THE STATE OF NEW JERSEY

# School Food Waste Guidelines

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

# Acknowledgements

*We would like to thank our agency partners for their continuous participation when shaping these guidelines.*

- New Jersey Department of Agriculture
- New Jersey Department of Education
- New Jersey Department of Health
- Office of the Secretary of Higher Education

# Contents



Find the webpage here

# Executive Summary

The New Jersey Department of Environmental Protection (DEP) developed voluntary guidelines for K–12 schools and higher education institutions to reduce, recover, and recycle food waste. The guidelines were developed in consultation with the New Jersey Department of Agriculture, the New Jersey Department of Education, the New Jersey Department of Health, and the New Jersey Office of the Secretary of Higher Education and in accordance with P.L.2017, c.210, signed in August 2017. Since the Guidelines debut in 2019 they have served as a roadmap for schools seeking to manage their food waste and introduce students to best management practices in the hope of impressing environmentally aware and sustainable habits that may last a lifetime.

In June 2020, the New Jersey State Board of Education adopted Climate Change Education Student Learning Standards making New Jersey the first state in the nation to incorporate K–12 climate change education across student curricula. Later that year DEP released the 2020 Global Warming Response Act 80x50 report. In the report the Department attributes 5% of the state's greenhouse gas emissions to methane and carbon dioxide emissions originating from decomposing organic matter in landfills and wastewater treatment facilities. The report calls for better organic waste management, source reduction and food waste separation and the development of enhanced waste management to help reach New Jersey's climate goals. Teaching students how to reduce, recover, and recycle their food waste in schools is a hands-on way to incorporate NJ's Climate Change Education Student Learning Standards and pursue our climate goals.

These School Food Waste Guidelines are meant to advise K–12 schools and Higher Education Institutions on how they can implement a food waste management program by providing up-to-date food waste best management practices. The guidelines provide resources so schools can implement strategies to reduce, recover, and recycle surplus food and waste by highlighting best management practices that may be used. As New Jersey pursues its climate goals the Guidelines have been updated with renewed vigor for providing a jumping off point for school faculty to help students reduce their food waste and carbon footprints with strategies and habits that may last a lifetime.

# Introduction

## *Why is it important?*

Food waste generation has increased over the past five decades and places considerable stress on the environment, and our wallets. Today, Americans waste at least 50%more food than we did in the 1970s costing up to $218 billion each year[1]. Getting food to our table requires 16% of the U.S. energy budget, nearly 50% of U.S. land, and 67%of the freshwater consumed in the nation[1]. Reducing, recycling, and recovering food waste can mean more money in our pockets, less emissions from landfills, and more food to feed the nearly 42 million Americans who are food insecure and unsure of when they will have their next meal[1].

Taking steps towards managing food waste in schools has both environmental and social benefits for students. Students can participate by advocating for food waste reduction and better management through associated clubs or after school organizations, composting activities, and learning hands-on how compost is used in school gardens. Students who learn about the importance of and strategies to prevent and manage food waste are more likely to bring these lessons home with them to the audience of other family or household members, who could then have an additional impact reducing food waste. Teaching and incorporating food waste best management practices can span generations, bring forth a greater appreciation of the food we have and promote the protection of the environment we live in.

These guidelines are meant to advise K–12 schools and higher education institutions on how they can effectively reduce, recover and recycle food waste.


Text Version: Food Waste in the US Diagram

[1]Gunders, D., & Bloom, J. (2017). Wasted: How America Is Losing Up To 40% of Its Food from Fork to Landfill. NRDC. www.nrdc.org/sites/default/files/wasted-2017-report.pdf

## The EPA Wasted Food Scale

The EPA Wasted Food Scale helps illustrate how to prioritize actions schools can take to prevent and divert wasted food. The Scale prioritizes food waste actions from the most preferred methods to the left to the least preferred to the right.

