As more frequent and intense climate change disasters imperil food supplies around the world, where our food comes from matters more than ever.

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

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

New England Feeding New England explores this question and what it will 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 where we eat. Our research presents an opportunity for the region: significant changes in diet (e.g., dramatically reducing consumption of ultra-processed foods and increasing fruit and vegetable consumption), a significant increase in land in agriculture, stopping the decrease in farmers and fishermen, and finding a way to actually get local/regional food in the places people shop are daunting challenges, but addressing them will leave our food system stronger and more resilient.

Through 7 research Volumes, New England Feeding New England lays out the case for a regional approach to food system resilience.

- https://nefoodsystemplanners.org/
How self-reliant is our region?

*New England Feeding New England Volume 2* estimates regional food self-reliance (RSR)—how much food we produce compared to how much food we consume—for the five major food groups. RSR percentages varied widely from food product to food product, showing a rather lopsided capacity for self-reliance. A small number of foods were produced in large quantities relative to consumption and had self-reliance ratios near or exceeding 100% (e.g., dairy, maple syrup, potatoes, lobster, clams). Most foods, however, had self-reliance ratios of less than 10% (e.g., beef, lettuce, wheat).

**New England Regional Self-Reliance for Major Food Groups**

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Servings</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
<td>1.6%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Vegetables</td>
<td>28.3%</td>
<td>41.0%</td>
</tr>
<tr>
<td>Fruits</td>
<td>8.7%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Dairy</td>
<td>50.0%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Proteins</td>
<td>3.2%</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

Source: *Volume 2: Estimating Production for 30% Regional Self-Reliance*. Note: vegetables consists of a significant amount of calorie-dense potatoes grown in Maine; dairy includes a significant amount of production in Vermont.

What can each New England state do to increase food security and access while building resilience for the whole region?

What strengths does Vermont’s food system possess and what opportunities can be pursued? What weaknesses persist and what threats loom?

This State Brief contextualizes important characteristics of Vermont’s food system for consideration.

For example, Vermont’s food system strategic plan, Farm to Plate, has led the way for food system planning efforts across the country. Farm to Plate has a laser focus on the power of networks to transform systems. The Farm to Plate Network has committed to building a strong business services, technical assistance, and financing support system for small and midsize producers, processors, and food system businesses. Vermont has already made significant investments in long-term food production, increasing the viability of local farms and food businesses, and protecting and preserving agricultural land.

At the same time, Vermont’s food system is small by national standards and heavily dependent on dairy production. Vermont, along with Maine, will have to both increase the total amount of land in agriculture and increase vegetable, produce, livestock, and grain production to meet a 30% by 2030 goal.

Dollar stores are by far the most common type of major grocery chain in Vermont, but the state also has a significant number of independent grocery stores, like Healthy Living, 11 food co-ops, and many country stores. These smaller stores may also facilitate access to regional food.
Since 2009, Farm to Plate has been Vermont’s food system plan to increase economic development and jobs across the food system, improve the resiliency of the working landscape in the face of climate change, and improve access to healthy local foods for all Vermonters. The 15 goals and 34 priority strategies contained in the Vermont Agriculture and Food System Strategic Plan 2021-2030 are being implemented by over 350 organizations who comprise the Farm to Plate Network. The Strategic Plan also informs the work of the Vermont Agency of Agriculture, Food & Markets, the Governor’s Commission on the Future of Agriculture, the Vermont Climate Council, and the Working Lands Enterprise Board. To have all these entities aligned around the same food system development plan means we have a greater ability to achieve the plan’s goals by 2030, and contribute to the regions 30% x 2030 goal.

Vermont Farm to Plate

State Snapshot

» Top Agricultural Products by Sales, 2017
Milk from cows and cattle/calf sales made up the majority ($405 million out of $684 million) of agricultural sales in Vermont.

- MILK FROM COWS 59.2%
- MAPLE SYRUP 8.5%
- CATTLE 8.4%

» Top Manufactured Products by Sales, 2017

- OTHER DAIRY PRODUCTS 25.3%
- CHEESE 18.5%
- OTHER PRODUCTS 16.3%

» Top Retail Food Sales by Market Channel, 2017
Grocery stores and restaurants accounted for 86.8% of total retail food sales ($3.3 billion).

