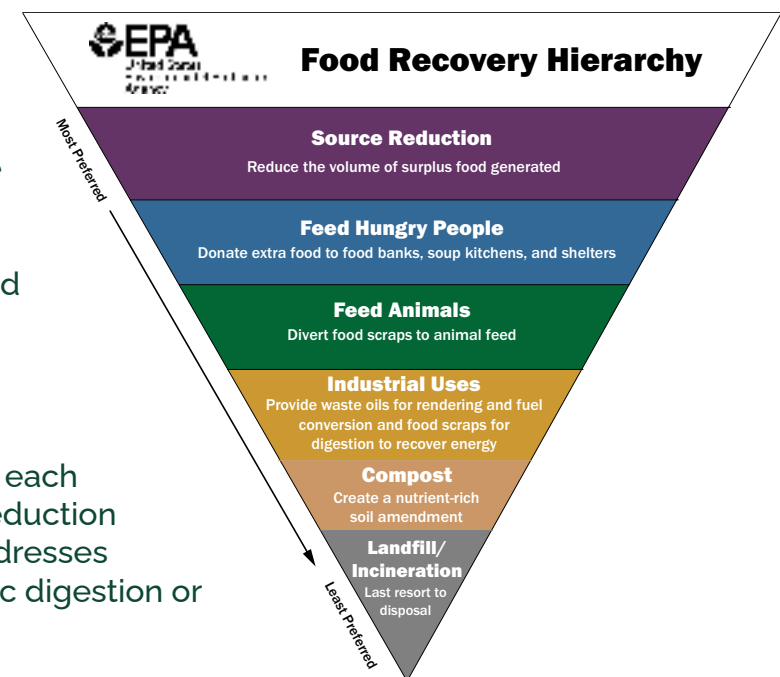




Source Reduction of Food Waste Guidance

The Center for EcoTechnology (CET) developed this original document under contract to MassDEP as part of MassDEP's RecyclingWorks in Massachusetts program. This best management practice is for the source reduction of food waste at institutional foodservice operations. CET and MassDEP interviewed universities and colleges, hospitals, corporate cafeterias, and other foodservice operations, as well as providers of waste-tracking services. Stakeholders were interviewed on their strategies for reducing wasted food. In addition, two stakeholder meetings were held for additional feedback. The information gained from interviews and stakeholder meetings was used to create this guidance document.

The US EPA's [Food Recovery Hierarchy](#) ranks source reduction at the top of its priorities as a strategy to reduce wasted food. Businesses should consider how each strategy on the EPA hierarchy can contribute to a comprehensive food waste reduction plan. While this guidance focused on source reduction, other CET guidance addresses [food donation](#) and [source separation](#) of food material for composting, anaerobic digestion or animal feed.





Why should my business reduce food waste?

According to [ReFED](#), each year businesses in the US throw away 25 million tons of food, and spend roughly \$57 billion dollars on growing, processing, transporting, and disposing of food that is never consumed. In Massachusetts, food waste is the largest material in our trash. Reducing wasted food can have beneficial impacts on a business' bottom line, employee and customer satisfaction, and the environment.

Decreasing the volume of wasted food from foodservice operations reduces the overall cost of operations and increases efficiency. Source reduction is the most cost-effective food recovery strategy, since both waste hauling and food purchasing costs can significantly decrease when source reduction strategies are employed. The US EPA's [Food Waste Management Cost Calculator](#) can be used to compare costs of different food recovery strategies. This calculator also describes the environmental impacts of food recovery, including an estimate for the impact on greenhouse gas emissions from reducing food waste.

According to the [Food Waste Reduction Alliance](#), 25% – 40% of food grown, processed, and transported in the US will never be consumed. Reducing food waste is important as it keeps food out of landfills, reduces emissions of methane, and has other environmental impacts. Natural resources, such as water, soil, and energy are required to grow and transport food, which are conserved when food is not wasted.

Waste Tracking

Tracking wasted food is a great first step to start or expand a source reduction program. Collecting wasted food separately from other waste highlights the type and volume of foods that are being wasted. Data from food waste audits can then be used to develop reduction strategies. There are several ways to track wasted food: pen and paper, spreadsheets, and comprehensive wasted food tracking systems. The [EPA Food Waste Log](#) is an example of a food waste tracking system. There are companies that provide waste tracking systems, such as [LeanPath](#) and [Phood](#), which assist in tracking wasted food. Tracking generally includes quantifying wasted food by weight, and tracking the amount disposed of during service.