The School Food Waste Guidelines take the EPA's Wasted Food Scale and organizes the actions of the six sections of the Scale into three categories; reduction, recovery and recycling, which are prioritized over traditional disposal.


Text Version: EPA Wasted Food Scale

## Reduction

Reduction best management practices are the most important action for preventing food waste and are most preferred on the EPA Wasted Food Scale. Reducing food waste prevents the need to deal with excess or spoiled food by not producing the food in the first place.

## Recovery

Food recovery covers the second tier of the Wasted Food Scale "Donate or Upcycle" and "Feed Animals or Leave Unharvested" and is the process of preventing edible food from being wasted at schools, restaurants, grocery stores, markets, or dining facilities by donating excess to food banks, food pantries, soup kitchens or for use as livestock feed and leaving them unharvested in fields to be used as a soil amendment or for animals to feed on.

## Recycling

For the purpose of these guidelines, food waste recycling refers to the following two tiers that follow on the Scale including "Composting", "Anaerobic Digestion" and "Apply to the Land". Recycling school food waste significantly reduces a school's municipal solid waste generation and creates an avenue for the food waste to be recycled.

# Getting Started

## Where to begin?

The efforts needed to begin a food waste program may vary from school to school, and we all know getting started can be the hardest part. To help with this, suggestions for where to begin or steps to take are provided below to get the ball rolling on a food waste program in your school or district.

### Possible first steps when starting a food waste program

→ Garner initial support

→ Identify goals, objectives and key players

→ Receive buy-in from key players

→ Incorporate food waste into student learning standards

→ Run a food waste audit – determine how much is being produced

→ Create a club, group or committee

*Picture on left: Students at Egg Harbor Township High School adding compost to garden bed*
*Picture on right: A student of Reeds Road Elementary adding food scraps to composter*
*(source: Sustainable Jersey for Schools)*

## Garner initial support

Gathering an impassioned group of initiators can help enact the first steps and gather the momentum a school food waste program may need to get off the ground. While only one person is required to start off, more is always merrier! Anyone who has indicated an interest in starting a food waste program is a great place to start. Bringing together a team with the similar vision and goal to begin a food waste program in the school district is the most important step for getting the ball rolling.

Bringing students into the mix once an initial staff team is formed, if appropriate and possible, can also help build momentum and support in the program. Interested students that are appropriately aged can gain important skills by helping to lead the movement and will ensure a student focus stays core to the program. Likewise, teacher approval and interest is crucial as they play a key educational role in helping students understand complex sustainability issues.

Important figures may include:

- → Facility managers and custodians
- → Food service staff
- → Educational support professionals
- → Parent-teacher organizations/associations
- → Parents
- → School board representatives
- → Business administrators
- → Green teams
- → Associated community groups
- → Relevant nonprofit organizations

## Identify goals, objectives and key players

The following are points that should be considered when developing a strategy for starting a school food waste program.

- → Decide on main motivators for managing food waste.
    - This can include engaging students, reducing costs for the school and/or environmental benefits.
- → What is the school's or district's budget for managing food waste? On-site food waste management may require an initial investment in compost bins, collection buckets, shovels and other supplies.
- → Identify who will need to be engaged to make this happen, including facilities members and management authorities. Is there an existing committee that may champion a food waste management initiative?
- → Will this be done at a school or district level?
- → How are major decisions made in the district or school? What is the typical decision-making timetable (e.g., budgets created; staff hired; new programs launched)?
- → Does the school board operate with a unified vision? Do board members work as a team to set policies? Is there anyone on the board who might champion a food waste management initiative?
- → What is the superintendent's role? How do they communicate expectations? What are the superintendent's priorities?
- → How much power do individual principals have? What authority does a principal have to make decisions regarding budget, staffing and curricula?
- → What are the community's or parent-teacher organization's expectations for the schools? Are they the same for all schools? Is there anyone in these groups who might be a strong champion for a food waste management initiative?

