments primarily engaged in raising cattle (including cattle for dairy herd replacements).
112120	Dairy Cattle and Milk Production	Comprises establishments primarily engaged in milking dairy cattle.
1123	Poultry and Egg Production	Comprises establishments primarily engaged in breeding, hatching, and raising poultry for meat or egg production.
1122, 1124, 1125, and 1129	Animal Production (except Cattle and Poultry/ Eggs)	Includes hog and pig farming, sheep and goat farming, aquaculture, and all other animal production (e.g., apiculture, horses).
114111 and 114112	Fisheries	Comprises establishments primarily engaged in the commercial catching or taking of finfish (e.g., bluefish, salmon, trout, tuna) from their natural habitat. Also comprises establishments primarily engaged in the commercial catching or taking of shellfish (e.g., clams, crabs, lobsters, mussels, oysters, sea urchins, shrimp) from their natural habitat.

TABLE 4: NAICS Codes Definitions

NAICS Code	Industry Group	Definition
Support Activities for Crop and Animal Production		
1151	Support Activities for Crop Production	Comprises establishments primarily engaged in providing support activities for growing crops (e.g., farm management services, cultivating services).
1152	Support Activities for Animal Production	Comprises establishments primarily engaged in performing support activities related to raising livestock (e.g., cattle, goats, hogs, horses, poultry, sheep).
Census of Agriculture	Farm Producers	A farm producer is someone involved in making decisions for the farm operation. The producer may be the owner, a member of the owner's household, a tenant, renter, or a sharecropper.
Census of Agriculture	Hired Farm Workers	Comprises hired farm workers, including family members. Excludes contract laborers.
Food and Beverage Manufacturing		
3111	Animal Food	Comprises establishments primarily engaged in manufacturing food and feed for animals from ingredients, such as grains, oilseed mill products, and meat products.
3112	Grain and Oilseed Milling	Comprises establishments primarily engaged in milling flour or meal from grains or vegetables, manufacturing malt, wet milling corn and other vegetables, crushing oilseeds and tree nuts, refining and/or blending vegetable oils, and manufacturing breakfast cereals.
3113	Sugar and Confectionary Products	Comprises (1) establishments that process agricultural inputs, such as sugarcane, beet, and cacao, to give rise to a new product (sugar or chocolate) and (2) those that begin with sugar and chocolate and process these further.
3114	Fruit and Vegetable Preserving	Includes (1) establishments that freeze food and (2) those that use preservation processes, such as pickling, canning, and dehydrating.
3115	Dairy Products	Comprises establishments that manufacture dairy products from raw milk, processed milk, and dairy substitutes.
311511	Fluid Milk Manufacturing	Comprises establishments primarily engaged in (1) manufacturing processed milk products, such as pasteurized milk or cream and sour cream and/or (2) manufacturing fluid milk dairy substitutes from soybeans and other nondairy substances.
311513	Cheese	Comprises establishments primarily engaged in (1) manufacturing cheese products (except cottage cheese) from raw milk and/or processed milk products and/or (2) manufacturing cheese substitutes from soybean and other nondairy substances.

TABLE 4: NAICS Codes Definitions

NAICS Code	Industry Group	Definition
Food and Beverage Manufacturing		
311514, 31152	Other Dairy (including dry/condensed/evaporated and ice cream/frozen desserts)	Comprises establishments primarily engaged in manufacturing dry, condensed, and evaporated milk and dairy substitute products and establishments primarily engaged in manufacturing ice cream, frozen yogurts, frozen ices, sherbets, frozen tofu, and other frozen desserts (except bakery products).
3116	Animal Slaughtering and Processing	Comprises establishments primarily engaged in one or more of the following: (1) slaughtering animals; (2) preparing processed meats and meat byproducts; and (3) rendering and/or refining animal fat, bones, and meat scraps.
3117	Seafood Product Preparation and Packaging	Comprises establishments primarily engaged in one or more of the following: (1) canning seafood (including soup); (2) smoking, salting, and drying seafood; (3) eviscerating fresh fish by removing heads, fins, scales, bones, and entrails; (4) shucking and packing fresh shellfish; (5) processing marine fats and oils; and (6) freezing seafood.
3118	Bakeries and Tortilla Manufacturing	Comprises establishments primarily engaged in manufacturing fresh and frozen bread and other bakery products.
3119	Other Food Manufacturing	Comprises establishments primarily engaged in manufacturing food such as snack food manufacturing; coffee and tea manufacturing; concentrate, syrup, condiment, and spice manufacturing
312120	Breweries	Comprises establishments primarily engaged in brewing beer, ale, lager, malt. liquors, and nonalcoholic beer.
3121	Other Beverages	Comprises establishments primarily engaged in manufacturing soft drinks and ice; purifying and bottling water; and manufacturing winery and distillery products.
Food Distribution		
4244	Grocery Wholesaling	Comprises establishments primarily engaged in the merchant wholesale distribution of a general line (wide range) of groceries.
4245	Farm Product Raw Material Merchant Wholesalers	Comprises establishments primarily engaged in the merchant wholesale distribution of farm products (except grain and field beans, livestock, raw milk, live poultry, and fresh fruits and vegetables).
4248	Beer, Wine, and Distilled Beverage Wholesaling	Comprises establishments primarily engaged in the merchant wholesale distribution of wine, distilled alcoholic beverages, and/or neutral spirits and ethyl alcohol used in blended wines and distilled liquors.
424910	Farm Supplies Merchant Wholesalers	Comprises establishments primarily engaged in the merchant wholesale distribution of farm supplies, such as animal feeds, fertilizers, agricultural chemicals, pesticides, plant seeds, and plant bulbs.

TABLE 4: NAICS Codes Definitions

NAICS Code	Industry Group	Definition
Retail Trade		
445	Food and Beverage Stores	Comprises establishments primarily engaged in retailing food and beverages merchandise from fixed point-of-sale locations. Establishments in this subsector have special equipment (e.g., freezers, refrigerated display cases, refrigerators) for displaying food and beverage goods. They have staff trained in the processing of food products to guarantee the proper storage and sanitary conditions required by regulatory authority.
Food Services		
722	Food Services and Drinking Places	Comprises establishments primarily engaged in preparing meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption.

personal income and value-added measures used in the preparation of the National Income and Product Accounts, the primary data that measures economic activity in the U.S. and that are used in many regional economic models.

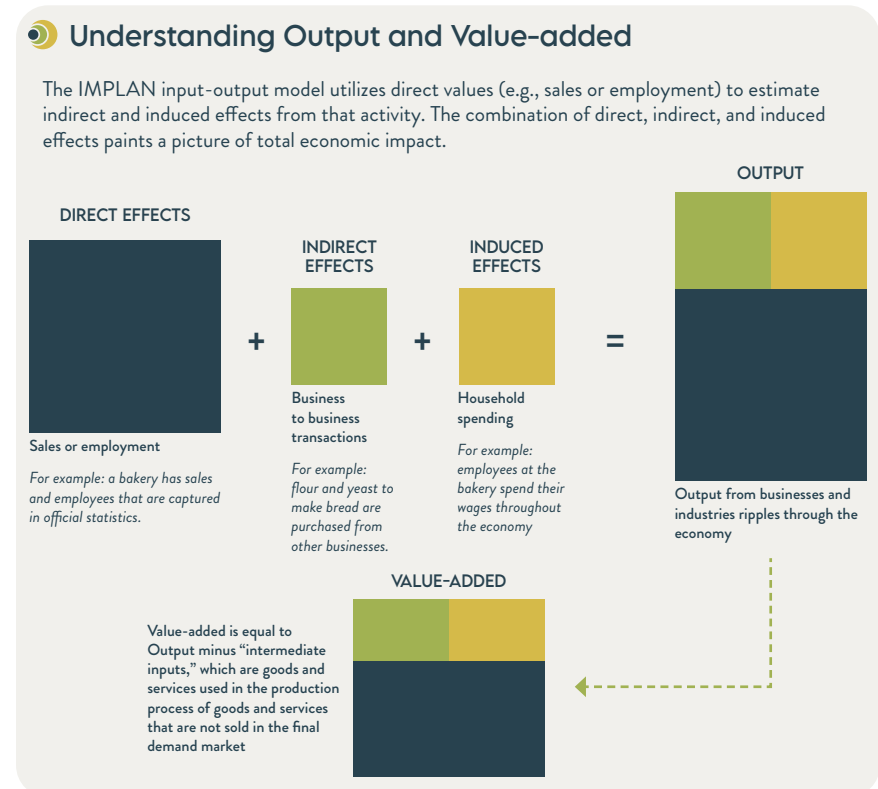
The BEA employment data provide measures of the number of jobs, with full-time and part-time job counts. Different industries have a different propensity to rely on part-time workers and there is variation in the average number of hours worked per week when mixing full- and part-time jobs. This makes for an imperfect measure of labor effort over different sectors. Changes in the proportion of part-time workers and the number of hours worked vary both over time (and with the business cycle) and over space. We do not attempt to standardize the employment effort by the use of “full-time equivalent” employment estimates. It is important to remember that what is being counted are jobs, with all their inherent differences as to resulting wage and salary income.

Sales (Output)

Industry sales (or “value of shipments” or “output”) represents sales to producers and/or consumers without regard to whether those goods and services undergo further processing. It is a key measure when applied in the context of gauging the impact of growth in the food system. It does not include production that is placed in inventory. When summed over all producers, total sales value includes a significant volume of double-counting. Since the value of purchased inputs figures into the sales prices of subsequent producers, when they all tally their value of shipments, there is an overlap of the sales value as far as intermediate goods and services are concerned. For this reason, it is sometimes more useful to look at value-added to determine what each industry contributes to the regional economy.

Value-added

Value-added measures the change in value of goods and services that producers create minus the cost of goods and services used in production. It is comparable to two other measures of production, namely gross domestic product and gross domestic income. Gross domestic product is the value of goods and services produced and sold to final users (i.e., not intermediate users, so there is no double-counting). Gross domestic income measures the payments made to labor and capital owners (e.g., rent, dividends, interest). Although they are estimated from different data sources, the three measures are conceptually similar and any differences between them are considered statistical discrepancies.





ECONOMIC SUMMARY FOR THE REGION

We have assembled data from the Economic Censuses for 2007, 2012, and 2017. Data included here are employment, measured as jobs (full- and part-time combined) and sales (or value of shipments, depending on the publication), measured in thousands of constant 2020 dollars. We made the conversion to constant dollars using national [producer price indices](#) (PPIs) for the relevant industries based on data from the U.S. Bureau of Labor Statistics. In many instances, employment and/or shipments data for some industries were suppressed to avoid disclosing the sales or operating characteristics of firms. This is generally done when there are only few producers in an industry or there is a dominant firm whose operations dwarf the others that are in that industry. In these cases, we made estimates for the missing values, using information supplied in the Economic Censuses.³

Employment

For the region as a whole, we see moderately slow growth for employment and sales. **Food system employment grew from 888,976 jobs in 2007 to 999,277 jobs in 2017**, a growth rate of 1.1% per year (compound annual growth rate) for the 2007-2017 interval. Growth in the second half of this interval was somewhat higher, 1.3% per year, than was seen in the first half, 1.0% per year (Table 5). For reference,

food system employment accounted for approximately 10% of total regional employment in 2017, based on the BEA total employment figure of 9.9 million jobs in New England.

The largest employment by sector is found in the Services category, which consists entirely of eating and drinking places (i.e., restaurants and fast food). In 2017, regional employment in Food Services amounted to nearly 560,000 jobs, which is just a little more than one-half of the region's food system employment. This category generates many jobs, but is characterized by having numerous part-time employees. Most recently, 43% of eating and drinking places jobs were part-time.⁴ The next largest sector in terms of regional employment is Trade and Distribution employment, with 258,489 jobs, about one-quarter of regional food system. This sector, which consists of grocery and beverage wholesaling and retailing, characteristically has about 30% of its jobs as part-time.

Agriculture and fisheries are the third largest sector in the regional food system with 127,072 jobs in 2017. This sector includes crop and animal production, fisheries, support for crop and animal production, hired labor, and farm producers. This sector saw modest growth from 2007 to 2012, which was offset by a moderate decline in the 2012 to 2017 period. **Overall, agriculture and fisheries had a 10-year job growth rate of 0.0% per year.**

TABLE 5: Employment by Sector for the Region, 2007, 2012, 2017

Sector	Employment (Jobs)			Annual Employment Growth Rate		
	2007	2012	2017	2007-2012	2012-2017	2007-2017
Agriculture and Fisheries	127,575	134,643	127,072	1.1%	-1.2%	0.0%
Food and Beverage Manufacturing	48,239	47,619	52,979	-0.3%	2.2%	0.9%
Food Distribution and Retail Trade	241,668	257,583	258,489	1.3%	0.1%	0.7%
Food Services	471,494	495,349	560,737	1.0%	2.5%	1.7%
TOTAL	888,976	935,194	999,277	1.0%	1.3%	1.1%

The smallest sector in the regional food system is in Food and Beverage Product Manufacturing, with approximately 53,000 jobs, or 5%, of 2017 total employment. This sector experienced a small decline in the first half of the 10-year period, -0.3% per year, but picked-up 6,000 jobs over the second half, growing at 2.2% per year for a 10-year growth rate of 0.9% per year.

Sales

Sales data offer a somewhat different view of the New England food system. By dollar volume (constant 2020 dollars), the Trade and Distribution sector generates two-thirds of all food system sales, with the Services sector representing one-fifth of the total (Table 6). Manufacturing, which had 7% of food system employment, generates about 12% of total sales, reflecting the greater productivity of manufacturing activities. Agriculture and Fisheries had about 2% of total sales in 2017, significantly lower than its share of jobs.

Taken together, the regional food systems saw annual growth of 1.3% per year over the 10-year interval from 2007 to 2017. Trade and

Distribution sales grew at the highest 10-year rate, at almost 2% per year, with accelerated growth in the later 5-year period (2.3%). Agriculture and Fisheries saw declining sales value of 1.1% per year over those ten years. As we will see in the next sections, the declines in this sector were broadly based in both crop production and animal production. Food Services sales had moderate growth over the 10-year period of 1.7% per year (identical to its employment growth rate), and Manufacturing showed a modest decline over the 10-year period, -0.5% per year, with gains in the second half of the interval, 2.1%, offsetting the -3.0% decline of the first half.

Summary for the Six States

Employment and sales in New England’s food system closely mirrors distribution of the region’s population (Figure 4). Massachusetts has the largest share of population and food system employment and sales, with approximately 45-46% of the totals for each measure, respectively. Connecticut follows with 24.1% of the region’s population, 21.2% of employment, and about 26% of sales. New Hampshire had about 9% of New England’s population and food

TABLE 6: Sales by Sector for the Region, 2007, 2012, 2017

Sector	Sales			Annual Sales Growth Rate		
	2007	2012	2017	2007-2012	2012-2017	2007-2017
Agriculture and Fisheries	\$4,475,799,000	\$4,773,349,000	\$4,213,547,000	1.3%	-2.5%	-0.6%
Food and Beverage Manufacturing	\$22,949,659,000	\$19,698,306,000	\$21,821,352,000	-3.0%	2.1%	-0.5%
Food Trade and Distribution	\$104,797,226,000	\$112,717,864,000	\$126,229,082,000	1.5%	2.3%	1.9%
Food Services	\$31,787,648,000	\$32,291,029,000	\$37,569,985,000	0.3%	3.1%	1.7%
TOTAL	\$164,125,400,000	\$169,092,163,000	\$189,734,780,000	0.7%	2.3%	1.3%

system jobs, but only 7.5% of sales. Maine accounted for 9% of the region’s population, 11% of food system employment, and 8.1% of sales. Rhode Island made up 7.2% of New England’s population but only 6.6% of food system employment and 6.3% of sales. Finally, Vermont made up only 4.3% of New England’s population but 6.1% of food system employment and 7.5% of sales.

Across New England, Food Services (i.e., eating and drinking places) accounted for 56.1% of jobs in 2017, but only 19.8% of sales (Figure 5). Food Retail Trade (i.e., grocery stores) accounted for 20.5% of jobs and 26.4% of sales. Agriculture made up 11.6% of employment, but only 1.4% of sales, while Fisheries made up 1.2% of employment and 1.5% of sales. Food and Beverage Product Manufacturing accounted for 5.3% of employment and 11.5% of sales. Finally, Wholesale Distribution accounted for just 5.4% of jobs but 40.1% of sales!

FIGURE 4: Share of New England Population, Food System Jobs, and Sales by State, 2017

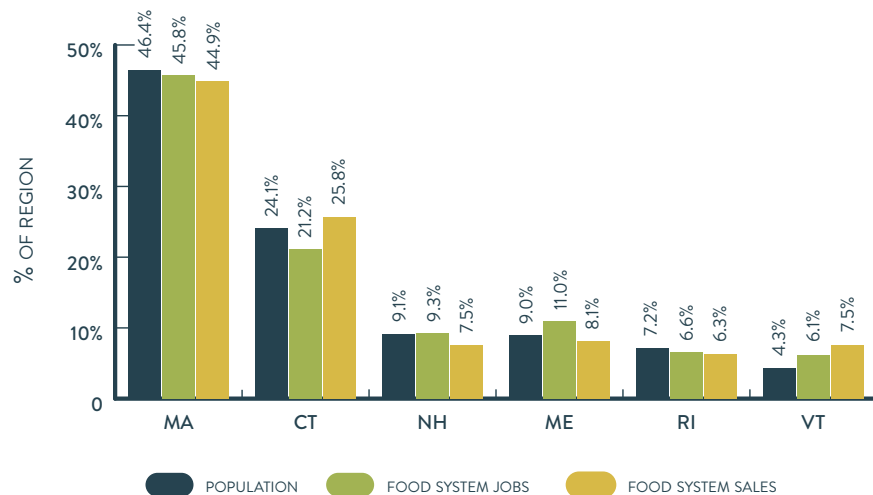
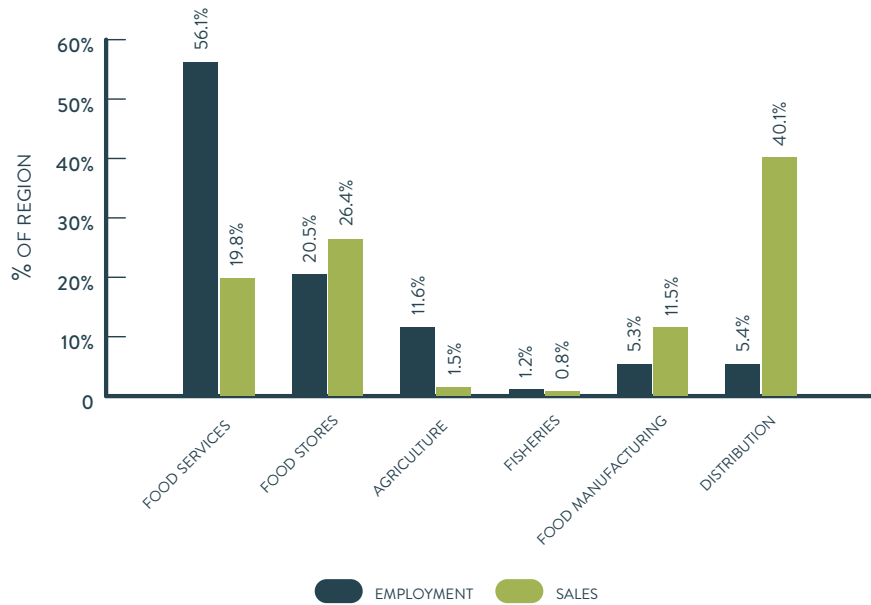


FIGURE 5: New England Food System Employment and Sales by Industry, 2017



For the region as a whole, Food Services accounts for greatest employment in each state except for Vermont in 2017. Massachusetts and Connecticut lead the region in Food Services employment, facilitated by both states being highly populated and urbanized. In the least populated state, Vermont, the leading employer is in Agriculture and Fisheries (none of which is in Fisheries, as it's the only state in the region without an ocean coastline). Even in Vermont, though, Food Services employment is a close second to Agriculture (33.5% compared to 35.4%).

The Food Retail Trade sector is the second largest industry group in each state except Vermont, with job-counts being roughly one-half those of each state's Services sector jobs. In Vermont, Food Retail Trade jobs rank third among its food system sectors. Except for Connecticut and Rhode Island, Food and Beverage Product Manufacturing is the fourth largest source of food system employment. In Connecticut and Rhode Island, Wholesale Distribution

is the fourth largest source of food system employment. In every other state, Wholesale Distribution had the lowest concentration of food system jobs.

Wholesale Distribution was the top generator of food system sales in every state except Maine and New Hampshire in 2017. Retail Food Trade was the top source of food system sales in Maine and New Hampshire and the second largest source in each of the other states. Food Services was the third largest source of food system sales in every state except Vermont. Food and Beverage Product Manufacturing was the third largest source of food system sales in Vermont and the fourth largest for every other state. Finally, Agriculture and Fisheries was the lowest source of food system sales in every state.

A picture emerges of a proportionally higher scale of activity in Agriculture and Food and Beverage Manufacturing in Vermont and Maine, and a proportionally higher scale of activity in Wholesale Distribution, Retail Trade, and Food Services in Massachusetts, Connecticut, and Rhode Island (Figure 6). New Hampshire is somewhat anomalous compared to the other New England states: It has the highest proportional Retail Trade sales out of total food system sales, and Retail Trade is the second largest source of food system employment. This may be a reflection of a lack of sales tax in New Hampshire, but it is also the case that all of the New England states have [relatively low sales taxes](#).

FIGURE 6: Employment and Sales by State, 2017

VERMONT

Industry	Jobs	Sales
Agriculture + Fisheries	21,700	\$704 million
Manufacturing	5,682	\$3.0 billion
Wholesaling	3,530	\$7.1 billion
Stores	9,871	\$2.2 billion
Food Services	20,555	\$1.2 billion
TOTAL	61,338	\$14.3 billion

MASSACHUSETTS

Industry	Jobs	Sales
Agriculture + Fisheries	30,421	\$1.2 billion
Manufacturing	26,068	\$10.4 billion
Wholesaling	23,967	\$30.7 billion
Stores	98,789	\$23.5 billion
Food Services	278,738	\$19.5 billion
TOTAL	457,983	\$85.3 billion

CONNECTICUT

Industry	Jobs	Sales
Agriculture + Fisheries	22,478	\$607 million
Manufacturing	7,773	\$3.3 billion
Wholesaling	14,071	\$25.6 billion
Stores	44,728	\$11.3 billion
Food Services	122,550	\$8.2 billion
TOTAL	211,600	\$48.9 billion

MAINE

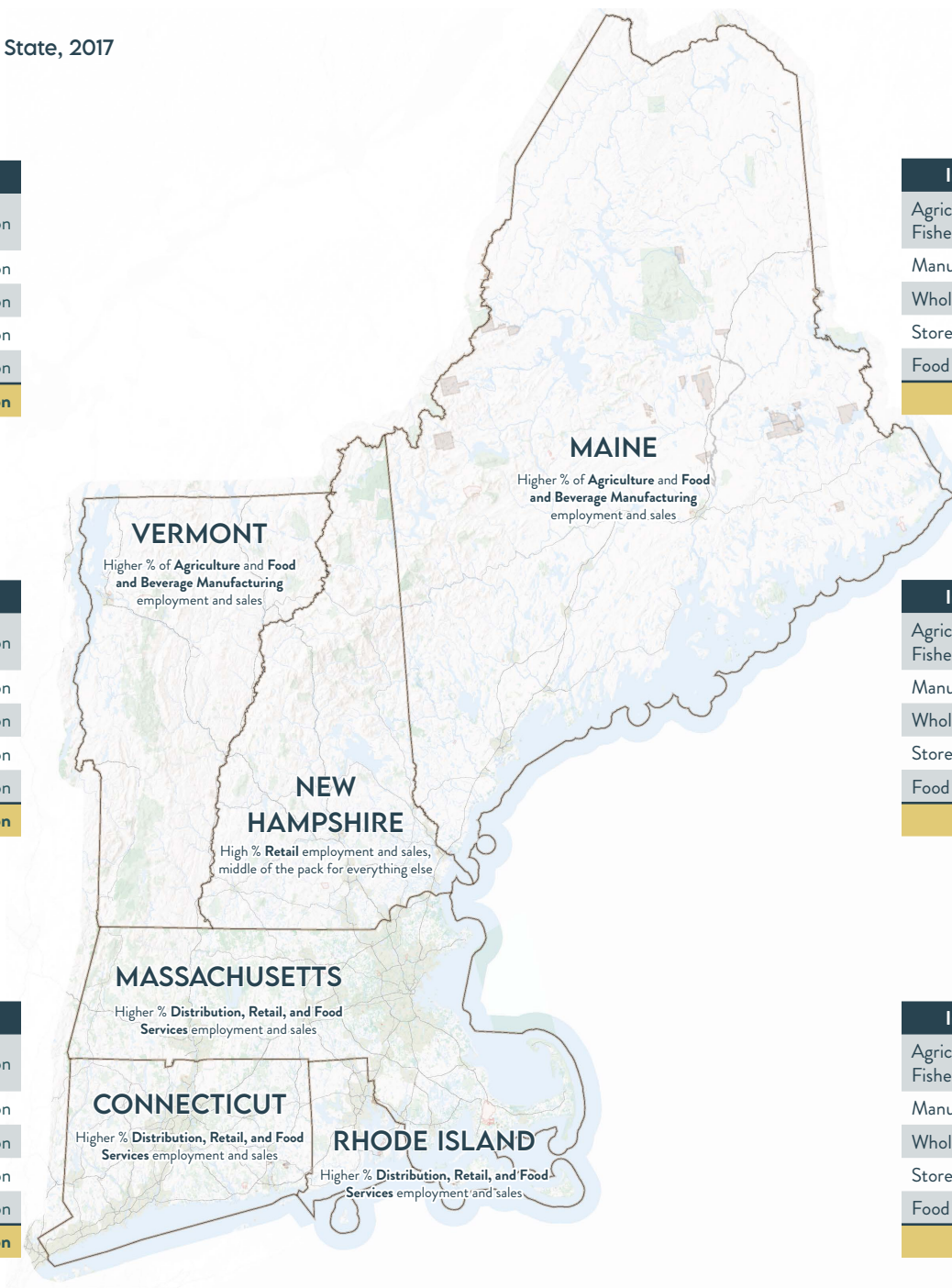
Industry	Jobs	Sales
Agriculture + Fisheries	34,905	\$1.3 billion
Manufacturing	6,862	\$2.6 billion
Wholesaling	4,858	\$4.2 billion
Stores	18,269	\$4.4 billion
Food Services	44,641	\$2.8 billion
TOTAL	109,535	\$15.3 billion

NEW HAMPSHIRE

Industry	Jobs	Sales
Agriculture + Fisheries	12,854	\$237 million
Manufacturing	3,868	\$1.7 billion
Wholesaling	3,875	\$3.5 billion
Stores	21,789	\$5.5 billion
Food Services	50,102	\$3.0 billion
TOTAL	92,488	\$14.2 billion

RHODE ISLAND

Industry	Jobs	Sales
Agriculture + Fisheries	4,714	\$173 million
Manufacturing	2,726	\$729 million
Wholesaling	3,477	\$5.1 billion
Stores	11,265	\$3.1 billion
Food Services	44,151	\$2.8 billion
TOTAL	66,333	\$11.9 billion





The New England Food System by Detailed Industries

We can further disaggregate the regional food system to identify the prominent industries among the four broad sectors. Within these industries, we can look at each states' relative shares and growth characteristics.

