Reducing Food Waste in Massachusetts:

Local Successes Informing Statewide Solutions

MASSACHUSETTS FOOD SYSTEM COLLABORATIVE

In early 2016, after completing a statewide food system plan for Massachusetts, the Massachusetts Local Food Action Plan, a group of stakeholder organizations, formed the Massachusetts Food System Collaborative, a network of organizations and institutions dedicated to working toward an equitable and sustainable food system in the Commonwealth. The Collaborative leads campaigns that build the capacity of food-system stakeholders to advocate for policy recommendations in the plan.

Reducing food waste is one of the goals of the plan, and has been one of our lead projects for several years. We have brought together food banks and pantries, farmers, compost and anaerobic digester operators, food-rescue organizations, regulators, and other stakeholders to develop a set of policy priorities to reduce food waste and divert edible surplus food to families in need and to advocate for those policies. This report is part of that effort.

This report was made possible in part thanks to a grant provided by Whole Foods Market.

Author: Brittany Peats. brittany@mafoodsystem.org

www.mafoodsystem.org

November 2019

Reducing Food Waste in Massachusetts:
Local Successes Informing Statewide Solutions

Contents

Food Waste in Massachusetts

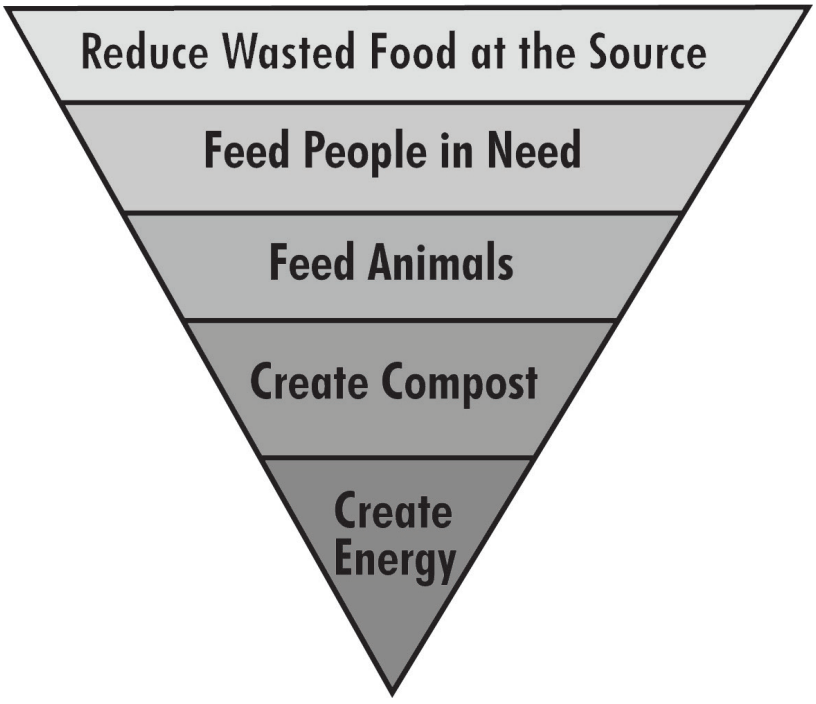
According to the Natural Resources Defense Council, at least 40% of all the food in the US is wasted.[1] In Massachusetts, food producers and consumers disposed of more than a million tons of food waste in 2016,[2] representing a quarter of the waste stream.

At the same time, more than 650,000 Massachusetts residents are food-insecure,[3] making the disposal of edible food a missed opportunity to better integrate and strengthen the many sectors of the food system.

Food waste poses an environmental hazard as well, because discarded organic matter in landfills creates methane, a greenhouse gas that contributes to climate change. And landfilling or incinerating food waste is expensive for municipalities and causes public health and environmental impacts, with a disproportionately negative impact on the low-income communities in which these facilities are often built.

Importantly, just as the problem of food waste illuminates the connection between different sectors of the food system and the weaknesses within them, more sustainable solutions can result from connecting and strengthening those sectors. From educating children in their lunchrooms, to providing curbside pickups of food scraps, to generating energy on farms, the efforts we highlight in this report prove that thoughtful, targeted investments in infrastructure, programs, and education can be effective in improving environmental health, food access, and economic sustainability. But additional attention is needed to bring these community-based models to scale.

The Massachusetts Food System Collaborative has adapted and simplified the United States Environmental Protection Agency (EPA)'s food recovery hierarchy to indicate how we prioritize the ways in which food waste can be reduced.



All businesses and institutions that handle food—grocery stores, restaurants, hotels, offices, hospitals, schools, and others—should first work to reduce the amount of excess food they create. This can be done by ordering only the type and amount of food that will be selected and eaten, displaying smaller amounts of food at once, reusing leftovers, and reducing serving sizes. Grocery stores could display less food at once, especially near the end of the day, sell imperfect produce at a discount, and reduce incentives meant to encourage bulk buying to help pare down at-home food waste. To make these changes, businesses need to more closely monitor how much food they are wasting and need more education about the negative environmental and financial impact of that waste. They also need technology, tools, and infrastructure to support these changes.

After food businesses undertake reduction efforts, the next step is to donate nutritious, surplus, edible food to those in need. Businesses can make donations directly to food banks, food pantries, and other service organizations, and many food-rescue organizations collect edible food—usually cosmetically damaged or unsold or unwanted food resulting from overproduction or overstocking that can be safely eaten as-is or processed into food that is safe for consumption—from grocery stores, restaurants, and farms, and transport it to organizations that distribute it to families in need. While this system captures large amounts of edible food that would otherwise be wasted, most edible food waste is still not donated, often because businesses are concerned they will be held liable if anyone eating the donated food gets sick. This is despite the fact that almost all food donors are protected from liability. Many businesses also report they do not donate surplus food because of the time and effort required to do so—staff need to separate and store food at correct temperatures and follow food-safety guidelines. Given these obstacles, it is clear that businesses need to be incentivized to donate surplus food to those in need.

If excess food remains after reduction and donation efforts, this waste—particularly inedible food such as scraps and spoiled items—should then be fed to animals, composted to create valuable soil amendments, or sent to anaerobic digestion facilities to generate power. Though there are many facilities throughout Massachusetts that process food in these ways, access to them is uneven, especially from the urban areas, where most of the food waste is created.

Individuals also create food waste. Consumers may buy too much at the grocery store and then end up throwing food out at home in their trash. Some of that waste is due to confusing date labels on food. Consumers may believe food is unsafe to eat past the date on the label, when in fact few of the dates are related to safety and instead refer to when the product is at peak quality. Clarifying date labels would reduce confusion and waste. Consumers often don't consider the impact of the items they discard, and more education around the negative environmental and social consequences of food waste and potential solutions will help convince more consumers to change behavior. For example, individuals may be able to compost at home or separate their food scraps to be collected and composted. Municipalities can help provide the tools and education to help individuals compost.

The Commonwealth of Massachusetts is a national leader in food-waste reduction and has taken many steps to reduce food waste. Most notably, in 2014, the Massachusetts Department of Environmental Protection (MassDEP) enacted the Commercial Food Material Disposal Ban, which requires that generators

of more than one ton of organic waste per week divert that material from the waste stream. These institutions can reduce the amount of waste they produce, donate it, or send it to composting or anaerobic digestion facilities. The regulation has shown positive effects, but has limitations, because many businesses creating significant amounts of food waste—though below the threshold—are still able to send it to be landfilled or incinerated.

It will take attention, effort, and resources to further reduce food waste in Massachusetts and require the engagement of state and local governments, schools, businesses, institutions, nonprofits, and individuals. This report outlines existing state supports—including regulations, technical assistance, and funding—to encourage food-waste reduction and diversion. Many organizations, businesses, and municipalities are already doing great work to reduce food waste. The case studies and resources in the next section are examples of models that can be replicated, adapted, and brought to scale to reduce food waste. The final section outlines recommendations for what the state and others can do to reduce the barriers and encourage more sustainable solutions to food waste in Massachusetts.

[1] *Wasted: How America is Losing up to 40 Percent of its Food From Farm to Fork to Landfill. Natural Resources Defense Council. August 2017.*

[2] *MassDEP Organics Subcommittee Meeting Powerpoint. John Fischer. September 20, 2019. https://www.mass.gov/files/documents/2019/09/24/osc0919.pdf*

[3] *Map the Meal Gap. Feeding America. 2018*

Food Waste Policy and Public Sector Support

The Bill Emerson Good Samaritan Food Donation Act

The Emerson Act is a federal law that provides liability protection to individuals, businesses, nonprofit food-recovery organizations, government entities, and gleaners that donate food to a nonprofit organization. To receive protection, the food must be donated in good faith, be properly labeled, and be distributed to people in need. This is important, as businesses often decline to donate edible food, citing unfounded liability concerns.

In addition, Massachusetts law provides civil protection for food donors, including when the end recipient pays for the food. Massachusetts law explicitly allows donation of past-date food, as long as the food is wholesome, separated from foods that are not past-date, and is clearly labeled as past-date.