## Receive Buy-in from Key Players

### School Administration Approval

Principals and superintendents typically have the power and influence to make initiatives, like starting a food waste program, sink or swim. When these school leaders are convinced of the value of a project, they can take steps to secure the active participation of school staff and community partners, greatly increasing the project's chances for success.

### Loop in cafeteria providers, custodians and staff

Cafeteria providers and staff play a crucial role in implementing a school food waste program as they are the ones who handle food and students with food the most. Chefs on the production side and cafeteria supervisors on the student side are necessary to have on board in any school food waste program. Ensure that custodians understand the importance of source separation of food waste when emptying collection bins.

### Connect with other schools taking similar initiative through Sustainable Jersey for Schools

Sustainable Jersey for Schools points are available for schools recycling food waste and schools that have achieved certification can be found on the Sustainable Jersey for School's website. Involvement in Sustainable Jersey for Schools can provide recognition for the sustainable actions schools take, help qualify a school or district for grants and funding, as well as network with schools taking similar actions.

**Find out more at the Sustainable Jersey for Schools website at sustainablejerseyschools.com**

## Incorporate Food Waste into Student Learning Standards

In June 2020, New Jersey became the first state in the U.S. to incorporate K–12 climate change education across content areas when the State Board of Education adopted the 2020 New Jersey Student Learning Standards. With the implementation of these standards, New Jersey will better equip its students to combat the climate crisis, thrive in the green economy of the future and become the leaders who will accelerate the state's progress toward a cleaner, more sustainable future.

Climate change is one of humankind's most pressing concerns and its effects are more intense in New Jersey than in many other places of the world. In order to develop solutions to the problems that arise as a result of climate change, we must prepare a climate-literate populace with comprehensive and accurate knowledge of the topic as the priority of our environmental actions in schools. Integrating climate change education in schools thoroughly and effectively should be the first priority of any school tackling a problem like food waste. Education about food waste and implementation of food waste best management practices in schools may be included with climate change education as an effective way to reduce greenhouse gas emissions – produced when food waste is sent to landfill - and conserve resources used for growing and transporting wasted food.

**Find more links and information on how to best integrate New Jersey's Climate Change Education Standards in your school in the School Food Waste Education Resources listed in Appendix A.**

## Create a club, group or committee and designate a faculty leader

Creating a food waste management team can help kickstart and maintain a food waste program. Having at least one food service professional as a leader of a food waste management initiative at each school is recommended to help facilitate a student-led food waste club, group, or committee. Faculty-led groups or committees, instead of student-led committees, are recommended for schools with students under middle school age since faculty are often at schools longer than students. A student-led food waste or environmental club may be initiated if appropriate for an individual school. A faculty and student collaborative food waste club, group, or committee can spearhead efforts to train cafeteria and waste associated staff and student volunteers, when appropriate, to handle food waste and run food waste best management practice programs. The appointed club, group, or committee should arrange periodic meetings where they can connect and discuss volunteer recruitment and management, training schedules, training protocols, program logistics and share ideas. Creating a supportive, connected community around food waste among students and faculty can help create the most effective and long-lasting food waste movement within schools.

## Run a food waste audit – determine how much is being produced

One step for addressing food waste issues in cafeteria settings is to measure the amount of food waste being produced. With an accurate representation of how much food waste is produced, schools are more motivated and prepared to tackle the challenge of addressing food waste. Food waste can be measured either in the "front of house" or "back of house." "Back of house," production side food waste audits are often much simpler than "front of house," consumption side food waste audits since those working in the kitchen are paid professionals. Kitchen professionals can be trained to divert all food waste produced in the kitchen into five-gallon buckets to be weighed periodically. If more detailed information is preferred, kitchen professionals can be prompted to pay attention to why most food waste is produced and asked to report on what reasons were most common.