Agriculture and Fisheries

New England Employment

The employment data we report here for Agriculture and Fisheries are limited to aggregated categories for hired labor in the case of animal and crop production, farm operators, and fishery business owners. There are multiple reasons for this limitation: Our primary source of agricultural product information is the [USDA Census of Agriculture](#), conducted every five years. It reports on sales by crop or animal products, but does not report employment information by specific crop or product.

The Census of Agriculture does provide totals for producers (i.e., farmers) and hired labor and we have shown these in Table 7. Other sources of employment data, notably the federal Bureau of Labor Statistics and the various state departments of labor, rarely maintain and report employment information for businesses without a payroll.



Squid processing at the Port of Galilee in Rhode Island.

Photo credit: Julianne Stelmazyk

Having a payroll—and social insurance coverage—are rare concepts in the agricultural and fishery industries. To estimate for this employment, we used the [Nonemployer Statistics](#) from the Census Bureau. This source provides data on businesses without payrolls, which operate primarily as sole-proprietorships. We have reported these under Support Activities for Crop and Animal Production,

TABLE 7: New England Agriculture and Fisheries: Detailed Industry Employment and Sales

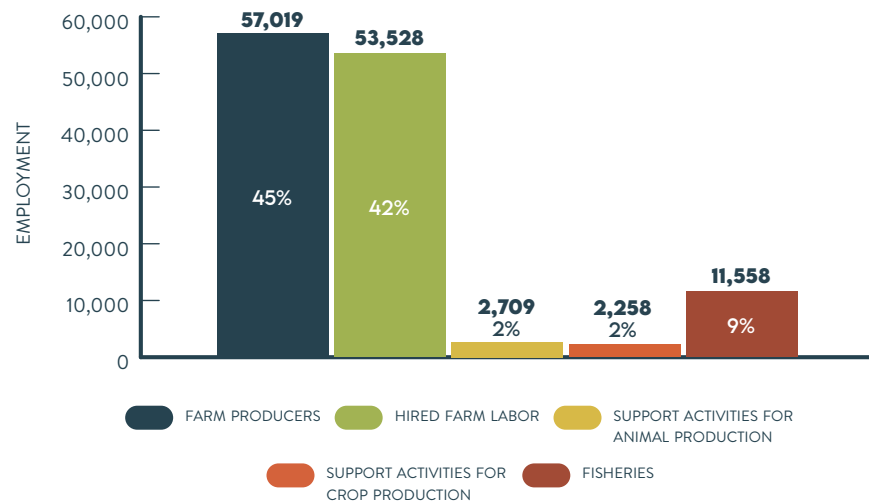
Sector	2017 Employment	Annual Employment Growth Rate			2017 Sales	Annual Sales Growth Rate		
		2007-2012	2012-2017	2007-2017		2007-2012	2012-2017	2007-2017
Oilseed farming	na	na	na	na	\$2,652,000	23.8%	2.1%	12.4%
Grain farming	na	na	na	na	\$56,742,000	15.4%	7.5%	11.4%
Vegetable and melon farming	na	na	na	na	\$464,390,000	8.1%	-2.0%	2.9%
Fruit farming	na	na	na	na	\$214,368,000	0.1%	-10.1%	-5.1%
Greenhouse, nursery, floriculture	na	na	na	na	\$630,073,000	-6.6%	0.1%	-3.3%
All other crop farming	na	na	na	na	\$250,246,000	-0.1%	-1.0%	-0.6%
Cattle ranching	na	na	na	na	\$113,887,000	-2.4%	0.2%	-1.1%
Dairy cattle and milk production	na	na	na	na	\$659,852,000	5.2%	-2.1%	1.5%
All other animal production	na	na	na	na	\$202,284,000	5.1%	-0.2%	2.4%
Poultry and egg production	na	na	na	na	\$62,597,000	-7.5%	-9.0%	-8.3%
FARM OUTPUT	na	na	na	na	\$2,657,091,000	0.6%	-2.1%	-0.8%
Farm Producers	57,019	1.3%	-0.1%	0.6%	na	na	na	na
Hired Farm Labor	53,528	1.7%	-2.8%	-0.6%	na	na	na	na
FARMERS AND WORKERS	110,547	1.5%	-1.4%	0.0%	na	na	na	na
Support Activities for Crop Production	2,258	1.7%	3.2%	2.4%	\$50,693,000	-6.5%	9.5%	1.2%
Support Activities for Animal Production	2,709	-6.7%	2.1%	-2.4%	\$68,345,000	-3.6%	1.3%	-1.1%
SUPPORT FOR FARM PRODUCTION	4,967	-3.5%	2.6%	-0.5%	\$119,038,000	-4.6%	4.4%	-0.2%
AGRICULTURE TOTAL	115,514	1.3%	-1.3%	0.0%	\$2,776,129,000	0.4%	-1.9%	-0.8%
Fisheries	11,558	-1.1%	0.3%	-0.4%	\$1,437,418,000	3.1%	-3.5%	-0.3%
FISHERIES TOTAL	11,558	-1.1%	0.3%	-0.4%	\$1,437,418,000	3.1%	-3.5%	-0.3%
AGRIGULTURE AND FISHERIES TOTAL	127,072	1.1%	-1.2%	0.0%	\$4,213,547,000	1.3%	-2.5%	-0.6%

and for Fisheries, under the assumption that there is a one-to-one correspondence of business establishments to jobs. To the degree that these establishments use more than one person to produce their goods or services, such as in the case of unpaid family workers, our assumption will be an *undercount* of the true labor effort.

Employment in the Agricultural and Fisheries sector is highly concentrated in Farm Producers and Hired Farm Labor, with 45% and 42% of all Agricultural and Fisheries jobs in these two industries (Figure 7). Far behind are fisheries, with 9% of the total, and 2% each in Support Activities for Crop Production and support for Animal Production.

There was almost no employment growth in the Agriculture and Fisheries sector over the 2007-2017 interval. As shown in Table 7, this can be seen for Farmers and Workers (i.e., producers and hired farm labor), and for Farm activity overall. There was a small decline, -0.5% per year, for Support for Farm Production, with growth in crop production offset by reductions in animal production. For Fisheries, employment fell slightly over the 10-year interval at -0.4% per year.

FIGURE 7: Agricultural and Fishery Employment, 2017



Member of the Gervais family at their dairy farm in Enosburg Falls, Vermont.

Photo credit: Vermont Agency of Agriculture

New England Sales

Whereas the overall employment growth for this sector is flat over the 2007-2017 period, growth in sales turned negative, with the sector declining at a -0.6% per year rate (Table 7). Farm output fell at a -0.8% per year rate over the same interval, and Support for Farm Production declined at -0.8% per year rate, such that overall Farm sales fell at a -0.3% per year rate. For Fisheries, the drop was identical, with 10-year growth falling at a -0.3% rate.

Sales of products from the four largest industries within the Agriculture and Fishery sector comprise three-quarters of the sector total (Figures 8-9). The leading industry is Fisheries, with 34% of the regional total sector sales. Following this industry are Dairy Cattle and Milk Production with a share of 16%, Greenhouse, Nursery, and Floriculture Production with 15%, and Vegetable and Melon Farming with 11%.

None of the other six industries have a share greater than 5%, and one, Oilseed farming had a share near 0%, with sales of less than \$3 million.

FIGURE 8: Composition of Agricultural and Fishery Sales, 2017

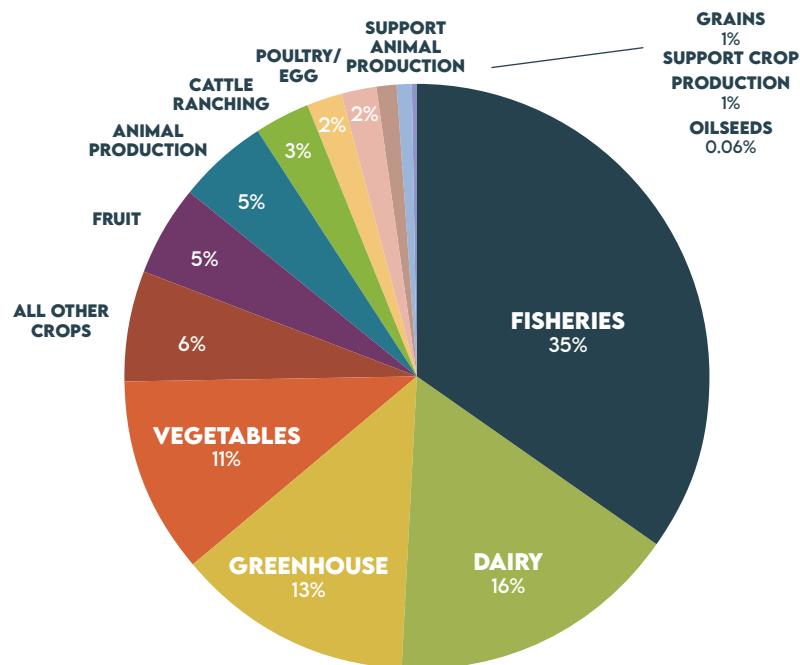


FIGURE 9: Top Product Categories by Sales, 2017



For the 10-year interval, the highest growth rates are seen for Oilseed farming, increasing at 12% per year, but this is from an extremely small base. It was followed by Grain farming, with a 11% per year growth rate, and which also started from a small base. Other growth industries for the region were Vegetable and Melon farming and Animal Production (except Cattle and Poultry and Eggs), growing at approximately 3% and 2%, respectively. Among the larger industries, Fisheries were stable, but the decline in Fruit farming at -5.1% and Greenhouse, Nursery, and Floriculture of -3.3% per year were sizable reductions. For the latter, the decline was very large in the first 5-year interval, with annual reductions of -7% per year, followed by a recovery at a rate of approximately 0.1% per year in the second 5-year interval.

Agricultural and Fishery Sales by State

Although we do not have product specific employment data, it is worth examining the 2017 amount and growth rates for the value of product sales for the two subgroups of Agriculture and Fisheries products by the six states (Table 8). Maine was the leading crop producing state in the region with 29% of the regional total sales. It was followed closely by Massachusetts and Connecticut with 25% and 24%, respectively. The smaller crop producing states were Vermont at 12%, New Hampshire at 7%, and Rhode Island at 3%.

In terms of Crop sales growth, Vermont led the region over the 2007-2017 interval with an 7% per year growth rate, followed by Maine at 1% per year. All of the other states saw negative sales growth, with the large decline in Rhode Island at -11% per year, followed by Connecticut, Maine, and Massachusetts all declining at 5% per year. There is no evident pattern in the growth rates among the states between the two 5-year intervals, with some seeing a shift from positive growth to negative and others seeing the reverse or slowing rates of decline (Figure 10). Vermont was the only state to maintain a zero or positive rate for both intervals. Massachusetts and Rhode

TABLE 8: Crop Production Sales, Farm Sales, and Support Activities Combined

State	2017 Sales	Share of Region	Annual Sales Growth		
			2007-2012	2012-2017	2007-2017
Maine	\$464,852,000	28%	6%	-4%	1%
Connecticut	\$441,291,000	26%	-5%	0%	-5%
Massachusetts	\$394,985,000	24%	-3%	-3%	-5%
Vermont	\$205,866,000	12%	6%	0%	7%
New Hampshire	\$117,228,000	7%	-5%	0%	-5%
Rhode Island	\$44,944,000	3%	-7%	-4%	-11%
New England	\$1,669,165,000	100%	-1%	-2%	-3%

Island both saw declines in both intervals, while Connecticut and New Hampshire went from negative to zero growth in the second 5-year period.

With the exception of Vermont, Animal Product sales in each state are lower than that seen for Crop Production (Table 9). In total, New England Animal Product sales of approximately \$1.1 billion are about two-thirds the level of Crop Production which was \$1.6 billion in 2017. Animal Product sales in Vermont were nearly one-half of the regional total at \$499 million, 45% of the regional total. Maine's sales were slightly less than one-half Vermont's at \$238 million, with Connecticut and Massachusetts having sales that were one-fourth the size of Vermont. New Hampshire and Rhode Island volumes were very small, not unlike with Crop Production.

The 10-year growth rate of Animal Product sales was zero for the region as a whole, with modest growth for Rhode Island at 6%, followed by Vermont at 2% and Connecticut at 1%. Declines were seen for Massachusetts and New Hampshire of -2% per year.

FIGURE 10: Crop Production Sales Growth by State

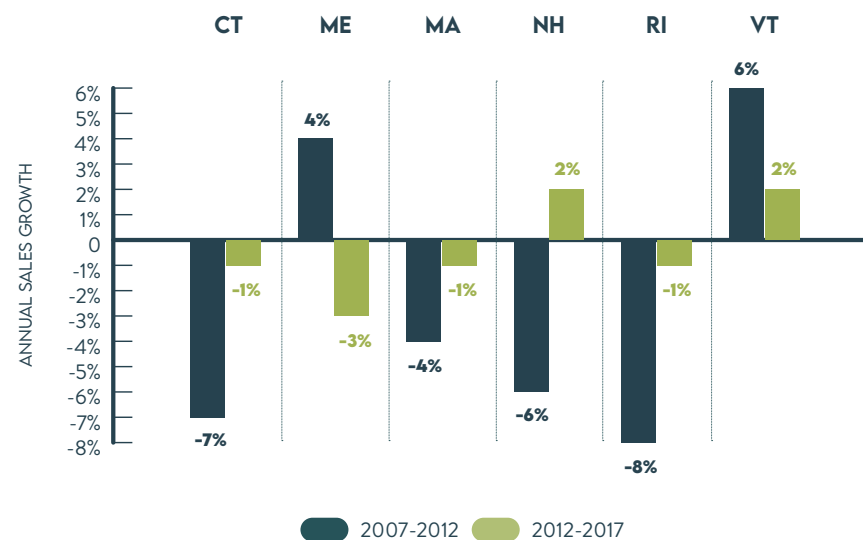
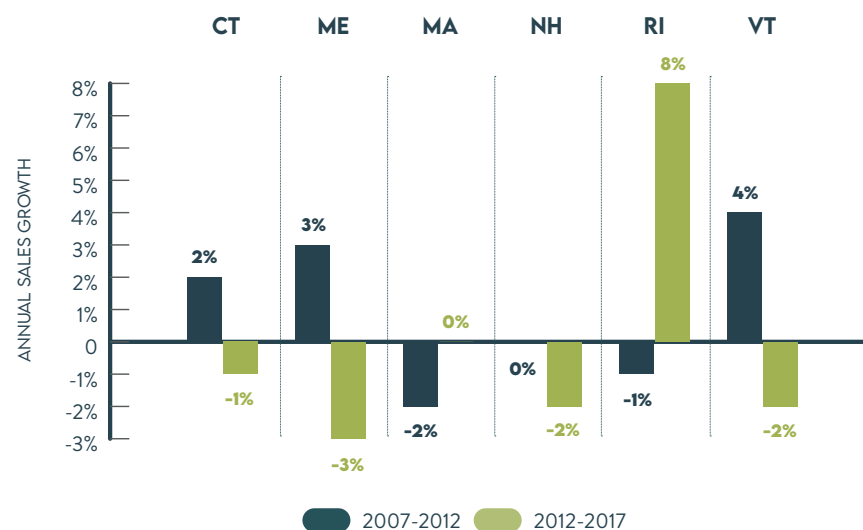


TABLE 9: Animal Product Sales, Farm Sales, and Support Activities Combined

STATE	2017 SALES	SHARE OF REGION	ANNUAL SALES GROWTH		
			2007-2012	2012-2017	2007-2017
Vermont	\$498,539,000	45%	4%	-2%	2%
Maine	\$237,661,000	21%	3%	-3%	0%
Connecticut	\$150,664,000	14%	2%	-1%	1%
Massachusetts	\$121,147,000	11%	-2%	0%	-2%
New Hampshire	\$81,022,000	7%	0%	-2%	-2%
Rhode Island	\$17,930,000	2%	-1%	8%	6%
New England	\$1,106,964,000	100%	2%	-2%	0%

The two 5-year intervals for Animal Products (Figure 11) show a very different pattern than we saw for Crop production: all states showed changes of growth direction between the two periods. Rhode Island saw a very large gain in sales during the second 5-year interval, up a total of nearly 65% from 2012 to 2017, yielding a growth rate of 8% per year.

FIGURE 11: Animal Product Sales Growth by State



Note: The large Rhode Island gain, based on figures from the Census of Agriculture, appears to be concentrated in certain of the detailed subcategories in the Animal Products industry. These gains are to be found among hogs/pigs, sheep/goats, or other animal production. For disclosure reasons, we estimated sales for these three subcategories, constraining their total to the known value for their sum and then apportioning that known value to the three subcategories based on known establishment counts weighted by the regional sales per establishment. Although the estimated subcategory distribution is subject to error, their sum is consistent with the actual Census total for Animal products and the high Rhode Island growth rate shown in Figure 11 is “real”.

Challenges to Farm and Fishery Viability

Small and midsize farms and fishing businesses operate under extraordinary pressures that impact their viability.

- » **Scale of Production and Market Concentration:** A key challenge to increasing regional self-reliance is the difficulty of competing with the current large-scale, global system that delivers food to the region. Compared to the rest of the country, New England’s farm base is small in terms of both the typical acreage operated and revenue earned. For example, data from the 2017 Census of Agriculture indicates that about **78% of farms in New England had sales of less than \$25,000. A little more than 3% of New England farms accounted for 69% of total agricultural sales.** Small and midsize operations have trouble scaling up the size of their operation to become financially viable and provide a decent livelihood. This is due to a number of issues, including access to resources such as land, labor, and capital, difficulty acquiring scale-appropriate machinery, and needing to learn new business skills to meet the needs of wholesale markets. In some segments of the wild capture fishery system, there has been a recent trend towards consolidation and out-of-region ownership of fishing vessels and permits.
- » **Access to Land and Waterfront:** Soaring land values make it increasingly difficult for farmers to compete with other land uses and prevent farmland loss. New England has some of the highest farm real estate values in the country, especially in Southern New England. Seafood production is constrained by similar factors. Around the region, working waterfronts face competition and increasing costs due to development and expansion of the tourism industry.
- » **Aging Workforce:** Nearly a third of New England’s farming population are 65 or older, while just one-fifth are under 45. This demographic balance has shifted dramatically in the last 15 years as producers continue to age. On average, New England counties have increased their proportion of producers over 65 by at least 50%, and some have more than doubled their older farming population since 2002.

See [Common Food System Challenges Backgrounder](#) for more information.



Photo credit: ink + Light Creative

[Highwater Farm](#) in Bartlett, New Hampshire is a small, queer owned and operated family farm growing diversified vegetables and berries. Most New England farms are small by national standards and face significant pressures to maintain viability.

Food and Beverage Product Manufacturing

New England Employment

Food product manufacturing employment and sales data were taken from the U.S. Census Bureau's [Annual Survey of Manufactures](#) (Table 10). We transformed the current dollar sales data to constant

2020 dollars using producer price index data from the U.S. Bureau of Labor Statistics Producer Price Index series. Note that employment includes both production and nonproduction workers, and that employment is measured as jobs, not full-time equivalents. These figures include combined counts of full-time and part-time workers. For the entire region, there were 52,979 jobs in the Food and Beverage Product Manufacturing industries in 2017, growing at 0.9% per year over the 2007-2017 period. Of these jobs, approximately 85% are found in food products and 15% in beverage production.

TABLE 10: Food and Beverage Product Manufacturing: Detailed Industry Employment and Sales

Sector	2017 Employment	Annual Employment Growth Rate			2017 Sales	Annual Sales Growth Rate		
		2007-2012	2012-2017	2007-2017		2007-2012	2012-2017	2007-2017
Animal Food	481	9.7%	3.3%	6.5%	\$366,798,000	-13.0%	18.8%	1.7%
Grain and Oilseed Milling	298	-3.9%	-2.7%	-3.3%	\$264,125,000	-8.7%	12.4%	1.3%
Sugar and Confectionary Products	3,354	2.1%	-1.4%	0.4%	\$887,388,000	9.3%	-10.3%	-1.0%
Fruit and Vegetable Preserving	3,626	-1.5%	2.8%	0.6%	\$1,480,566,000	-4.1%	4.7%	0.2%
Dairy Products	5,827	-0.6%	-0.9%	-0.7%	\$4,070,103,000	-0.5%	-3.6%	-2.0%
Fluid Milk	3,167	3.5%	-2.2%	0.6%	\$1,994,974,000	6.7%	-7.8%	-0.8%
Cheese	1,086	-1.7%	2.6%	0.4%	\$671,962,000	-1.8%	-3.8%	-2.8%
Other Dairy Products	1,574	-6.7%	-0.2%	-3.5%	\$1,403,167,000	-11.3%	5.8%	-3.2%
Animal Slaughtering and Processing	3,792	-2.8%	5.4%	1.2%	\$1,283,564,000	1.3%	1.2%	1.3%
Seafood Products	2,904	1.0%	0.3%	0.6%	\$1,899,394,000	-1.2%	1.0%	-0.1%
Bakeries and Tortilla Mfg.	15,472	-2.6%	1.6%	-0.5%	\$3,158,710,000	-8.8%	5.3%	-2.0%
Other Food Products	8,853	4.2%	3.2%	3.7%	\$4,402,656,000	2.5%	2.0%	2.2%
FOOD MANUFACTURING	44,607	-0.4%	1.6%	0.6%	\$17,813,304,000	-1.2%	0.6%	0.3%
Breweries	3,701	1.4%	25.5%	12.8%	\$1,141,955,000	-13.3%	20.5%	2.2%
All Other Beverages	4,671	0.8%	-2.0%	-0.6%	\$2,866,093,000	-11.9%	8.3%	-2.4%
BEVERAGE MANUFACTURING	8,372	0.9%	5.6%	3.3%	\$4,008,048,000	-12.2%	11.0%	-1.3%
TOTAL	52,979	-0.3%	2.2%	0.9%	\$21,821,352,000	-3.0%	2.1%	-0.5%

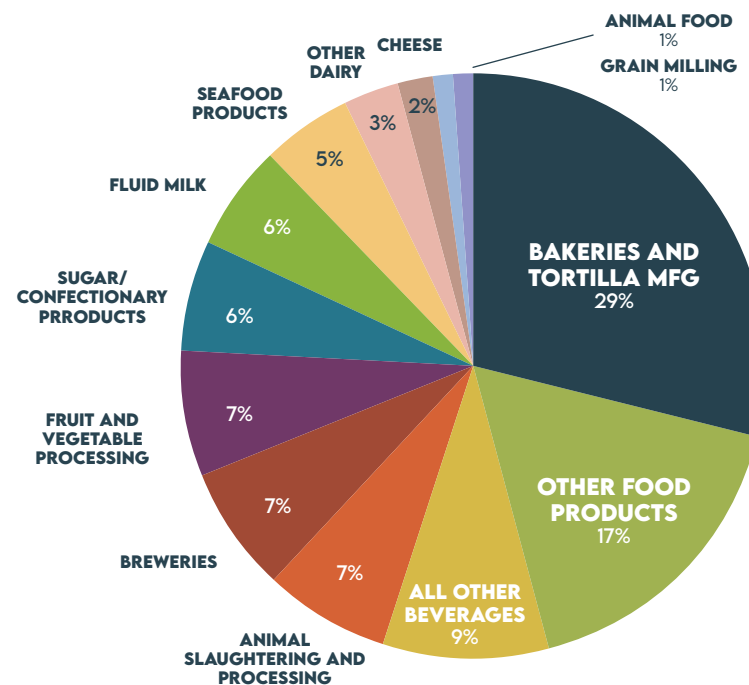
Beverage production, particularly Breweries, has been a source of significant growth over the 10-year interval, growing at nearly 13% per year. This high growth served to offset the moderate declines seen for All Other Beverage manufacturing, -0.6% per year, such that all beverages taken together had a 3.3% per year growth rate over the 2007-2017 period.



Bakery products, like [Olivia's Crotons](#) in Brandon, Vermont, are the top source of food manufacturing employment in New England.

The largest sector among all type of product manufacturing measured by employment in 2017 is shown to be Bakery and Tortilla Products, with 15,472 jobs, followed by Other Food Products with 8,853 jobs (Figure 12). This category includes products as snack foods (e.g., nuts, potato chips, popcorn), coffee and tea (not as finished beverages), seasonings, spices, dressings, and other similar goods. The third largest sector was Dairy Products, which had 5,827 jobs. This category includes Fluid Milk, Cheese, and Other Dairy Products (e.g., butter, frozen desserts, dry and condensed milk). Other Food Products had

FIGURE 12: Composition of Food and Beverage Product Manufacturing Employment, 2017



strong growth over the period, growing at 3.7% per year between 2007 and 2017. Dairy products, on the other had, show consistent weakness over the same period, falling at -0.7% per year, but as shown in Table 6, the decline was concentrated in the Other Dairy Product sector, as both Fluid Milk and Cheese saw modest growth.

The smallest sectors included Animal Food and Grain and Oilseed Milling, both with fewer than 500 jobs. Animal Food job growth, however, was the second highest of all sectors over 2007-2017 at 6.5% per year.

The fastest growing sector over the 10-year interval was Breweries, at 12.8% per year, an exceptionally strong performance, led by the rapid expansion of craft-brewing establishments. This was followed by Animal Food, at 6.5% per year (again, however, starting from a small base), and Other Food Products, at 3.7% per year. Some of this growth was offset by the lower growth in Other Dairy Products, Other Bakery and Tortilla Products, and All Other Beverages. Some of the sectors display sizeable volatility when measuring 5-year intervals. Among these are Animal Food, Cheese, Other Dairy Products, Animal Slaughtering and Processing, and Breweries. Some of these are affected by national factors, such as those in the dairy products group, which have seen fluctuations in product pricing and shifts in production centers (mostly away from New England). Other sectors, such as Breweries, saw a major increase in production as part of a national upturn in craft-brewing (something unlikely to continue as the market for those products reaches saturation).

New England Sales

The regional food system generated approximately \$22 billion in Food and Beverage Product Manufacturing sales. We see some differences in the composition of sales by sector compared to that of employment (Figures 13-14): The largest sector by 2017 sales volume was Other Food Products, whose combined subsectors had \$4.4 billion in sales (20% of the total). The second largest sector was Dairy Products with sales of \$4.1 billion, which is shown as three subsectors in the chart including Fluid Milk (9%), Cheese (3%) and Other Dairy Products (6%) for a total of \$4.1 billion, representing 18% of the total. The third largest sector by sales was Bakeries and Tortilla Products at \$3.2 billion, which is 15% of total sales.