- GROCERY STORES 56.2%
- RESTAURANTS/FAST FOOD 30.6%
- LIQUOR STORES 4.0%
- DIRECT SALES 1.6%

Vermont had the highest percentage of food and beverage processing and manufacturing employment and sales of any state in New England. Food and beverage processing and manufacturing accounted for 9.2% of food system jobs and 21.3% of sales.

Source: Volume 3: Economic Impact of New England’s Food System
**Food System Economy**

**How big is Vermont's food system? What sectors are growing? What sectors are contracting?**

Vermont’s food system employs over 61,000 people and generates over $14.2 billion in sales. Agricultural employment increased slightly and sales decreased slightly from 2007 to 2017. Employment and sales in every other category, except grocery store sales, increased from 2007 to 2017.

» **Economic Impact of Vermont’s Food System, 2017**

<table>
<thead>
<tr>
<th></th>
<th>2017 Employment</th>
<th>% of Total</th>
<th>Growth from 2007-2017</th>
<th>2017 Sales</th>
<th>% of Total</th>
<th>Growth from 2007-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>21,700</td>
<td>35.4%</td>
<td>0.6%</td>
<td>$704,405,500</td>
<td>4.9%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Fisheries</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
<td>$0.00</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Food Manufacturing</td>
<td>4,806</td>
<td>7.8%</td>
<td>2.3%</td>
<td>$2,788,294,100</td>
<td>19.6%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Beverage Manufacturing</td>
<td>867</td>
<td>1.4%</td>
<td>11.8%</td>
<td>$240,740,000</td>
<td>1.7%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Wholesaling + Distributing</td>
<td>3,530</td>
<td>5.7%</td>
<td>1.2%</td>
<td>$7,132,355,700</td>
<td>50.1%</td>
<td>11.7%</td>
</tr>
<tr>
<td>Stores</td>
<td>9,871</td>
<td>16.1%</td>
<td>0.4%</td>
<td>$2,178,873,100</td>
<td>15.3%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Food Services + Drinking Places</td>
<td>20,555</td>
<td>33.5%</td>
<td>0.4%</td>
<td>$1,206,743,600</td>
<td>8.5%</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>61,338</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>0.7%</strong></td>
<td><strong>$14,251,411,900</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>4.3%</strong></td>
</tr>
</tbody>
</table>

Source: [Volume 3: Economic Impact of New England’s Food System][1]. Note: Agriculture sales in this table includes support activities. Sales values are adjusted for inflation to 2020 dollars. Agricultural sales are adjusted using producer price indices for crops and livestock.

» **Food System Employment Multiplier**

The employment multiplier calculated in Volume 3 shows that for each additional job created in Vermont's food system, total employment in the state's economy will increase by 1.8 jobs (i.e., for every 1 additional food system job, there will be 0.8 jobs spun-off those).

Total Food System Employment Impact

Vermont Food System Employment

<table>
<thead>
<tr>
<th>Multiplier 1.8</th>
<th>GROWS TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>61,338</td>
<td>108,568</td>
</tr>
</tbody>
</table>

The additional 0.8 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.

[1]: Volume 3: Economic Impact of New England's Food System
Food System Wages

How much do food system workers in Vermont earn?

Wages/salaries are the most common source of income for the majority of Americans. Unfortunately, Vermont’s food system workers, particularly food service workers, receive some of the lowest wages of any occupational category in the state. Vermont has the third lowest minimum wage of the New England states, and median hourly wages for many food system jobs are below living wage levels.

Median Hourly Wages by Major Occupational Category, 2022

Median Hourly Wages by Selected Food System Occupations, 2022

The U.S. GAO found that restaurants and other eating places employed the largest percentage of working adult Medicaid enrollees and SNAP recipients in states that provided employer data.

Median Hourly Wages by Selected Food System Occupations, 2022

The U.S. GAO found that restaurants and other eating places employed the largest percentage of working adult Medicaid enrollees and SNAP recipients in states that provided employer data.
Food Access

Do Vermonter have equitable access to food stores?

Vermont’s biracial, Hispanic, Asian, Black, and other non-White populations disproportionately live in low income/low access (LILA)* census tracts.

A higher percentage (i.e., a more purple census tract) means that residents are more likely to be non-White, Hispanic, and/or low income with limited access to grocery stores, particularly in cities.

Vermont is also home to predominantly rural, White populations with low income and low access.

* Low Income/Low Access (LILA) = Where a large proportion of the residents have low-incomes and are more than 1/2 mile from a food source for urban populations, and over 10 miles for rural populations.