"Front of house," more student-involved, food waste audits may require a more detailed and dedicated data collection method but come with the added benefit of involving and engaging students. Student-produced food waste audits, as they are guided by the US Department of Agriculture, measure plate waste and interview each food waste contributor so that student volunteers or faculty can collect data on what was wasted and why directly from the students. Therefore, as staff note when, how and why items are wasted, corrections can be made to help prevent that food item from being made in the future.

Follow up food waste audits can reveal if the corresponding strategies for reducing food waste informed by the first food waste audit were successful and can help further inform and correct problems that may be contributing to excess food waste. It is recommended for schools to run food waste audits at least once a school year to keep faculty informed and students engaged.

## Sample Food Waste Audit Steps

1. **Plan!**

   Collect items for the audit, connect with dining services, find location for the audit.

2. **Organize!**

   Gather volunteers, decide time intervals for shifts, make a survey, develop a shift schedule.

3. **Train!**

   Devise an interview question sheet, train volunteers on their specific duties, prompt volunteers on the questions they will be asking and how they will be recording them.

4. **Run!**

   Set up an area for collected items, close off student access to trash cans, weigh an empty bucket to subtract from later weights, walk morning shift volunteers through the procedure and advise them on how to show the next shift to do so, have one or multiple leaders check in throughout the day.

5. **Analyze!**

   Find the average amount of food waste generated by each student during a meal using the number of students counted during the meal service divided by the weight of food waste generated for each meal. Create a graph displaying the average food waste generated for each student per meal over the duration of the study. The resulting data can be used internally by the school or released to the student, teacher or parent body to communicate the study's findings and conclusions.

*Pictured below: A student at Reeds Road Elementary School in Galloway, runs a food waste audit collecting each food item into separate bins to be weighed. (source: Sustainable Jersey for Schools)*

# Reduction

Reduction is the most important action for preventing food waste and is at the very top of EPA's Wasted Food Scale. Reducing food waste prevents the need to deal with excess or spoiled food by not producing the food in the first place. Schools can adopt best management practices that pertain to how food is both handled and served to effectively reduce the food waste they produce and reap the financial and environmental benefits of doing so.

The following are food waste reduction best management practices that are recommended for K–12 schools and higher education institutions in New Jersey.

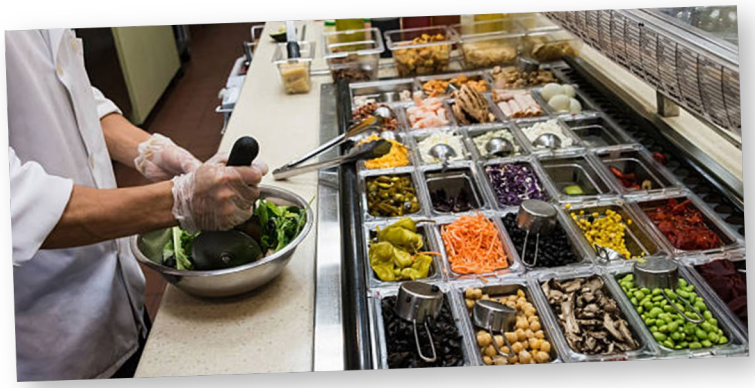
## Inventory management

### Food purchasing and storage

- Use the "First In-First Out Method" of reducing waste by ensuring that food that has been stored the longest ("first in") is the next food used ("first out"). This method can be implemented by placing the newest items in the back and the oldest items in the front when new deliveries are received.
- Keep records of food thrown away from overproduction, expiration, spoilage, trimming or handling issues. Give staff incentives and training to reduce the waste that appears most in the records.
- Streamline inventory control to reduce the amount of excess and out-of-date inventory.
- Adjust inventory levels if it is found that certain perishables tend to experience spoilage or dehydration.
- Wrap freezer products tightly, label and date them, and ensure that they are used as fast as possible to prevent freezer burn.
- Restore hydration in vegetables such as celery, lettuce, carrots and broccoli by trimming off the very bottom part of the stalk and immersing them in warm water (100°F) for 15 to 20 minutes.
- Store leftovers properly to minimize spoilage. Use leftover foods within two days of preparation to minimize spoilage.
- Do not accept samples or food donations that may become food waste.
- Work alongside suppliers to minimize and send back materials used for packaging and shipping.