Important differences are seen to be the high share of jobs in Bakery and Tortilla Products, with 29% compared to a sales share of 15%. Also notable are Seafood Products with 5% of total jobs but 9% of sales, and the All Other Beverages sector with 9% of total jobs by

FIGURE 13: Composition of Food and Beverage Product Manufacturing Sales, 2017

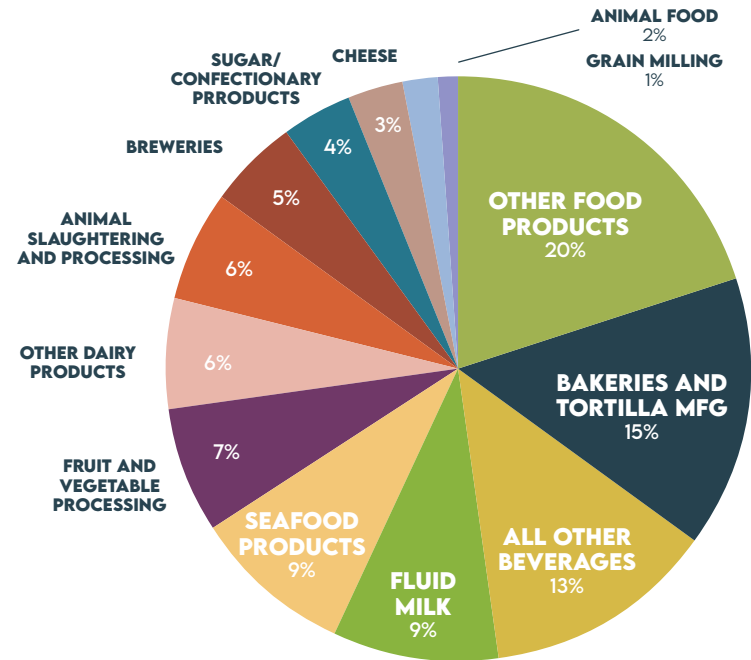
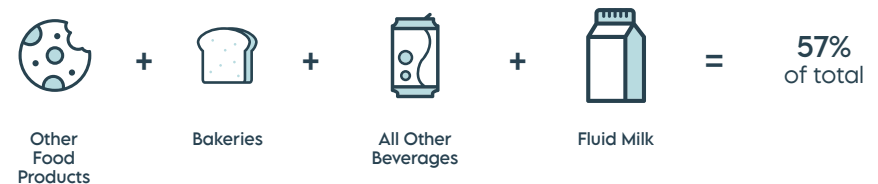


FIGURE 14: Top Manufactured Food and Beverage Product Categories by Sales, 2017



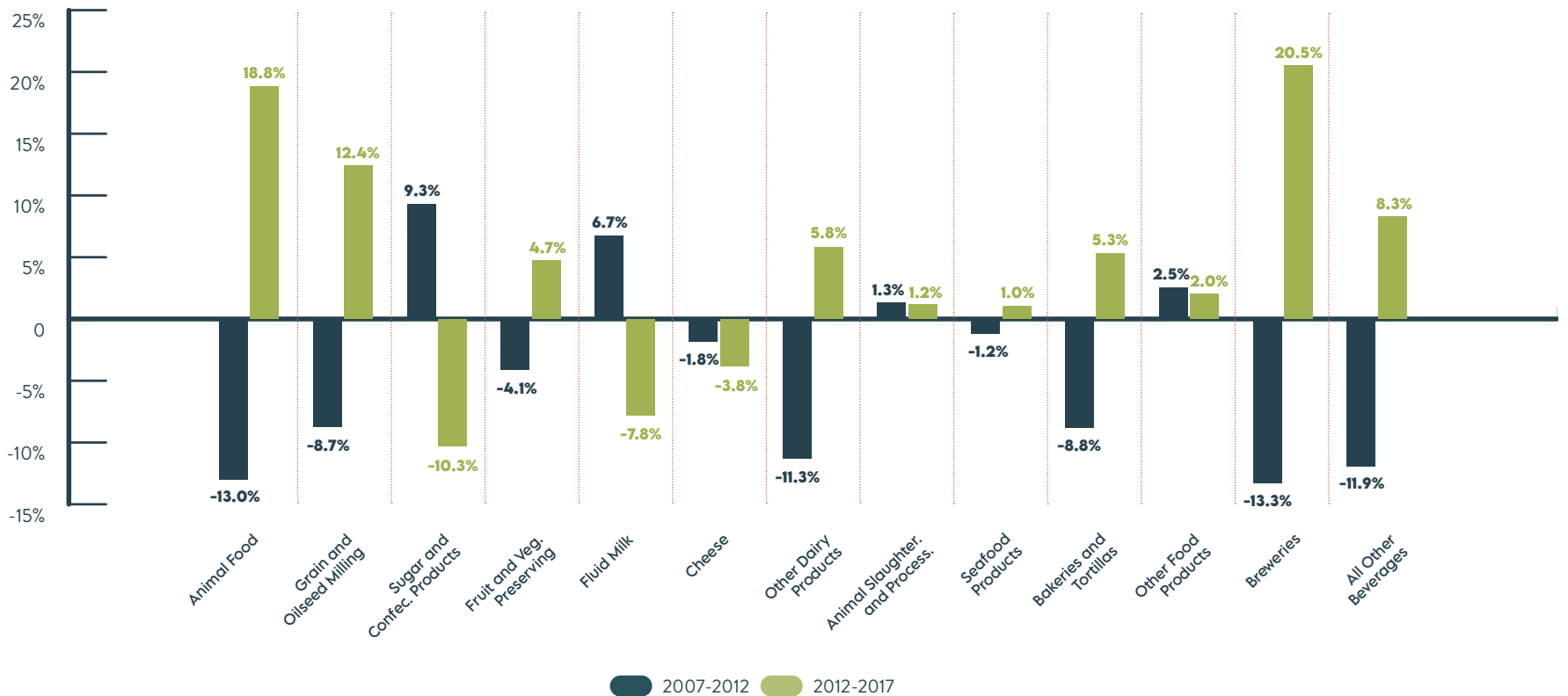
13% of sales. Higher labor intensity-to-sales is evident for Bakery and Tortilla Products compared to the opposite being the case with Seafood Products and All Other Beverages having lower labor intensity-to-sales ratios.

As was the case with employment, some of the larger sectors by sales had negative growth rates over the 10-year interval. The lowest growth was seen for All Other Beverages at 2.4% per year, followed by Bakeries and Tortillas and Dairy Products, both at 2.0% per year. The fastest growing sectors by sales were Other Foods and Breweries, both growing at 2.2% per year and Animal Foods at 1.7% per year.

The patterns of sales growth appear to be volatile from one period to the next (Figure 15). Half of the sectors saw a change in signs

between the two 5-year periods of 2007-2012 to 2012-2017. We suspect that product markets outside the New England region have a significant effect on local sales growth, particularly as regards prices paid for the underlying commodities that are used in the manufacture of food products and where prices are determined in larger markets outside of New England. These price changes are in addition to changes in consumer spending for different food items, some of which may also be national in scope.

FIGURE 15: Manufactured Food and Beverage Products Sales Growth Rate, 5-Year Intervals by Sector



Food and Beverage Product Manufacturing Employment by State

As shown in Table 1 (page 4), Food and Beverage Product Manufacturing is the smallest of the major food system industry groups in the region, with only 5% of New England’s food system employment. The job count understates the importance of the

Food and Beverage Product Manufacturing to New England’s food system and the regional economy: Food and Beverage Product Manufacturing sales represent approximately 11% of the regional food system total (Table 2, page 5). Some of this manufacturing is an important source of export activity for the entire regional economy, and one whose growth continues to outpace regional population growth (Tables 11-12). Table 12 shows the state and regional population for 2007, 2012, and 2017, the period on which this analysis is based.

TABLE 11: Food and Beverage Product Manufacturing Employment, 2017

State	2017 Employment	Share of Region	Annual Employment Growth		
			2007-2012	2012-2017	2007-2017
Massachusetts	26,068	49%	0.4%	2.2%	1.3%
Connecticut	7,773	15%	-5.4%	5.0%	-0.3%
Maine	6,862	13%	-5.8%	4.7%	-0.7%
Vermont	5,682	11%	6.8%	-0.2%	3.2%
New Hampshire	3,868	7%	7.6%	-2.0%	2.7%
Rhode Island	2,726	5%	-1.0%	0.4%	-0.3%
New England	52,979	100%	-0.3%	2.2%	0.9%

TABLE 12: New England Population by State, 2007, 2012, and 2017

State	2007	2012	2017	Compound Annual Growth Rate		
				2007-2012	2012-2017	2007-2017
Massachusetts	6,431,559	6,692,712	6,958,374	0.8%	0.8%	0.8%
Connecticut	3,527,270	3,605,259	3,607,615	0.4%	0.0%	0.2%
Maine	1,327,040	1,330,899	1,344,851	0.1%	0.2%	0.1%
New Hampshire	1,312,540	1,327,287	1,358,984	0.2%	0.5%	0.3%
Rhode Island	1,057,315	1,063,602	1,084,914	0.1%	0.4%	0.3%
Vermont	623,481	630,661	639,061	0.2%	0.3%	0.2%
New England	14,279,205	14,650,420	14,993,799	0.5%	0.5%	0.5%

The regional population has grown consistently at 0.5% per year over the 2007-2017 period. Growth is highest in Massachusetts at 0.8% per year and lowest in Maine at 0.1% per year. All other states have growth rates well below Massachusetts figure. Although small in terms of its share of food system employment, Food and Beverage Product Manufacturing is growing at a rate nearly double that of population at 0.9% per year. Based on 2017 job figures for the states, Massachusetts was the leading food manufacturing center in the region with almost half of the region’s employment at 26,068 jobs (49%), followed by Connecticut at 7,773 jobs (15%), Maine with 6,862 (13%), Vermont with 5,682 (11%), New Hampshire with 3,868 (7%), and Rhode Island with 2,726 (5%).

The three most important sectors in terms of 2017 job counts were Bakeries and Tortilla Products at 15,400 jobs (29% of total regional Food Product Manufacturing jobs), followed by Other Food Products with about 9,000 jobs (17% of total regional Food Product Manufacturing), and Dairy Products, with almost 6,000 jobs (11%). Together, these three accounted for just over half of all Food Product Manufacturing jobs (Table 13). The leading regional sector, Bakery and Tortilla products is the top food product in four of the six states, as measured by its share of the state’s food product manufacturing jobs. The highest concentrations are found in Connecticut (42%) and Rhode Island (40%). Lesser shares are found in Massachusetts and Vermont (32% each), and Maine (21%). The exception to this is found

TABLE 13: Top Three Sectors of Food and Beverage Product Manufacturing Employment, 2017

State	2017 Employment	Percent of New England	Top Three Sectors					
			Largest Sector	Percent of State	Second Largest Sector	Percent of State	Third Largest Sector	Percent of State
Massachusetts	26,068	49%	Bakeries and Tortilla Mfg.	32%	Other Food Products	17%	All Other Beverages	9%
Connecticut	7,773	15%	Bakeries and Tortilla Mfg.	42%	Other Food Products	22%	Dairy Products	11%
Maine	6,862	13%	Bakeries and Tortilla Mfg.	21%	Fruit and Vegetable Products	20%	Other Food Products	18%
Vermont	5,682	11%	Dairy Products	32%	Other Food Products	15%	Bakeries and Tortilla Mfg.	14%
New Hampshire	3,868	7%	Sugar and Confectionary Products	29%	Dairy Products	19%	Breweries	16%
Rhode Island	2,726	5%	Bakeries and Tortilla Mfg.	40%	Animal Slaughtering and Processing	22%	Other Food Products	13%
New England	52,979	100%	Bakeries and Tortilla Mfg.	29%	Other Food Products	17%	Dairy Products	11%

in New Hampshire, where Bakery and Tortilla products are not among the top three sectors.

The next most prominent sector, Other Food Products, appears as second most important in three of the states, Connecticut, Massachusetts, and Vermont, and as the third most important in Maine and Rhode Island. The third most important sector, Dairy Products, has the largest share of jobs in Vermont (32% of Food and Beverage Product Manufacturing jobs), and is also important in New Hampshire (19%) and Connecticut (11%).

Food and Beverage Product Manufacturing Sales by State

With 11% of total 2017 food system sales, Food and Beverage Product Manufacturing has somewhat outsized importance to the region. But it also experienced a declining growth rate at -0.5% per year (Table 14). The decline occurred in the earlier part of the interval and nearly recovered completely in the latter half. Food and Beverage Product Manufacturing sales by state looks very much like the job shares. Massachusetts is the leader, with 48% of Food and Beverage Product Manufacturing sales, followed by Connecticut (15%), Vermont (14%), Maine (12%), New Hampshire (8%), and Rhode Island (3%).

Earlier we noted the high percentage of jobs in the Bakery and Tortilla Products sector in the region, but it had the lowest sales value per employee of all the manufactured food products in the region at \$204,000 per job (Table 15). Other Food Products, the second most important sector in terms of share of regional jobs, had higher than average sales per employee at \$532,000 per job, and Dairy Products, the third most important in job-share had nearly the highest sales per job at \$765,000. The highest average sales per job is found in Animal Food Products, at \$783,000, but there are fewer than 500 such jobs in the entire region.

Because of the apparent differences in productivity per job, the identification of the largest sectors in each state is different than for jobs (Table 16). The leading sector within the region is Other Food Products (20%), followed by Dairy Products (19%), and Bakeries and Tortilla Products (14%). Whereas Bakery and Tortilla Products was the leading sector in four states by job count, the concentration is more diverse when measured by sales: Dairy is the leading sector in Vermont (50%) and New Hampshire (27%), and third largest in Connecticut (19%). Other Food Products is the leading Connecticut sector (31%), and in Massachusetts (21%). In Maine, the leading sector is Other Beverage Products, a category that includes bottled water, soft drinks, and distilled beverages at 29%. In Rhode Island,

TABLE 14: New England Food and Beverage Product Manufacturing Sales, 2017

State	2017 Sales	Share of Region	Annual Sales Growth		
			2007-2012	2012-2017	2007-2017
Massachusetts	\$10,417,832,000	48%	-0.5%	1.9%	0.7%
Connecticut	\$3,279,124,000	15%	-12.1%	8.4%	-2.4%
Vermont	\$3,029,034,000	14%	1.6%	-1.2%	0.2%
Maine	\$2,586,906,000	12%	-11.4%	6.2%	-3.0%
New Hampshire	\$1,779,002,000	8%	4.6%	-2.0%	1.3%
Rhode Island	\$729,454,000	3%	-2.0%	-4.5%	-3.3%
New England	\$21,821,352,000	100%	-3.0%	2.1%	-0.5%

the leading Manufactured Food Product is Animal Slaughtering and Processing at 28% of the total. Other differences from what we saw with the leading job categories were the appearance of Sugar and Confectionary Products as the third largest category in both New Hampshire (17%) and Vermont (10%).

TABLE 15: Average Food and Beverage Product Manufacturing Sales Per Employee, 2007-2017

Sector	Sales Per Employee
Animal Food	\$783,000
Dairy Products	\$765,000
Seafood Products	\$663,000
Grain and Oilseed Milling	\$624,000
Other Food Products	\$532,000
Fruit and Vegetable Preserving	\$401,000
Animal Slaughtering and Processing	\$363,000
Sugar and Confectionary Products	\$331,000
Bakeries and Tortilla Manufacturing	\$204,000
FOOD MANUFACTURING	\$418,000
All Other Beverages	\$573,000
Breweries	\$505,000
BEVERAGE MANUFACTURING	\$534,000
TOTAL	\$522,000



[Aqua ViTea Kombucha](#) in Middlebury, Vermont

Photo credit: Erica Housekeeper



[Kassumay Products](#) in Warren, Rhode Island

Photo credit: USDA



[The Cellars at Jasper Hill](#) in Greensboro, Vermont

Photo credit: USDA



[The Brewery at Four Star Farms](#) in Northfield, Massachusetts

Photo credit: Community Involved in Sustaining Agriculture

TABLE 16: Top Three Sectors of Food and Beverage Product Manufacturing Sales, 2017

State	2017 Sales	Percent of New England	Top Three Sectors					
			Largest Sector	Percent of State	Second Largest Sector	Percent of State	Third Largest Sector	Percent of State
Massachusetts	\$10,417,832,000	48%	Other Food Products	21%	Bakeries and Tortilla Mfg.	16%	All Other Beverages	15%
Connecticut	\$3,279,124,000	15%	Other Food Products	31%	Bakeries and Tortilla Mfg.	25%	Dairy Products	19%
Vermont	\$3,029,034,000	14%	Dairy Products	50%	Other Food Products	16%	Sugar and Confect. Products	10%
Maine	\$2,586,906,000	12%	All Other Beverages	29%	Fruit and Vegetable Products	19%	Other Food Products	15%
New Hampshire	\$1,779,002,000	8%	Dairy Products	27%	Breweries	26%	Sugar and Confect. Products	17%
Rhode Island	\$729,454,000	3%	Animal Slaughtering and Processing	28%	Other Food Products	16%	Bakeries and Tortilla Mfg.	21%
New England	\$21,821,352,000	100%	Other Food Products	20%	Dairy Products	19%	Bakeries and Tortilla Mfg.	14%

Food Distribution and Retail Trade

New England Employment

We have included five trade sectors in our historical analysis. These consist of four wholesaling categories and one retailing category (Table 17). The largest trade sector among the five shown is Food and Beverage Store Retailing with approximately 205,000 jobs. This is about one-fifth of food system employment and nearly double the size of the next largest sector for the food system that includes farm producers and hired farm labor (111,000, Table 6, page 18). The next largest sector in the Trade group is grocery wholesaling with approximately 42,000 jobs. Beer, Wine, and Distilled Beverage wholesaling is the third largest sector with about 11,000 jobs, and Farm Product Raw Materials and Farm Supplies Wholesalers complete the industry with about 2,000 jobs combined.



C-Town Supermarket is an independently owned grocery store chain in the metropolitan New York City region, including Hartford, Connecticut.

Photo credit: CFSA

TABLE 17: Food Distribution and Retail Trade: Detailed Industry Employment and Sales

Sector	2017 Employment	Annual Employment Growth Rate			2017 Sales	Annual Sales Growth Rate		
		2007-2012	2012-2017	2007-2017		2007-2012	2012-2017	2007-2017
Grocery Wholesaling	41,547	-0.4%	1.2%	0.4%	\$64,024,086,000	4.1%	4.5%	4.3%
Farm Product Raw Material Merchant	268	-16.1%	6.1%	-5.7%	\$1,538,537,000	24.7%	35.9%	30.2%
Beer, Wine, and Distilled Beverage Distribution	10,523	0.5%	1.5%	1.0%	\$7,223,474,000	-3.3%	-0.5%	-1.9%
Farms Supplies Merchant Wholesalers	1,440	-3.9%	5.6%	0.8%	\$3,419,493,000	7.6%	10.7%	9.2%
WHOLESALING	53,779	-0.5%	1.3%	0.4%	\$76,205,590,000	3.1%	4.5%	3.8%
Food and Beverage Stores	204,711	1.7%	-0.3%	0.7%	\$50,023,491,000	-0.3%	-0.6%	-0.5%
RETAILING	204,711	1.7%	-0.3%	0.7%	\$50,023,491,000	-0.3%	-0.6%	-0.5%
TOTAL	258,489	1.3%	0.1%	0.7%	\$126,229,082,000	1.5%	2.3%	1.9%

The highest growth rate among the five sectors for the 2007-2017 period is for Beer, Wine, and Distilled Beverage wholesaling, growing at rate of 1% per year. Food and Beverage Store Retailing is second, with a growth rate of 0.7% per year, which represents approximately 1,400 new jobs per year on a 2017 base figure. The employment growth rate figures present evidence for cyclical volatility. Three sectors, Grocery Wholesaling, Farm Product Wholesaling and Farm Supply Wholesaling showed declining growth in the 2007-2012 period, followed by a recovery in the later period from 2012-2017. The combined periods give a better sense of the industry’s dynamics, which is not as volatile. Here we see combined wholesaling jobs growing at 0.4%, about the rate of population growth we saw in the previous section, and retailing growing at a slightly higher 0.7%.

New England Sales

Based on sectoral sales figures, a different picture of this part of the food system is seen. Grocery Wholesaling leads in sales with \$64 billion, followed by Food and Beverage Store Retailing at \$50 billion. Together, they account for 90% of the sales volume. Of the remaining 10% of sales, Beer, Wine and Distilled Beverages account for \$7 billion and the farming related wholesaling together account about \$5 billion.

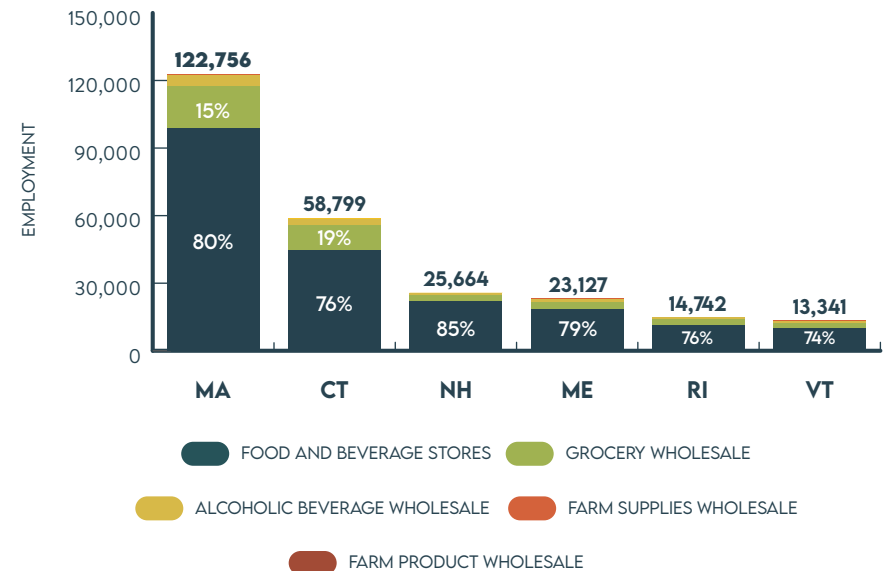
Grocery Wholesaling displayed solid growth—it saw growth of 4.3% per year over 2007-2017, with strong rates in both the five-year intervals shown in Table 12—which is worth noting as it is such a large sector. The two farming related wholesale sectors, Farm Product Raw Materials and Farm Supplies exhibited very strong growth over the decade from 2007-2017, 30% per year and 9% per year, respectively, but both started from very low bases. Nevertheless, these two sectors bear watching when next measured in the 2022 Economic Census. On the other extreme, Food and Beverage Retailing saw a reduction in sales volume at a rate of -0.5% over the 2007-2017 period and for both the two 5-year intervals, as well.

We note that Beer, Wine, and Distilled Beverage wholesaling also weakened over the 2007-2017 period at a -1.9% annual rate, which is somewhat surprising in view of the emergence of craft beer and distilled beverage manufacturing. Most likely, the craft beer products are not being distributed in large enough volumes yet to require new wholesaling capacity or are not yet entering into larger geographic distribution yet.

Food Distribution and Retail Trade Employment by State

State level employment in the different Trade Activities is closely linked to size of the state market, as represented by population (Figure 16). State employment in both Grocery Wholesaling and Food and Beverage Retailing, the two dominant sectors, are highly concentrated in the most populous states, Massachusetts and Connecticut. Of the 205,000 regional jobs in Food and Beverage

FIGURE 16: Food Distribution and Retail Trade Employment, 2017

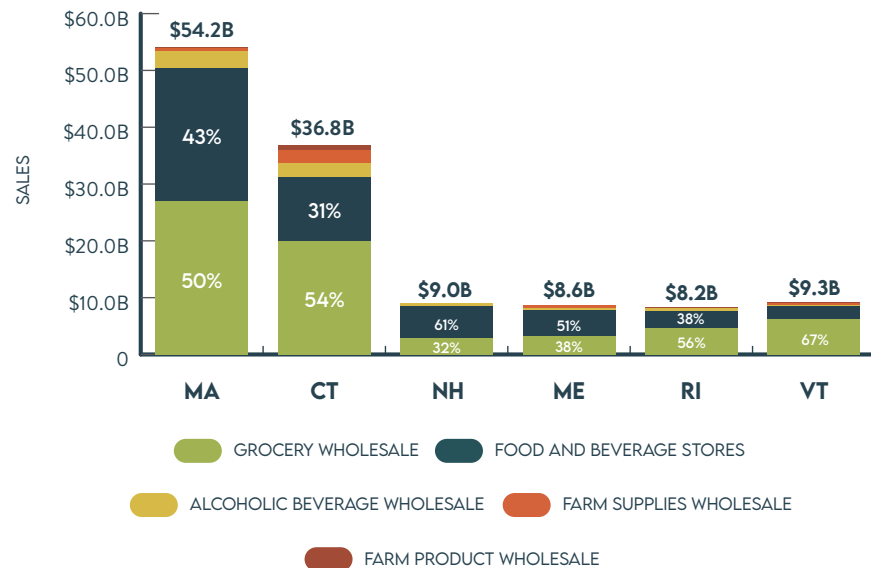


retailing, approximately one-half are in Massachusetts and just under one-quarter are in Connecticut. The remaining quarter is distributed among the other four states proportionately to population.

Food Distribution and Retail Trade Sales by State

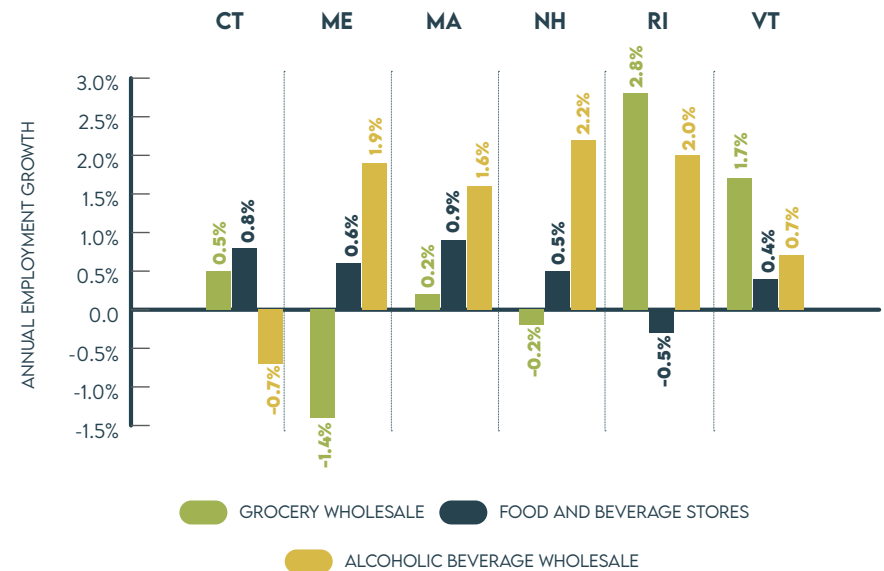
State level sales of the different Trade Activity sectors have a somewhat different composition (Figure 17). Massachusetts and Connecticut still dominate in Food and Beverage Retailing and the other states appear to have the same pattern as for employment. However, Grocery Wholesaling are different in that the two smallest states by population, Vermont and Rhode Island, have outsized shares of this activity. We are not aware of any simple explanation as to how these two states developed relatively large shares for this form of distribution, but the headquarters of [United Natural Foods \(UNFI\)](#)—the largest distributor of specialty food in the country—is located in Providence.