The Bill Emerson Good Samaritan Food Donation Act: *https://www.feedingamerica.org/about-us/partners/become-a-product-partner/food-partners*

Mass. General Laws: Part 1, Title XV, Chapter 94, Section 328: *https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXV/Chapter94/Section328*

Legal Fact Sheet for Massachusetts Food Donation: Liability Protections - July 2015: *http://www.recyclingworksma.com/wp-content/uploads/2015/07/Legal_Fact_Sheet_-MA_Liability_Protections-FINAL_RWF.pdf*

Date Labels

There is no federal law regulating date labels, the dates on food packaging that are accompanied by phrases such as "use by," or "best before." Massachusetts has relatively strict labelling requirements, including that prepackaged perishable and semi-perishable foods must have date labels. These labels reflect dates when the manufacturers believe the food is of highest quality—they do not reflect science-based food safety information. Standardizing date labels at the state or federal level would reduce consumer confusion and food waste.

Legal Fact Sheet for Massachusetts Food Donation: Date Labeling Laws - July 2015: *https://recyclingworksma.com/wp-content/uploads/2015/07/Legal_Fact_Sheet_-MA_Date_Labeling-edited_FINAL_RWF.pdf*

Tax Incentives

There are federal tax incentives for businesses that donate food, available as a general or enhanced tax deduction. Some states have augmented those with state-level incentives, though Massachusetts has not.

Legal Fact Sheet for Massachusetts Food Donation: Tax Incentives for Businesses: *https://recyclingworksma.com/wp-content/uploads/2015/07/Legal_Fact_Sheet_-_MA_Donation_Tax_Incentives-FINAL_RWF.pdf*

Commercial Food Waste Disposal Ban

In 2014, Massachusetts implemented the Commercial Food Waste Disposal Ban for facilities that dispose of one ton or more of food waste per week. Around 2,900 businesses and institutions meet that threshold and must comply with this regulation.[4] To comply, they can reduce the amount of food waste they create to a level below the threshold, donate edible food, or separate their food waste and process it onsite, or send it to be composted or anaerobically digested or fed to animals.

In 2014, before the Ban went into effect, about 110,000 tons of food waste was diverted from landfills. In 2018, 278,000 tons of food waste was diverted, demonstrating that the Ban has had a positive impact. Of that waste, 44,000 tons went to composting facilities, 160,000 tons to anaerobic digesters, 40,000 tons were fed to animals, and 26,000 tons were donated.[5] Massachusetts has set a goal of diverting 450,000 tons of food waste annually by 2020, and officials have expressed optimism about meeting this goal.

The impact is also evident in the number of businesses contracting with haulers to dispose of food waste separately: 1,350 customers were separating food waste in 2014 and around 2,300 in 2018. In addition, the rescue of fresh and perishable foods by food-rescue organizations and food banks has more than doubled since 2014.[6]

A 2016 report found that the Commercial Food Waste Ban led to the creation of 500 jobs—among haulers, processors, and food rescue organizations—and $175 million in direct and indirect economic activity during its first two years.[7]

Enforcement of the Ban is carried out by inspectors when waste haulers dump their trucks at landfills, transfer stations, and other waste facilities. The inspectors are looking not only for food waste, but also for the presence of many other banned materials, such as glass, tires, lead acid batteries, carboard, and others. Only some loads are inspected, however, and there are no inspections carried out at the businesses or institutions where the waste is generated.

***Commercial Food Material Disposal Ban**: https://www.mass.gov/guides/commercial-food-material-disposal-ban*
***Bans and Beyond: Designing and Implementing Organic Waste Bans and Mandatory Organics Recycling Laws**: https://www.chlpi.org/wp-content/uploads/2013/12/Organic-Waste-Bans_FINAL-compressed.pdf*
***Sites Accepting Diverted Food Material**: https://www.mass.gov/files/documents/2019/06/19/fdcomlst.pdf*

Composting and Anaerobic Digestion Regulations

MassDEP issues permits to commercial and municipal composting and anaerobic digestion operations through the Site Assignment Regulations for Solid Waste Facilities (310 CMR 16.00). The permit requires that the "owner and operator of an operation that composts or aerobically or anaerobically digests organic materials shall: 1. ensure the operation and its products do not result in an unpermitted discharge of pollutants to air, water or other natural resources of the Commonwealth, create a public nuisance, or present a significant threat to public health, safety or the environment; 2. ensure that the operation incorporates best management practices," among other requirements. Smaller operations, including composting operations receiving less than 30 tons per day and AD operations receiving less than 100 tons per day, may apply for a general permit. Larger operations must apply for a more rigorous Recycling, Composting or Conversion (RCC) permit. New or expanding operations must file a Site Assignment Application, which includes a process of public comments and notification of abutters.

The Massachusetts Department of Agricultural Resources (MDAR) manages an Agricultural Composting Registration process (330 CMR 25.00) for farms, all of which are exempt from the DEP composting permitting

Composting

Composting is the process by which organic materials are allowed to decompose, with microorganisms and oxygen breaking down the materials into a nurtrient-rich soil additive. Compost must contain carbon sources, such as leaves, wood chips, or paper, and nitrogen sources, such as food scraps, grass clippings, or manure. Operating a composting facility requires managing this carbon-nitrogen balance, along with particle size, moisture content, oxygen flow, and temperature, to maintain a healthy compost pile that will decompose quickly, safely, and with as little odor as possible.

There are three primary methods for composting large volumes: windrow, aerated static pile, and in-vessel composting. Windrow involves putting the organic waste into long rows, which are then manually or mechanically turned. In aerated static piles, blowers are installed under the piles, or loose material provides space for air to circulate. In-vessel composting involves putting scraps into a drum which is then mechanically turned. Home composters often use specially designed, rodent-proof bins for their household scraps. Thirty-two compost operations in Massachusetts now accept off-site food scraps.

Composting creates a soil amendment that helps foster plant growth which, in turn, sequesters carbon, helping to mitigate the effects of climate change. It also provides a local source of fertilizer for agriculture, reducing the need for imported additives. Large-scale composting requires space, equipment, and skilled management, and can create odors if poorly managed or during certain weather patterns.

Anaerobic Digestion

Anaerobic digestion (AD) is the process by which organic matter, such as animal waste or food scraps, is decomposed in an oxygen-free tank to produce methane gas, which is then used to create energy. Anaerobic digesters are able to take large volumes of food waste and process it quickly. The process is mostly odor free and can power or heat farms or businesses where the facilities are sited, or it can generate electricity to be sent to the grid.

There are three main types of AD, all of which are in use in Massachusetts: co-digestion facilities at wastewater treatment plants, where food is mixed with treated waste; on-farm co-digesters, where food is mixed with animal waste; and stand-alone, single-source digesters, which are often owned and operated by food companies. The matter that remains after the material has broken down, also known as digestate, can sometimes be used as fertilizer. Eight anaerobic digesters in Massachusetts currently accept food waste produced off-site.

There are also some challenges to AD. Anaerobic digesters are large, expensive to build and operate, and require a constant, large volume of product to be able to operate efficiently. Like commercial compost operations, many of the digesters are located far from the urban areas producing high levels of food waste, requiring that the waste be trucked long distances. Many of the facilities that process food waste are "wet digesters," meaning they require that the food waste be in liquid form, or slurry, therefore requiring an intermediate step to process the food. Sometimes this processing happens in a depackaging facility, where food that can be composted is separated from its packaging, which is disposed of.

When food waste is processed in an anaerobic digester at a wastewater treatment plant, the food is mixed with treated sewage. While the digestate is tested by public agencies for hazards, there are concerns that the sewage contaminants that remain makes it inappropriate for use on land used for crop prodiction, or on any land where it may seep into groundwater.

process. Farms registered with MDAR attain status as "an agricultural operation conditionally exempted from site assignment as a solid waste facility." This agricultural composting registration process recognizes the legitimate agricultural nature of such on-farm composting operations. MDAR also supports composting on farms by providing technical assistance to compost operators.

MassDEP Site Assignment Regulations for Solid Waste Facilities (310 CMR 16)*: https://www.mass.gov/files/documents/2016/08/tx/310cmr16.pdf*

MassDEP Permit*: https://www.mass.gov/how-to/general-permit-initial-annual-certification-recycling-composting-digestion*

MDAR Guide to Agricultural Composting*: https://www.mass.gov/files/documents/2017/12/11/Guide%20to%20Agricultural%20Composting.pdf*

MDAR Agricultural composting program (330 CMR 25)*: https://www.mass.gov/files/documents/2017/09/15/330cmr25.pdf*

Funding and Technical Support

Several Massachusetts state agencies offer technical assistance, grants, or loans to municipalities, businesses, and nonprofits that are doing composting or anaerobic digestion.