### Meal Planning and Preparation

- Review menus frequently and reduce or eliminate commonly wasted items.
- Have secondary uses for menu items in case they are over produced.
- Design menu cycles to allow for secondary uses of food (e.g., chicken sandwiches, chicken casserole, then chicken soup).
- Examine products for freshness if past their "Best Use By" date and do not discard if still fresh.
- Utilize hourly or daily production charts to prevent over prepping.
- Only trim what is not needed when preparing food and use trimmings for meat and vegetable stock when possible.
- Allow students to purchase smaller portions. Make portions smaller if a menu option is consistently disposed of.



## Offer vs. Serve

The Offer Versus Serve program or OVS is a program that applies to menu planning and meal service in schools. OVS allows students to decline some of the food offered in a reimbursable lunch or breakfast. A reimbursable meal is a federal formula which helps each district determine whether they receive a monetary reimbursement from the Federal Government for each meal given to students. OVS prevents food waste by giving students more choice in declining foods from their breakfasts or lunches they may not want to eat. The goals of OVS are to reduce food waste and to permit students to choose the foods they put on their plates.

## Lunch times

School food waste can be greatly reduced by extending time blocks given to students to eat their meals. A nutritionist at the University of Illinois- Chicago, Mary Jane Getlinger, noted that the amount of time given to first, second and third graders in Rockford, Illinois was fifteen minutes long. This is all the time given to students to get their lunch, eat, socialize, and clear their tray. A study, conducted by Central Washington's Dr. Ethan Bergman, compared students who had twenty-minute lunch to those with thirty-minute lunch and found that students with twenty-minute lunch times ate 10 to 15% less food than those given thirty-minute lunch times. Another proven way to further reduce food waste is to schedule lunch after recess.

## Market your meals

Highlight new foods on your menus and serving lines. Consider holding taste tests and recipe competitions or creating a student advisory committee to provide feedback on food acceptability and recipe names.

## Saving food items

Students who may not have time to finish their meal during the designated lunch period may save certain meal components for later in the day. For food safety reasons, this practice should be limited to food items that do not require cooling or heating.

# Extra Credit Reading

### Know Your Dates

Most date labels are an indicator of food quality, not food safety, decided by manufacturers. Consumers mistakenly believe that all date labels are connected to food safety, whereas date labels are more commonly a means for producers and manufacturers to indicate prime condition of the item for sale purposes. Except for infant formula, dates are not an indicator of the product's safety and are not required by federal law. Confusion surrounding the interpretation around date labels leads to the disposal of perfectly edible food.

Below are some common phrases found on food packaging:

- "Best if Used By/Before" indicates when a product will be of best flavor or quality. It is not a purchase or safety date.
- "Sell-By" date tells the store how long to display the product for sale for inventory management. It is not a safety date.
- "Use-By" date is the last date recommended for the use of the product while at peak quality. It is not a safety date except for when used on infant formula.

#### Date Labelling Laws in NJ

Currently New Jersey law only requires dairy products and shellfish to display a date label on the product, in addition to the federal law requiring baby formula to display a date label. All dairy products are required to be date labelled and any sales of products after the date marked is not permitted under NJ law. All shellfish products with a capacity of less than one-half gallon are required to display a date label but there is no restriction to selling shellfish that is past the sell-by date.

**Learn more about food waste policy in New Jersey here: policyfinder.refed.org**

# Recovery

Food recovery is the process of preventing edible food from being wasted at schools, restaurants, grocery stores, markets, or dining facilities by donating excess to food banks, food pantries, or soup kitchens under certain legal requirements. Many schools have initiated food waste recovery actions by donating whole, unused, and unopened food items where they are needed. Food recovery programs can raise a school's awareness about what is most wasted and what can be adjusted to limit food waste in the 'back of house' production side. They also strengthen the community by fostering relationships among food service departments, parents, students, and community organizations, as well as altering how students think about their food, where it comes from, and what happens when it is not eaten.