FIGURE 17: Food Distribution and Retail Trade Sales, 2017



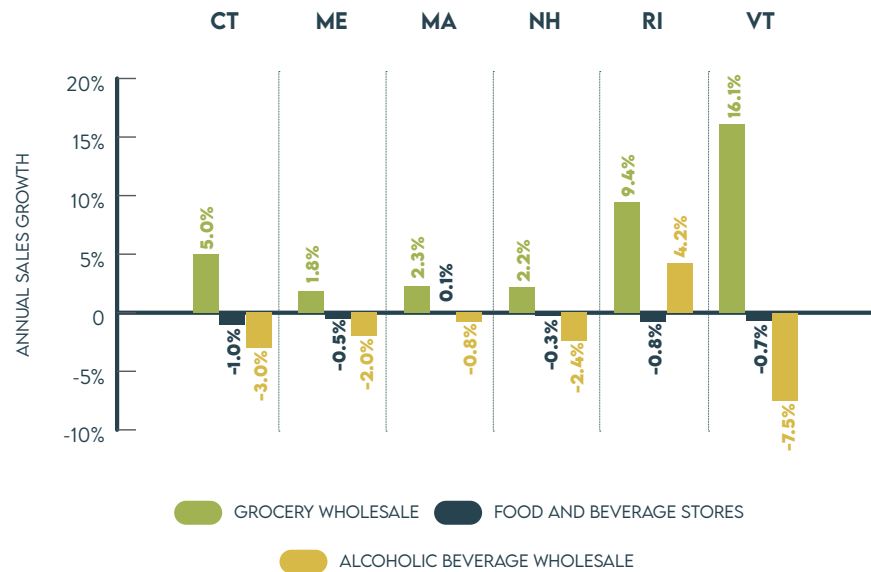
Not including the two very small Farm Products and Farm Supplies wholesaling sectors, two states, Massachusetts and Vermont showed employment growth over the 2007-2017 period in all three trade activities (Figure 18). Large growth in alcoholic beverage employment over the period was seen in all states except for Connecticut, and positive growth was in-line with population growth for Food and Beverage Stores except for Rhode Island, which had an inconsequential reduction.

FIGURE 18: Food Distribution and Retail Trade Employment Growth, 2007-2017



Sales growth over the period was more dynamic, with high growth (5% per year or more) in Grocery Wholesaling volume in Connecticut, Rhode Island, and Vermont. Grocery Retailing, however has shown little sales growth in any state, and Alcoholic Beverage Wholesaling sales were down in all states except Rhode Island (Figure 19). What emerges from these charts is that there are few uniform growth patterns for the different sectors, and the data may be subject to high variation between short periods without a clear direction across the region.

FIGURE 19: Food Distribution and Retail Trade Sales Growth, 2007-2017



Healthy Living in South Burlington, Vermont, specializes in local and regional food products.

Photo credit: Vermont Agency of Agriculture

Food Services

New England Employment

Food Services (e.g., restaurants, fast food, bars) is the largest sector in terms of jobs of the thirty-four sectors included in this analysis with 560,737 jobs in 2017. Not surprisingly, state level employment in Food Services is closely linked to size of the state market. Massachusetts accounts for 49.7% of Food Services jobs, followed by Connecticut at 21.8%. For the region as a whole, the sector has had a relatively high job growth rate. Over the 2007-2017 period, Food Service jobs grew at 1.7% per year, more than three times the population growth rate.

Among the states, job growth is highest in the highly urbanized ones—Massachusetts and Connecticut—and/or with strong tourism support, as in the case of Vermont. These three states saw job growth at 2% per year over the 2007-2017 period. The other three states saw growth of 0.9% to 1.1% per year (Table 18).



Photo credit: ink + Light Creative

Food service jobs, like food preparation and serving jobs at [Throwback Brewery](#) in North Hampton, New Hampshire, are the most common type of food system job in New England.

TABLE 18: Food Service and Drinking Places: Detailed Industry Employment and Sales

Sector	2017 Employment	Annual Employment Growth Rate			2017 Sales	Annual Sales Growth Rate		
		2007-2012	2012-2017	2007-2017		2007-2012	2012-2017	2007-2017
Massachusetts	278,738	1.6%	2.7%	2.1%	\$19,496,151,000	0.6%	3.4%	2.0%
Connecticut	122,550	1.4%	2.7%	1.1%	\$8,212,897,000	0.4%	2.2%	1.3%
New Hampshire	50,102	-0.4%	2.2%	0.9%	\$3,087,304,000	-0.7%	3.2%	1.2%
Maine	44,641	0.3%	1.9%	1.1%	\$2,792,143,000	-0.4%	3.7%	1.7%
Rhode Island	44,151	-0.1%	2.0%	0.9%	\$2,774,747,000	0.1%	2.8%	1.5%
Vermont	20,555	1.4%	2.7%	2.0%	\$1,206,744,000	0.4%	2.2%	1.3%
NEW ENGLAND	560,737	1.0%	2.5%	1.7%	\$37,569,985,000	0.3%	3.1%	1.7%

The high number of Food Service jobs reflects both the importance of the sector, but also one of the sector's key characteristics which is that many of the jobs are part-time (The job figures we report are for full- and part-time jobs combined) and have low wages. This is the reason that it generates a relatively high number of jobs per dollar of sales volume. As we will see in the next section, however, **a high number of jobs does not generate an equivalent growth rate in value-added, because this sector tends to have relatively low wage rates and wages are the largest contributor to value-added.**

New England Sales

Food Services is the third largest food system sector in terms of sales volume at \$37.5 billion in 2017. The sales growth rate for Food Services matches that of jobs— 1.7% per year. In terms of sales growth, only Massachusetts attained 2% per year growth over the ten-year period. The others range from a low of 1.3% in Connecticut and Vermont to 1.7% in Maine. The sector appears to have seen sharply lower job and sales growth (and some declines) during the first five-year period shown. These are likely a result of the Great Recession, whose effects lingered for several years beyond its official end in mid-2009.

Challenges for Food Services Workers

Food Service workers make up the majority of food system jobs but these jobs are characterized by low wages and limited benefits.

- » **Low Wages and Limited Benefits for Food System Workers:** Wage data is collected for nearly 800 occupations by the U.S. Bureau of Labor Statistics. Food preparation and serving workers—the largest category of employment in New England's food system—have the lowest wages of any occupational category! Median hourly wages for several food preparation and serving occupations are lower than all livable wage estimates for New England states.

See *Common Food System Challenges* for more information.



The Economic Impact of New England's Food System

In the preceding section, we saw which sectors figure prominently in the size and growth rate of the regional food system. Further, we saw the degree to which states share common features with respect to sectoral importance and growth. This review is useful to understand the parts but does not give us a concise view as to the functioning of the entire regional food system. What is needed is a means to understand how these sectors come together to form a functioning food system. In this section, we present the modeled performance of the food system viewed through the lens of a regional interindustry model, better known as an input-output model.

Input-Output Models

Input-output economic models, at their most basic, are constructed by measuring three types of transactions:

1. Sales from one producer to others for use as production inputs
2. Purchases of goods and services from other producers to be used as production inputs
3. Sales of goods and services to final users, such as consumers.

By dividing an economy into many discrete industries, we can calculate how transactions in one industry will affect all others. A traditional example would be the production of steel which, in its simplest form, requires the combination of iron ore, limestone, coal, and labor. For each dollar of steel produced, we might need \$0.30 worth of iron ore, \$0.05 worth of limestone, \$0.40 worth of coal, and \$0.25 of labor. If we intend to make \$100 of steel, we can multiply the per dollar figures by 100 to determine how much of each input is needed. Those inputs, in turn, would need to be produced based on the technology of their production, but we know we need to produce additional coal, iron ore, and limestone in order to produce the \$100 worth of steel. The producers of those commodities have their own purchases to make in order to produce their output. By including more industries' products into the production process, we can simulate a far more complex economic structure. When assembled for an entire country or region, we have snapshot of the workings of that economy which shows us how each sector is connected to each other.

Over the years, there have been a number of advancements in the development of these models. They are modified to reflect industry redefinitions made to include new products. The latest U.S. Bureau of Economic Analysis' national "benchmark" input-output model dates from 2012 and covers 405 different industries and 405 commodities. This benchmark model incorporates all of the empirical

data for 2012, representing the technology and resources available at that time, at prices charged for those resources in 2012. From this model, many regional models have been constructed by controlling for the availability of resources from within a region, and updating for national and regional price-level changes for each of the regional industries. Regional models developed in this way are viewed as feasible representations of how regional production can occur, but since they are constrained to national production technologies, presumption of homogeneous products, and the employment of identical production processes for all places, it is hard to estimate their true accuracy.

The model we employ in this analysis of the New England regional food system is the IMPLAN model of the economy, which in this case gives us six state-level estimated input-output models based on the 2012 BEA benchmark model updated to 2017 transaction values. Many of the updated transactions are taken from actual data extracted from the Census Bureau's Economic Census for 2017, which offers us updated state-level employment, sales, and value-added for all industries. The IMPLAN model we use represents 546 industries and commodities, of which 32 comprise elements in the food system.⁵

Input-output models offer a concise means of estimating not only the "recipe" for making certain products, as we described in simple form for steel, but how transactions in one industry propagate, eventually, through all industries. The consequential volume of transactions generated by any given change in an industry's output is often described as an "indirect effect" of production. The more complex any given product process or product is, there is a tendency to generate a greater indirect effect. In the steel example, the additional \$1 of steel is termed the direct effect of a \$1 dollar purchase. As more coal, iron ore, and limestone are needed, initial indirect effect totals \$0.75, not including labor (i.e., \$0.30 iron ore + \$0.05 limestone + \$0.40 coal). Since producing more coal, iron ore, and limestone will require more

equipment, fuel, and other services, subsequent transactions that are linked to the initial indirect transactions add to the total effect on the economy. At the end of these iterative transactions, when each successive transaction becomes very small, they may sum to more than double what was spent to start the process, the \$1 for steel. Multiples of two and three are not unusual at a national level.

As we move to a regional level, the total transaction multiples tend to become smaller as more goods and services are purchased outside a region, forming "leakages." For very small regions with limited production activity, the indirect effect multiples (or "multipliers") move close to the direct starting value. In multiplier form, these tend to be close to 1 for very small regions where a purchase may involve importation of the entire value of a good or service.

Labor and capital are treated separately in many input-output analyses because, strictly speaking, they are not the product of an industry or commodity. They are factors of production and indispensable, but not ones produced, per se, to meet current production needs. That said, we can include labor and capital consumption transactions as produced by industries. The input cost that different industry producers face is the value of wages, salaries, and benefits for labor and capital consumption (i.e., annual depreciation) for capital, which together form value-added. They are "produced" through household consumption and capital investment.

Whereas the multipliers obtained through indirect transactions depict the economic value of regional interindustry activity, when we include capital and labor into the model, household consumption and private investment become the source of another set of interindustry transactions. For every additional dollar of labor used in production, household consumption also increases (by the average propensity to consume), as does the need for capital equipment (such as machinery or software.) Because of the manner in which the model treats wage income driving household consumption regardless of the

industry from which it comes, a dollar of wages from farming and a dollar of wages from food product manufacturing generate the same consumption response (i.e., the same goods purchased per dollar). The interindustry effects of consumption stemming from additional wage income are termed “induced effects.” Added together with the direct and indirect value of transactions give us a so-called “Type II” multiplier.

The induced effect can vary in size from one state to the next depending on how economically large the region in question is and how much of the local consumption a region can supply. Each dollar of additional household consumption from one industry looks like an additional dollar from another industry. Only the size of the wage bill of different industries matters. The incremental consumption in the induced effect will have the same composition for all industries in a region. The indirect effect is different in that way, since each industry’s production requirements and location of purchasers is different.

As we state earlier, input-output models are constructed from measuring sales transactions. These are equivalent to measuring “output” or “shipments” in U.S. Census data terminology. Using changes in output to “drive” impact estimates, the model can then be used to estimate value-added and employment. This is done by applying ratios of value-added per unit of output and jobs per unit of output to the impact estimates. These ratios are based on averages for the industry in a region. In the IMPLAN model, local value-added and employment ratios are used, so to the degree these vary by region, our employment and value-added estimates reflect these characteristics.

In the next section, we present the multipliers for the region, states, and industries based on a multiregional interindustry design. The inter-regional approach allows industries in the producing state to utilize regionally-produced goods in proportion to the size of their

available output of the other states in the region. In so doing, indirect and induced transactions can serve to stimulate other producers in other states in the New England region.

An example of the multiregional effect would be the utilization of Vermont-produced cheese used as an input to a Massachusetts manufactured food product. Since Massachusetts production increases demand for cheese in the rest of region outside of Massachusetts, the regional multiplier effects will occur both inside and outside of Massachusetts. When multiregional linkage effects are included, the region-wide indirect and induced impacts will be larger (albeit slightly for most industries in the region) than the sum of the state-only parts. We present the food system economic multipliers incorporating this multiregional effect for the New England region, the states, as well as regional industries. We present multipliers for each industry by state in the Appendix B.

Economic Multipliers by Region and State

Economic multipliers depict the amount of activity generated by a unit change in output. As shown in Table 19, each change of \$1 of food system output ultimately changes total output by \$1.45 for the New England region when considering just indirect impact (shown as “Type I” which is interindustry impact without labor effects included), and \$1.90 when combining indirect with induced impact (shown as “Type II”, which includes labor earnings and linked consumption effects). Inclusion of labor effects increases the region-wide multiplier by about 30%. The difference in the Type I multipliers over the six states ranges from 1.42 in Connecticut to 1.53 in Vermont for Type I, the latter being 8% greater than the former. For Type II, we see a range of 1.81 in Connecticut to 1.94 in Massachusetts and New Hampshire, a 7% difference.

TABLE 19: Economic Multipliers for New England States, 2017

State	Output		Value Added		Employment	
	Type I	Type II	Type I	Type II	Type I	Type II
Connecticut	1.42	1.81	1.42	1.86	1.22	1.45
Maine	1.46	1.91	1.47	2.00	1.29	1.60
Massachusetts	1.44	1.94	1.46	2.05	1.22	1.51
New Hampshire	1.49	1.94	1.52	2.08	1.24	1.50
Rhode Island	1.45	1.90	1.43	1.92	1.23	1.49
Vermont	1.53	1.88	1.67	2.23	1.44	1.77
NEW ENGLAND	1.45	1.90	1.47	2.01	1.24	1.52

From the size of the Type I multipliers, we conclude that food system production in Vermont is more closely integrated relative to the other states when not considering labor consumption effects (i.e., not including induced effects that primarily stimulate food retailing). The interindustry non-retail production linkages are somewhat stronger here. The differences across the states for the Type I multipliers is not large, however.

The size of the Type II multiplier shows that the addition of impact from labor’s consumption of food and beverages favors states with broader interindustry linkages connected to retailing, such as transportation, utilities, other types of retailing, and distribution. The high Type II values for Massachusetts and New Hampshire reflect these characteristics.

We see a more pronounced difference in the derived impact measures for value-added and employment. For value-added, the Type I multiplier for the entire region is 1.47, and 2.01 for Type II. This difference means that when accounting for the consumption-related linkages, the region derives approximately one-third more of the food system’s economic impact through consumption from

workers within the food system (and linked industries) relative to nonlabor impact. The difference is greatest in Massachusetts, where the Type II multiplier exceeds the Type I by 40%, indicating that the amount of value-added via consumption goods is greater here relative to that generated in the other states. This is not surprising in view of Massachusetts’ size and more diversified range of linked activities, particularly in services where value-added can represent a large proportion of total output. The highest Type I multiplier for value-added occurs in Vermont at 1.67, a result tied to the state’s high proportion of agricultural production and its linkages to food production activities (largely dairy products). It gives rise to the largest Type II multiplier because it starts with stronger interindustry linkage (the Type I multiplier) relative to other states.

The Type I regional employment multiplier of 1.24 says that for each existing or new job in the New England food system, we expect an additional one-quarter job to be created. The employment effect is greater when we look at the Type II multiplier, such that each new direct job in the food system, an additional one-half a job is created elsewhere within the regional economy. The effect, once again, is most pronounced in Vermont, with multipliers of 1.44 and 1.77 for

the Type I and II multipliers, respectively. Apart from Vermont and Maine, the other four states have relatively low employment multipliers for the food system as a whole.

Economic Multipliers by Industry

In reviewing the aggregate state multipliers in Table 20, we see that there are distinct differences in size and range of the value-added multipliers. Value-added is important for no other reason than it is key contributor to a state and region's economic prosperity. The differences between states arise for a number of reasons, but among the most important are the mix of activities that are in the food system in each state and how all of the productive factors (i.e., land, labor, and capital) come together to generate income for workers, households, and residents.

In Table 21, we show the sector specific multipliers computed at a regional level. We also show sector-group summaries for farm/fishery products, food product manufacturing, and trade/services in the last three rows. The sector group summary figures for output multipliers show that food product manufacturing and trade/service have identical Type I output multipliers but that trade and services have a greater Type II output multiplier. The reason for this has to do with how output is measured (e.g., wholesale and retail activities include the output of each transaction at each point where goods change hands). Repeated transactions along the supply-chain leads to double (and more)-counting and thus the higher output multiplier. (This also serves to produce low employment-to-output and value-added-to-output ratios.)

As a general rule, farm and fishery products have the lowest multiplier within the multiplier types. The lower Type I multipliers are the results of having relatively few "backward" linkages, as is normally the case with agricultural and fishery activities where productive factors,

(i.e., land, labor, and capital) are the key contributors to the value of output, with few interindustry input requirements to generate multiplier effects. The opposite is true of food product manufacturing, where relatively high wage and salary earnings produce the largest Type II multipliers as workers spend money on goods.

Among the agricultural sectors that have greatest total employment impact with changes in activity are Dairy Cattle and Milk Production, Poultry and Egg Production. Both Oilseed Farming and Grain Farming have high multipliers but these sectors are each too small to account for much activity, and for climatic and topographical reasons, can not be expected to achieve sizeable increases in output. For value-added, both Dairy Cattle and Milk Production and Poultry and Egg Production have the strongest multipliers. Among Food Product Manufacturing sectors, Cheese Production is the standout sector, with an employment multiplier of 4.5 and a value-added multiplier of 5.7.

Some of the largest sectors in terms of employment size and sales, such as Bakery and Tortilla Products and Other Food Products have low or moderate sized multipliers, whereas the high-growth Breweries sector also has only moderate employment impact and low value-added impact (Craft-brewing, as an activity, is relatively high cost in terms of labor and capital intensity, and has become highly competitive. Combined with the need to import the principal ingredients causing regional "leakage", its low multiplier seems warranted.)

The Trade and Services Sector's multipliers fall between the range of Farm and Fishery Products Sectors and the Food Product Manufacturing ones in terms of sizes and relative impact on the regional economy. Grocery Wholesaling has been high growth in terms of sales over the past ten years, but it has only moderate employment and value-added multiplier effects. Food and Drinking Places and Food and Beverage Retail, the two largest food system employers in the region with three-quarters of total employment

TABLE 20: Economic Multipliers by Food System Industry, 2017

State	Output		Value Added		Employment	
	Type I	Type II	Type I	Type II	Type I	Type II
Oilseed Farming	1.26	1.74	1.20	1.63	1.84	3.00
Grain Farming	1.47	1.80	1.59	2.08	1.59	1.89
Vegetable and Melon Farming	1.44	1.94	1.46	2.05	1.22	1.51
Fruit Farming	1.31	1.68	1.31	1.71	1.17	1.28
Greenhouse, Nursery, and Floriculture Production	1.32	1.75	1.32	1.78	1.18	1.36
All Other Crops	1.32	1.80	1.27	1.73	1.04	1.08
Cattle Ranching and Farming	1.30	1.58	1.26	1.55	1.16	1.30
Dairy Cattle and Milk Production	1.54	1.78	1.76	2.23	1.85	2.32
Animal Production (except Cattle and Dairy)	1.22	1.56	1.18	1.47	1.09	1.21
Poultry and Egg Production	1.42	1.56	2.01	2.47	1.55	1.84
Support for Crop and Animal Production	1.19	2.07	1.15	1.94	1.03	1.20
Fisheries	1.05	1.80	1.03	1.50	1.02	1.41
Animals Food Products	1.30	1.42	2.30	3.00	2.72	3.76
Grain and Oilseed Milling	1.36	1.53	2.24	3.03	3.07	4.55
Sugar and Confectionary Products	1.50	1.74	2.53	3.42	2.48	3.22
Preserved Fruit and Vegetable Products	1.39	1.62	2.01	2.74	2.11	2.86
Fluid Milk Production	1.61	1.85	2.62	3.51	3.27	4.53
Cheese Production	1.74	1.95	4.22	5.66	4.25	5.75
Other Dairy Products	1.62	1.91	1.98	2.68	1.64	2.11
Animal Slaughtering	1.33	1.53	2.23	3.10	2.17	2.90
Seafood Product Processing	1.43	1.75	2.26	3.27	2.10	2.96
Bakeries and Tortilla Manufacturing	1.44	1.81	1.66	2.33	1.33	1.70
Other Food Products	1.47	1.71	2.20	2.96	2.81	3.66
Breweries	1.38	1.59	1.59	1.98	1.91	2.69
All Other Beverages	1.42	1.62	1.99	2.60	2.40	3.40
Grocery Wholesaling	1.52	2.00	1.55	2.10	1.64	2.30
Farm Product and Beverage Wholesaling	1.41	1.76	1.37	1.71	1.89	2.70
Food and Beveraging Retailing	1.50	2.08	1.44	2.04	1.19	1.44
Food Service and Drinking Places	1.42	1.90	1.38	1.87	1.16	1.39

TABLE 20: Economic Multipliers by Food System Industry, 2017, continued

Sector Group Summary						
FARM AND FISHERY PRODUCTS	1.27	1.77	1.21	1.67	1.12	1.32
FOOD PRODUCT MANUFACTURING	1.46	1.72	2.05	2.78	1.99	2.65
FOOD DISTRIBUTION, RETAIL AND SERVICES	1.46	1.96	1.42	1.94	1.20	1.46

are actually poor generators of spin-off economic activity. They both have employment multipliers (Type II) of 1.4, below average in the context of the whole region, and their value-added impact is just around the regional overall rate, which is not a surprise, given their scale. They should not be viewed as a means of advancing regional economic development except in a highly localized context.

To determine the effect of growth in each of the food system sectors, we have prepared estimates of total job impact per percentage change in direct sales and total value-added change per \$1 of direct sales (Table 21). It is worth remembering that when we look at a job effects of a change in sales or value-added per change in sales, the results, while tied to the sector in which the change is initiated, is going to be distributed across many local industries because the indirect and induced effects are found throughout the local economy. The induced effect is driven by consumer spending, which connects food system labor earning to all of the industries affected through consumption. It is also important to remember that additional sales of some products, particularly farm ones, are not always readily achieved. The production quantities of many crops are fixed in the short-run and may require significant resource reallocations to change the product mix.

Increasing total jobs and value-added (i.e., economic growth) from sector output changes occurs at the fastest rate among the Farm and Fishery Products sectors. As a group, they will generate 2.1 jobs for 1% increase in direct sales, whereas Food Product Manufacturing

generates 0.6 jobs per 1% increase, and Trade and Services jobs growth is between the two but closer to Farm and Fishery Products at 1.7 jobs. For value-added, the greatest increase in the total occurs with Trade and Services at \$1.16 per \$1 change in direct sales. This followed by \$1.08 for Farm and Fishery Products, and Food Product Manufacturing, at \$0.60 per \$1 change in sales. Although lowest in both total job and value-added creation per unit of sales, it may be the case that additional sales are easier to attain in manufacturing products, as it not as likely to be resource constrained as agricultural production, nor demographically limited in volume as with the large retail trade and food services sectors. (The latter can and does see growth, however, with changes through increased tourism and recreational related sales.) We show the job and value-added effects of increased sales by state and sector in the Appendices.

TABLE 21: Regional Impact of Sales Change on Employment and Value-Added

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
New England	1.48	1.03
Oilseed Farming	0.86	1.06
Grain Farming	1.36	0.83
Vegetable and Melon Farming	1.98	0.91
Fruit Farming	2.79	0.96
Greenhouse, Nursery	1.94	1.03
All Other Crops	8.08	1.08
Cattle Ranching and Farming	1.87	0.87
Dairy Cattle and Milk	0.80	0.68
Animal Production	2.21	0.97
Poultry and Egg Production	0.56	0.46
Support for Crops and Animals	3.98	1.31
Fisheries	1.71	1.43
Animal Food Products	0.30	0.31
Grain and Oilseed Milling	0.31	.40
Sugar and Confectionary Prod.	0.66	0.57
Preserved Fruits and Vegetables	0.55	0.53
Fluid Milk Production	0.52	0.56
Cheese Production	0.55	0.50
Other Dairy Products	0.84	0.69
Animal Slaughtering	0.48	0.44
Seafood Product Processing	0.67	0.65
Bakeries and Tortilla Mfg.	1.03	0.81
Other Food Products	0.63	0.59
Breweries	0.45	0.64
All Other Beverages	0.43	0.54
Grocery Wholesaling	1.03	1.15
Farm Product and Bev. Whole.	0.70	1.10
Food and Beverage Retailing	2.00	1.22
Food Services and Bars	1.76	1.14

Sector Group Summary		
FARM AND FISHERY PRODUCTS	2.11	1.08
FOOD PRODUCT MANUFACTURING	0.63	0.60
FOOD DISTRIBUTION, RETAIL AND SERVICES	1.70	1.16



Next Steps

Can the six New England states provide 30% of their food from regional farms and fisheries by 2030? The New England State Food System Planners Partnership, through its *New England Feeding New England* project, set out to explore this question. Inspired by Food Solution New England’s *New England Food Vision* of achieving 50% regional consumption by 2060, our objective was to better understand our current food system environment, and exactly what it will take to grow, raise, produce, harvest, catch and move more food through a complex regional supply chain to our homes and other places we eat.

The 16 NEFNE researchers developed this foundational research so that we can begin to mobilize around a regional food goal, develop strategies, and take action to build a more just, equitable, resilient, and reliable regional food system. A central concept of this approach is the idea of **regional food self-reliance, which is an estimate of how much food we produce compared to how much food we consume.** No single county or state can provide a full menu of food products to meet the needs of its population. For example, within New England, the northern states have *most of the farmland*, while the southern states have *most of the consumers*. Moving toward 30x30 will require, for example, enormous investment in retaining and expanding land in agriculture in the northern states, with most of the people, political power, and potential sources of funding based in southern New England.



A resilient regional food system is both an investment in our shared future and an insurance policy against future risks.

This dynamic—big population centers in the southern states, and major agricultural production in the northern states—sets the stage for exploring regional food self-reliance.

Volume 3 has highlighted that **the economic contribution of New England’s food system is significant, accounting for more than 10% of all jobs and \$190 billion in sales. However, agricultural and seafood employment were essentially flat and sales were down during our period of analysis.** Most New Englanders appreciate and value the community of people working together to catch, raise, and grow food across the region. But, we need to be concerned about the future of regional agriculture and fisheries: farmers, farmworkers, and fishermen are crucial—if undersupported—resources. Without their expertise—and a pipeline of new farmers, farmworkers, and fishermen—opportunities for healthy, reliable regional food systems are drastically decreased.

The Questions We Started With

- » What might change if we intentionally and regionally plan for our future, making significant investments in strengthening our regional food system and communities?
- » If we ate in a healthier, more resilient way, could more of our food be supplied by regional production?
- » Could the six New England states meet a goal of supplying 30% of the region's food by 2030?
- » Do we have the right mix of industries to ramp up food production? What sectors are growing? What sectors are contracting?
- » What market channels offer the best opportunities for sourcing regional and local products?