- Matrix of Financial & Technical Assistance for Anaerobic Digestion Projects
  – https://www.mass.gov/info-details/financial-technical-assistance-for-anaerobic-digestion-projects
- Massachusetts Clean Energy Center: Organics-to-Energy program provides funding for AD facilities
  – https://www.masscec.com/commonwealth-organics-energy
- MassDEP
  – The Sustainable Materials Recovery Program (SMRP) Municipal Grants is available for municipalities for composting equipment and organics capacity development, among other things.
    - https://www.mass.gov/how-to/apply-for-a-sustainable-materials-recovery-program-smrp-municipal-grant

  – The Recycling Business Development Grant supports businesses that are recycling certain materials; previous rounds have included food waste.
    - https://www.mass.gov/how-to/apply-for-a-recycling-business-development-grant
- Massachusetts Recycling Loan Fund - Administered by BDC Capital and funded by the Massachusetts DEP, this program offers low-interest loans for composting or AD facilities.
  – http://www.bdcnewengland.com/programs/massachusetts-recycling-loan-fund/
- MDAR
  – Agricultural Composting Improvement Program - Grant
    - https://www.mass.gov/files/documents/2018/10/05/RFR%20AGR-COMPOST-19.pdf
  – Agricultural Climate Resiliency & Efficiencies (ACRE) Program - Grant
    - https://www.mass.gov/service-details/agricultural-climate-resiliency-efficiencies-acre-program
  – Agricultural Environmental Enhancement Program - Grant
    - https://www.mass.gov/service-details/agricultural-environmental-enhancement-program-aeep
  – MDAR provides technical assistance to support well-managed, on-farm composting programs. New proposed regulations about on-farm composting include mandatory training programs for farmers who compost food waste.

RecyclingWorks in Massachusetts

RecyclingWorks in Massachusetts is funded by MassDEP and administered by the Center for EcoTechnology (CET), to help businesses comply with Massachusetts waste bans, including the Commercial Food Waste Disposal Ban. RecyclingWorks has a database of local haulers and processors as well as many case studies.

The organization offers no-cost technical assistance to help businesses divert waste from disposal through helping businesses reduce, donate, and collect wasted food for processing. Any business in Massachusetts can receive assistance over the phone, and RecyclingWorks evaluates eligibility for on-site assistance based on the amount of waste the business produces. The organization regularly works with hotels, restaurants, supermarket chains, colleges, and universities to help them reduce their food waste through customized signage and tailored recommendations based on site visits.

For organizations looking to donate surplus food, RecyclingWorks offers guidance developed through engagement with state and local health officials, food-rescue organizations, food banks, and organizations with established food-donation programs. This guidance includes information on liability protections, food labeling, tax incentives, and building a relationship with a food-rescue organization.

RecyclingWorks also offers compost-site technical assistance to compost-site operators. Composting experts contracted through RecyclingWorks provide consulting advice on best management practices.

Hotline: (888) 254-45525 / info@recyclingworksma.com
https://recyclingworksma.com/how-to/materials-guidance/food-waste-2/

The Green Team

MassDEP funds and administers the Green Team to empower students and teachers to improve the environment through waste reduction, recycling, composting, energy conservation, and pollution prevention. It is free to register for the program, and schools can request assistance to start or expand diversion programs. Some of the resources available through this program include:

- a Slash Trash curriculum that helps students reduce waste, including food waste, at both home and school;
- free recycling equipment, including outdoor compost bins for school gardens and vouchers for composting worms; and
- an instructional video on how cafeterias can separate food waste from other trash.

The Green Team: https://thegreenteam.org/

[4] *Organics Subcommittee Meeting Powerpoint. John Fischer. September 20, 2019. https://www.mass.gov/files/documents/2019/09/24/osc0919.pdf*
[5] *Organics Subcommittee Meeting Powerpoint. John Fischer. September 20, 2019. https://www.mass.gov/files/documents/2019/09/24/osc0919.pdf*
[6] *Organics Subcommittee Meeting Powerpoint. John Fischer. April 17, 2019. https://www.mass.gov/files/documents/2019/04/26/osc419-pres_0.pdf*
[7] *ICF International, Inc. "Massachusetts Commercial Food Waste Ban Economic Impact Analysis." December 2016. https://www.mass.gov/doc/massachusetts-commercial-food-waste-ban-economic-impact-analysis/download*

Food Waste Reduction Efforts:
Businesses, Nonprofits, and Institutions

Businesses and nonprofits throughout Massachusetts are using innovative methods and programs to reduce and divert food waste. These programs can serve as a blueprint for others looking to reduce food waste. The following case studies profile some of these programs, though the selected studies do not represent all of the work being done.

Reduce Wasted Food at the Source

The best way to reduce food waste is to not create excess food in the first place. Some businesses and institutions use specialized tools and tracking systems to analyze their food waste, with the ultimate goal of reducing the amount of excess food they order and produce. Others find ways to make their excess food available to those who need it. Still others have found ways to repurpose, or upcycle, materials that would otherwise become food waste, transforming them into different edible food.

LeanPath

It can be difficult for businesses to reduce food waste because they have many competing demands and often can't see the impact of food waste on the environment or their finances. LeanPath is a company that offers a system to track back-of-house food waste in an effort to help companies and institutions reduce food waste at the source. The company currently works with a few dozen universities, hospitals, and other institutions in Massachusetts.

Using camera technology and integrated scales, the program creates a database that food-service professionals can analyze and use to create changes in their operations. Simply seeing information about the food that is being wasted, including the environmental and financial costs if that same item is wasted every day for a year, can also prompt behavior change, says Steven Finn, Vice President of Food Waste Prevention at LeanPath. Companies typically reduce their food waste by 50% and save 2-8% on food purchasing costs, says Finn.

Boston College began working with LeanPath in 2015. They measured the food waste created by the kitchen—or pre-consumer waste—for two weeks to create a baseline. After that, staff weighed and categorized food waste and came up with solutions to reduce the waste. Since much of the waste was taking place at the salad bar and dessert bar, staff began displaying the food on smaller trays and reduced the amount of food that was prepared for those areas. The college now has weighing stations in several other kitchen locations on campus and continues to utilize the program to maintain their food waste reduction. Boston College has seen a 65% decrease in pre-consumer food

waste since 2015 and estimates that during that time they have saved more than 580,000 pounds of food from being wasted.

LeanPath: https://www.leanpath.com/

Food for All

Most restaurants prepare more food than they will sell in a day. The Food for All app connects consumers with this excess prepared food so that the food is eaten rather than discarded. Participating fast-casual restaurants in Boston list the approximate number of meals they expect to be available at the end of the day. Customers sign up to pay a reduced price on those meals, assuming that they are able to pick them up at the specified time and location and are flexible about what food they will receive. For example, a Boloco restaurant may estimate that they will have five burritos left at the end of the night. A customer can use the app to indicate they will pay four dollars for a burrito that they will pick up between 8:00 and 9:00 pm. They will receive a selection of the fillings that remain at that time. The restaurant receives a portion of the price, with the rest going to the Food for All app. Boloco has donated its profits from this program to the Greater Boston Food Bank, raising approximately $25,000 through Food for All's Meal Multiplier program.

The program has been widely adopted, due in part to the company's work in educating businesses about the amount of food waste that they create and the importance of reducing it.

Food for All: https://foodforall.com/

UMass Dartmouth

Universities serving several meals a day to thousands of students can create large amounts of waste, so they often need many approaches to effectively reduce it. The University of Massachusetts at Dartmouth has relied on the EPA WasteWise food waste hierarchy to introduce many food waste reduction programs, including Trim Trax, an analysis and reduction program managed by Compass, the university's food-management company, beginning in 2011.

The university has also tried to reduce plate waste—the amount of food that students take from the buffet but don't eat—through measuring it and educating students about how to select proper portion sizes. Plate waste dropped dramatically in the first week of the program, but the impact wasn't maintained over time. The university hopes to engage student leaders to create programming and education to maintain the reduction.

The university donates prepared food from its kiosks to a local ministry that distributes the food to people who are homeless. The university combines food that is prepared for the buffet but not served into balanced individual meals and freezes them. The meals are available for students and staff at the on-campus food pantry.

In 2017, the university provided more than 62,000 pounds of food scraps to Double S Farm to use for animal feed. Recently, Farmer Ben, a UMass Dartmouth graduate, has begun collecting used coffee grounds and shredded paper from the university for his compost.

Critical to the university's success has been the presence of a passionate leader managing the programs, taking advantage of education and information available from the EPA's WasteWise program and other sources, and making programmatic and culture changes gradually to increase participation.

Umass Dartmouth Dining Services: https://www.dineoncampus.com/umassd/sustainability
EPA WasteWise: https://www.epa.gov/smm/wastewise

Superfrau

In cheese making, about 90% of the milk becomes whey, and Melissa Martinelli of Superfrau estimates that cheesemakers create 3.1 million gallons of surplus whey in New England every year. In Iceland, Switzerland, and other countries, whey is often sold as a nutritious beverage; in the US it is often thrown out, fed to animals, or used as a fertilizer, and many cheesemakers pay to have the product removed. Martinelli and her partner are trying to reduce waste, capture the value of the whey created through the energy-intensive process of raising cows, and provide a nutritious beverage to consumers by creating drinks made from whey.