## Why recover food waste?

→ Feeds people, not landfills. Sends food where it is needed instead of creating waste.

→ Bolsters connections between community members.

→ Helps non-profits improve financially through food donations.

## Implementing a Food Recovery Program

*Guidance from the New Jersey Department of Health*

### Donation Guidance

There are many ways for schools to participate in food recovery programs including donating excess prepared food, produce, packaged foods and canned goods to food banks. The following specifies the requirements for safely implementing a school food recovery program.

## Extra Credit Reading

### The Bill Emerson Good Samaritan Food Donation Act

The federal Bill Emerson Good Samaritan Food Donation Act asserts that covered parties engaging in covered donation activities "shall not be subject to civil or criminal liability arising from the nature, age, packaging, or condition" of the donated items if requirements stated by the Act are met by donors. These include:

- The donated items must be apparently wholesome food.
- The covered party must donate the items in good faith.
- The donation must be made to a nonprofit organization.
- The nonprofit must distribute the donated items to needy individuals.

**Find more food recovery regulatory guidance from the Department of Health in Appendix B.**

## Share Tables

Share tables in schools help reduce the amount of food waste by redistributing food where it is wanted. Students can contribute to share tables by placing unwanted, whole, unconsumed and unopened food and beverage items on the table for other students. Other students are then given the ability to take the items placed on the table free of charge. These guidelines cover how to begin a share table program that is effective and safe in a K–12 cafeteria environment.

### Suitable Foods

Suitable foods include non-perishable, prepackaged products like food bars, drinks, crackers, and cereal packets. Also fruits and vegetables that are wrapped or have a thick skin such as bananas and oranges.

- Commercially prepackaged Time and Temperature Controlled foods (TCS foods) such as milk and cheese are required to be placed in an ice bath or refrigerator at the share table.

## Food Safety Requirements for Share Tables

1. The table should be placed close to the cashier or wherever students exit the food service line for increased visibility and use by students.
2. The sharing table should not be monitored by the cashier but should be monitored by any other employee.
3. An ice bath or small refrigerator must be available for foods and beverages that require refrigeration, such as prepackaged milk or fruit cups.
4. Food placed on the table should be kept separate and distinct from unsold foods. Students should only place food on the share table if they have not sat down to eat yet to avoid potential contamination.

# Recycling

It's estimated that a single student can generate over two pounds of compostable materials, such as food scraps and soiled paper, each day.[2] That means a large quantity of compostable materials will unnecessarily be sent to landfills if not diverted and recycled. Recycling school food waste significantly reduces a school's solid waste generation and creates an avenue for the waste to be recycled. There are many options for recycling food waste. Schools can send food off-site to be handled by contracted food waste recycling facilities or choose from a variety of on-site food waste recycling techniques based on how they suit the school's facility and food waste management program.

## Benefits of recycling – possibly cheaper than traditional disposal

The establishment of a well-run food waste reduction, recovery and recycling program will result in less material disposed as trash which may enable schools to utilize smaller solid waste dumpsters and reduce the number of solid waste pick-ups. Negotiating solid waste services for your school with the solid waste hauler can result in considerable cost savings. Furthermore, the avoided cost of disposal must not be overlooked when considering the economic benefits of waste reduction, recovery and recycling.

## Recycling Case Study

### Whitehouse Elementary School's Food Waste Recycling Program

Whitehouse Elementary has an on-site food waste recycling program for food waste collected from staff and through the school's "compost corner." Their program uses two small garden tumblers and three large rectangular lasagna style bins made of wood pellets. Students participate in composting daily and are learning how to make different composting recipes so that additional food waste materials can be added on a regular basis. Compost materials are collected from the cafeteria, teachers' room, classrooms and science labs and combined in the outside bins to achieve the correct ratio of carbon to nitrogen. The resulting compost is used in the school garden.