After a year of intensive exploration by four research teams, we can begin to answer these questions. We have identified key stakeholder groups that we want to engage with over the coming years, because we believe that they have a big role to play in producing and sourcing more regional food and getting into the market channels where most New Englanders access it. We have identified a number of areas where additional investments are most needed to have the greatest impact in order to achieve the 30% regional goal.

The Questions We Now Have

What do we need to do by 2030 to make tangible progress towards this bold vision? What can we do as a region to make our regional food system more equitable and fair, resilient and reliable?

Economic Development Questions

- » What strategies/policies be advanced to retain and expand independent ownership of all types and scales of farms, fishing, and food system businesses?
- » How will climate change impact the viability of agriculture and fisheries in New England?
- » How can we attract more young people to careers in the food system so that we can continue existing and expand additional state-level production in the region?
- » Would converting tipped minimum wage jobs to standard minimum wage jobs be enough to attract people to food service jobs? What additional benefits in fixed work places (e.g., flexible hours, family leave time, benefits) are required?
- » What strategies for expanding value-added production should be explored? What are current limits for expanding value-added production? Should targets for specific industries be created?
- » Should we be concerned about the future of automation in food system occupations?
- » What is the relationship between immigrant labor constraints and national/state policies? How might this issue unfold in New England?
- » How can local/regional demand for food production (including processed and manufactured food and beverages) be increased in the region?

- » What scale of agricultural production could New England move to? If the average size of farms doubled, would that increase production without necessarily requiring new labor? How could the productivity capacity of agriculture in Vermont and Maine be increased?
- » What existing public sector programs and policies need to be expanded to support the viability of regional farms and fisheries?

What Comes Next for the Region?

A regional approach to food system resilience means that we work collectively to adapt, expand, and fortify New England's food production and distribution systems to ensure the availability of adequate, affordable, and culturally appropriate food for all who call New England home. As a collaboration between state-level food system organizations and the region-wide Food Solutions New England network, the New England Feeding New England project provides additional focus for communication, collaboration, and coordination in the region.

It is clear that sustained and collaborative action along with a significant and coordinated investment of resources will be required to meet the 30% by 2030 goal. But we know that the work we intend to do together is by no means the totality of what will be needed. We invite you to consider—and then act upon—how your business, your organization, your community and your choice around the food you consume can contribute towards the regional goal we are inspired to work towards. All of us will need to work together, in alignment, to make progress toward this goal. Each of us—whether we are a farmer, fisher, food entrepreneur, retailer, nonprofit organization, researcher, educator, capital provider, government official, community organizer,

or an “eater”—has an important role to play. Each of us has something to contribute, to advance, to accomplish.

System-level change is by its very nature complex, and no one organization, entity or state can change it alone. System-level change requires collaboration, highly networked multi-stakeholder alignment, transparency, continuous communication and strategic action that is properly resourced and built upon trusted relationships.

So let's come together around this goal of 30% by 2030 so that we can build the kind of equitable, resilient, and reliable regional food system that we need to adapt to climate change and ensure that everyone who lives in New England has access to healthy, regionally sourced food from successful food producers and retailers.

We need to do this. We can do this. We invite you to be part of what comes next.



Endnotes

- 1 Dr. Thomas W. Sproul, February 1, 2015, [The Economic Impact of Rhode Island Plant-Based Industries and Agriculture: An Update to the 2012 Study](#). To highlight the complexity of estimating food production jobs in Rhode Island, Dr. Sproul (University of Rhode Island) found that official data sources significantly underestimated the number of jobs. By his estimate, using surveys, Sproul found at least 2,630 jobs in the agriculture sector alone in Rhode Island in 2012.
- 2 There were a number of earlier censuses but at irregular intervals and with selected industry coverage.
- 3 In nearly all cases where data are suppressed, Census provides the number of business establishments. In many cases, detailed industry employment is given as a range value, sometimes accompanied by sales value. To make estimates for employment when a range is given, we select the center value of the range as our estimate. If no range is given, we estimate sales and employment using estimates for the sales per establishment or sales per employee for the next higher-level of industry aggregation. More comprehensive estimating techniques attempt to use higher level geographic and industry totals that are not suppressed relative to known unsuppressed totals to set limits on the size of missing values and then apportion these to places and/or industries based on known parameters such as establishment counts or other indicators of business activity size that are not suppressed. All methods to fill-in missing data values are prone to error. Such methods produce feasible values, although without having access to the actual figures, the size of errors can not be known.
- 4 See U.S. Bureau of Labor Statistics, <https://www.bls.gov/cps/cpsaat21.htm>. Note: These figures are slightly revised (1% point) from when the original figures were cited.
- 5 The IMPLAN model uses data from a number of benchmark tables going back to the 1970s. Earlier tables have included sectors that are no longer included in the latest BEA accounts, but which they have retained through price-adjustments and various means of disaggregating the activity of certain industries into more detailed industry definitions. These adjustments involve estimations for missing and/or suppressed data that designed to maintain confidentiality of individual firms. It is difficult to determine how accurate these estimates are or how they affect the accuracy of the models' estimates.



Appendices

A. State and Regional Data: Employment and Sales by Sector....	56
B. Sector Economic Multipliers by State.....	71
C. State and Sectoral Job and Value-Added Impact of Unit Changes in Sales.....	86



State and Regional Data: Employment and Sales by Sector

Table A1: New England: Food System Employment and Sales, 2007-2017.....	57
Table A2: Connecticut: Food System Employment and Sales, 2007-2017.....	59
Table A3: Maine: Food System Employment and Sales, 2007-2017.....	61
Table A4: Massachusetts: Food System Employment and Sales, 2007-2017.....	63
Table A5: New Hampshire: Food System Employment and Sales, 2007-2017.....	65
Table A6: Rhode Island: Food System Employment and Sales, 2007-2017.....	67
Table A7: Vermont: Food System Employment and Sales, 2007-2017.....	69

TABLE A1: New England: Food System Employment and Sales, 2007-2017

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FARM AND FISHERIES OUTPUT												
Oilseed Farming	na	na	na	na	na	na	\$821,400	\$2,387,000	\$2,652,400	23.8%	2.1%	12.4%
Grain Farming	na	na	na	na	na	na	\$19,352,200	\$39,544,000	\$56,742,200	15.4%	7.5%	11.4%
Vegetable and Melon Farming	na	na	na	na	na	na	\$3,478,735,000	\$5,140,233,000	\$4,643,904,000	8.1%	-2.0%	2.9%
Fruit Farming	na	na	na	na	na	na	\$3,626,329,000	\$3,649,878,000	\$2,143,680,000	0.1%	-10.1%	-5.1%
Greenhouse, Nursery, Floriculture	na	na	na	na	na	na	\$8,784,247,000	\$6,255,172,000	\$6,300,728,000	-6.6%	0.1%	-3.3%
All Other Crops	na	na	na	na	na	na	\$2,655,510,000	\$2,636,664,900	\$2,502,458,000	-0.1%	-1.0%	-0.6%
Cattle Ranching and Farming	na	na	na	na	na	na	\$1,275,863,000	\$1,129,886,000	\$1,138,866,000	-2.4%	0.2%	-1.1%
Dairy Cattle and Milk Production	na	na	na	na	na	na	\$5,702,892,000	\$7,330,798,000	\$6,598,518,000	5.2%	-2.1%	1.5%
All Other Animal Production	na	na	na	na	na	na	\$1,590,701,000	\$2,041,700,000	\$2,022,838,000	5.1%	-0.2%	2.4%
Poultry and Egg Production	na	na	na	na	na	na	\$1,483,606,000	\$1,005,573,000	\$62,596,900	-7.5%	-9.0%	-8.3%
FARM OUTPUT SUBTOTAL	na	na	na	na	na	na	\$2,879,661,900	\$2,960,920,600	\$2,657,090,700	0.6%	-2.1%	-0.8%
Farm Producers	53,567	57,248	57,019	1.3%	-0.1%	0.6%	na	na	na	na	na	na
Hired Farm Labor	56,738	61,635	53,528	1.7%	-2.8%	-0.6%	na	na	na	na	na	na
FARMERS AND WORKERS SUBTOTAL	110,305	118,883	110,547	1.5%	-1.4%	0.0%	na	na	na	na	na	na
Support Activities for Crop Production	1,775	1,931	2,258	1.7%	3.2%	2.4%	\$45,113,800	\$32,233,000	\$50,693,100	-6.5%	9.5%	1.2%
Support Activities for Animal Production	3,444	2,438	2,709	-6.7%	2.1%	-2.4%	\$76,579,300	\$63,913,200	\$68,345,000	-3.6%	1.3%	-1.1%
SUPPORT FOR FARM PRODUCTION SUBTOTAL	5,219	4,369	4,967	-3.5%	2.6%	-0.5%	\$121,693,100	\$96,146,200	\$119,038,100	-4.6%	4.4%	-0.2%
FARM TOTAL	115,524	123,252	115,514	1.3%	-1.3%	0.0%	\$3,117,423,100	\$2,668,681,300	\$2,676,942,800	-3.1%	0.1%	-1.5%
Fisheries	12,051	11,391	11,558	-1.1%	0.3%	-0.4%	\$1,474,444,000	\$1,716,282,000	\$1,437,418,000	3.1%	-3.5%	-0.3%
FISHERIES TOTAL	12,051	11,391	11,558	-1.1%	0.3%	-0.4%	\$1,474,444,000	\$1,716,282,000	\$1,437,418,000	3.1%	-3.5%	-0.3%
AGRICULTURE AND FISHERIES TOTAL	127,575	134,643	127,072	1.1%	-1.2%	0.0%	\$4,475,799,000	\$4,773,348,800	\$4,213,546,800	1.3%	-2.5%	-0.6%

TABLE A1: New England: Food System Employment and Sales, 2007-2017, continued

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FOOD AND BEVERAGE MANUFACTURING OUTPUT												
Animal Food	257	409	481	9.7%	3.3%	6.5%	\$310,719,800	\$154,948,300	\$366,798,000	-13.0%	18.8%	1.7%
Grain and Oilseed Milling	418	342	298	-3.9%	-2.7%	-3.3%	\$232,101,400	\$147,250,900	\$264,125,300	-8.7%	12.4%	1.3%
Sugar and Confectionary Products	3,231	3,590	3,354	2.1%	-1.4%	0.4%	\$976,939,700	\$1,524,609,800	\$887,387,800	9.3%	-10.3%	-1.0%
Fruit and Vegetable Preserving	3,415	3,164	3,626	-1.5%	2.8%	0.6%	\$1,448,194,900	\$1,177,083,600	\$1,480,566,000	-4.1%	4.7%	0.2%
Dairy Products	6,276	6,090	5,827	-0.6%	-0.9%	-0.7%	\$4,998,338,200	\$4,877,632,000	\$4,070,103,000	-0.5%	-3.6%	-2.0%
Fluid Milk	2,982	3,542	3,167	3.5%	-2.2%	0.6%	\$2,169,610,800	\$3,001,376,500	\$1,994,974,300	6.7%	-7.8%	-0.8%
Cheese	1,039	955	1,086	-1.7%	2.6%	0.4%	\$895,577,600	\$816,735,900	\$671,962,200	-1.8%	-3.8%	-2.8%
Other Dairy Products	2,255	1,593	1,574	-6.7%	-0.2%	-3.5%	\$1,933,149,800	\$1,059,519,600	\$1,403,166,600	-11.3%	5.8%	-3.2%
Animal Slaughtering and Processing	3,362	2,919	3,792	-2.8%	5.4%	1.2%	\$1,131,800,000	\$1,210,040,800	\$1,283,564,100	1.3%	1.2%	1.3%
Seafood Products	2,723	2,867	2,904	1.0%	0.3%	0.6%	\$1,917,205,200	\$1,809,080,900	\$1,899,393,900	-1.2%	1.0%	-0.1%
Bakeries and Tortilla Manufacturing	16,321	14,303	15,472	-2.6%	1.6%	-0.5%	\$3,853,169,900	\$2,437,502,800	\$3,158,710,400	-8.8%	5.3%	-2.0%
Other Food Products	6,167	7,574	8,853	4.2%	3.2%	3.7%	\$3,525,878,900	\$3,983,312,800	\$4,402,655,600	2.5%	2.0%	2.2%
FOOD PRODUCTS TOTAL	42,170	41,258	44,607	-0.4%	1.6%	0.6%	\$18,394,347,800	\$17,321,462,000	\$17,813,304,200	-1.2%	0.6%	-0.3%
Breweries	1,107	1,187	3,701	1.4%	25.5%	12.8%	\$916,439,000	\$449,728,400	\$1,141,954,700	-13.3%	20.5%	2.2%
All Other Beverages	4,962	5,174	4,671	0.8%	-2.0%	-0.6%	\$3,637,872,300	\$1,927,115,100	\$2,866,093,400	-11.9%	8.3%	-2.4%
BEVERAGE PRODUCTS TOTAL	6,069	6,361	8,372	0.9%	5.6%	3.3%	\$4,554,311,300	\$2,376,843,500	\$4,008,048,100	-12.2%	11.0%	-1.3%
FOOD AND BEVERAGE PRODUCTS TOTAL	48,239	47,619	52,979	-0.3%	2.2%	0.9%	\$22,948,659,100	\$19,698,305,500	\$21,821,352,200	-3.0%	2.1%	-0.5%
DETAILED TRADE OUTPUT												
Grocery Wholesaling	40,117	39,223	41,547	-0.4%	1.2%	0.4%	\$42,086,950,800	\$51,361,742,000	\$64,024,085,900	4.1%	4.5%	4.3%
Farm Product Raw Material Wholesalers	480	199	268	-16.1%	6.1%	-5.7%	\$110,038,400	\$332,430,500	\$1,538,537,200	24.7%	35.9%	30.2%
Beer, Wine, and Distilled Beverage Whole.	9,520	9,775	10,523	0.5%	1.5%	1.0%	\$8,793,968,200	\$7,424,054,800	\$7,223,474,200	-3.3%	-0.5%	-1.9%
Farm Supplies Merchant Wholesalers	1,334	1,095	1,440	-3.9%	5.6%	0.8%	\$1,422,032,300	\$2,053,629,000	\$3,419,492,700	7.6%	10.7%	9.2%
WHOLESALE TOTAL	51,451	50,292	53,778	-0.5%	1.3%	0.4%	\$52,412,989,700	\$61,171,856,200	\$76,205,590,100	3.1%	4.5%	3.8%
Food and Beverage Stores	190,217	207,291	204,711	1.7%	-0.3%	0.7%	\$52,384,236,800	\$51,546,008,200	\$50,023,491,500	-0.3%	-0.6%	-0.5%
FOOD AND BEVERAGE STORES TOTAL	190,217	207,291	204,711	1.7%	-0.3%	0.7%	\$52,384,236,800	\$51,546,008,200	\$50,023,491,500	-0.3%	-0.6%	-0.5%
FOOD DISTRIBUTION AND RETAIL TRADE TOTAL	241,668	257,583	258,489	1.3%	0.1%	0.7%	\$104,797,226,500	\$112,717,864,400	\$126,229,081,500	1.5%	2.3%	1.9%
Food Services and Drinking Places	471,494	495,349	560,737	1.0%	2.5%	1.7%	\$31,787,647,600	\$32,291,029,400	\$37,569,985,000	0.3%	3.1%	1.7%
FOOD SERVICES AND DRINKING PLACES TOTAL	471,494	495,349	560,737	1.0%	2.5%	1.7%	\$31,787,647,600	\$32,291,029,400	\$37,569,985,000	0.3%	3.1%	1.7%
FOOD SYSTEM GRAND TOTAL	888,976	935,194	999,277	1.0%	1.3%	1.2%	\$164,009,332,200	\$169,480,548,100	\$189,833,965,600	0.7%	2.3%	1.5%

TABLE A2: Connecticut: Food System Employment and Sales, 2007-2017

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FARM AND FISHERIES OUTPUT												
Oilseed Farming	na	na	na	na	na	na	\$73,800	\$76,300	\$284,700	0.7%	30.1%	14.5%
Grain Farming	na	na	na	na	na	na	\$2,303,100	\$8,493,000	\$11,868,000	29.8%	6.9%	17.8%
Vegetable and Melon Farming	na	na	na	na	na	na	\$37,749,900	\$49,689,300	\$45,588,600	5.6%	-1.7%	1.9%
Fruit Farming	na	na	na	na	na	na	\$41,918,100	\$33,723,900	\$26,837,700	-4.3%	-4.5%	-4.4%
Greenhouse, Nursery, Floriculture	na	na	na	na	na	na	\$380,765,300	\$272,113,700	\$305,616,500	-6.5%	2.3%	-2.2%
All Other Crops	na	na	na	na	na	na	\$101,560,600	\$61,607,900	\$45,841,700	-9.5%	-5.7%	-7.6%
Cattle Ranching and Farming	na	na	na	na	na	na	\$11,686,400	\$8,965,200	\$11,030,800	-5.2%	4.2%	-0.6%
Dairy Cattle and Milk Production	na	na	na	na	na	na	\$51,127,800	\$63,656,100	\$64,943,800	4.5%	0.4%	2.4%
All Other Animal Production	na	na	na	na	na	na	\$31,309,600	\$33,466,800	\$33,570,300	1.3%	0.1%	0.7%
Poultry and Egg Production	na	na	na	na	na	na	\$41,307,700	\$38,280,400	\$27,313,500	-1.5%	-6.5%	-4.1%
FARM OUTPUT SUBTOTAL	na	na	na	na	na	na	\$699,802,200	\$570,072,500	\$572,895,600	-4.0%	0.1%	-2.0%
Farm Producers	7,913	9,880	9,526	4.5%	-0.7%	1.9%	na	na	na	na	na	na
Hired Farm Labor	13,061	13,719	11,897	1.0%	-2.8%	-0.9%	na	na	na	na	na	na
FARMERS AND WORKERS SUBTOTAL	20,974	23,599	21,423	2.4%	-1.9%	0.2%	na	na	na	na	na	na
Support Activities for Crop Production	230	267	190	3.0%	-6.6%	-1.9%	\$5,237,400	\$5,069,000	\$5,253,800	-0.7%	0.7%	0.0%
Support Activities for Animal Production	515	524	533	0.3%	0.3%	0.3%	\$5,069,000	\$14,098,600	\$13,805,900	22.7%	-0.4%	10.5%
SUPPORT FOR FARM PRODUCTION SUBTOTAL	745	791	723	1.2%	-1.8%	-0.3%	\$10,306,400	\$19,167,600	\$19,059,700	13.2%	-0.1%	6.3%
FARM TOTAL	21,719	24,390	22,146	2.3%	-1.9%	0.2%	\$710,108,600	\$589,240,100	\$591,955,300	-3.7%	0.1%	-1.8%
Fisheries	391	361	332	-1.6%	-1.7%	-1.6%	\$67,659,000	\$28,530,000	\$14,877,000	-15.9%	-12.2%	-14.1%
FISHERIES TOTAL	391	361	332	-1.6%	-1.7%	-1.6%	\$67,659,000	\$28,530,000	\$14,877,000	-15.9%	-12.2%	-14.1%
AGRICULTURE AND FISHERIES TOTAL	22,110	24,751	22,478	2.3%	-1.9%	0.2%	\$777,767,600	\$617,770,100	\$606,832,300	-4.5%	-0.4%	-2.5%

TABLE A2: Connecticut: Food System Employment and Sales, 2007-2017, continued

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED MANUFACTURING OUTPUT												
Animal Food	0	60	19	nm	-20.5%	nm	\$0.0	\$22,730,800	\$14,488,900	nm	-8.6%	nm
Grain and Oilseed Milling	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Sugar and Confectionary Products	527	227	375	-15.5%	10.6%	-3.3%	\$145,269,500	\$96,402,900	\$88,538,600	-7.9%	-1.7%	-4.8%
Fruit and Vegetable Preserving	336	411	435	4.1%	1.1%	2.6%	\$146,794,700	\$152,901,800	\$240,396,500	0.8%	9.5%	5.1%
Dairy Products	838	791	835	-1.1%	1.1%	0.0%	\$641,755,400	\$621,160,600	\$614,940,300	-0.7%	-0.2%	-0.4%
Fluid Milk	436	375	375	-3.0%	0.0%	-1.5%	\$311,064,700	\$324,016,700	\$251,347,500	0.8%	-5.0%	-2.1%
Cheese	118	175	159	8.2%	-1.9%	3.0%	\$101,514,400	\$147,779,000	\$48,162,600	7.8%	-20.1%	-7.2%
Other Dairy Products	284	241	301	-3.2%	4.5%	0.6%	\$229,176,200	\$149,364,900	\$315,430,100	-8.2%	16.1%	3.2%
Animal Slaughtering and Processing	452	375	396	-3.7%	1.1%	-1.3%	\$123,611,200	\$151,173,400	\$85,650,400	4.1%	-10.7%	-3.6%
Seafood Products	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Bakeries and Tortilla Manufacturing	3,586	2,874	3,276	-4.3%	2.7%	-0.9%	\$1,480,662,000	\$500,247,600	\$830,155,900	-19.5%	10.7%	-5.6%
Other Food Products	1,529	968	1,687	-8.7%	11.8%	1.0%	\$1,064,242,700	\$509,089,900	\$1,030,605,300	-13.7%	15.1%	-0.3%
FOOD PRODUCTS TOTAL	7,268	5,706	7,023	-4.7%	4.2%	-0.3%	\$3,602,335,500	\$2,053,707,100	\$2,904,775,900	-10.6%	7.2%	-2.1%
Breweries	0	17	396	nm	87.7%	nm	\$0.0	\$6,440,900	\$122,187,000	nm	80.1%	nm
All Other Beverages	750	358	354	-13.7%	-0.2%	-7.2%	\$582,135,800	\$135,298,800	\$252,160,900	-25.3%	13.3%	-8.0%
BEVERAGE PRODUCTS TOTAL	750	375	750	-12.9%	14.9%	0.0%	\$582,135,800	\$141,739,700	\$374,347,900	-24.6%	21.4%	-4.3%
FOOD AND BEVERAGE PRODUCTS TOTAL	8,018	6,081	7,773	-5.4%	5.0%	-0.3%	\$4,184,471,200	\$2,195,446,800	\$3,279,123,800	-12.1%	8.4%	-2.4%
DETAILED TRADE OUTPUT												
Grocery Wholesaling	10,401	10,184	10,958	-0.4%	1.5%	0.5%	\$12,270,575,700	\$17,018,028,200	\$20,040,789,300	6.8%	3.3%	5.0%
Farm Product Raw Material Wholesalers	175	60	135	-19.3%	17.6%	-2.6%	\$40,118,200	\$100,230,300	\$844,927,200	20.1%	53.2%	35.6%
Beer, Wine, and Distilled Beverage Whole.	2,739	2,418	2,547	-2.5%	1.0%	-0.7%	\$3,251,964,800	\$1,839,961,800	\$2,389,041,400	-10.8%	5.4%	-3.0%
Farm Supplies Merchant Wholesalers	375	199	431	-11.9%	16.7%	1.4%	\$399,746,700	\$518,972,000	\$2,293,381,200	5.4%	34.6%	19.1%
WHOLESALING TOTAL	13,690	12,861	14,071	-1.2%	1.8%	0.3%	\$15,962,405,400	\$19,477,192,300	\$25,568,139,200	4.1%	5.6%	4.8%
Food and Beverage Stores	41,163	43,566	44,728	1.1%	0.5%	0.8%	\$12,462,141,200	\$11,976,089,500	\$11,260,472,900	-0.8%	-1.2%	-1.0%
FOOD AND BEVERAGE STORES TOTAL	41,163	43,566	44,729	1.1%	0.5%	0.8%	\$12,462,141,200	\$11,976,089,500	\$11,260,472,900	-0.8%	-1.2%	-1.0%
FOOD DISTRIBUTION AND RETAIL TRADE TOTAL	54,853	56,427	58,799	0.6%	0.8%	0.7%	\$28,424,546,600	\$31,453,281,800	\$36,828,612,000	2.0%	3.2%	2.6%
Food Services and Drinking Places	100,129	107,171	122,550	1.4%	2.7%	2.0%	\$7,208,838,800	\$7,369,949,600	\$8,212,897,200	0.4%	2.2%	1.3%
FOOD SERVICES AND DRINKING PLACES TOTAL	100,129	107,171	122,550	1.4%	2.7%	2.0%	\$7,208,838,800	\$7,369,949,600	\$8,212,897,200	0.4%	2.2%	1.3%
FOOD SYSTEM GRAND TOTAL	185,110	194,430	211,600	1.0%	1.7%	1.3%	\$40,595,624,300	\$41,636,448,300	\$48,927,465,300	0.5%	3.3%	1.9%

TABLE A3: Maine: Food System Employment and Sales, 2007-2017

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FARM AND FISHERIES OUTPUT												
Oilseed Farming	na	na	na	na	na	na	\$322,800	\$639,900	\$425,500	14.7%	-7.8%	2.8%
Grain Farming	na	na	na	na	na	na	\$9,107,300	\$10,363,200	\$17,270,200	2.6%	10.8%	6.6%
Vegetable and Melon Farming	na	na	na	na	na	na	\$193,740,800	\$283,029,100	\$248,378,900	7.9%	-2.6%	2.5%
Fruit Farming	na	na	na	na	na	na	\$124,671,200	\$141,383,100	\$55,087,100	2.5%	-17.2%	-7.8%
Greenhouse, Nursery, Floriculture	na	na	na	na	na	na	\$73,102,100	\$81,774,100	\$73,119,900	2.3%	-2.2%	0.0%
All Other Crops	na	na	na	na	na	na	\$35,937,900	\$60,675,500	\$49,608,200	11.0%	-3.9%	3.3%
Cattle Ranching and Farming	na	na	na	na	na	na	\$19,458,700	\$28,571,700	\$24,909,600	8.0%	-2.7%	2.5%
Dairy Cattle and Milk Production	na	na	na	na	na	na	\$89,332,600	\$115,417,800	\$107,836,400	5.3%	-1.3%	1.9%
All Other Animal Production	na	na	na	na	na	na	\$49,257,300	\$93,785,400	\$82,450,100	13.7%	-2.5%	5.3%
Poultry and Egg Production	na	na	na	na	na	na	\$69,187,700	\$30,507,400	\$13,179,700	-15.1%	-15.5%	-15.3%
FARM OUTPUT	na	na	na	na	na	na	\$664,118,500	\$846,147,200	\$672,265,500	5.0%	-4.5%	0.1%
Farm Producers	13,063	13,406	13,414	0.5%	0.0%	0.3%	na	na	na	na	na	na
Hired Farm Labor	15,634	15,072	13,440	-0.7%	-2.3%	-1.5%	na	na	na	na	na	na
FARMERS AND WORKERS	28,697	28,478	26,854	-0.2%	-1.2%	-0.7%	na	na	na	na	na	na
Support Activities for Crop Production	464	438	831	-1.1%	13.7%	6.0%	\$9,512,700	\$6,058,700	\$20,962,000	-8.6%	28.2%	8.2%
Support Activities for Animal Production	378	289	382	-5.2%	5.7%	0.1%	\$13,830,200	\$9,339,600	\$9,285,600	-7.6%	-0.1%	-3.9%
SUPPORT FOR FARM PRODUCTION	842	727	1,213	-2.9%	10.8%	3.7%	\$23,342,900	\$15,398,300	\$30,247,600	-8.0%	14.5%	2.6%
FARM TOTAL	29,539	29,205	28,067	-0.2%	-0.8%	-0.5%	\$687,461,400	\$861,545,500	\$702,513,100	4.6%	-4.0%	0.2%
Fisheries	6,698	6,440	6,838	-0.8%	1.2%	0.2%	\$588,319,000	\$716,206,000	\$622,164,000	4.0%	-2.8%	0.6%
FISHERIES TOTAL	6,698	6,440	6,838	-0.8%	1.2%	0.2%	\$588,319,000	\$716,206,000	\$622,164,000	4.0%	-2.8%	0.6%
AGRICULTURE AND FISHERIES TOTAL	36,237	35,645	34,905	-0.3%	-0.4%	-0.4%	\$1,275,780,400	\$1,577,751,500	\$1,324,677,100	4.3%	-3.4%	0.4%