Still in the start-up phase, Superfrau launched its first line of beverages in April 2019 using whey collected from two of the oldest farms in Massachusetts, Mayval Farm in Westhampton and Appleton Farms in Ipswich.

CommonWealth Kitchen and Ellen Fitzgibbons, at the Massachusetts Department of Public Health (DPH), were instrumental in helping the company design a safe, trackable system for ensuring that the whey stays at the correct temperature at the farm, during transit, and through processing so that the product remains safe and wholesome.

The company has been doing outreach to dairy farmers and cheesemakers about the opportunities that can come from capturing whey and handling it safely. They have also been educating consumers about the environmental and health benefits of whey drinks. More awareness about upcycled food, and more technical and financial support for these businesses, including the state purchasing more of the products, would help businesses like Superfrau, says Martinelli.

Superfrau: https://www.drinksuperfrau.com/

Brewer's Crackers

After Kyle Fiasconaro learned how much effort went into creating malted barley—growing it, malting it, milling it—just for it to be disposed of after it was boiled for a batch of beer, he started baking crackers with the spent grain.

Brewer's Crackers took shape with support from several local businesses and CommonWealth Kitchen. Fiasconaro developed his product at Cutty's, a sandwich shop in Brookline, and sold it there. "The ability to get a business to let you do R and D—it was an unbelievable deal," he said. After developing trust with the breweries, he used spent grain from Lamplighter, a brewery in Cambridge, and Cambridge Brewing Company for his product. Scott Allen at DPH helped him design a safe way to process the grain. He baked at CommonWealth Kitchen until he wanted more space and moved the operation to Burlington, VT.

Brewer's Crackers: https://brewerscrackers.com/

CommonWealth Kitchen

CommonWealth Kitchen (CWK) in Dorchester is a shared kitchen space that, among many other things, works with farmers to turn surplus produce into value-added products to capture the full measure of the harvest.

Originally, when Lakeside Organics, in Hadley, would peel and spiralize butternut squash for their wholesale customers, the ends were sent to the compost bin. Now, CWK collects, washes, roasts, and purees the product into mashed squash that is sold to Boston Children's Hospital and a local soup company.

CWK works with about 15 farms to provide a unique on-demand processing service to turn their surplus into a range of value-added products, most of which goes back to the farms to sell at farm stands and CSAs. In 2017, CWK turned 25 tons of produce that would have gone into compost piles or been plowed back into fields into more than 15,000 containers of tomato sauce, applesauce, pickles, and pesto. CWK continues to collaborate with institutions and businesses to create additional customers for value-added products made from food that would otherwise be wasted. In 2019, they expect to process surplus produce worth approximately $100,000.

CommonWealth Kitchen: http://www.commonwealthkitchen.org/

Boston Area Gleaners

Because the climate and markets are unpredictable, farmers often plant more crops than their market projections call for. As a result, about 20% of food grown on farms in the US is never harvested. Gleaning is when a third party harvests surplus crops left behind in farmers' fields and distributes it to people in need.

Boston Area Gleaners estimates that farmers grow approximately 12 million pounds of surplus produce in eastern Massachusetts every year. When it is a good year for a certain crop, many farmers may have a surplus of that same crop, resulting in lower demand and price. It may cost farmers more to harvest the crop then it would be worth if they sold it, so they often plow the crops back into the soil.

Boston Area Gleaners (BAG) provides another option. The nonprofit organizes groups of volunteers to harvest and pack the surplus produce so it can be distributed to people in need. In 2018, BAG and about 200 volunteers gleaned 820,000 pounds of produce from more than 80 farms in eastern Massachusetts, distributing the produce to around 500 hunger-relief organizations.

BAG would like to expand the amount of produce it is able to glean, but it is constrained by a limited staff, as gleaning is difficult to coordinate and labor intensive. The organization is also limited by a lack of transportation and storage infrastructure. Some farmers are hesitant to work with the group, concerned that having a surplus would be viewed as a failure. In addition, there are few financial incentives to offset the potential risks and effort of allowing strangers onto their land.

More tools to help farmers use technology to estimate and reduce their surplus crops would help alleviate over-production. More financial incentives for farmers who donate food and more funding for infrastructure to support gleaning would help capture any further excess crops.

Boston Area Gleaners: https://www.bostonareagleaners.org/

Feed People in Need

Many grocery stores regularly have excess food that is still good to eat. They may have ordered too much of a certain item, shelf-stable goods may be nearing their printed date label, packaging may be damaged, or produce may have imperfections. Restaurants, businesses, and institutions often cook large quantities of foods that will not be eaten. All of this food, if stored and handled correctly, can still be safely consumed. There are many food-rescue organizations that collect food from these companies and bring it to service organizations, such as food pantries, to be distributed to people in need.

Rachel's Table

About 250 volunteers with Rachel's Table in Springfield collect excess food from more than 60 food donors and transport it in their vehicles directly to 40 social service organizations. In addition, they have a gleaning program that brings volunteers to farms once a week to harvest produce. They serve Hampden, Hampshire, and Franklin counties and work to keep excess food in the community where it is produced.

Jodi Falk, the executive director, says that some businesses are hesitant to donate out of fear of being held liable if anyone were to get sick from the donated food, even though the businesses are protected by federal law. There is a clear need for more education about existing liability protection for food donation.

Rachel's Table: https://rachelstablespringfield.org/

Food For Free

Food For Free is a food-rescue nonprofit based in Cambridge that has been operating since 1981. The group improves access to healthy food by rescuing food that would otherwise go to waste and distributing it.

Its Family Meals program uses surplus foods from university dining halls and other sources, rescued via the Prepared Foods Rescue program, which are turned into single-serving heat-and-eat meals for people with limited access to kitchens, such as students and families sheltered in hotels.

The Weekend Backpack Program is available to every elementary and upper school student in Cambridge and Somerville public schools who struggles with food insecurity. The program puts two lunches, two breakfasts, milk, and fresh fruit discreetly in the students' backpacks each Friday afternoon.

The city values the contributions of the nonprofit. In 2015, when Cambridge residents voted on funding community projects, Food For Free received the most votes and was awarded $48,000 to purchase a van to transport frozen meals. This type of support for infrastructure to reduce food waste could be replicated in other municipalities or throughout the state.

Food For Free: https://foodforfree.org/

Fair Foods

Fair Foods collects, at no cost, produce that is excess or blemished from the New England Produce Center in Chelsea. The nonprofit assembles bags of produce, and delivers the bags to more than 60 distribution sites—including low-income housing, health centers, and community centers—where the bags are sold for $2 each. The program does not require registration or proof of income to purchase a bag, so those who are not eligible for other food assistance programs, such as SNAP, can still participate. The program relies on approximately 400 volunteers, plus more than 100 people who receive stipends for managing the distribution sites, and grants to supplement the proceeds from the bags.

Fair Foods, which is based in Dorchester, has a strong partnership with the Produce Center. Vendors put aside food for the organization in specific parts of the coolers, so the organization doesn't need to have its own storage facility. Over the 30-plus years that the organization has been operating, founder Nancy Jamison estimates that this innovative business-nonprofit partnership has salvaged 150 million pounds of produce, worth about $200 million. She also estimates that they have saved the Center $50 million in dumping costs.

Fair Foods: http://www.fairfoods.org/index.php

Food Bank of Western Massachusetts

The Food Bank of Western Massachusetts educates food pantries and community meal programs that receive food from it about food rescue. The Food Bank offers presentations about how food rescue works, what types of businesses are likely to have food to be rescued, the logistics of collecting food to be donated, and what topics to cover when discussing food rescue with a potential donor. The Food Bank also provides the EPA Hierarchy diagram and the Liability Protections Fact Sheet so that potential food donors learn the benefits of donating food and understand that they are well protected from liability by the Emerson Act. "We make sure our agencies are prepared to talk about liability protections when they reach out to potential new food donors," says Michelle Geoffroy, the Food Bank's agency training coordinator. The agencies are then able to have informed conversations with food businesses about how to donate their excess food.

Food Bank of Western MA: https://www.foodbankwma.org/
Legal Fact Sheet for Massachusetts Food Donation: Liability Protections - July 2015: http://www.recyclingworksma.com/wp-content/uploads/2015/07/Legal_Fact_Sheet_-MA_Liability_Protections-FINAL_RWF.pdf

Feed Animals

Troiano Trucking

Some businesses and institutions send food waste to farms to be fed to livestock, while other companies process food waste to create a shelf stable animal feed product. This is another method for keeping excess food in the local food system and out of the waste stream.

Troiano Trucking is a waste removal company in North Grafton. They collect around 1,600 tons of food waste monthly from bakeries, restaurants, grocery stores and other institutions. With help from a grant from MassDEP, they homogenize, pasteurize and dehydrate the food to create pelletized animal feed. The pellets are then shipped to animal food manufacturing plants.