Food Insecurity

In the past 20 years, food insecurity was highest in 2011, as a result of the Great Recession.

The COVID-19 pandemic also triggered economic hardship across the country, but USDA estimates of food insecurity were not noticeably higher in 2020 and 2021. What explains this? The federal government rapidly fortified the social safety net to fight the pandemic.

However, other research found that as much as 40% of Vermont’s population experienced food insecurity from July 2021 to July 2022.

Source: National Food Access and COVID Research Team
How much do Vermonters spend on food? Where do they shop?

Vermonters spent over $3.3 billion at stores and restaurants in 2017. Grocery stores (56.2%) and restaurants (30.6%)—which includes full-service and fast food restaurants—accounted for 86.8% of total sales. Direct sales from farmer to customer made up 1.6% of total retail sales, the highest percent in New England.

Food Stores and Services Sales, 2017

```
TOTAL = $3.3 BILLION
```

<table>
<thead>
<tr>
<th>Type of Store</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery Stores/Supermarkets</td>
<td>$1.8 billion</td>
<td>56.2%</td>
</tr>
<tr>
<td>Restaurants</td>
<td>$1.0 billion</td>
<td>30.6%</td>
</tr>
<tr>
<td>Liquor Stores</td>
<td>$133 million</td>
<td>4.0%</td>
</tr>
<tr>
<td>Convenience Stores</td>
<td>$60.8 million</td>
<td>2.4%</td>
</tr>
<tr>
<td>Specialty Stores</td>
<td>$92.2 million</td>
<td>12.2%</td>
</tr>
<tr>
<td>Food Service Contractors</td>
<td>$124 million</td>
<td>3.8%</td>
</tr>
<tr>
<td>Direct Sales</td>
<td>$52.8 million</td>
<td>1.6%</td>
</tr>
<tr>
<td>Mobile Food Services</td>
<td>$1.7M, 0.1%</td>
<td></td>
</tr>
</tbody>
</table>

Note: this estimate does not include gas station convenience stores or pharmacy chains like Walgreens and CVS.

Count of Food Stores in Vermont

Vermont has over 100 independent stores, including many general/country stores and small grocery stores. Vermont also has 11 co-ops (with 13 storefronts) and a few small chains.

Dollar stores are by far the most common type of national grocery stores in Vermont. It has historically been challenging for local and regional food producers to get their products stocked in national chains.

Source: Economic Census

Note: Vermont Farm to Plate and Google search.
What would it take to meet a 30% food expenditure goal?

Vermont had the thirteenth highest per capita food expenditures ($5,283) of any state in the country in 2020. With an average annual food expenditure growth rate of 1.5% from 1997 to 2020—and population increase to 711,870 by 2030—per capita food expenditures may reach $5,512 by 2030. About $1,653 per capita would then have to be spent on regional food to meet our 30% goal.

Northeast consumer expenditure data indicates that ultraprocessed food and beverage products make up the top 3 food expenditure categories, followed by fresh fruit.

Source: USDA State-Level Food Expenditure Series

Source: Consumer Expenditure Survey
Climate Change

How will climate change impact Vermont’s food system?

Food system activities like cultivating crops, raising livestock, and land use changes, are major drivers of climate change and food systems are particularly vulnerable to a changing climate. July 2023 was the warmest month on record and major changes are already underway across Vermont and New England:

- **Benefits to Agriculture:** longer growing periods and milder temperatures should allow farmers to experiment with new crops or practices that were previously not viable in Vermont.

- **Loss of Seasonality:** at the same time, less distinct seasons, milder winters, earlier spring conditions, and more unpredictable and extreme weather are expected to impact agricultural production. For example, a late frost event in May 2023 led to a USDA Secretarial Disaster Designation for every county in Vermont. An iconic Vermont agricultural activity—maple syrup production—is expected to decrease as climate change impacts the range in which tree species can survive, shortens the length of the sugaring season, and aids in the expansion of invasive tree pests.

The average temperature in Vermont in 2022, 44.2°F, was 2.9°F higher than the average temperature during the previous century.

- **Air Temperature Anomaly**

![Temperature Anomaly Graph](image)

Source: NOAA National Centers for Environmental Information

- **Projected Climate Risks**
  - **EXTREME RAIN:** Annual precipitation and extreme precipitation events in Vermont have been above average in recent years.
  - **HURRICANES:** Hurricanes Irene (2011), Floyd (1999), and Gloria (1985), were all billion-dollar disasters that impacted Vermont.
  - **WATER STRESS:** Vermont has experienced more abnormally dry days during the past 10 years than it did in the early 2000s.