TABLE A3: Maine: Food System Employment and Sales, 2007-2017, continued

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED MANUFACTURING OUTPUT												
Animal Food	0	54	57	nm	1.1%	nm	\$0.0	\$20,457,700	\$62,356,100	nm	25.0%	nm
Grain and Oilseed Milling	119	0	0	-100%	0.0%	-100%	\$47,371,000	\$0.0	\$0.0	-100%	0.0%	-100%
Sugar and Confectionary Products	527	60	144	nm	19.1%	nm	\$0.0	\$25,480,900	\$11,461,100	nm	-14.8%	nm
Fruit and Vegetable Preserving	1,735	1,329	1,348	-5.2%	0.3%	-2.5%	\$748,921,800	\$494,419,800	\$480,830,300	-8.0%	-0.6%	-4.3%
Dairy Products	559	475	380	-3.2%	-4.4%	-3.8%	\$359,579,400	\$381,711,800	\$254,861,800	1.2%	-7.8%	-3.4%
Fluid Milk	504	432	300	-3.0%	-7.0%	-5.1%	\$359,579,400	\$373,267,300	\$201,078,000	0.7%	-11.6%	-5.6%
Cheese	0	10	10	nm	0.0%	nm	\$0.0	\$8,444,500	\$6,187,500	nm	-6.0%	nm
Other Dairy Products	55	33	70	-9.7%	16.2%	2.4%	\$0.0	\$0.0	\$47,596,200	0.0%	0.0%	nm
Animal Slaughtering and Processing	0	80	88	nm	1.9%	nm	\$0.0	\$32,250,300	\$14,299,900	nm	-15.0%	nm
Seafood Products	393	430	407	1.8%	-1.1%	0.4%	\$92,144,900	\$104,018,900	\$234,219,000	2.5%	17.6%	9.8%
Bakeries and Tortilla Manufacturing	2,720	1,750	1,469	-8.4%	-3.4%	-6.0%	\$595,375,800	\$304,604,500	\$272,007,400	-12.5%	-2.2%	-7.5%
Other Food Products	532	521	1,219	-0.4%	18.5%	8.6%	\$388,644,800	\$271,967,200	\$383,392,300	-6.9%	7.1%	-0.1%
FOOD PRODUCTS TOTAL	6,058	4,699	5,112	-5.0%	1.7%	-1.7%	\$2,232,037,800	\$1,634,911,100	\$1,713,427,700	-6.0%	0.9%	-2.6%
Breweries	0	139	612	nm	34.5%	nm	\$0.0	\$52,664,100	\$115,668,600	nm	17.0%	nm
All Other Beverages	1,307	611	1,138	-14.1%	13.2%	-1.4%	\$1,277,155,300	\$230,815,400	\$757,810,000	-29.0%	26.8%	-5.1%
BEVERAGE PRODUCTS TOTAL	1,307	750	1,750	-10.5%	18.5%	3.0%	\$1,277,155,300	\$283,479,400	\$873,478,500	-26.0%	25.2%	-3.7%
FOOD AND BEVERAGE PRODUCTS TOTAL	7,365	5,449	6,862	-5.8%	4.7%	-0.7%	\$3,509,193,000	\$1,918,390,600	\$2,586,906,300	-11.4%	6.2%	-3.0%
DETAILED TRADE OUTPUT												
Grocery Wholesaling	3,983	3,446	3,458	-2.9%	0.1%	-1.4%	\$2,703,051,400	\$2,500,019,500	\$3,241,817,200	-1.5%	5.3%	1.8%
Farm Product Raw Material Wholesalers	50	0	0	-100%	0.0%	-100%	\$11,462,300	\$0.0	\$0.0	-100%	0.0%	-100%
Beer, Wine, and Distilled Beverage Whole.	1,014	1,084	1,225	1.3%	2.5%	1.9%	\$646,703,600	\$808,014,700	\$527,108,200	4.6%	-8.2%	-2.0%
Farm Supplies Merchant Wholesalers	60	75	175	4.6%	18.5%	11.3%	\$50,650,000	\$57,663,100	\$415,563,300	2.6%	48.4%	23.4%
WHOLESALING TOTAL	5,107	4,605	4,858	-2.0%	1.1%	-0.5%	\$3,411,867,300	\$3,365,697,200	\$4,184,488,700	-0.3%	4.5%	2.1%
Food and Beverage Stores	17,274	18,108	18,269	0.9%	0.2%	0.6%	\$4,654,517,000	\$4,556,734,600	\$4,433,197,000	-0.4%	-0.5%	-0.5%
FOOD AND BEVERAGE STORES TOTAL	17,274	18,108	18,269	0.9%	0.2%	0.6%	\$4,654,517,000	\$4,556,734,600	\$4,433,197,000	-0.4%	-0.5%	-0.5%
FOOD DISTRIBUTION AND RETAIL TRADE TOTAL	22,381	22,713	23,127	0.3%	0.4%	0.3%	\$8,066,384,300	\$7,922,431,800	\$8,617,685,700	-0.4%	1.7%	0.7%
Food Services and Drinking Places	39,919	40,538	44,641	0.3%	1.9%	1.1%	\$2,369,151,200	\$2,323,236,400	\$2,792,142,900	-0.4%	3.7%	1.7%
FOOD SERVICES AND DRINKING PLACES TOTAL	39,919	40,538	44,641	0.3%	1.9%	1.1%	\$2,369,151,200	\$2,323,236,400	\$2,792,142,900	-0.4%	3.7%	1.7%
FOOD SYSTEM GRAND TOTAL	105,902	104,345	109,535	-0.3%	1.0%	0.3%	\$15,220,508,900	\$13,741,810,300	\$15,321,411,900	-2.0%	2.2%	0.1%

TABLE A4: Massachusetts: Food System Employment and Sales, 2007-2017

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FARM AND FISHERIES OUTPUT												
Oilseed Farming	na	na	na	na	na	na	\$13,200	\$254,000	\$176,700	80.6%	-7.0%	29.6%
Grain Farming	na	na	na	na	na	na	\$1,814,700	\$3,950,700	\$5,701,100	16.8%	7.6%	12.1%
Vegetable and Melon Farming	na	na	na	na	na	na	\$73,901,400	\$110,900,200	\$114,567,600	8.5%	0.7%	4.5%
Fruit Farming	na	na	na	na	na	na	\$147,268,700	\$154,858,400	\$94,574,200	1.0%	-9.4%	-4.3%
Greenhouse, Nursery, Floriculture	na	na	na	na	na	na	\$239,256,700	\$155,128,300	\$143,104,100	-8.3%	-1.6%	-5.0%
All Other Crops	na	na	na	na	na	na	\$47,705,100	\$26,323,400	\$28,573,700	-11.2%	1.7%	-5.0%
Cattle Ranching and Farming	na	na	na	na	na	na	\$15,462,600	\$8,737,200	\$10,508,500	-10.8%	3.8%	-3.8%
Dairy Cattle and Milk Production	na	na	na	na	na	na	\$35,682,300	\$40,331,300	\$36,332,300	2.5%	-2.1%	0.2%
All Other Animal Production	na	na	na	na	na	na	\$43,358,000	\$44,372,900	\$44,049,400	0.5%	-0.1%	0.2%
Poultry and Egg Production	na	na	na	na	na	na	\$12,050,000	\$9,204,400	\$9,633,400	-5.2%	0.9%	-2.2%
FARM OUTPUT SUBTOTAL	na	na	na	na	na	na	\$616,512,600	\$554,060,900	\$487,221,000	-2.1%	-2.5%	-2.3%
Farm Producers	12,265	12,595	12,778	0.5%	0.3%	0.4%	na	na	na	na	na	na
Hired Farm Labor	13,039	15,649	13,142	3.7%	-3.4%	0.1%	na	na	na	na	na	na
FARMERS AND WORKERS SUBTOTAL	25,304	28,244	25,920	2.2%	-1.7%	0.2%	na	na	na	na	na	na
Support Activities for Crop Production	559	559	501	0.0%	-2.2%	-1.1%	\$13,849,700	\$8,534,200	\$8,287,200	-9.2%	-0.6%	-5.0%
Support Activities for Animal Production	1,679	812	909	-13.5%	2.3%	-6.0%	\$27,673,900	\$18,217,200	\$20,623,800	-8.0%	2.5%	-2.9%
SUPPORT FOR FARM PRODUCTION SUBTOTAL	2,238	1,371	1,410	-9.3%	0.6%	-4.5%	\$41,523,600	\$26,751,400	\$28,911,000	-8.4%	1.6%	-3.6%
FARM TOTAL	27,542	29,615	27,330	1.5%	-1.6%	-0.1%	\$658,036,200	\$580,812,300	\$516,132,000	-2.5%	-2.3%	-2.4%
Fisheries	3,427	3,226	3,091	-1.2%	-0.9%	-1.0%	\$674,827,000	\$830,611,000	\$652,067,000	4.2%	-4.7%	-0.3%
FISHERIES TOTAL	3,427	3,226	3,091	-1.2%	-0.9%	-1.0%	\$674,827,000	\$830,611,000	\$652,067,000	4.2%	-4.7%	-0.3%
AGRICULTURE AND FISHERIES TOTAL	30,969	32,841	30,421	1.2%	-1.5%	-0.2%	\$1,332,863,200	\$1,411,423,300	\$1,168,199,000	1.2%	-3.7%	-1.3%

TABLE A4: Massachusetts: Food System Employment and Sales, 2007-2017, continued

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED MANUFACTURING OUTPUT												
Animal Food	0	60	81	nm	6.2%	nm	\$0.0	\$22,730,800	\$33,999,900	nm	8.4%	nm
Grain and Oilseed Milling	299	342	298	2.7%	-2.7%	0.0%	\$184,730,400	\$147,250,900	\$264,125,300	-4.4%	12.4%	3.6%
Sugar and Confectionary Products	1,610	1,146	1,152	-6.6%	0.1%	nm	\$500,883,400	\$486,686,000	\$180,928,200	-0.6%	-18.0%	-9.7%
Fruit and Vegetable Preserving	1,037	1,014	1,490	-0.4%	8.0%	3.7%	\$422,289,200	\$377,232,200	\$688,611,900	-2.2%	12.8%	5.0%
Dairy Products	2,496	2,207	1,911	-2.4%	-2.8%	-2.6%	\$1,919,159,800	\$1,663,012,700	\$1,125,110,800	-2.8%	-7.5%	-5.2%
Fluid Milk	1,482	1,750	1,307	3.4%	-5.7%	-1.2%	\$1,057,334,700	\$1,512,078,100	\$876,337,000	7.4%	-10.3%	-1.9%
Cheese	0	10	60	nm	43.1%	nm	\$0.0	\$18,729,100	\$37,125,000	nm	14.7%	nm
Other Dairy Products	1,014	447	544	-15.1%	4.0%	-6.0%	\$861,825,200	\$132,205,500	\$211,955,900	-31.3%	9.9%	-13.1%
Animal Slaughtering and Processing	2,148	1,750	2,289	-4.0%	5.5%	0.6%	\$798,035,400	\$738,783,000	\$886,337,000	-1.5%	3.7%	1.1%
Seafood Products	2,023	2,262	2,322	2.3%	0.5%	1.4%	\$1,664,481,400	\$1,594,636,800	\$1,550,714,300	-0.9%	-0.6%	-0.7%
Bakeries and Tortilla Manufacturing	7,698	7,500	8,287	-0.5%	2.0%	0.7%	\$1,402,555,300	\$1,253,374,500	\$1,623,284,700	-2.2%	5.3%	1.5%
Other Food Products	3,181	3,380	4,488	1.2%	5.8%	3.5%	\$1,540,967,700	\$1,779,644,000	\$2,192,980,000	2.9%	4.3%	3.6%
FOOD PRODUCTS TOTAL	20,492	19,661	22,318	-0.8%	2.6%	0.9%	\$8,433,102,500	\$8,063,350,900	\$8,546,092,100	-0.9%	1.2%	0.1%
Breweries	175	375	1,352	16.5%	29.2%	22.7%	\$144,875,200	\$142,079,300	\$269,257,900	-0.4%	13.6%	6.4%
All Other Beverages	2,278	3,375	2,398	8.2%	-6.6%	0.5%	\$1,119,247,300	\$1,275,317,900	\$1,602,481,800	2.6%	4.7%	3.7%
BEVERAGE PRODUCTS TOTAL	2,453	3,750	3,750	8.9%	0.0%	4.3%	\$1,264,122,500	\$1,417,397,200	\$1,871,739,700	2.3%	5.7%	4.0%
FOOD AND BEVERAGE PRODUCTS TOTAL	22,945	23,411	26,068	0.4%	2.2%	1.3%	\$9,697,225,000	\$9,480,748,100	\$10,417,831,800	-0.5%	1.9%	0.7%
DETAILED TRADE OUTPUT												
Grocery Wholesaling	18,454	18,308	18,814	-0.2%	0.5%	0.2%	\$21,496,948,000	\$22,812,814,500	\$26,976,162,200	1.2%	3.4%	2.3%
Farm Product Raw Material Wholesalers	175	69	60	-17.0%	-2.8%	-10.2%	\$40,118,200	\$115,264,800	\$344,448,600	23.5%	24.0%	24.0%
Beer, Wine, and Distilled Beverage Whole.	3,892	4,228	4,556	1.7%	1.5%	1.6%	\$3,163,294,500	\$3,211,365,600	\$2,924,639,400	0.3%	-1.9%	-0.8%
Farm Supplies Merchant Wholesalers	548	491	537	-2.2%	1.8%	-0.2%	\$600,304,900	\$413,197,100	\$453,960,500	-7.2%	1.9%	-2.8%
WHOLESALE TOTAL	23,069	23,096	23,967	0.0%	0.7%	0.4%	\$25,300,665,600	\$26,552,642,000	\$30,699,210,600	1.0%	2.9%	2.0%
Food and Beverage Stores	90,032	99,593	98,789	2.0%	-0.2%	0.9%	\$23,821,831,700	\$23,718,166,300	\$23,469,398,400	-0.1%	-0.2%	-0.1%
FOOD AND BEVERAGE STORES TOTAL	90,032	99,593	98,789	2.0%	-0.2%	0.9%	\$23,821,831,700	\$23,718,166,300	\$23,469,398,400	-0.1%	-0.2%	-0.1%
FOOD DISTRIBUTION AND RETAIL TRADE TOTAL	113,101	122,689	122,756	1.6%	0.0%	0.8%	\$49,122,497,400	\$50,270,808,300	\$54,168,609,100	0.5%	1.5%	1.0%
Food Services and Drinking Places	225,602	243,840	278,738	1.6%	2.7%	2.1%	\$16,020,173,200	\$16,493,944,500	\$19,496,150,600	0.6%	3.4%	2.0%
FOOD SERVICES AND DRINKING PLACES TOTAL	225,602	243,840	278,738	1.6%	2.7%	2.1%	\$16,020,173,200	\$16,493,944,500	\$19,496,150,600	0.6%	3.4%	2.0%
FOOD SYSTEM GRAND TOTAL	392,617	422,781	457,983	1.5%	1.6%	1.6%	\$76,172,758,800	\$77,656,924,200	\$85,250,790,400	0.4%	1.9%	1.1%

TABLE A5: New Hampshire: Food System Employment and Sales, 2007-2017

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FARM AND FISHERIES OUTPUT												
Oilseed Farming	na	na	na	na	na	na	\$0.0	\$0.0	\$23,300	0.0%	nm	nm
Grain Farming	na	na	na	na	na	na	\$860,100	\$2,854,200	\$4,438,500	27.1%	9.2%	17.8%
Vegetable and Melon Farming	na	na	na	na	na	na	\$15,879,200	\$28,610,000	\$20,194,500	12.5%	-6.7%	2.4%
Fruit Farming	na	na	na	na	na	na	\$18,979,600	\$13,289,100	\$13,846,100	-6.9%	0.8%	-3.1%
Greenhouse, Nursery, Floriculture	na	na	na	na	na	na	\$92,714,500	\$53,677,600	\$54,597,500	-10.4%	0.3%	-5.2%
All Other Crops	na	na	na	na	na	na	\$20,353,500	\$15,091,000	\$19,929,500	-5.8%	5.7%	-0.2%
Cattle Ranching and Farming	na	na	na	na	na	na	\$8,378,700	\$8,713,300	\$9,150,100	0.8%	1.0%	0.9%
Dairy Cattle and Milk Production	na	na	na	na	na	na	\$41,793,900	\$49,945,200	\$42,034,200	3.6%	-3.4%	0.1%
All Other Animal Production	na	na	na	na	na	na	\$15,172,000	\$12,595,000	\$15,575,700	-3.7%	4.3%	0.3%
Poultry and Egg Production	na	na	na	na	na	na	\$14,041,700	\$10,567,700	\$2,082,500	-5.5%	-27.7%	-17.4%
FARM OUTPUT SUBTOTAL	na	na	na	na	na	na	\$228,173,100	\$195,343,100	\$181,871,900	-3.1%	-1.4%	-2.2%
Farm Producers	7,022	7,300	7,198	0.8%	-0.3%	0.2%	na	na	na	na	na	na
Hired Farm Labor	5,020	6,110	4,832	4.0%	-4.6%	-0.4%	na	na	na	na	na	na
FARMERS AND WORKERS SUBTOTAL	12,042	13,410	12,030	2.2%	-2.1%	0.0%	na	na	na	na	na	na
Support Activities for Crop Production	146	189	193	5.3%	0.4%	2.8%	\$5,107,900	\$4,360,700	\$4,198,300	-3.1%	-0.8%	-1.9%
Support Activities for Animal Production	306	283	322	-1.6%	2.6%	0.5%	\$12,208,400	\$10,054,900	\$12,179,600	-3.8%	3.9%	0.0%
SUPPORT FOR FARM PRODUCTION SUBTOTAL	452	472	515	0.9%	1.8%	1.3%	\$17,316,300	\$14,415,600	\$16,377,900	-3.6%	2.6%	-0.6%
FARM TOTAL	12,494	13,882	12,545	2.1%	-2.0%	0.0%	\$245,489,400	\$209,758,700	\$198,249,800	-3.1%	-1.1%	-2.1%
Fisheries	324	332	309	0.5%	-1.4%	-0.5%	\$27,345,000	\$31,376,000	\$38,454,000	2.8%	4.2%	3.5%
FISHERIES TOTAL	324	332	309	0.5%	-1.4%	-0.5%	\$27,345,000	\$31,376,000	\$38,454,000	2.8%	4.2%	3.5%
AGRICULTURE AND FISHERIES TOTAL	12,818	14,214	12,854	2.1%	-2.0%	0.0%	\$272,834,400	\$241,134,700	\$236,703,800	-2.4%	-0.4%	-1.4%

TABLE A5: New Hampshire: Food System Employment and Sales, 2007-2017, continued

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED MANUFACTURING OUTPUT												
Animal Food	0	60	33	nm	-11.3%	nm	\$0.0	\$22,730,800	\$14,433,000	nm	-8.7%	nm
Grain and Oilseed Milling	0	0	0	nm	nm	nm	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Sugar and Confectionary Products	750	1,750	1,131	18.5%	-8.4%	4.2%	\$226,773,400	\$743,194,200	\$303,289,200	26.8%	-16.4%	3.0%
Fruit and Vegetable Preserving	0	175	30	nm	-29.7%	nm	\$0.0	\$65,104,200	\$6,700,600	nm	-36.5%	nm
Dairy Products	375	750	750	14.9%	0.0%	7.2%	\$309,643,500	\$588,963,900	\$478,852,200	13.7%	-4.1%	4.5%
Fluid Milk	375	750	750	14.9%	0.0%	7.2%	\$309,643,500	\$588,963,900	\$478,852,200	13.7%	-4.1%	4.5%
Cheese	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Other Dairy Products	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Animal Slaughtering and Processing	0	60	60	nm	0.0%	nm	\$0.0	\$24,187,700	\$28,187,600	nm	3.1%	nm
Seafood Products	149	175	175	3.3%	0.0%	1.6%	\$108,682,500	\$110,425,200	\$114,460,700	0.3%	0.7%	0.5%
Bakeries and Tortilla Manufacturing	564	375	568	-7.8%	8.7%	0.1%	\$96,684,700	\$65,272,400	\$136,247,400	-7.6%	15.9%	3.5%
Other Food Products	201	175	242	-2.7%	6.7%	1.9%	\$104,559,300	\$92,035,900	\$132,718,500	-2.5%	7.6%	2.4%
FOOD PRODUCTS TOTAL	2,039	3,520	2,989	11.5%	-3.2%	3.9%	\$846,343,400	\$1,711,914,400	\$1,214,889,300	15.1%	-6.6%	3.7%
Breweries	750	375	635	-12.9%	11.1%	-1.7%	\$620,893,600	\$142,079,300	\$467,689,600	-25.5%	26.9%	-2.8%
All Other Beverages	175	375	244	16.5%	-8.2%	3.4%	\$100,830,200	\$113,960,000	\$96,423,400	2.5%	-3.3%	-0.4%
BEVERAGE PRODUCTS TOTAL	925	750	879	-4.1%	3.2%	-0.5%	\$721,723,900	\$256,039,300	\$564,113,000	-18.7%	17.1%	-2.4%
FOOD AND BEVERAGE PRODUCTS TOTAL	2,964	4,270	3,868	7.6%	-2.0%	2.7%	\$1,568,067,300	\$1,967,953,700	\$1,779,002,400	4.6%	-2.0%	1.3%
DETAILED TRADE OUTPUT												
Grocery Wholesaling	2,905	2,729	2,843	-1.2%	0.8%	-0.2%	\$2,336,339,800	\$2,170,605,600	\$2,905,378,200	-1.5%	6.0%	2.2%
Farm Product Raw Material Wholesalers	10	0	0	-100%	0.0%	-100%	\$2,292,500	\$0.0	\$0.0	-100%	0.0%	-100%
Beer, Wine, and Distilled Beverage Whole.	750	920	932	4.2%	0.3%	2.2%	\$692,802,100	\$710,281,900	\$544,038,100	0.5%	-5.2%	-2.4%
Farm Supplies Merchant Wholesalers	60	60	100	0.0%	10.8%	5.2%	\$63,959,500	\$112,527,600	\$52,415,400	12.0%	-14.2%	-2.0%
WHOLESALING TOTAL	3,725	3,709	3,875	-0.1%	0.9%	0.4%	\$3,095,393,800	\$2,993,415,100	\$3,501,831,600	-0.7%	3.2%	1.2%
Food and Beverage Stores	20,704	23,302	21,789	2.4%	-1.3%	0.5%	\$5,737,158,500	\$5,738,002,900	\$5,563,018,900	0.0%	-0.6%	-0.3%
FOOD AND BEVERAGE STORES TOTAL	20,704	23,302	21,789	2.4%	-1.3%	0.5%	\$5,737,158,500	\$5,738,002,900	\$5,563,018,900	0.0%	-0.6%	-0.3%
FOOD DISTRIBUTION AND RETAIL TRADE TOTAL	24,429	27,011	25,664	2.0%	-1.0%	0.5%	\$8,832,552,300	\$8,731,418,000	\$9,064,850,600	-0.2%	0.8%	0.3%
Food Services and Drinking Places	45,825	44,957	50,102	-0.4%	2.2%	0.9%	\$2,741,119,900	\$2,641,687,000	\$3,087,303,800	-0.7%	3.2%	1.2%
FOOD SERVICES AND DRINKING PLACES TOTAL	45,825	44,957	50,102	-0.4%	2.2%	0.9%	\$2,741,119,900	\$2,641,687,000	\$3,087,303,800	-0.7%	3.2%	1.2%
FOOD SYSTEM GRAND TOTAL	86,036	90,452	92,488	1.0%	0.4%	0.7%	\$13,414,573,900	\$13,582,193,400	\$14,167,860,600	0.2%	0.8%	0.5%

TABLE A6: Rhode Island: Food System Employment and Sales, 2007-2017

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FARM AND FISHERIES OUTPUT												
Oilseed Farming	na	na	na	na	na	na	\$0.0	\$16,200	\$0.0	nm	-100%	0.0%
Grain Farming	na	na	na	na	na	na	\$96,500	\$461,300	\$281,500	36.7%	-9.4%	11.3%
Vegetable and Melon Farming	na	na	na	na	na	na	\$10,128,700	\$12,742,600	\$8,884,900	4.7%	-7.0%	-1.3%
Fruit Farming	na	na	na	na	na	na	\$6,561,200	\$5,093,900	\$3,257,500	-4.9%	-8.6%	-6.8%
Greenhouse, Nursery, Floriculture	na	na	na	na	na	na	\$57,618,100	\$35,322,100	\$28,244,000	-9.3%	-4.4%	-6.9%
All Other Crops	na	na	na	na	na	na	\$3,076,200	\$1,979,600	\$2,161,800	-8.4%	1.8%	-3.5%
Cattle Ranching and Farming	na	na	na	na	na	na	\$1,051,200	\$1,084,900	\$1,012,500	0.6%	-1.4%	-0.4%
Dairy Cattle and Milk Production	na	na	na	na	na	na	\$3,250,500	\$3,556,400	\$3,656,800	1.8%	0.6%	1.2%
All Other Animal Production	na	na	na	na	na	na	\$3,958,200	\$3,458,000	\$10,280,600	-2.7%	24.3%	10.0%
Poultry and Egg Production	na	na	na	na	na	na	\$1,740,800	\$1,705,600	\$1,121,800	-0.4%	-8.0%	-4.3%
FARM OUTPUT SUBTOTAL	na	na	na	na	na	na	\$87,481,300	\$65,420,800	\$58,901,400	-5.6%	-2.1%	-3.9%
Farm Producers	1,912	2,055	1,794	1.5%	-2.7%	-0.6%	na	na	na	na	na	na
Hired Farm Labor	1,641	1,869	1,759	2.6%	-1.2%	0.7%	na	na	na	na	na	na
FARMERS AND WORKERS SUBTOTAL	3,553	3,924	3,553	2.0%	-2.0%	0.0%	na	na	na	na	na	na
Support Activities for Crop Production	63	73	84	3.0%	2.8%	2.9%	\$2,246,500	\$823,600	\$2,113,900	-18.2%	20.7%	-0.6%
Support Activities for Animal Production	81	62	89	-5.2%	7.5%	0.9%	\$3,241,100	\$2,502,600	\$1,857,900	-5.0%	-5.8%	-5.4%
SUPPORT FOR FARM PRODUCTION SUBTOTAL	144	135	173	-1.3%	5.1%	1.9%	\$5,487,600	\$3,326,200	\$3,971,800	-9.5%	3.6%	-3.2%
FARM TOTAL	3,697	4,059	3,726	1.9%	-1.7%	0.1%	\$92,968,900	\$68,747,000	\$62,873,200	-5.9%	-1.8%	-3.8%
Fisheries	1,211	1,032	988	-3.1%	-0.9%	-2.0%	\$116,294,000	\$109,559,000	\$109,856,000	-1.2%	0.1%	-0.6%
FISHERIES TOTAL	1,211	1,032	988	-3.1%	-0.9%	-2.0%	\$116,294,000	\$109,559,000	\$109,856,000	-1.2%	0.1%	-0.6%
AGRICULTURE AND FISHERIES TOTAL	4,908	5,091	4,714	0.7%	-1.5%	-0.4%	\$209,262,900	\$178,306,000	\$172,729,200	-3.2%	-0.6%	-1.9%