Meal Planning

One of the most cost-effective and efficient ways to reduce the volume of wasted food is to utilize meal planning strategies. Accurate meal planning minimizes waste by reducing overproduction. Tools that can be used for meal planning include production sheets and menu planning software. Production sheets are used to compare the number of meals prepared and served to the number of uneaten meals. A cycle menu can be used to organize ordering and purchasing. Cycle menu planning means that menus are repeated in the same order on a rotated basis, usually 2, 3, or 4 weeks. Commercial software such as [CBORD](#) and [Menu Management](#) assists with menu planning and recipe scaling to increase food ordering accuracy.

Food that is served should have a good 'taste profile' and a high 'popularity index,' meaning that the food is appealing and people eating the meals are receptive to the recipes used. In settings where meal choice is limited, cooking foods that are appealing to the consumer can cut down on the amount of uneaten food. It is helpful to incorporate test kitchens in dining operations where customers can try new recipes and provide comments and feedback.

Special events and catering events can be challenging when it comes to food purchasing and meal planning. Tracking attendance and using data from past events can help determine how much food to order. Refer to the reduction strategies section for ways to reduce wasted food during events.

Food Purchasing and Procurement

Food purchasing agents have a tremendous opportunity to reduce wasted food within the organization. By comparing purchasing history to meal consumption history, purchasing agents can often reduce wasted food by not over-ordering. When waste tracking strategies are implemented, foods that are commonly wasted can be identified and steps can be taken to adjust future orders and reduce waste. Ensuring that food is of high quality and has a long shelf also reduces waste. Take the following steps to ensure that the appropriate amount of food is purchased:

- Purchase the correct amount of food for your needs.
- Carefully inspect food for quality and freshness as it is received.
- Communicate with the food vendor if the quality does not meet expectations.
- Engage with food vendors about your goal to reduce wasted food.
- Ensure food is transported in containers that prolong shelf-life and freshness.



Reduction Strategies

Food service staff should implement both pre-consumer “back of house” and post-consumer “front of house” strategies to prevent wasted food. Many of these strategies are simple, cost-effective, and provide enormous environmental and social benefits.

Back of House

There are many prevention strategies that can be used to reduce wasted food before it reaches customers' plates. Encourage creativity and innovative methods to reduce wasted

Food Storage and Inventory

- Ensure food is properly handled and stored to prevent damage and spoiling.
- Incorporate first-in, first-out storage and rotation systems for dry stock, deli, produce, seafood, dairy, and baked goods.
- Clearly mark priority items for utilization with “use-first” labels.
- Make sure to label all prepared food with descriptive language rather than simply a date. (Use by, freeze by, etc.)
- Avoid inventory shrinkage by taking frequent physical inventory, and comparing it to what should be on hand based on sales and usage.
- Maintain refrigeration and freezers by performing routine maintenance to avoid catastrophic down time and potential food loss from inadequate temperature control.

Preparation

- Employ root-to-stalk cooking (using the entire vegetable) along with nose-to-tail cooking (using the entire animal) to reduce food scraps and makes healthy and delicious stocks and soups.
- Cut food uniformly for evenly cooked and aesthetically pleasing dishes.
- Repurpose surplus food or food items that are not appealing to customers (overripe bananas, bruised fruit, stale bread), to create new meals.
- Avoid using garnishes that do not get eaten.





Cooking and Serving Methods

- Practice batch or just-in-time cooking. This method of preparing food in small batches throughout mealtimes improves food quality and prevents waste by limiting overproduction. On demand cooking is pre-ordered and portioned dishes that are often purchased. Customers are more likely to eat what they have purchased.
- Offer varying serving size options, or pre-plated and portioned meals or desserts, to regulate the amount of food customers take. Make portions appropriate rather than supersized.

Special Events / Catered Meals

- Discuss food waste prevention efforts with vendors prior to event and communicate last minute changes with culinary staff.
- Source food from vendors that limit waste.
- Ensure contracts include food waste reduction and food recovery strategies, along with solid waste reduction and recycling.
- Require frequent updated headcounts prior to the event, and day of event.
- Hold post-event meetings to discuss successes and areas of improvement.

Back of House Training

Kitchen managers should communicate regularly with staff to ensure successful food waste reduction programs. It is important that staff understand all aspects of the food waste reduction plan. Staff should know why the plan is in place, the benefits of the plan, and steps involved in implementation. This includes properly educating new hires, conducting frequent refresher trainings, and providing one-on-one trainings, as needed. Strategically place educational signage in prep areas, walk-in refrigerators and freezers, and other appropriate areas to increase awareness.