» **Risks to Cities:** the Northeastern U.S. is home to densely populated cities, rural communities, critical transportation corridors and infrastructure, and culturally and historically significant sites. Climate change impacts, including from flooding and hurricanes can damage infrastructure, displace populations, strain our emergency response system, and disproportionately affect historically marginalized and low-income communities.

In July, 2023, Vermont was inundated with extreme rainfall. Restaurants, stores, homes, and other businesses in the capital, Montpelier, were flooded. Farms across the state were again submerged, about 12 years after Tropical Storm Irene devastated the state.

» **Threats to Health:** increases in heat and humidity, ground-level ozone pollution, air pollution from wildfires, mold, pollen season, vector-borne diseases (e.g., Lyme disease), and gastrointestinal illnesses from waterborne and foodborne contaminants can lead to more illness and death.

Source: Fourth National Climate Assessment, Chapter III, Northeast

» **Projected Climate Risks**

- **Wildfire:** Large wildfires are not very common in Vermont, but 200-400 small fires (1.5-2 acres) occur per year.

- **Heat Stress:** Temperatures have risen about 3.0°F since the beginning of the 20th century, resulting in warmer nights, shorter freeze-free seasons, and longer growing seasons.

- **Sea Level Rise:** With no ocean coastline, Vermont is spared the direct impacts of sea level rise.

Agriculture

What kinds of agricultural products does Vermont grow/raise? How have land uses changed over time?

» Land in Agriculture

- Harvested cropland: 417,925 acres
- Total land in agriculture: 1,193,437 acres
- Cropland: 457,748 acres (39.3%)
- Pasture: 158,304 acres (13.3%)
- Woodland: 503,496 acres (42.2%)
- Farmsteads: 73,889 acres (6.2%)

END USES

- ANIMAL FEED
- EDIBLE

- Acreage for animal feed equaled 93.6% (391,420 acres) of harvested cropland and 32.8% of total land in agriculture. Boosting vegetable, fruit, and grain production—whether in the open or indoors—is one way Vermont could help the region.

» Agricultural Sales

- Total $683,935,400
- The dairy industry is the dominant factor in Vermont agriculture. Dairy farms accounted for 9.5% of farms and 59.2% of sales.

Note: Agriculture sales in this figure do not include support activities. Sales values are adjusted for inflation to 2020 dollars using producer price indices for crops and livestock.

*Source: USDA 2017 Census of Agriculture*
Vermont has the highest percentage of agricultural land as a percentage of total land area, 20.5%, of any state in New England, but only a small percentage of agricultural land is used for crops to directly feed people.

An analysis from the American Farmland Trust (AFT) estimates that Vermont could lose an additional 41,200 acres by 2040 under a “Business as Usual” development scenario and 61,800 acres under a “Runaway Sprawl” scenario.

AFT projects that Addison, Franklin, and Rutland counties will experience the biggest decreases in land in agriculture.

Source: American Farmland Trust, Farms Under Threat 2040: Choosing an Abundant Future

20.5% Vermont has the highest percentage of agricultural land as a percentage of total land area, 20.5%, of any state in New England, but only a small percentage of agricultural land is used for crops to directly feed people.

Number of Farms Engaged in Each Category

25% of farms are engaged in hay production, which accounted for 5.6% of sales.

Source: USDA 2017 Census of Agriculture
Food Waste

How much food waste is landfilled in Vermont?

A 2018 “Waste Characterization” study found that food waste (vegetative and protein) is the second most common material in Vermont’s municipal waste stream at 82,000 tons, or 1.6 million pounds.

Landfilled Food Waste

- **Paper**: 83,880 tons (19.9%)
- **Food waste**: 81,627 tons (19.3%)
- **Other**: 55,086 tons (13.0%)
- **Plastic**: 53,712 tons (12.7%)
- **Construction/Demolition**: 46,823 tons (11.1%)
- **Bulky waste**: 41,263 tons (9.8%)
- **Other organics**: 21,499 tons (5.1%)
- **Metal**: 10,692 tons (2.5%)
- **Textiles**: 17,830 tons (4.2%)
- **Glass**: 8,102 tons (1.9%)
- **Special waste**: 1,742 tons (0.4%)