TABLE A6: Rhode Island: Food System Employment and Sales, 2007-2017, continued

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED MANUFACTURING OUTPUT												
Animal Food	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Grain and Oilseed Milling	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Sugar and Confectionary Products	0	60	56	nm	-1.4%	nm	\$0.0	\$25,480,900	\$6,188,800	nm	-24.7%	nm
Fruit and Vegetable Preserving	132	175	117	5.8%	-7.7%	-1.2%	\$55,977,100	\$65,104,200	\$17,127,400	3.1%	-23.4%	-11.2%
Dairy Products	100	175	137	11.8%	-4.8%	3.2%	\$62,245,800	\$137,424,900	\$96,907,900	17.2%	-6.7%	4.5%
Fluid Milk	0	60	60	nm	0.0%	nm	\$0.0	\$51,842,700	\$12,865,300	nm	-24.3%	nm
Cheese	0	60	50	nm	-3.6%	nm	\$0.0	\$50,667,100	\$21,597,700	nm	-15.7%	nm
Other Dairy Products	100	55	27	-11.3%	-13.3%	-12.3%	\$62,245,800	\$34,915,100	\$62,444,900	-10.9%	12.3%	0.0%
Animal Slaughtering and Processing	547	375	605	-7.3%	10.0%	1.0%	\$119,860,500	\$151,173,400	\$200,843,300	4.8%	5.8%	5.3%
Seafood Products	158	0	0	nm	nm	-100%	\$51,896,300	\$0.0	\$0.0	-100%	0.0%	-100%
Bakeries and Tortilla Manufacturing	1,236	1,124	1,077	-1.9%	-0.9%	-1.4%	\$155,835,200	\$195,643,100	\$155,696,300	4.7%	-4.5%	0.0%
Other Food Products	296	375	367	4.8%	-0.4%	2.2%	\$89,169,400	\$197,219,700	\$169,061,300	17.2%	-3.0%	6.6%
FOOD PRODUCTS TOTAL	2,469	2,284	2,359	-1.5%	0.6%	-0.5%	\$534,984,300	\$772,046,300	\$645,825,000	7.6%	-3.5%	1.9%
Breweries	0	10	101	nm	58.8%	nm	\$0.0	\$3,788,800	\$27,107,200	nm	48.2%	nm
All Other Beverages	346	383	266	2.1%	-7.0%	-2.6%	\$485,633,900	\$144,754,400	\$56,521,700	-21.5%	-17.1%	-19.4%
BEVERAGE PRODUCTS TOTAL	346	393	367	2.6%	-1.4%	0.6%	\$485,633,900	\$148,543,200	\$83,628,900	-21.1%	-10.9%	-16.1%
FOOD AND BEVERAGE PRODUCTS TOTAL	2,815	2,677	2,726	-1.0%	0.4%	-0.3%	\$1,020,618,200	\$920,589,500	\$729,453,900	-2.0%	-4.5%	-3.3%
DETAILED TRADE OUTPUT												
Grocery Wholesaling	2,280	2,332	3,005	0.5%	5.2%	2.8%	\$1,837,256,700	\$3,308,064,600	\$4,594,261,000	12.0%	6.8%	9.4%
Farm Product Raw Material Wholesalers	10	10	13	0.0%	5.4%	2.7%	\$2,292,500	\$16,705,000	\$4,712,700	48.8%	-22.4%	7.5%
Beer, Wine, and Distilled Beverage Whole.	375	375	459	0.0%	4.1%	2.0%	\$346,401,100	\$284,810,300	\$520,590,500	-3.8%	12.8%	4.2%
Farm Supplies Merchant Wholesalers	60	0	0	-100%	nm	-100%	\$63,959,500	\$0.0	\$0.0	-100%	0.0%	-100%
WHOLESALING TOTAL	2,725	2,717	3,477	-0.1%	5.1%	2.5%	\$2,285,909,700	\$3,609,579,900	\$5,119,564,200	9.6%	7.2%	8.4%
Food and Beverage Stores	11,571	12,033	11,265	0.8%	-1.3%	-0.3%	\$3,368,277,700	\$3,094,639,500	\$3,118,531,100	-1.7%	0.2%	-0.8%
FOOD AND BEVERAGE STORES TOTAL	11,571	12,033	11,265	0.8%	-1.3%	-0.3%	\$3,368,277,700	\$3,094,639,500	\$3,118,531,100	-1.7%	0.2%	-0.8%
FOOD DISTRIBUTION AND RETAIL TRADE TOTAL	14,296	14,750	14,742	0.6%	0.0%	0.3%	\$5,654,137,400	\$6,704,219,400	\$8,238,095,300	3.5%	4.2%	3.8%
Food Services and Drinking Places	40,319	40,040	44,151	-0.1%	2.0%	0.9%	\$2,402,290,200	\$2,417,179,600	\$2,774,747,000	0.1%	2.8%	1.5%
FOOD SERVICES AND DRINKING PLACES TOTAL	40,319	40,040	44,151	-0.1%	2.0%	0.9%	\$2,402,290,200	\$2,417,179,600	\$2,774,747,000	0.1%	2.8%	1.5%
FOOD SYSTEM GRAND TOTAL	62,338	62,558	66,333	0.1%	1.2%	0.6%	\$9,286,308,700	\$10,220,294,600	\$11,915,025,300	1.9%	3.1%	2.5%

TABLE A7: Vermont: Food System Employment and Sales, 2007-2017

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED FARM AND FISHERIES OUTPUT												
Oilseed Farming	na	na	na	na	na	na	\$411,600	\$1,401,200	\$1,742,200	27.8%	4.5%	15.5%
Grain Farming	na	na	na	na	na	na	\$5,170,600	\$13,421,600	\$18,898,100	21.0%	7.1%	13.8%
Vegetable and Melon Farming	na	na	na	na	na	na	\$16,473,600	\$29,052,100	\$26,776,000	12.0%	-1.6%	5.0%
Fruit Farming	na	na	na	na	na	na	\$23,234,200	\$16,639,400	\$20,765,400	-6.5%	4.5%	-1.1%
Greenhouse, Nursery, Floriculture	na	na	na	na	na	na	\$35,068,100	\$27,501,500	\$25,390,900	-4.7%	-1.6%	-3.2%
All Other Crops	na	na	na	na	na	na	\$56,517,700	\$97,987,500	\$102,415,700	11.6%	0.9%	6.1%
Cattle Ranching and Farming	na	na	na	na	na	na	\$71,548,700	\$56,916,300	\$57,275,100	-4.5%	0.1%	-2.2%
Dairy Cattle and Milk Production	na	na	na	na	na	na	\$349,102,000	\$460,172,900	\$405,048,300	5.7%	-2.5%	1.5%
All Other Animal Production	na	na	na	na	na	na	\$16,015,100	\$16,491,800	\$16,357,600	0.6%	-0.2%	0.2%
Poultry and Egg Production	na	na	na	na	na	na	\$10,032,700	\$10,291,900	\$9,266,000	0.5%	-2.1%	-0.8%
FARM OUTPUT SUBTOTAL	na	na	na	na	na	na	\$583,574,200	\$729,876,200	\$683,935,400	4.6%	-1.3%	1.6%
Farm Producers	11,392	12,012	12,309	1.1%	0.5%	0.8%	na	na	na	na	na	na
Hired Farm Labor	8,343	9,216	8,458	2.0%	-1.7%	0.1%	na	na	na	na	na	na
FARMERS AND WORKERS SUBTOTAL	19,735	21,228	20,767	1.5%	-0.4%	0.5%	na	na	na	na	na	na
Support Activities for Crop Production	313	405	459	5.3%	2.5%	3.9%	\$9,159,600	\$7,386,800	\$9,877,900	-4.2%	6.0%	0.8%
Support Activities for Animal Production	485	468	474	-0.7%	0.3%	-0.2%	\$14,556,700	\$9,700,300	\$10,592,200	-7.8%	1.8%	-3.1%
SUPPORT FOR FARM PRODUCTION SUBTOTAL	798	873	933	1.8%	1.3%	1.6%	\$23,716,300	\$17,087,100	\$20,470,100	-6.3%	3.7%	-1.5%
FARM TOTAL	20,533	22,101	21,700	1.5%	-0.4%	0.6%	\$607,290,500	\$746,963,300	\$704,405,500	4.2%	-1.2%	1.5%
Fisheries	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
FISHERIES TOTAL	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
AGRICULTURE AND FISHERIES TOTAL	20,533	22,101	21,700	1.5%	-0.4%	0.6%	\$607,290,500	\$746,963,300	\$704,405,500	4.2%	-1.2%	1.5%

TABLE A7: Vermont: Food System Employment and Sales, 2007-2017, continued

	2007 Jobs	2012 Jobs	2017 Jobs	Annual Employment Growth Rate			2007 Sales	2012 Sales	2017 Sales	Annual Sales Growth Rate		
				2007- 2012	2012- 2017	2007- 2017				2007- 2012	2012- 2017	2007- 2017
DETAILED MANUFACTURING OUTPUT CONTINUED												
Animal Food	257	175	291	-7.4%	10.7%	0.0%	\$310,719,800	\$66,298,200	\$241,520,000	-26.6%	29.5%	-2.5%
Grain and Oilseed Milling	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Sugar and Confectionary Products	344	347	496	0.2%	7.4%	3.7%	\$104,013,400	\$147,364,800	\$296,981,900	7.2%	15.0%	11.1%
Fruit and Vegetable Preserving	175	60	206	-19.3%	28.0%	1.6%	\$74,212,000	\$22,321,400	\$46,899,200	-21.4%	16.0%	-4.5%
Dairy Products	1,908	1,692	1,814	-2.4%	1.4%	-0.5%	\$1,705,954,200	\$1,485,358,000	\$1,499,430,000	-2.7%	0.2%	-1.3%
Fluid Milk	185	175	375	-1.1%	16.5%	7.3%	\$131,988,500	\$151,207,800	\$174,801,200	2.8%	2.9%	2.8%
Cheese	921	700	807	-5.3%	2.9%	-1.3%	\$794,063,200	\$591,116,100	\$558,889,400	-5.7%	-1.1%	-3.5%
Other Dairy Products	802	817	632	0.4%	-5.0%	-2.4%	\$779,902,600	\$743,034,100	\$765,739,400	-1.0%	0.6%	-0.2%
Animal Slaughtering and Processing	215	279	354	5.3%	4.9%	5.1%	\$90,292,900	\$112,473,000	\$68,245,900	4.5%	-9.5%	-2.8%
Seafood Products	0	0	0	0.0%	0.0%	0.0%	\$0.0	\$0.0	\$0.0	0.0%	0.0%	0.0%
Bakeries and Tortilla Manufacturing	517	680	795	5.6%	3.2%	4.4%	\$122,056,800	\$118,360,600	\$141,318,700	-0.6%	3.6%	1.5%
Other Food Products	428	2,155	850	38.2%	-17.0%	7.1%	\$338,295,000	\$1,133,356,100	\$493,898,300	27.4%	-15.3%	3.9%
FOOD PRODUCTS TOTAL	3,844	5,388	4,806	7.0%	-2.3%	2.3%	\$2,745,544,200	\$3,085,532,200	\$2,788,294,100	2.4%	-2.0%	0.2%
Breweries	182	271	605	8.3%	17.4%	12.8%	\$150,670,200	\$102,676,000	\$140,044,400	-7.4%	6.4%	-0.7%
All Other Beverages	106	72	271	-7.4%	30.4%	9.8%	\$72,869,900	\$26,968,600	\$100,695,500	-18.0%	30.1%	3.3%
BEVERAGE PRODUCTS TOTAL	288	343	876	3.6%	20.6%	11.8%	\$223,540,100	\$129,644,600	\$240,740,000	-10.3%	13.2%	0.7%
FOOD AND BEVERAGE PRODUCTS TOTAL	4,132	5,731	5,682	6.8%	-0.2%	3.2%	\$2,969,084,300	\$3,215,176,800	\$3,029,034,100	1.6%	-1.2%	0.2%
DETAILED TRADE OUTPUT												
Grocery Wholesaling	2,094	2,224	2,469	1.2%	2.1%	1.7%	\$1,406,779,300	\$3,552,209,700	\$6,265,678,100	20.4%	12.0%	16.1%
Farm Product Raw Material Wholesalers	60	60	60	0.0%	0.0%	0.0%	\$13,754,800	\$100,230,300	\$344,448,600	48.8%	28.0%	38.0%
Beer, Wine, and Distilled Beverage Whole.	750	750	804	0.0%	1.4%	0.7%	\$692,802,100	\$569,620,600	\$318,056,700	-3.8%	-11.0%	-7.5%
Farm Supplies Merchant Wholesalers	231	270	197	3.2%	-6.1%	-1.6%	\$243,411,700	\$951,269,100	\$204,172,300	31.3%	-26.5%	-1.7%
WHOLESALE TOTAL	3,135	3,304	3,530	1.1%	1.3%	1.2%	\$2,356,747,900	\$5,173,329,600	\$7,132,355,700	17.0%	6.6%	11.7%
Food and Beverage Stores	9,473	10,689	9,871	2.4%	-1.6%	0.4%	\$2,340,360,600	\$2,462,375,500	\$2,178,873,100	1.0%	-2.4%	-0.7%
FOOD AND BEVERAGE STORES TOTAL	9,473	10,689	9,871	2.4%	-1.6%	0.4%	\$2,340,360,600	\$2,462,375,500	\$2,178,873,100	1.0%	-2.4%	-0.7%
FOOD DISTRIBUTION AND RETAIL TRADE TOTAL	12,608	13,993	13,401	2.1%	-0.9%	0.6%	\$4,697,108,500	\$7,635,705,100	\$9,311,228,800	10.2%	4.0%	7.1%
Food Services and Drinking Places	19,700	18,803	20,555	-0.9%	1.8%	0.4%	\$1,046,074,300	\$1,045,032,200	\$1,206,743,600	0.0%	2.9%	1.4%
FOOD SERVICES AND DRINKING PLACES TOTAL	19,700	18,803	20,555	-0.9%	1.8%	0.4%	\$1,046,074,300	\$1,045,032,200	\$1,206,743,600	0.0%	2.9%	1.4%
FOOD SYSTEM GRAND TOTAL	56,973	60,628	61,338	1.3%	0.2%	0.7%	\$9,319,557,600	\$12,642,877,400	\$14,251,411,900	6.3%	2.4%	4.3%



Sector Economic Multipliers by State

Table B1: New England Output Multipliers, 2017.....	72	Table B12: Massachusetts Value-Added Multipliers, 2017.....	79
Table B2: New England Employment Multipliers, 2017.....	72	Table B13: New Hampshire Output Multipliers, 2017.....	80
Table B3: New England Value-Added Multipliers, 2017.....	73	Table B14: New Hampshire Employment Multipliers, 2017.....	80
Table B4: Connecticut Output Multipliers, 2017.....	74	Table B15: New Hampshire Value-Added Multipliers, 2017.....	81
Table B5: Connecticut Employment Multipliers, 2017.....	74	Table B16: Rhode Island Output Multipliers, 2017.....	82
Table B6: Connecticut Value-Added Multipliers, 2017.....	75	Table B17: Rhode Island Employment Multipliers, 2017.....	82
Table B7: Maine Output Multipliers, 2017.....	76	Table B18: Rhode Island Value-Added Multipliers, 2017.....	83
Table B8: Maine Employment Multipliers, 2017.....	76	Table B19: Vermont Output Multipliers, 2017.....	84
Table B9: Maine Value-Added Multipliers, 2017.....	77	Table B20: Vermont Employment Multipliers, 2017.....	84
Table B10: Massachusetts Output Multipliers, 2017.....	78	Table B21: Vermont Value-Added Multipliers, 2017.....	85
Table B11: Massachusetts Employment Multipliers, 2017.....	78		

TABLE B1: New England Output Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.26	1.74
Grain	1.47	1.80
Fruit	1.31	1.68
Vegetables	1.45	1.81
Greenhouse	1.32	1.75
All Other Crops	1.32	1.80
Cattle Ranching	1.30	1.58
Dairy Cattle and Milk	1.54	1.78
Other Animal Production	1.22	1.56
Poultry and Eggs	1.42	1.56
Agriculture Support	1.19	2.07
Fisheries	1.05	1.80
Animal Food	1.30	1.42
Grain and Oilseed Milling	1.36	1.53
Sugar and Confectionary	1.50	1.74
Fruit and Vegetable Preserving	1.39	1.62
Fluid Milk	1.61	1.85
Cheese	1.74	1.95
Other Dairy	1.62	1.91
Animal Slaughtering	1.33	1.53
Seafood	1.43	1.75
Bakeries and Tortilla Mfg.	1.44	1.81
Other Food Manufacturing	1.47	1.71
Breweries	1.38	1.59
All Other Beverages	1.42	1.62
Grocery Wholesaling	1.52	2.00
Misc. Nondurable Wholesaling	1.41	1.76
Food and Beverage Retailing	1.50	2.08
Food Serv. and Drinking Places	1.42	1.90
NEW ENGLAND	1.45	1.90

TABLE B2: New England Employment Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.84	3.00
Grain	1.59	1.89
Fruit	1.17	1.28
Vegetables	1.29	1.47
Greenhouse	1.18	1.36
All Other Crops	1.04	1.08
Cattle Ranching	1.16	1.30
Dairy Cattle and Milk	1.85	2.32
Other Animal Production	1.09	1.21
Poultry and Eggs	1.55	1.84
Agriculture Support	1.03	1.20
Fisheries	1.02	1.41
Animal Food	2.72	3.76
Grain and Oilseed Milling	3.07	4.55
Sugar and Confectionary	2.48	3.22
Fruit and Vegetable Preserving	2.11	2.86
Fluid Milk	3.27	4.53
Cheese	4.25	5.75
Other Dairy	1.64	2.11
Animal Slaughtering	2.17	2.90
Seafood	2.10	2.96
Bakeries and Tortilla Mfg.	1.33	1.70
Other Food Manufacturing	2.81	3.66
Breweries	1.91	2.69
All Other Beverages	2.40	3.40
Grocery Wholesaling	1.64	2.30
Misc. Nondurable Wholesaling	1.89	2.70
Food and Beverage Retailing	1.19	1.44
Food Serv. and Drinking Places	1.16	1.39
NEW ENGLAND	1.24	1.52

TABLE B3: New England Value-Added Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.20	1.63
Grain	1.59	2.08
Fruit	1.31	1.71
Vegetables	1.50	1.97
Greenhouse	1.32	1.78
All Other Crops	1.27	1.73
Cattle Ranching	1.26	1.55
Dairy Cattle and Milk	1.76	2.23
Other Animal Production	1.18	1.47
Poultry and Eggs	2.01	2.47
Agriculture Support	1.15	1.94
Fisheries	1.03	1.50
Animal Food	2.30	3.00
Grain and Oilseed Milling	2.24	3.03
Sugar and Confectionary	2.53	3.42
Fruit and Vegetable Preserving	2.01	2.74
Fluid Milk	2.62	3.51
Cheese	4.22	5.66
Other Dairy	1.98	2.68
Animal Slaughtering	2.23	3.10
Seafood	2.26	3.27
Bakeries and Tortilla Mfg.	1.66	2.33
Other Food Manufacturing	2.20	2.96
Breweries	1.59	1.98
All Other Beverages	1.99	2.60
Grocery Wholesaling	1.55	2.10
Misc. Nondurable Wholesaling	1.37	1.71
Food and Beverage Retailing	1.44	2.04
Food Serv. and Drinking Places	1.38	1.87
NEW ENGLAND	1.47	2.01

TABLE B4: Connecticut Output Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	2.23	3.03
Grain	1.49	2.04
Fruit	1.13	1.32
Vegetables	1.21	1.66
Greenhouse	1.17	2.07
All Other Crops	1.03	1.84
Cattle Ranching	1.13	1.69
Dairy Cattle and Milk	1.55	2.35
Other Animal Production	1.07	1.90
Poultry and Eggs	1.42	2.11
Agriculture Support	1.02	1.26
Fisheries	1.00	1.26
Animal Food	2.40	2.43
Grain and Oilseed Milling	3.12	3.34
Sugar and Confectionary	1.75	2.26
Fruit and Vegetable Preserving	1.67	1.76
Fluid Milk	2.95	3.08
Cheese	2.82	2.88
Other Dairy	1.22	1.75
Animal Slaughtering	2.41	2.50
Seafood	1.85	2.08
Bakeries and Tortilla Mfg.	1.28	1.81
Other Food Manufacturing	2.45	2.72
Breweries	1.75	2.05
All Other Beverages	2.11	2.29
Grocery Wholesaling	1.60	1.77
Misc. Nondurable Wholesaling	1.83	2.38
Food and Beverage Retailing	1.19	2.12
Food Serv. and Drinking Places	1.15	1.37
CONNECTICUT	1.42	1.81

TABLE B5: Connecticut Employment Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	2.23	3.03
Grain	1.49	2.04
Fruit	1.13	1.32
Vegetables	1.21	1.66
Greenhouse	1.17	2.07
All Other Crops	1.03	1.84
Cattle Ranching	1.13	1.69
Dairy Cattle and Milk	1.55	2.35
Other Animal Production	1.07	1.90
Poultry and Eggs	1.42	2.11
Agriculture Support	1.02	1.26
Fisheries	1.00	1.26
Animal Food	2.40	2.43
Grain and Oilseed Milling	3.12	3.34
Sugar and Confectionary	1.75	2.26
Fruit and Vegetable Preserving	1.67	1.76
Fluid Milk	2.95	3.08
Cheese	2.82	2.88
Other Dairy	1.22	1.75
Animal Slaughtering	2.41	2.50
Seafood	1.85	2.08
Bakeries and Tortilla Mfg.	1.28	1.81
Other Food Manufacturing	2.45	2.72
Breweries	1.75	2.05
All Other Beverages	2.11	2.29
Grocery Wholesaling	1.60	1.77
Misc. Nondurable Wholesaling	1.83	2.38
Food and Beverage Retailing	1.19	2.12
Food Serv. and Drinking Places	1.15	1.37
CONNECTICUT	1.22	1.45

TABLE B6: Connecticut Value-Added Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	2.79	3.06
Grain	1.89	2.40
Fruit	1.31	1.75
Vegetables	1.49	2.36
Greenhouse	1.33	2.27
All Other Crops	1.39	1.75
Cattle Ranching	1.41	1.81
Dairy Cattle and Milk	1.96	2.87
Other Animal Production	1.19	1.56
Poultry and Eggs	2.04	2.52
Agriculture Support	1.12	1.57
Fisheries	1.01	1.43
Animal Food	1.74	2.20
Grain and Oilseed Milling	3.45	3.97
Sugar and Confectionary	2.77	3.47
Fruit and Vegetable Preserving	1.71	2.08
Fluid Milk	2.52	2.84
Cheese	3.12	3.36
Other Dairy	1.48	2.52
Animal Slaughtering	2.09	2.36
Seafood	2.02	2.45
Bakeries and Tortilla Mfg.	1.57	2.17
Other Food Manufacturing	1.85	2.35
Breweries	1.72	2.27
All Other Beverages	1.65	2.30
Grocery Wholesaling	1.50	1.94
Misc. Nondurable Wholesaling	1.29	1.72
Food and Beverage Retailing	1.38	2.10
Food Serv. and Drinking Places	1.37	1.86
CONNECTICUT	1.42	1.86

TABLE B7: Maine Output Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.55	1.93
Grain	1.48	1.79
Fruit	1.30	1.68
Vegetables	1.47	1.85
Greenhouse	1.35	1.77
All Other Crops	1.42	1.86
Cattle Ranching	1.37	1.60
Dairy Cattle and Milk	1.51	1.73
Other Animal Production	1.31	1.69
Poultry and Eggs	1.46	1.60
Agriculture Support	1.23	2.19
Fisheries	1.09	1.90
Animal Food	1.35	1.48
Grain and Oilseed Milling	1.42	1.55
Sugar and Confectionary	1.44	1.63
Fruit and Vegetable Preserving	1.47	1.72
Fluid Milk	1.90	2.18
Cheese	1.67	1.82
Other Dairy	1.47	1.81
Animal Slaughtering	1.46	1.65
Seafood	1.50	1.80
Bakeries and Tortilla Mfg.	1.48	1.84
Other Food Manufacturing	1.62	1.90
Breweries	1.39	1.59
All Other Beverages	1.40	1.59
Grocery Wholesaling	1.64	2.16
Misc. Nondurable Wholesaling	1.54	1.93
Food and Beverage Retailing	1.53	2.11
Food Serv. and Drinking Places	1.46	1.93
MAINE	1.46	1.91

TABLE B8: Maine Employment Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	2.23	3.03
Grain	1.49	2.04
Fruit	1.13	1.32
Vegetables	1.21	1.66
Greenhouse	1.17	2.07
All Other Crops	1.03	1.84
Cattle Ranching	1.13	1.69
Dairy Cattle and Milk	1.55	2.35
Other Animal Production	1.07	1.90
Poultry and Eggs	1.42	2.11
Agriculture Support	1.02	1.26
Fisheries	1.00	1.26
Animal Food	2.40	2.43
Grain and Oilseed Milling	3.12	3.34
Sugar and Confectionary	1.75	2.26
Fruit and Vegetable Preserving	1.67	1.76
Fluid Milk	2.95	3.08
Cheese	2.82	2.88
Other Dairy	1.22	1.75
Animal Slaughtering	2.41	2.50
Seafood	1.85	2.08
Bakeries and Tortilla Mfg.	1.28	1.81
Other Food Manufacturing	2.45	2.72
Breweries	1.75	2.05
All Other Beverages	2.11	2.29
Grocery Wholesaling	1.60	1.77
Misc. Nondurable Wholesaling	1.83	2.38
Food and Beverage Retailing	1.19	2.12
Food Serv. and Drinking Places	1.15	1.37
MAINE	1.22	1.45

TABLE B9: Maine Value-Added Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	2.08	3.00
Grain	1.67	2.20
Fruit	1.27	1.66
Vegetables	1.51	1.99
Greenhouse	1.34	1.82
All Other Crops	1.42	1.93
Cattle Ranching	1.42	1.73
Dairy Cattle and Milk	2.04	2.59
Other Animal Production	1.25	1.62
Poultry and Eggs	2.13	2.63
Agriculture Support	1.19	2.10
Fisheries	1.04	1.55
Animal Food	2.40	3.10
Grain and Oilseed Milling	3.80	4.93
Sugar and Confectionary	3.02	4.06
Fruit and Vegetable Preserving	2.22	2.99
Fluid Milk	3.01	3.99
Cheese	8.27	10.81
Other Dairy	1.48	1.98
Animal Slaughtering	2.95	3.92
Seafood	2.97	4.18
Bakeries and Tortilla Mfg.	1.75	2.43
Other Food Manufacturing	3.03	4.15
Breweries	1.62	2.00
All Other Beverages	1.82	2.31
Grocery Wholesaling	1.71	2.34
Misc. Nondurable Wholesaling	1.52	1.93
Food and Beverage Retailing	1.43	1.98
Food Serv. and Drinking Places	1.39	1.86
MAINE	1.47	2.00