Cooks should be properly trained on food preparation practices that limit food waste. Good knife skills can significantly reduce the amount of wasted food. Educate culinary staff on proper knife skills to ensure the best yield from products. Uniformly cut food cooks evenly, which increases taste profiles; aesthetically pleasing food is more likely to get eaten. Food that is adequately prepared prevents excess trim waste, uneaten food, and financial loss. Appropriate and consistent portions also help with meal planning and procurement.

Front of House Reduction Strategies

There are many prevention strategies that can be used to reduce food waste in dining areas, including waste tracking, food presentation, scheduling, and education:

- Include front-of-house food waste in any waste tracking or audit. Observe which items are not getting eaten.
- In buffet and self-serve settings, encourage customers to take only what they will eat:
 - Incorporate trayless dining and/or smaller plates to limit the amount of food customers take.
 - Avoid refreshing chafing dishes. Instead, transfer food into smaller dishes, and use upside down trays or other items to fill empty space, to make the buffet look full and inviting.
- Orient pastry and cookie trays horizontally in display cases to make the case appear full. UMass Amherst kitchen staff are trained on proper knife skills to minimize waste. Trayless dining in buffet settings significantly reduces food waste.
- Consider taste stations to introduce consumers to small bites of lesser known items.
- Schedule mealtimes to align with customer needs.
- Strategically place educational signage and/or digital screens around dining areas to increase awareness of wasted food. These could include data about the amount of food wasted as well as associated costs, environmental, and social costs. Help connect people to their food by providing information on the farms it came from, or what happens to the food they do not consume.

Front-of-house staff can observe first-hand how customers waste food. Work with staff to develop creative solutions to prevent food from going to disposal.

Designing Dining Areas to Reduce Wasted Food

Design decisions made when laying out a dining area have an impact on food waste. Since mealtimes can be busy and crowded, cafeterias should be set up to accommodate the number of customers during peak eating times. When customers have to wait in long lines they will likely take more food to avoid having to go back into the line for seconds. Set up dining and service areas to minimize waiting. For instance, consider having multiple service stations rather than a single buffet line.

Successful source reduction plans typically take time and go through many changes and evolutions. In the beginning, it can be helpful to start small and incorporate achievable goals. Celebrating small successes encourages staff participation and improves morale. Explain “the why” and obtain buy-in from chefs and front-line kitchen workers. Make food waste tracking a positive activity. Set goals for reduction, track and measure progress, empower kitchen staff, and reward good performance.



Surplus Food After Source Reduction

It is generally not possible to eliminate all surplus food from foodservice operations, but that does not mean extra food should be thrown away. Food can be sent home with employees, or your organization can work with a food donation organization to make sure that surplus food is redistributed. See Center for EcoTechnology's [Food Donation Guidance](#) for more information on setting up a food donation program.

Some organic waste, such as food scraps, dropped food, and soiled paper, is inevitable. Setting up an organic waste diversion program to complement source reduction and food donation strategies can further reduce your organization's environmental impact. See Center for Technology's [Source Separation Guidance](#) for information on collecting food waste for composting, anaerobic digestion, or animal feed.

Resources

Guidance Documents and Videos

[Food Waste Reduction Alliance](#)

[LeanPath Stay Ahead of Food Loss \(video\)](#)

[New Venture Fund REDUCING FOOD WASTE by Changing the Way Consumers Interact with Food](#)

[Spoiler Alert Using Data to Reduce Food Waste](#)

[National Restaurant Association ConServe Program](#)

[National Restaurant Association ConServe Reduce Waste in Your Restaurant: Extend Oil Life with Proper Fry Cooking Techniques \(video\)](#)

[Hotel Kitchen Toolkit](#)

[University of Massachusetts Amherst's Making Local, Healthy, Sustainable Delicious; The How-To Guide for Foodservice Operators](#)

Tools

[EPA Reducing Food Waste Page](#)

[EPA Food Waste Cost Savings Calculator](#)

[EPA Food Loss Prevention Options for Grade Schools, Manufacturers, Restaurants, Universities and Grocery Stores](#)

[EPA Guide to Conducting and Analyzing a Food Waste Assessment](#)

[FDA Refrigerator and Freezer Storage Chart](#)

Waste Tracking Systems

[LeanPath](#)

[Phood](#)

[Winnow](#)



The Center for EcoTechnology (CET) helps people and businesses save energy and reduce waste. CET acts as a catalyst to accelerate the development of a vibrant marketplace to divert wasted food from the commercial and institutional sectors. We have been a leader in the wasted food reduction and diversion movement for more than 20 years, implementing some of the first wasted food composting programs in the country, and contributing to effective public policy.

We believe that better managing wasted food is critical in order to address climate change, feed more hungry people, and grow our economy. If you are a city, state or federal agency, industry group or foundation, and want to tackle the issue of wasted food, please contact us!

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