[2] Composting School Food Scraps and Soiled Paper. (2010, September). NERC. nerc.org/documents/composting_school_food_paper.pdf

## On-Site Food Waste Management

### Composting

Composting food waste on-site using various methods of aerobic, or "open air", composting is often low-cost and a relatively simple method of recycling food waste that has many benefits. Composting on school property provides the ability for students to become involved in composting operations. Because the resulting compost is required to be used on school property, the school may be able to use the soil amendment for landscaping or to be utilized in a school garden.

### Initiating an on-site or off-site school food waste recycling program

1. Study and measure your school's food waste production through a waste audit.

   Understanding your school's food waste production will help determine the right composting solution for your school. Refer to p. 8 for sample food waste audit steps for schools.

2. Match your school's production with the appropriate recycling method.

   The appropriate recycling method for a school may vary based on a school's available space, budget, quantity of food waste production and type of food waste produced.

3. Develop a collection plan.

   Involve the kitchen staff, custodial staff and administration in the collection plan development. Determine how the materials will be collected in the kitchen and cafeteria. Five-gallon buckets with lids work well; often these are available at no cost from restaurants or stores. Food waste is very heavy, so smaller containers work best, especially if students are involved with moving the materials from the cafeteria to a storage or recycling area. Bins for the kitchen need to be accessible to staff but placed out of the way. Devise a preliminary collection schedule.

4. Start small.

   Implement the collection first with the kitchen staff. Set up buckets or bins into which the kitchen staff can toss food preparation scraps. Label the bin with a sign that has the acceptable materials listed. Conduct training for the staff. Decide how the materials will be transferred from the kitchen to the collection bin or storage area for composting.

5. Expand the system to student lunches.

   Phase in the collection one lunch period or one grade at a time. Solicit student volunteers to monitor the cafeteria food scrap collection. Have at least one monitor to stand by the collection bin to assist younger students and ensure that all students know how to participate. Create easy to read signage (with pictures) to place on collection bins.

6. Monitor and promote the program.

   Get volumes or weights from the hauler or processor and publicize these in school announcements, newsletters, the school website and local media. Work out any collection issues, for example, is the storage area adequate, is collection running smoothly, is contamination from other waste items an issue, etc.

## Off-Site Food Waste Management

Sending food waste off-site to be used by an animal farming facility or a commercial composter may be the most accessible recycling method for schools, especially if facility space and staffing is limited.

### Using food waste as animal feed

Schools in the proximity of an animal farm or animal feed processing facility may be able to send their food scraps for animal feed. Using food scraps as animal feed often requires less processing and is a more direct use of energy than recycling food waste into compost.

### Using a commercial food waste recycling facility

Commercial composting requires schools to connect with a hauler and/or commercial composting facility that will handle food waste they generate. Commercial composting provides a service to schools that may not have the labor, resources, or space to run a full on-site composting operation.

## Extra Credit Reading

### Composting vs. Anaerobic Digestion

#### Aerobic Composting

Aerobic composting, or 'open air' composting, is often a low-cost and relatively simple method of recycling food waste into compost. This approach requires either the use of bins or piles so that students can learn the natural process of composting first-hand. Bins and piles can be built in a variety of ways that can be chosen based on the school's needs and budget.

#### Anaerobic Digestion

Anaerobic digestion occurs when organic matter, such as food waste, is deprived of oxygen and allowed to decompose. The process of anaerobic digestion uses a different set of organisms and conditions than aerobic composting. Anaerobic digestion uses the word "digestion" because it produces an acidic environment that loosely resembles what is produced in the stomachs of humans and animals. Anaerobic decomposition kills pathogens and weed seeds in organic matter with high enough levels of acidity. Anaerobic digestion produces two valuable products. It produces biogas (methane and carbon dioxide), a renewable energy source and left-over material called "digestate", a fertilizer. The cost of an anaerobic digester can be considerably higher than the costs associated with aerobic composting. Anaerobic digestion is preferable over aerobic composting because of its waste-to-energy feature, turning organic wastes into renewable energy.