TABLE B10: Massachusetts Output Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.73	1.92
Grain	1.61	1.85
Fruit	1.38	1.74
Vegetables	1.49	1.83
Greenhouse	1.36	1.82
All Other Crops	1.43	1.88
Cattle Ranching	1.30	1.39
Dairy Cattle and Milk	1.43	1.60
Other Animal Production	1.25	1.42
Poultry and Eggs	1.38	1.53
Agriculture Support	1.19	2.07
Fisheries	1.00	1.77
Animal Food	1.36	1.50
Grain and Oilseed Milling	1.36	1.53
Sugar and Confectionary	1.55	1.82
Fruit and Vegetable Preserving	1.37	1.61
Fluid Milk	1.50	1.73
Cheese	1.35	1.51
Other Dairy	1.42	1.77
Animal Slaughtering	1.32	1.53
Seafood	1.42	1.75
Bakeries and Tortilla Mfg.	1.46	1.88
Other Food Manufacturing	1.48	1.75
Breweries	1.41	1.66
All Other Beverages	1.44	1.66
Grocery Wholesaling	1.53	2.08
Misc. Nondurable Wholesaling	1.44	1.86
Food and Beverage Retailing	1.50	2.11
Food Serv. and Drinking Places	1.41	1.93
MASSACHUSETTS	1.44	1.94

TABLE B11: Massachusetts Employment Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	2.27	2.53
Grain	1.50	1.66
Fruit	1.17	1.26
Vegetables	1.24	1.36
Greenhouse	1.18	1.36
All Other Crops	1.03	1.06
Cattle Ranching	1.09	1.11
Dairy Cattle and Milk	1.50	1.75
Other Animal Production	1.07	1.12
Poultry and Eggs	1.42	1.67
Agriculture Support	1.02	1.19
Fisheries	1.00	1.43
Animal Food	2.69	3.81
Grain and Oilseed Milling	3.07	4.55
Sugar and Confectionary	1.95	2.62
Fruit and Vegetable Preserving	1.89	2.61
Fluid Milk	2.77	3.93
Cheese	2.58	3.56
Other Dairy	1.27	1.60
Animal Slaughtering	1.97	2.71
Seafood	2.04	2.91
Bakeries and Tortilla Mfg.	1.33	1.75
Other Food Manufacturing	2.51	3.41
Breweries	1.89	2.78
All Other Beverages	2.37	3.40
Grocery Wholesaling	1.63	2.35
Misc. Nondurable Wholesaling	1.87	2.77
Food and Beverage Retailing	1.18	1.44
Food Serv. and Drinking Places	1.15	1.40
MASSACHUSETTS	1.22	1.51

TABLE B12: Massachusetts Value-Added Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	NA	NA
Grain	2.77	3.57
Fruit	1.48	1.97
Vegetables	1.71	2.26
Greenhouse	1.39	1.95
All Other Crops	1.50	2.10
Cattle Ranching	1.40	1.53
Dairy Cattle and Milk	1.85	2.25
Other Animal Production	1.25	1.44
Poultry and Eggs	2.12	2.67
Agriculture Support	1.16	1.96
Fisheries	1.00	1.48
Animal Food	2.15	2.79
Grain and Oilseed Milling	2.24	3.03
Sugar and Confectionary	2.97	4.18
Fruit and Vegetable Preserving	1.97	2.77
Fluid Milk	2.55	3.53
Cheese	2.93	4.10
Other Dairy	1.60	2.27
Animal Slaughtering	2.10	2.98
Seafood	2.23	3.24
Bakeries and Tortilla Mfg.	1.66	2.39
Other Food Manufacturing	2.16	2.98
Breweries	1.62	2.09
All Other Beverages	2.21	2.98
Grocery Wholesaling	1.58	2.21
Misc. Nondurable Wholesaling	1.42	1.85
Food and Beverage Retailing	1.45	2.10
Food Serv. and Drinking Places	1.37	1.89
MASSACHUSETTS	1.46	2.05

TABLE B13: New Hampshire Output Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.71	1.97
Grain	1.50	1.73
Fruit	1.19	1.48
Vegetables	1.32	1.62
Greenhouse	1.27	1.69
All Other Crops	1.32	1.74
Cattle Ranching	1.16	1.24
Dairy Cattle and Milk	1.34	1.50
Other Animal Production	1.07	1.24
Poultry and Eggs	1.31	1.43
Agriculture Support	1.16	2.02
Fisheries	1.50	1.89
Animal Food	1.26	1.35
Grain and Oilseed Milling	1.19	1.27
Sugar and Confectionary	1.48	1.73
Fruit and Vegetable Preserving	1.26	1.38
Fluid Milk	1.59	1.82
Cheese	NA	NA
Other Dairy	1.22	1.55
Animal Slaughtering	1.33	1.47
Seafood	1.39	1.69
Bakeries and Tortilla Mfg.	1.46	1.76
Other Food Manufacturing	1.43	1.63
Breweries	1.37	1.58
All Other Beverages	1.39	1.57
Grocery Wholesaling	1.54	2.02
Misc. Nondurable Wholesaling	1.47	1.84
Food and Beverage Retailing	1.59	2.17
Food Serv. and Drinking Places	1.47	1.96
NEW HAMPSHIRE	1.49	1.94

TABLE B14: New Hampshire Employment Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	2.44	2.77
Grain	1.48	1.63
Fruit	1.10	1.17
Vegetables	1.18	1.29
Greenhouse	1.15	1.32
All Other Crops	1.03	1.05
Cattle Ranching	1.06	1.08
Dairy Cattle and Milk	1.45	1.66
Other Animal Production	1.02	1.07
Poultry and Eggs	1.39	1.58
Agriculture Support	1.03	1.21
Fisheries	1.18	1.43
Animal Food	2.50	3.28
Grain and Oilseed Milling	3.05	4.07
Sugar and Confectionary	3.42	4.50
Fruit and Vegetable Preserving	1.60	1.95
Fluid Milk	3.35	4.70
Cheese	NA	NA
Other Dairy	1.10	1.29
Animal Slaughtering	3.68	4.35
Seafood	2.12	2.98
Bakeries and Tortilla Mfg.	1.36	1.67
Other Food Manufacturing	3.25	4.02
Breweries	1.95	2.79
All Other Beverages	2.17	2.95
Grocery Wholesaling	1.68	2.36
Misc. Nondurable Wholesaling	1.92	2.68
Food and Beverage Retailing	1.21	1.44
Food Serv. and Drinking Places	1.18	1.41
NEW HAMPSHIRE	1.24	1.50

TABLE B15: New Hampshire Value-Added Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	6.97	9.49
Grain	1.71	2.10
Fruit	1.15	1.39
Vegetables	1.29	1.61
Greenhouse	1.23	1.63
All Other Crops	1.28	1.69
Cattle Ranching	1.13	1.20
Dairy Cattle and Milk	1.45	1.68
Other Animal Production	1.05	1.16
Poultry and Eggs	1.61	1.88
Agriculture Support	1.13	1.87
Fisheries	1.56	2.06
Animal Food	1.99	2.45
Grain and Oilseed Milling	2.06	2.58
Sugar and Confectionary	2.09	2.75
Fruit and Vegetable Preserving	2.16	2.77
Fluid Milk	2.27	2.97
Cheese	NA	NA
Other Dairy	1.25	1.69
Animal Slaughtering	2.64	3.34
Seafood	1.86	2.58
Bakeries and Tortilla Mfg.	2.01	2.79
Other Food Manufacturing	2.35	3.05
Breweries	1.50	1.84
All Other Beverages	1.86	2.33
Grocery Wholesaling	1.56	2.11
Misc. Nondurable Wholesaling	1.46	1.84
Food and Beverage Retailing	1.55	2.20
Food Serv. and Drinking Places	1.43	1.95
NEW HAMPSHIRE	1.52	2.08

TABLE B16: Rhode Island Output Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.21	1.81
Grain	1.30	1.70
Fruit	1.12	1.55
Vegetables	1.27	1.68
Greenhouse	1.22	1.71
All Other Crops	1.22	1.67
Cattle Ranching	1.10	1.44
Dairy Cattle and Milk	1.32	1.53
Other Animal Production	1.02	1.65
Poultry and Eggs	1.30	1.43
Agriculture Support	1.11	1.76
Fisheries	1.02	1.45
Animal Food	1.26	1.37
Grain and Oilseed Milling	1.36	1.49
Sugar and Confectionary	1.41	1.59
Fruit and Vegetable Preserving	1.32	1.50
Fluid Milk	1.49	1.67
Cheese	1.39	1.52
Other Dairy	1.28	1.69
Animal Slaughtering	1.30	1.48
Seafood	1.31	1.54
Bakeries and Tortilla Mfg.	1.45	1.82
Other Food Manufacturing	1.45	1.68
Breweries	1.42	1.59
All Other Beverages	1.36	1.55
Grocery Wholesaling	1.50	1.99
Misc. Nondurable Wholesaling	1.45	1.78
Food and Beverage Retailing	1.51	2.07
Food Serv. and Drinking Places	1.46	1.92
RHODE ISLAND	1.45	1.90

TABLE B17: Rhode Island Employment Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.23	1.99
Grain	1.17	1.42
Fruit	1.03	1.13
Vegetables	1.10	1.25
Greenhouse	1.09	1.30
All Other Crops	1.01	1.04
Cattle Ranching	1.02	1.12
Dairy Cattle and Milk	1.35	1.63
Other Animal Production	1.01	1.17
Poultry and Eggs	1.33	1.53
Agriculture Support	1.03	1.24
Fisheries	1.01	1.27
Animal Food	2.92	3.90
Grain and Oilseed Milling	2.84	3.65
Sugar and Confectionary	1.72	2.14
Fruit and Vegetable Preserving	1.70	2.15
Fluid Milk	2.82	3.77
Cheese	2.75	3.65
Other Dairy	1.13	1.38
Animal Slaughtering	1.98	2.65
Seafood	1.89	2.57
Bakeries and Tortilla Mfg.	1.34	1.70
Other Food Manufacturing	2.17	2.85
Breweries	1.96	2.53
All Other Beverages	2.06	2.81
Grocery Wholesaling	1.74	2.50
Misc. Nondurable Wholesaling	1.99	2.75
Food and Beverage Retailing	1.22	1.48
Food Serv. and Drinking Places	1.18	1.39
RHODE ISLAND	1.23	1.49

TABLE B18: Rhode Island Value-Added Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.15	1.69
Grain	1.27	1.70
Fruit	1.09	1.44
Vegetables	1.23	1.64
Greenhouse	1.18	1.63
All Other Crops	1.17	1.57
Cattle Ranching	1.07	1.33
Dairy Cattle and Milk	1.47	1.79
Other Animal Production	1.01	1.41
Poultry and Eggs	1.82	2.21
Agriculture Support	1.08	1.57
Fisheries	1.01	1.28
Animal Food	1.75	2.13
Grain and Oilseed Milling	3.09	4.00
Sugar and Confectionary	3.55	4.82
Fruit and Vegetable Preserving	2.42	3.31
Fluid Milk	2.96	3.94
Cheese	3.44	4.59
Other Dairy	1.28	1.77
Animal Slaughtering	2.23	3.07
Seafood	1.89	2.54
Bakeries and Tortilla Mfg.	1.74	2.46
Other Food Manufacturing	2.56	3.52
Breweries	1.95	2.43
All Other Beverages	2.07	2.70
Grocery Wholesaling	1.47	1.98
Misc. Nondurable Wholesaling	1.40	1.73
Food and Beverage Retailing	1.42	1.96
Food Serv. and Drinking Places	1.41	1.88
RHODE ISLAND	1.43	1.92

TABLE B19: Vermont Output Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.08	1.64
Grain	1.32	1.76
Fruit	1.13	1.60
Vegetables	1.25	1.67
Greenhouse	1.15	1.65
All Other Crops	1.22	1.77
Cattle Ranching	1.29	1.68
Dairy Cattle and Milk	1.59	1.87
Other Animal Production	1.03	1.63
Poultry and Eggs	1.61	1.78
Agriculture Support	1.22	2.15
Fisheries	NA	NA
Animal Food	1.28	1.41
Grain and Oilseed Milling	1.17	1.23
Sugar and Confectionary	1.49	1.72
Fruit and Vegetable Preserving	1.28	1.41
Fluid Milk	2.01	2.29
Cheese	1.80	2.03
Other Dairy	1.81	2.08
Animal Slaughtering	1.59	1.82
Seafood	NA	NA
Bakeries and Tortilla Mfg.	1.40	1.73
Other Food Manufacturing	1.47	1.70
Breweries	1.34	1.51
All Other Beverages	1.38	1.54
Grocery Wholesaling	1.54	2.01
Misc. Nondurable Wholesaling	1.49	1.85
Food and Beverage Retailing	1.47	1.97
Food Serv. and Drinking Places	1.39	1.82
VERMONT	1.53	1.88

TABLE B20: Vermont Employment Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.36	2.89
Grain	1.59	2.07
Fruit	1.11	1.28
Vegetables	1.22	1.45
Greenhouse	1.11	1.35
All Other Crops	1.04	1.11
Cattle Ranching	1.20	1.43
Dairy Cattle and Milk	1.96	2.52
Other Animal Production	1.02	1.31
Poultry and Eggs	1.82	2.24
Agriculture Support	1.03	1.19
Fisheries	NA	NA
Animal Food	2.67	3.71
Grain and Oilseed Milling	2.79	3.49
Sugar and Confectionary	2.50	3.19
Fruit and Vegetable Preserving	1.97	2.54
Fluid Milk	4.60	6.18
Cheese	4.55	6.16
Other Dairy	3.04	4.13
Animal Slaughtering	4.59	5.69
Seafood	NA	NA
Bakeries and Tortilla Mfg.	1.34	1.68
Other Food Manufacturing	4.50	5.49
Breweries	1.85	2.46
All Other Beverages	2.11	2.76
Grocery Wholesaling	1.66	2.28
Misc. Nondurable Wholesaling	1.91	2.60
Food and Beverage Retailing	1.20	1.44
Food Serv. and Drinking Places	1.16	1.38
VERMONT	1.44	1.77

TABLE B21: Vermont Value-Added Multipliers, 2017

State	Output	
	Type I	Type II
Oilseed	1.04	1.40
Grain	1.26	1.70
Fruit	1.18	1.54
Vegetables	1.08	1.41
Greenhouse	1.10	1.49
All Other Crops	1.15	1.57
Cattle Ranching	1.21	1.56
Dairy Cattle and Milk	1.72	2.22
Other Animal Production	1.01	1.37
Poultry and Eggs	1.88	2.33
Agriculture Support	1.17	2.05
Fisheries	NA	NA
Animal Food	2.38	3.15
Grain and Oilseed Milling	3.40	4.36
Sugar and Confectionary	2.94	4.03
Fruit and Vegetable Preserving	2.27	3.03
Fluid Milk	4.16	5.52
Cheese	4.41	5.92
Other Dairy	2.96	3.96
Animal Slaughtering	4.73	6.23
Seafood	NA	NA
Bakeries and Tortilla Mfg.	1.68	2.33
Other Food Manufacturing	3.08	4.18
Breweries	1.70	2.13
All Other Beverages	1.81	2.21
Grocery Wholesaling	1.60	2.17
Misc. Nondurable Wholesaling	1.50	1.91
Food and Beverage Retailing	1.37	1.86
Food Serv. and Drinking Places	1.33	1.75
VERMONT	1.67	2.23



Sector Economic Multipliers by State

Table C1: New England Impact of Sales Change on Employment and Value Added, 2017.....87

Table C2: Connecticut Impact of Sales Change on Employment and Value Added, 2017.....88

Table C3: Maine Impact of Sales Change on Employment and Value Added, 2017.....89

Table C4: Massachusetts Impact of Sales Change on Employment and Value Added, 2017.....90

Table C5: New Hampshire Impact of Sales Change on Employment and Value Added, 2017.....91

Table C6: Rhode Island Impact of Sales Change on Employment and Value Added, 2017.....92

Table C7: Vermont Impact of Sales Change on Employment and Value Added, 2017.....93

TABLE C1: New England Impact of Sales Change on Employment and Value Added, 2017

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Oilseed	0.86	1.06
Grain	1.36	0.83
Fruit	2.79	0.96
Vegetables	1.98	0.91
Greenhouse	1.94	1.03
All Other Crops	8.08	1.08
Cattle Ranching	1.87	0.87
Dairy Cattle and Milk	0.80	0.68
Other Animal Production	2.21	0.97
Poultry and Eggs	0.56	0.46
Agriculture Support	3.98	1.31
Fisheries	1.71	1.43
Animal Food	0.30	0.31
Grain and Oilseed Milling	0.31	0.40
Sugar and Confectionary	0.66	0.57
Fruit and Vegetable Preserving	0.55	0.53
Fluid Milk	0.52	0.56
Cheese	0.55	0.50
Other Dairy	0.84	0.69
Animal Slaughtering	0.48	0.44
Seafood	0.67	0.65
Bakeries and Tortilla Mfg.	1.03	0.81
Other Food Manufacturing	0.63	0.59
Breweries	0.45	0.64
All Other Beverages	0.43	0.54
Grocery Wholesaling	1.03	1.15
Misc. Nondurable Wholesaling	0.70	1.10
Food and Beverage Retailing	2.00	1.22
Food Serv. and Drinking Places	1.76	1.14
NEW ENGLAND	1.48	1.03

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Sector Group Summary		
Farm and Fishery Products	2.11	1.08
Food Product Manufacturing	0.63	0.60
Trade and Services	1.70	1.16

TABLE C2: Connecticut Impact of Sales Change on Employment and Value Added, 2017

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Oilseed	1.01	0.80
Grain	1.33	0.87
Fruit	2.63	1.05
Vegetables	1.92	0.97
Greenhouse	1.86	1.05
All Other Crops	8.79	1.08
Cattle Ranching	2.03	0.74
Dairy Cattle and Milk	0.67	0.63
Other Animal Production	2.16	0.95
Poultry and Eggs	0.52	0.47
Agriculture Support	2.88	1.35
Fisheries	2.46	1.31
Animal Food	0.23	0.38
Grain and Oilseed Milling	0.22	0.26
Sugar and Confectionary	0.55	0.53
Fruit and Vegetable Preserving	0.43	0.52
Fluid Milk	0.44	0.53
Cheese	0.35	0.38
Other Dairy	0.95	0.75
Animal Slaughtering	0.48	0.44
Seafood	0.54	0.51
Bakeries and Tortilla Mfg.	0.95	0.79
Other Food Manufacturing	0.49	0.59
Breweries	0.41	0.59
All Other Beverages	0.36	0.61
Grocery Wholesaling	0.89	1.13
Misc. Nondurable Wholesaling	0.56	1.10
Food and Beverage Retailing	1.76	1.20
Food Serv. and Drinking Places	1.68	1.11
CONNECTICUT	1.37	1.05

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Sector Group Summary		
Farm and Fishery Products	2.35	0.97
Food Product Manufacturing	0.63	0.64
Trade and Services	1.49	1.13

TABLE C3: Maine Impact of Sales Change on Employment and Value Added, 2017

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Oilseed	1.13	0.70
Grain	1.32	0.73
Fruit	2.42	0.93
Vegetables	1.87	0.89
Greenhouse	1.73	0.92
All Other Crops	7.42	0.94
Cattle Ranching	1.84	0.70
Dairy Cattle and Milk	0.77	0.58
Other Animal Production	2.03	0.96
Poultry and Eggs	0.55	0.42
Agriculture Support	4.79	1.27
Fisheries	1.97	1.43
Animal Food	0.33	0.32
Grain and Oilseed Milling	0.38	0.33
Sugar and Confectionary	0.66	0.42
Fruit and Vegetable Preserving	0.68	0.56
Fluid Milk	0.71	0.66
Cheese	0.52	0.37
Other Dairy	1.12	0.77
Animal Slaughtering	0.69	0.44
Seafood	0.80	0.58
Bakeries and Tortilla Mfg.	1.16	0.74
Other Food Manufacturing	0.98	0.60
Breweries	0.49	0.60
All Other Beverages	0.44	0.53
Grocery Wholesaling	1.28	1.11
Misc. Nondurable Wholesaling	0.95	1.05
Food and Beverage Retailing	2.09	1.19
Food Serv. and Drinking Places	1.91	1.08
MAINE	1.57	0.96

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Sector Group Summary		
Farm and Fishery Products	2.09	1.12
Food Product Manufacturing	0.71	0.59
Trade and Services	1.88	1.11

TABLE C4: Massachusetts Impact of Sales Change on Employment and Value Added, 2017

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Oilseed	1.08	0.48
Grain	1.49	0.67
Fruit	3.05	0.91
Vegetables	2.21	0.86
Greenhouse	2.09	1.01
All Other Crops	10.17	0.98
Cattle Ranching	2.22	0.63
Dairy Cattle and Milk	0.74	0.61
Other Animal Production	2.41	0.79
Poultry and Eggs	0.59	0.46
Agriculture Support	3.75	1.36
Fisheries	1.52	1.48
Animal Food	0.28	0.38
Grain and Oilseed Milling	0.31	0.40
Sugar and Confectionary	0.63	0.60
Fruit and Vegetable Preserving	0.52	0.53
Fluid Milk	0.46	0.51
Cheese	0.34	0.35
Other Dairy	1.02	0.75
Animal Slaughtering	0.45	0.44
Seafood	0.66	0.66
Bakeries and Tortilla Mfg.	1.03	0.86
Other Food Manufacturing	0.60	0.61
Breweries	0.46	0.69
All Other Beverages	0.44	0.54
Grocery Wholesaling	1.07	1.20
Misc. Nondurable Wholesaling	0.77	1.14
Food and Beverage Retailing	2.02	1.25
Food Serv. and Drinking Places	1.74	1.17
MASSACHUSETTS	1.50	1.07

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Sector Group Summary		
Farm and Fishery Products	2.04	1.22
Food Product Manufacturing	0.62	0.61
Trade and Services	1.74	1.20

TABLE C5: New Hampshire Impact of Sales Change on Employment and Value Added, 2017

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Oilseed	1.36	0.59
Grain	1.64	0.78
Fruit	3.09	1.04
Vegetables	2.27	0.95
Greenhouse	2.12	1.06
All Other Crops	11.54	1.06
Cattle Ranching	2.48	0.83
Dairy Cattle and Milk	0.77	0.69
Other Animal Production	2.61	1.01
Poultry and Eggs	0.62	0.49
Agriculture Support	3.60	1.33
Fisheries	1.40	0.98
Animal Food	0.25	0.30
Grain and Oilseed Milling	0.21	0.25
Sugar and Confectionary	0.64	0.63
Fruit and Vegetable Preserving	0.44	0.33
Fluid Milk	0.51	0.60
Cheese	NA	NA
Other Dairy	1.42	0.79
Animal Slaughtering	0.59	0.41
Seafood	0.64	0.64
Bakeries and Tortilla Mfg.	1.03	0.67
Other Food Manufacturing	0.63	0.52
Breweries	0.43	0.68
All Other Beverages	0.43	0.55
Grocery Wholesaling	1.06	1.15
Misc. Nondurable Wholesaling	0.81	1.08
Food and Beverage Retailing	2.26	1.20
Food Serv. and Drinking Places	1.87	1.12
NEW HAMPSHIRE	1.62	1.02

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Sector Group Summary		
Farm and Fishery Products	2.70	0.96
Food Product Manufacturing	0.56	0.62
Trade and Services	1.92	1.15

TABLE C6: Rhode Island Impact of Sales Change on Employment and Value Added, 2017

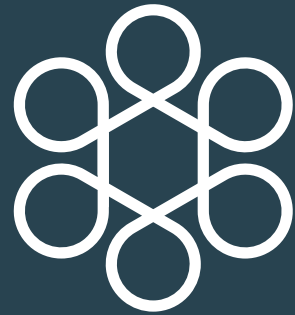
State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Oilseed	2.44	1.26
Grain	0.43	0.47
Fruit	0.29	0.39
Vegetables	11.81	1.06
Greenhouse	2.95	1.34
All Other Crops	0.45	0.40
Cattle Ranching	1.12	0.78
Dairy Cattle and Milk	0.48	0.53
Other Animal Production	2.69	1.05
Poultry and Eggs	0.36	0.34
Agriculture Support	0.76	0.68
Fisheries	1.32	1.26
Animal Food	0.46	0.45
Grain and Oilseed Milling	1.98	1.21
Sugar and Confectionary	1.87	1.11
Fruit and Vegetable Preserving	2.98	1.08
Fluid Milk	0.53	0.39
Cheese	1.46	0.94
Other Dairy	0.38	0.35
Animal Slaughtering	2.02	1.09
Seafood	1.02	1.17
Bakeries and Tortilla Mfg.	0.77	1.07
Other Food Manufacturing	1.03	1.14
Breweries	1.41	0.90
All Other Beverages	0.63	0.53
Grocery Wholesaling	0.61	0.44
Misc. Nondurable Wholesaling	0.57	0.55
Food and Beverage Retailing	0.59	0.42
Food Serv. and Drinking Places	2.19	1.01
RHODE ISLAND	1.61	1.06

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Sector Group Summary		
Farm and Fishery Products	1.75	1.19
Food Product Manufacturing	0.72	0.56
Trade and Services	1.75	1.14

TABLE C7: Vermont Impact of Sales Change on Employment and Value Added, 2017

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Oilseed	0.74	1.25
Grain	1.30	0.98
Fruit	2.53	1.16
Vegetables	1.92	1.04
Greenhouse	1.99	1.12
All Other Crops	6.73	1.17
Cattle Ranching	1.69	1.01
Dairy Cattle and Milk	0.84	0.72
Other Animal Production	1.86	1.31
Poultry and Eggs	0.61	0.49
Agriculture Support	4.72	1.25
Fisheries	NA	NA
Animal Food	0.30	0.30
Grain and Oilseed Milling	0.20	0.15
Sugar and Confectionary	0.71	0.50
Fruit and Vegetable Preserving	0.41	0.32
Fluid Milk	0.74	0.67
Cheese	0.59	0.53
Other Dairy	0.68	0.62
Animal Slaughtering	0.84	0.57
Seafood	NA	NA
Bakeries and Tortilla Mfg.	1.07	0.68
Other Food Manufacturing	0.83	0.50
Breweries	0.46	0.49
All Other Beverages	0.45	0.51
Grocery Wholesaling	1.17	1.05
Misc. Nondurable Wholesaling	0.91	0.99
Food and Beverage Retailing	2.02	1.11
Food Serv. and Drinking Places	1.81	1.04
VERMONT	1.23	0.80

State	Total Jobs Per 1% Change in Sales	Total Value-Added Per 1% Change in Sales
Sector Group Summary		
Farm and Fishery Products	1.99	0.88
Food Product Manufacturing	0.66	0.54
Trade and Services	1.62	1.06



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