Create Compost

Compost Collection, Hauling, and Processing Businesses

There are many companies and nonprofits that collect food waste from residents and/or businesses. Some of the companies deliver it to a facility to be composted or processed, while others do the processing at their own facilities. The compost is then used by the farm or local residents, or is sold to landscapers and other businesses.

The Compost Cooperative

There are several socially- and environmentally-minded local organizations that are filling a niche by collecting food waste. The Compost Cooperative in Greenfield was created to make a positive impact on the community and the earth, and to create employment opportunities for people coming out of jail. The organization collects food scraps from local restaurants and from a drop-off site at the Whately transfer station and brings it to Martin's Farm in Greenfield, where it is composted. After a year in operation, it is diverting 6 tons of waste every month, and it has just started offering curbside collections for a fee. The Compost Cooperative hires formerly incarcerated people to participate in a year-long apprenticeship program. It has employed seven people, one of whom is on track to become a worker-owner of the business. But without support from municipalities or the state, organizations like the Compost Cooperative are challenging to sustain.

The Compost Cooperative: https://www.thecompostcooperative.com/

CERO

CERO (Cooperative Energy, Recycling, and Organics) a worker-owned cooperative, commercial composting company based in Dorchester, sees first-hand the need for more places to take food waste near Boston. Using a fleet of four trucks, CERO collects 80 tons of food waste per week from 80 commercial clients in metro-Boston and transports it to farms for composting. The company is currently trucking the food waste long distances, which is inefficient and can counter the positive environmental impacts of diverting food waste.

For this reason, it plans to open a community-scale anaerobic digester. The AD facility would use less land and have fewer odor concerns than a composting operation, making it feasible in an urban area. They hope to have the AD heat and fertilize a greenhouse, which also would supply more green jobs to the region, along with reducing the distance to truck food waste.

It is important that the state be open to providing grants and incentives to AD facilities of varying size and that municipalities consider zoning in these areas to make it possible, as a successful food-waste system needs access to places near urban areas to take the waste.

CERO: http://www.cero.coop/

Black Earth Compost

Black Earth Compost has effectively worked with schools, businesses, and households in eastern Massachusetts to collect food waste and compost it at its composting sites. It has seen its client numbers double every year over the past few years.

Black Earth owns a site in Manchester, where they mix food waste with leaves and manure in aerated static piles. Manchester residents can pick up free compost, and landscapers can buy it in bags or in bulk. Black Earth also takes some collected food scraps to five other sites, including Hidden Acres in Medway (see below), to be composted.

Black Earth usually begins collecting from residents in a municipality once 30 households enroll, after which all households in the town may be eligible for a lower monthly rate. Municipalities can support food-waste reduction by encouraging residents to enroll in a composting collection program such as those operated by Black Earth.

Black Earth's ability to expand its operation is hindered by the difficulty of acquiring land that is affordable, suited to composting, close to collection sites, and located where the community will welcome a compost operation. The state and municipalities should help remove barriers to securing space for composting operations like these.

Resource: Black Earth Compost: https://blackearthcompost.com/

On-Farm Food Scrap Composting

On-farm food-scrap composting can be a solution for food waste, as it creates a useful product that is kept locally to help to enrich the soil and grow more food. There are more than 30 farms in Massachusetts that accept food scraps that they use to create compost to use or to sell.

Hidden Acres Farm

Hidden Acres Farm is a 4th generation pork and beef farm that has composted for many years. The farm created an additional compost site in 2013 to prepare for the food waste ban that was implemented the following year. They collect food scraps daily from households, schools, restaurants, and commercial customers as well as accept outside food waste from other haulers. They have found greatest success in working with smaller institutions, as it is easier to inspect individual totes for contamination than a dumpster from larger institutions.

The workers mix the scraps with leaves and wood chips from several municipalities in addition to horse manure and on farm manures, and the finished compost is used on the farm's hay fields or sold wholesale to nurseries and the public. Hidden Acres has received technical assistance from RecyclingWorks regarding site work and odor planning. The farm's permit through MDAR would allow them to increase their current amount of food waste they are collecting and composting. "We would very much like to grow to meet that," says Jimmy Cassidy, co-owner.

Hidden Acres Farm: http://www.thehiddenacresfarm.com/
RecyclingWorks in MA Technical Assistance: https://recyclingworksma.com/learn-more/compost-site-technical-assistance/

Holly Hill Farm

Holly Hill Farm is an organic, nonprofit, educational farm in Cohasset. It collects about 1,000 pounds of food waste from coffee shops, restaurants, food pantries, and households every week. Using aerated static piles, it creates compost to fertilize the farm's fields. The organization received free consulting from RecyclingWorks, which enabled them design a compost plan and develop a recipe, and a grant from MassDEP to purchase the necessary materials. In addition, Holly Hill Farm has worked with 30 schools on the South Shore to help them start composting programs.

Holly Hill Farm: https://hollyhillfarm.org/

Food Depackaging

One of the challenges of processing food waste is that the food is often in packaging, and non-food substances need to be removed before food can be composted or digested. Machines that separate food from packaging, called depackaging machines, can separate most waste, though they are not able to process glass.

Save That Stuff/ Waste Management

Save That Stuff, a Boston-based recyclable materials and waste resource-management company, leases part of its property in Charlestown to Waste Management, which built and operates a food depackaging facility called Centralized Organic Recycling (CORe).

Save That Stuff collects around 100 tons of food waste per day in Boston. "We could fill up Fenway Park in a week with food waste," says Tom May of Save That Stuff.

Save That Stuff sends produce, food scraps, packaged food, and packaged beverages to the CORe facility, where the machine separates food waste from other materials. The packaging that is separated is disposed of. The food waste is mixed and made into a slurry that is trucked to the Greater Lawrence Sanitary District in North Andover. There, the food waste slurry is mixed with treated solids in an anaerobic digester. Adding the food waste increases the amount of energy that is produced in the process. According to Waste Management, one ton of food waste creates enough energy to power nine homes. The solids that remain at the end of the process are processed, pelletized, and used as a fertilizer on highway medians and hayfields.

Working with this depackaging facility enables Save That Stuff to accept food waste with higher levels of contamination—up to 10%—from materials that cannot be composted, including recyclables and trash. This makes it easier for larger businesses to participate, as their scale often makes it more difficult to ensure that their food waste is not contaminated.

The fact that the food waste is mixed with sewer waste increases the risk of contamination with heavy metals, pharmaceutical residue, and other substances that make the solids and liquids produced here less than ideal for agricultural use. However, according to Tom, "There are space limitations in an urban area that make composting difficult, so this is an efficient option."

Save That Stuff: http://www.savethatstuff.com/services/what-we-collect/organics-2/

E.L. Harvey & Sons

E. L. Harvey & Sons collects about 60 tons of food waste per day from large generators. Some is taken directly to a commercial compost facility, while the packaged food is sent to its depackaging facility in Westborough. The resulting slurry, which can fill two trailer trucks a day, is taken to five on-farm anaerobic digesters.

Contamination, including glass containers and plastic bags, is a big problem, says Ben Harvey, president, so they try to educate their clients about the difference between trash, recycling, and compost and help the businesses develop systems that result in less contamination. Several years ago, E. L. Harvey was taking food scraps to a digester in Maine because there was a lack of infrastructure in the state. Ben says that he has since seen the capacity in Massachusetts increase; however, there are still no facilities within Route 495.

E.L. Harvey & Sons: http://www.elharvey.com/
Organizations in Massachusetts Managing Packaged Food Material for Depackaging: https://recyclingworksma.com/wp-content/uploads/2019/02/190215_Packaged_Food_Interest.pdf

Create Energy

At noted above, anaerobic digestion is the process by which organic matter, including animal waste and/or food scraps, is broken down in an oxygen-free tank to produce gas that can be used to create energy. AD facilities can be sited on farms, at wastewater treatment facilities, and elsewhere.

Jordan Dairy Farms

Jordan Dairy Farms is able to turn manure from its dairy cows and food waste from food manufacturers into energy via an anaerobic digester owned by Vanguard Renewables. In business since 1941, Jordan Dairy Farms in Rutland is a fifth-generation, family-owned-and-operated farm with 300 milking cows. The farm partners with Casella Resource Solutions to bring in food waste from several local companies, including HP Hood & Sons, Cabot Creamery, Kayem Foods, and Cains Foods. The Jordan facility processes more than 9,000 tons of manure and more than 20,000 tons of food waste annually, creating electricity, heat, and hot water for the farm as well as providing energy to area businesses via net metering credits.

Jordan Dairy Farms: https://jordandairyfarms.com/

Vanguard Renewables

Vanguard Renewables owns and operates five farm-based anaerobic digesters in Massachusetts. The farms lease the land to the business and receive liquid fertilizer from the digester as well as power to offset their energy costs. Collectively, the facilities process 500 tons of food waste per day—from Gillette Stadium, MGM Springfield, Gorton's Seafood, Cabot Creamery, Treehouse Brewing, Cape Cod Potato Chips, Whole Foods, and others—as well as 120 tons of manure daily.