Source: DSM Environmental Services, 2018, 2018 Vermont Waste Characterization

Local Food Count

Vermont’s Local Food Counts showcase growth in local food sales at most market outlets. Dairy products, processed/manufactured food products, beverages, and meat were the top local products sold. Vermont local food development efforts have led to increased local food sales, from $114 million (5% of all food sales in 2011) to $371 million (16.1% in 2020). Given their value to understanding actual regional food purchases, Local Food Counts will be conducted in the five other New England states in 2023.
Key Vermont Strengths, Weaknesses, Opportunities, and Threats

**STRENGTHS**

- Strong farming community and overall sense of farming as core to Vermont’s identity.
- % of total land in ag production, with strong commitment to farmland conservation and access
- Strong culture and practice of local food consumption (from 5% to 16.1% over 10 years)
- Retail grocers training program has built relationships between producers, independent grocers, distributors and food hubs
- Robust support system of NGOs, producer associations, state government, academic institutions, funders and financial institutions

**WEAKNESSES**

- Significant decrease in land in agriculture
- Vulnerable to the ebbs and flows of dairy industry
- Low minimum wage ($13.13)
- Scale challenges: transportation costs are high and logistics efficiencies are difficult to attain in rural areas; geographic constraints limit sizes of farms and availability of contiguous land
- Disparities in healthy food access based on race/ethnicity
- BIPOC farmers struggle to secure sufficient land, capital and infrastructure

**OPPORTUNITIES**

- Invest in long-term food production (e.g., expand vegetable, fruit, and protein production; increase indoor food production)
- Increase the viability of local farms and food businesses
- Protect and preserve active agricultural land
- Invest in food processing/manufacturing and distribution infrastructure for small and midsize operations

**THREATS**

- Hurricanes and extreme rainfall are high risks for Vermont
- Aging population, including the population of farmers and food business owners
- Insufficient succession planning
- Land development pressures, including from climate migration into Vermont

**Next Steps: What Can Vermont do to Meet the 30% by 2030 Goal?**

To help meet the region’s 30x2030 goal, Vermont needs to aggressively implement priority strategies from its 2021-2030 Strategic Plan related to market development, climate resilience, food security, and racial equity. To accomplish its aims, and the region’s, Vermont will need to closely coordinate with partnering New England states on policy innovation, consumer engagement, and financing and funding. Areas of priority include:

» Production, processing, and distribution infrastructure and supply chain investment
» Cultivating viable wholesale grocer market opportunities within the state and New England
» Supporting and accelerating land access and land affordability with a particular focus on equitable access for beginning, socially disadvantaged, and BIPOC farmers
» Creating synergies between climate policy and resilience and food system development
» Leveraging cross-sector coalitions to stimulating systemic solutions to food access and security.

Funding for this project has been made possible by the Henry P. Kendall Foundation and the Angell Foundation.
Demographic Trends

Population Density by Census Tract, 2020 5-year Average

More than 26% of Vermont’s population lives in Chittenden County.

Population by Age Cohort, 2020 Actual and 2030 Projection

<table>
<thead>
<tr>
<th>AGE COHORT</th>
<th>2020</th>
<th>2030</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-17</td>
<td>135,839</td>
<td>138,959</td>
<td>12.3%</td>
</tr>
<tr>
<td>18-29</td>
<td>96,898</td>
<td>89,542</td>
<td>-7.6%</td>
</tr>
<tr>
<td>30-39</td>
<td>97,541</td>
<td>86,647</td>
<td>-11.2%</td>
</tr>
<tr>
<td>40-49</td>
<td>81,537</td>
<td>100,769</td>
<td>23.6%</td>
</tr>
<tr>
<td>50-59</td>
<td>91,855</td>
<td>80,986</td>
<td>-11.8%</td>
</tr>
<tr>
<td>60-69</td>
<td>96,023</td>
<td>85,579</td>
<td>-10.9%</td>
</tr>
<tr>
<td>70-79</td>
<td>59,559</td>
<td>78,518</td>
<td>31.8%</td>
</tr>
<tr>
<td>&gt;80</td>
<td>31,434</td>
<td>50,867</td>
<td>61.8%</td>
</tr>
</tbody>
</table>

Although the largest age cohort in 2030 will be 0-17, the biggest growth is expected in the cohorts 80+, 70-79, and 40-49. The number of people over the age of 60 is projected to increase by 14.9%, from 187,016 in 2020, to 214,964 in 2030. The aging of the Vermont population will have health, labor force, food access, and food security implications.

Source: CDC WONDER online database