In some cases, the system can form a closed loop. Milk from Barstow's Dairy in Hadley, for example, is sent to Cabot's West Springfield Creamery to produce butter and other dairy products. Waste from that plant is then sent back to Barstow's Longview Farm to be combined with manure from the cows in a Vanguard Renewables anaerobic digester. The digester produces methane gas that is used to create electricity, which offsets the power used by the Cabot plant to churn the butter.

The farms with the digesters have received grants and funding from Farm Credit East and MassCEC among others and the municipalities where the host farms operate have been supportive of the projects. Ongoing challenges include being able to consistently source the 200,000 tons a year of food waste that is needed to keep the five digesters operating efficiently.

Vanguard Renewables: https://vanguardrenewables.com/

Food Waste Reduction Efforts:
Public Sector

Municipalities and schools have an important role to play in reducing food waste as they are able to reach and educate a large number of people about the issue. They are also able to help residents and students participate in food-waste diversion through providing systems to enable them to separate and compost food waste.

Public Schools

A significant amount of the food that schools serve students for breakfast, lunch, and snacks is not eaten, creating a large amount of waste. Many schools throughout the state have implemented innovative programs to reduce the amount of food they send to the landfill, instead distributing the uneaten food to students or other residents in need, or teaching students how to compost their food scraps.

Share Tables

Andover Public Schools

A share-table program enables students who are not going to eat certain parts of their school meal to set aside their unopened food so those in need can eat them. Andover Public Schools participate in a share-table program that involves trays or baskets with ice packs situated in the cafeteria. Students who don't want to eat their packaged food, such as cartons of milk, string cheese, fruit with a peel, granola bars, or yogurts, can place the items in the tray. Other students who are hungry can take the food from the tray for free. At the end of the lunch hour, any remaining items are placed in the refrigerator, which was purchased for the project, and at the end of the week the leftover food is donated to local food pantries.

Share tables are allowed by the state but must be approved by local boards of health. Carina Schusterman, who is part of Green Schools Andover, which has organized the share tables as well as composting and recycling in the schools cafeterias, invited the members of the local board of health to see a pilot of the share tables: "They are worried about liability and cross-contamination," said Carina. "But once people see it, it's not as complicated as they think." She also wrote standard operating procedures for the program so everyone would know what department was responsible for what aspect of the program. The document was approved by the Department of Public Works, the Board of Health, and the school.

The model created in Andover could inform state-level guidance from DPH that would help other school districts looking to implement share tables.

Massachusetts' School Meal Programs - Share Table Guidance: https://thegreenteam.org/wp-content/uploads/2014/04/Share-Table-Guidance.pdf

Food Rescue

Newburyport Public Schools

Many schools must order food far in advance, leading to excess food that is then cleared out at the end of each week. Nourishing the North Shore, a food-justice organization, has created a program to capture that excess food for people in need. Every Friday, volunteers with Nourishing the North Shore rescue food from four Newburyport public schools. They collect milk cartons, cheese sticks, apples, and other items from four schools, which are then distributed from the Newbury Food Pantry. In 2018, the 12 volunteers collected 4,330 pounds of food from the four schools. The success of the program stems from the dedicated volunteers, close cooperation with the local health department, the support of the principals and head cafeteria staff person, clear systems, and good signage in the cafeterias. The state should encourage schools to donate excess edible food.

School Food Recovery: https://www.nourishingthenorthshore.org/school-food-recovery

The Hawlemont Regional Elementary School

The Hawlemont Regional Elementary School in Charlemont is an agriculture-focused school with a barn full of farm animals, a greenhouse, and beehives. The fifth grade teacher, Jennifer Sinistore, has introduced projects around waste reduction that align with the STEM standards as a way to implement a composting program at the school.

The fifth grade students weigh the waste from each classroom and present to their peers about how to compost and recycle as a way to reduce trash. Students then oversee the food waste separation in the cafeteria, where some of the food waste is fed to the school's chickens and the rest goes to be composted on-site for use in the school garden. The school recently acquired a composting vessel that will enable it to compost year-round. Continued state support for purchases of composting equipment at schools will help spread the lessons of composting to more students throughout the state.

Hawlemony Regional Elementary School: https://hawlemont.mohawktrailschools.org/

Arlington Public Schools

Students at all 10 Arlington Public Schools separate food scraps which are then collected by Black Earth Compost. Parent volunteers began the composting pilot project, which received support from Whole Foods Market and Bootstrap Compost. Later, the School Food Services Director switched to compostable trays and gave coupons to students who volunteered to support the composting program. The custodial staff have been

very involved in the project and have seen the amount of trash they remove from the cafeteria decline dramatically. High school students were critical in implementing the program at their school: one student began a once-a-week composting pilot with prizes for participation, and the environmental club produced a video about composting that was shown to the school.

Arlington DPW receives funds through the Recycling Dividends Program of MassDEP's Sustainable Materials Recovery Program (SMRP) to support the school's composting initiative. A MassDEP grant has also enabled the town to hire a school sustainability coordinator to help oversee the program. These state grants should continue to enable towns to undertake these food waste reduction projects and residents should encourage their towns to participate.

Sustainable Materials Recovery Program Recycling Dividends Program: https://www.mass.gov/how-to/apply-for-smrp-recycling-dividends-program-funds

Municipal

Towns and cities can help reduce food waste through encouraging and facilitating composting by residents. Municipalities can encourage residents to participate in food waste separation and composting through offsetting costs and by creating efficient collection systems.

Curbside Collection

A few Massachusetts municipalities offer curbside food waste collection to their residents. In some towns this program is open to all residents, while in others, residents pay to participate. Some towns work with compost collection businesses to offer a lower fee to their residents.

Some towns provide free kitchen countertop bins and outdoor bins in which to store the food scraps before pickup, while in others they are available for purchase, often at a subsidized price to encourage participation.

Cambridge

Cambridge launched free citywide curbside organics pickup in April 2018. All 1-12 unit buildings are included, granting approximately 25,000 households access to the program. The city has provided a kitchen countertop bin and a heavy-duty locking curbside cart (12 or 21 gallon) to residents. The compostables are brought to the CORe facility in Charlestown and then to an AD facility at the Greater Lawrence Sanitary District. Cambridge now collects about seven tons of organic waste per day, and the amount of trash it collects has dropped by approximately 7%.

Cambridge has a long history of encouraging food waste diversion. In the 1990s, the city provided around 3,000 discounted backyard composting bins to residents and established food waste drop-off sites around the city. Beginning in 2009, the public schools began rolling out composting until every school had a program by 2015.

Some keys to success include providing the kitchen bins and requiring the use of compostable bags, which reduces the "yuck factor" says Michael Orr, recycling director in Cambridge. Each residence was given an initial supply of compostable bags, and they continue to be available at the library and city buildings, and for purchase in stores. In addition, people who are using the program have enjoyed that their trash is lighter and less smelly. A large outreach campaign to educate people about the benefits of composting has also been

important. The department plans to continue to focus on increasing participation, which is currently around 50%, and to expand the program to serve larger residential buildings. Other municipalities should consider how to adapt this type of program for their city, and the state should consider how they could expand a food waste education campaign to encourage participation.

Cambridge Curbside Composting: https://www.cambridgema.gov/Services/curbsidecomposting

Manchester-by-the-Sea

Manchester-by-the-Sea has contracted with Black Earth Compost to provide curbside compost collection to any resident who is interested, free of charge. Thanks to a grant, the town offers indoor and outdoor bins for free as well. The food waste is collected two days a week, the same days that trash is collected.

After two years of operation, around 25%, or approximately 550 households, are participating each week. In 2018, the program collected 161 tons of food waste, and the town saved at least $10,000 in disposal costs by reducing the weight of their trash. In addition, the town received $3,000 from MassDEP through the Sustainable Materials Recovery Program Recycling Dividends Program to support its composting program. The combination of cost savings and state grants has proven to make the composting program financially sustainable.

Curbside Composting: https://www.manchester.ma.us/234/Curbside-Kitchen-Compost

Hamilton and Wenham

Hamilton and Wenham began curbside composting pilots in 2009 thanks to a volunteer, citizen-led project, and then began town-wide curbside compost collection in 2012. In Hamilton, trash pickup was reduced to every other week, while recycling and compost collection was every week. About 50% of households participated. In Wenham, where trash collection remained weekly, the participation rate was much lower. After complaints from some residents, Hamilton resumed weekly trash pick up in 2016, and the participation rate in the composting program has since dropped to around 30%.

To support the program, the towns have provided a 13-gallon outdoor compost container and a kitchen countertop container to each residence. The organic waste is brought to Brick Ends Farm in Hamilton and residents have access to the finished compost. In the first year of the program, the Hamilton Recycling Committee set up a hotline as an extension of the Town Hall number, so residents could ask questions and voice concerns about the program.

An initial review of the program found that 251 tons of organic waste were collected in Hamilton and 178 tons in Wenham in one year. During that time, Hamilton saved $40,600 on trash disposal, while Wenham saved $12,000. Staff time and material costs for the composting program are not included in those figures.

The Hamilton Waste Reduction Committee, led by Gretel Clark, has been working to increase composting participation rates by advocating that the town go back to collecting trash every other week and educating residents about how to compost through mailed informational postcards and letters. This speaks to the importance of incentivizing the use of a composting program through other trash-collection models, as well as the need for continued education and advocacy.

Hamilton Organic Waste Program: https://www.hamiltonma.gov/government/waste-reduction-committee/organic-waste-program/

Food Scrap Drop Off

Around 30 municipalities collect food scraps at transfer stations or other drop-off areas, then compost the waste on-site or send it to local farms or AD facilities.

Wellesley

After doing a pilot outreach campaign to educate residents about the importance of separating food waste and providing 600 free kitchen bins, Wellesley has begun collecting food waste at its transfer station. Wellesley then takes the food waste, along with the food waste collected at the transfer station in Dover and from some local institutions, to the CORe facility in Charlestown. Though the program is only a few months old, Jamie Manzolini, Recycling and Disposal Facility superintendent, estimates that they are collecting 2,000 pounds per week in Wellesley and 1,500 pounds in Dover. Dedicated food scrap drop-off facilities should be supported, particularly in less densely populated areas where curbside collection is less feasible.

Food Waste Drop-Off Program: https://wellesleyma.gov/899/Food-Waste-Program

Boston

Boston offers five bins throughout the city in which residents can drop off their food scraps to be composted. The Project Oscar bins are serviced by the Public Works team and promoted by Greenovate Boston. Municipalities should continue to experiment with innovative models to increase access to composting for individuals.

Project Oscar: https://www.boston.gov/departments/environment/project-oscar

Backyard Composting Support

Approximately 155 municipalities make it easier and more affordable for residents to compost their food scraps in their backyard by offering at-cost or subsidized compost bins to residents at a town facility. The state should continue to support this program and ensure that it is widely promoted.

List of Massachusetts Compost Bin Distribution Programs: https://www.mass.gov/files/documents/2017/10/11/bin-progs.pdf

Regional Support

Franklin County Solid Waste Management District

Many small towns have only part-time waste management staff who are not able to dedicate significant time to food waste reduction programs. Regionalization sometimes allows for more focus on these programs. The 21 towns around Greenfield collectively contribute to the Franklin County Solid Waste Management District. Amy Donovan works there as the program director, providing food waste education, programming, and technical assistance.

Amy helps the towns in her district participate in the state's Sustainable Materials Recovery Program (SMRP) Municipal Grant and Recycling Dividends Programs, which provide funds for municipalities that are participating in efforts to reduce waste, including food waste. The Franklin County Solid Waste Management District uses these funds to offset the cost of kitchen and backyard compost bins for residents and cover the cost of

transporting organic waste from the transfer stations to composting facilities. Ten of the district's transfer stations offer the ability to dispose of organic materials separately from trash.

Festivals and events can create a lot of trash, so Amy works with organizations that are holding events such as the Franklin County Fair and the Green River Festival to help them reduce waste. The district has recycling, compost, and trash stations, complete with bags, signs, sign stakes, and gloves that it lends out to about 45 events every year.

Amy has helped set up food waste diversion programs at 37 schools in the region. The students learn to separate their food waste, which is either composted on-site, taken to Martin's Farm or Clear View Composting in Orange to be composted, or collected by pig farmers to be used as feed. Small towns should consider regionalizing or otherwise combining resources so that there can be significant attention on food waste reduction programs.

Sustainable Materials Recovery Program Municipal Grant: https://www.mass.gov/how-to/apply-for-a-sustainable-materials-recovery-program-smrp-municipal-grant

Sustainable Materials Recovery Program Recycling Dividends Program Funds: https://www.mass.gov/how-to/apply-for-smrp-recycling-dividends-program-funds

Recommendations

Reducing food waste in Massachusetts will require action by state and local governments, schools, businesses, nonprofits and individuals to educate, innovate, and incentivize food waste reduction at every stage of the food chain and at all scales. These policy recommendations are ordered to align with our food waste reduction hierarchy.

Reduce Wasted Food at the Source

Legislate standard date labels

In order to help reduce consumer confusion and keep edible food from being disposed of, the state should standardize date-labeling requirements. Language in some Massachusetts legislation currently under consideration (2019: S.492/H.811) seeks to do this. The proposed standardized language should be updated to reflect the standards set by a private sector initiative (https://www.gmaonline.org/news-events/newsroom/grocery-industry-launches-new-initiative-to-reduce-consumer-confusion-on-pr/), where "best if used by" dates are an indicator of quality, and "use by" dates are an indicator of safety.

Coordinate an education campaign

Massachusetts should invest in and create educational materials and campaigns for schools, consumers, businesses, and nonprofits about food waste reduction practices. This could be led by MassDEP, MDAR, and DPH. The state could use the existing resources Save the Food and Food: Too Good to Waste as models.

Save The Food is a public service campaign designed to encourage consumers to reduce food waste. The campaign is a multi-year partnership between the Natural Resources Defense Council (NRDC) and the Ad Council and consists of a series of public service ads, a new website providing tips and tools to help consumers take action, and numerous brand and media partnerships. Many cities and towns have adapted these resources to encourage their residents to reduce food waste.

Food: Too Good to Waste is an implementation guide and toolkit that aim to reduce wasteful household food-management practices. Created by the EPA, the guide helps local governments and community organizations implement campaigns in their communities, while the toolkit provides behavior-change and outreach tools designed to assist individuals and households to create strategies to reduce wasted food in their homes.

Save the Food: https://savethefood.com/
Food: Too Good to Waste Implementation Guide and Toolkit: https://www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit#docs

Support school food waste efforts

Steps should be taken to reduce the amount of food that is wasted in school kitchens and lunchrooms. Public funds should be allocated to conduct waste audits in school cafeterias to help determine whether portion sizes

are appropriate as well as what foods are preferred by students, in an effort to reduce school food waste statewide.

"Offer Versus Serve" is federal guidance that allows students to decline some of the food offered at school lunch or breakfast, in order to reduce food waste and permit students to choose the foods they want to eat. The school is still federally reimbursed for the meal even though the students don't take all the components usually required under federal school food rules. Currently mandatory at lunch in Massachusetts high schools, this program should be expanded to elementary and middle schools as well.

In addition, since students with less than 30 minutes to eat lunch waste a significantly larger amount of food than those with ample time, the legislature should enact mandatory minimum lunch periods or otherwise promote longer lunch periods.

Fund food waste reduction technology

Many institutions and food businesses employ technologies that help reduce food waste. Using artificial intelligence and other technologies may also help improve on farm organization, communication, ordering, and storage to reduce on-farm food waste. These systems could more accurately predict crop surpluses and improve communication between farms and organizations able to collect excess crops. Public investments should be made in educating food handlers about these tools and in incentivizing their use.

Support innovative food businesses

Food businesses that upcycle food by-products into edible food products or that otherwise reduce food waste should be encouraged. To encourage the creation of such businesses, more kitchen space should be made available for this purpose and the Massachusetts Food Protection Program should continue to provide individualized support. The state should also prioritize purchasing from these companies.

Feed People in Need

Provide tax incentives for food donors

In order to incentivize donations, the state should provide a tax credit to individuals, businesses, and institutions that donate food to directly to individuals in need or to nonprofit organizations that distribute the food to those in need. Legislation under consideration this session (2019: S.869/S.962/H.1475) would offer a tax deduction of the total full market value (FMV), with a $2,000 annual cap. Another bill (2019: H.2630) would offer a tax deduction for donations made by farmers. Given the low profit margins of farms and their ability to deduct their costs against losses, such a deduction would likely not be enough of an incentive for them to take advantage of it. A tax credit would be more effective.

As provided for in S.869/S.962/H.1475, the deduction should be provided even if nonprofit food-recovery organizations charge a nominal amount to cover the cost of handling.

Any tax relief should also cover transportation costs for the donated food. The cost of transporting food from the donor to the recipient can be significant, even prohibitive. California has enacted such a credit, providing donors with "an amount equal to 50 percent of the transportation costs paid or incurred by the taxpayer in connection with the transportation of that donated agricultural product."

Protect donors from liability claims

Elimination of liability concerns is another important element of comprehensive food waste legislation. Under the current Massachusetts Good Samaritan law (ch. 94, § 328), liability protections are available only when food is donated to a nonprofit organization that then distributes that food to those in need. These liability protections should be extended to food-service establishments, retail stores, and farms that donate directly to end recipients. Extending protections to direct donations could help increase efficiency and enable timely use of perishable food. The proposed language in several bills (2019: S.869/S.962/H.1475, H.2630, H.1899, and H.1969) addresses liability concerns.

Additionally, the Massachusetts Good Samaritan law should be amended to provide liability protection regardless of compliance with any laws, regulations, or ordinances regulating the packaging or labeling of food. Many food-labeling requirements, such as the net weight of the item, are not essential to food safety. These requirements impose extraneous burdens on donors and food-recovery organizations by forcing them to meet all labeling standards, even when many food-labeling rules are not essential to ensure food safety.

To further encourage donations of edible food, there should be increased outreach and education to businesses and institutions about the liability protection that currently exists for those businesses that donate food.

Decrease the food disposal ban threshold

The Commercial Food Material Disposal Ban (310 CMR 19.000) threshold for compliance from institutions that generate one ton of organic waste per week should be lowered to those that produce half a ton per week. Decreasing this threshold would reduce food waste, divert more food waste from landfills and incinerators, and decrease greenhouse gas emissions. If this threshold was lowered to half a ton per week, MassDEP estimates that more than 1,800 additional businesses, which together produce almost 100,000 tons of food waste per year, would be required to divert their food waste.[8] MassDEP has begun taking steps to lower the threshold by proposing this step in the draft Massachusetts 2030 Solid Waste Master Plan, under consideration in late 2019.[9]

Hire additional inspectors

While the Commercial Food Waste Disposal Ban represents a significant commitment on the part of the Commonwealth to divert food waste, resources provided to MassDEP to consistently manage and enforce the ban are insufficient and only a small number of dumped loads of trash are inspected to ensure compliance. The MassDEP budget should be increased to enable the hiring of additional waste ban inspectors.

With additional staff, the inspection process should be made more rigorous to be better able to identify violators. Source inspections should be considered, and more precise ways to identify food waste in loads of trash, as well as the source of that waste, should be developed.

Issue guidance on food donation for businesses and share tables for schools

The Massachusetts Department of Public Health should issue statewide guidance on food donation for businesses. This document should outline best practices for food donation and provide information about liability protection. DPH and the Department of Elementary and Secondary Education should issue joint guidance about share tables at schools to help educate local regulators.

The first recommendation in the Massachusetts Department of Elementary and Secondary Education's guidance on share tables is, "Contact and obtain written approval from your local board of health regarding the use of share tables in your district." Municipal health inspectors and boards of health are often involved in deciding whether food donation and share tables can exist, so such guidance from state agencies could increase consistency and food safety.

Support infrastructure development

Some food waste results from a lack of infrastructure needed to cost-effectively manage, transport, and store excess food. To reduce on-farm food waste, more cold storage and processing should be available to help farmers sell produce throughout the year. Increased coordination around transportation could ensure that food is moved to where it is needed most. UMass Extension should provide more guidance on how to reduce on farm food waste.

Food-rescue operations could be more effective if they had access to additional infrastructure, including refrigerated trucks and cold storage. Gleaning and food rescue nonprofits rely on grants and donations to operate, but consistent public funding would enable them to continue and expand their important work. The state should expand the SMRP grant to make food rescue organizations and infrastructure eligible for funding

Consistent operating procedures among food donors, food-rescue operations, and agencies that accept donated food would also make the process easier. These can build on the resources available from RecyclingWorks.

Create Compost

Discourage food waste at the municipal level

There are many approaches to decreasing the amount that residents send to landfills or incinerate and increase the amount residents compost. Pay-as-you-throw makes residents pay for every bag of trash they dispose, incentivizing them to compost and recycle. In addition, when some municipalities have reduced the frequency of trash collection, they have seen an increase in participation in composting programs.

Encourage composting at the municipal level

Municipalities can help residents participate in composting by offering curbside collection or contracting with a hauler to provide the service. Towns can work with a compost collection company and encourage residents to enroll by offering a discount to those who participate. To further encourage participation, towns can provide kitchen countertop compost collection bins and outdoor, pest-proof compost bins. Education about the benefits and process of composting is also effective.

Encourage food waste separation in schools

Support from public agencies and from the community is important to creating a sustainable food waste separation and composting program in schools. Grants for school composting facilities, compost collection, and staff to oversee the program can help it succeed. Some towns have used SMRP grants to pay for staffing and materials needed to institute a school composting program.

Encourage composting at events and festivals

Since events and festivals often create a significant amount of trash, there should be requirements that events compost and recycle. Public sector support, for equipment and technical assistance, would help facilitate this.

Improve compost quality

Along with programs to increase the amount of food waste that is separated to be composted, there should be education to ensure that there is minimal contamination. When non-compostable materials are disposed of along with food waste, this decreases the quality and increases the effort associated with processing the waste. Education for food handlers and consumers would improve composting efficiency.

Encourage on-farm composting

Regulatory authority over on-farm composting should remain with MDAR, and regulations should recognize the differences between on-farm and commercial composting. Commercial composting regulations impose undue burdens on farms, and public safety and health concerns can be addressed with regulations more apprioriate to the reality of farms. All farm composting regulations should be paired with additional resources dedicated to providing technical assistance and education to help farmers apply proper management practices.

Change zoning regulations to allow composting

Most food waste is created in urban areas where there are few farms or other composting operations able to receive food waste. Local zoning ordinances, the high cost of urban land, and worries about nuisances to neighbors have made it difficult to secure land for urban compost operations.

The state will need to be creative about finding locations that would be suitable for composting—municipal yard waste sites and state-owned land may be appropriate. Changing local zoning ordinances and continuing to provide technical assistance to compost operators may encourage more composting operations near population centers. Making the permitting process easier for food waste collection companies to leave food waste at transfer stations would also help.

Expand grants for composting operations

The state should expand the SMRP to include municipalities that have composting programs and should renew the Agricultural Composting Improvement Program, which provides resources to agricultural composters for purchases of equipment and materials that will enhance their overall management of composting operations. Grants should be streamlined so municipalities with limited resources are able to apply.

Increase the market for local compost

As the number of businesses and institutions that are sending their food scraps to be composted increase, it is important to ensure that there is a commensurate increase in the demand for locally produced compost. This will help support existing composting operations and incentivize more to open. To ensure these operations are financial sustainable, the state should purchase locally made compost whenever possible. There should also be efforts to encourage farms, landscapers, and gardeners to purchase local compost as an important way to close the food waste loop.

Create Energy

Support more places to process food waste

Many anaerobic digestion facilities require that the food waste is processed before it can be added to the machine. This can happen with the depackaging process or through a separate slurrying process. There are a limited number of food depackaging and processing facilities in the state. The Recycling Business Development Grants should include funds for processing food waste in each application round.

Support for development of smaller-scale anaerobic digesters closer to urban areas should also be considered.

[8] *Organics Subcommittee Meeting Powerpoint. John Fischer. September 20, 2019. https://www.mass.gov/files/documents/2019/09/24/osc0919.pdf*

[9] *Massachusetts 2030 Solid Waste Master Plan Draft. September 2019. https://www.mass.gov/files/documents/2019/10/18/2030swmp-pcdraft.pdf*

Conclusion

Massachusetts has made great strides in working to reduce food waste, through state regulations, grants, and technical assistance. Innovative businesses, nonprofits, and municipalities and schools have brought additional attention and crafted many solutions to the challenge of food waste.

We must build on this momentum. Statewide legislation to increase incentives for farmers and others who donate food, as well as increased liability protection, will help steer more nutritious food to those in need, and legislation to standardize date labels on food will help reduce consumer confusion. The state can make a significant impact by lowering the Commercial Food Waste Ban from one ton per week to half a ton per week, and by increasing funding for enforcement.

Financial support for food waste reduction infrastructure is also needed, from funding food-rescue organizations, to incentivizing businesses that are repurposing surplus food for human consumption, to creating a market for locally produced compost. Because some food-donation programs, including food rescue and share tables as schools, must get approval from local boards of health, the Massachusetts Department of Public Health should issue guidance on these programs. A statewide education campaign, engaging many partners and building on successful existing national campaigns, would also bring needed attention to the issue and begin to change consumer habits. This education, along with support for adopting technology to track and manage food waste, will also help local businesses reduce their food waste.

Municipalities and schools can educate their residents and students about the negative impacts of food waste and provide systems that encourage them to separate and compost their food waste.

Businesses should work to reduce and repurpose food waste through innovative technology, recipes, and partnerships. They should be mindful of the negative environmental impacts of food waste that is not diverted from landfills.

Independent organizations should continue to rescue and glean edible food and provide it to people in need. Through their work, they can create new outlets for food that would otherwise be wasted and educate their food donors, partner social service organizations, and volunteers about how to reduce food waste.

And individuals can make a difference through reducing food waste at home, separating food waste from their trash, and composting. Individuals can support businesses and nonprofits that are doing good work in this area and can also advocate that their municipality, schools, and the state make the changes recommended in this report.

No single stakeholder can solve the challenges posed by food waste, nor can any one strategy. Only a comprehensive, systemic approach that considers the environmental, economic, and social impacts of the challenges and solutions can significantly reduce the amount of wasted food, and result in solutions that are sustainable, equitable, and that strengthen all sectors of the food system.

MASSACHUSETTS FOOD SYSTEM COLLABORATIVE

November 2019