# Recycling Case Study

## Tabernacle Elementary's Food Waste Collection and Management Strategy

Tabernacle Elementary school runs a composting program using a tumbler style composter they acquired using grant funds and another donated composter. Fourth grade students at the elementary school were involved in the waste audit and held class discussions and wrote letters to the principal with recommendations moving forward. The school also created color coded signage and put out a flyer to introduce composting to the school. Each grade level takes turns adding to the composter, food waste from the teachers' lounge and cafe kitchen area are also collected, posters were placed in both areas to help collection, and the TES Green Team collects and records the food waste collections. A worm bin is also being added to expand food waste recycling.

# Recycling Case Study

## Princeton University's In-Vessel Composting Demonstration Project

Princeton University launched an in-vessel composting demonstration project in September 2018 after two years of planning, construction and coordination among campus departments. The project is made possible through a donor grant to purchase a FOR Solutions composting system. The demonstration has been planned and implemented with high interest from students and faculty. Princeton now calls the project their Sustainable Composting Research at Princeton (S.C.R.A.P.) Lab. The demonstration project involves using a FOR Solutions Model 1000 in-vessel composting system to convert campus food scraps into a nutrient-rich soil amendment for campus grounds. The project also supports academic research around food scrap conversion to soil which is a topic of growing interest as federal and state targets for reduced food waste grow in number. Every week, the University sends campus food scraps from Frist Campus Center, campus cafes and a growing list of academic and residential building partners to the S.C.R.A.P. Lab. The uneaten food is loaded into the system along with a bulking agent/carbon source. The Model 1000 composting system uses a programmed rotation and aeration process to facilitate the aerobic digestion of food scraps into compost in five to seven days. After the compost is finished, it is then brought to a stockpile yard where it waits to be applied on campus landscapes.

# Appendix A

Find links online

## School Food Waste Education Resources

**Instructional Resources**

| Resource | Description | Grade Level(s) |
|---|---|---|
| Summary of Climate Change in New Jersey for Teachers | Summary of the 2020 NJ Scientific Report on Climate Change and the 2022 Health Addendum: Climate Change Impacts on Health and Communities is meant to provide you with the basic background and resources you need to teach about climate change. | K-12 |
| NJ Specific Exemplar Lesson Plans | Teacher-made lesson plans that are aligned with the NJ Climate Change Education Student Learning Standards | K–12 |
| 1400+ Teaching Resources | NJ Climate Change Education's full resource library. | K–12 |
| Guidance for School Boards for implementing the Climate Change Education Learning Standards | Access guidance documents recommended by the NJ Thought Leadership Report as you support schools implementing the Climate Change Education Student Learning Standards. | K–12 |

| Resource | Description | Grade Level(s) |
|---|---|---|
| Rutgers Agricultural Experiment Station – School Food Waste Reduction Toolkit | A toolkit developed by Rutgers Agricultural Experiment Station, Middlesex County partners and Elijah's Promise that focuses on ways that communities can reduce food waste in schools following the EPA Wasted Food Scale. | K–12 |
| Rutgers Food Waste Audit Guide | Guidance developed by Rutgers University for how schools can run a school food waste audit. | K–12 |
| Sustainable Jersey for Schools Food Waste Management Action | This action awards points for a comprehensive food waste recycling program that is active and that has been operational in the previous school year. | K–-12 |
| Sustainable Jersey for Schools School Gardens Action | This action awards points for food-producing school gardens. | K–12 |
| EPA - A Guide to Conducting School Food Waste Audits | Guide provides information on why and how to do a food waste audit, what to do with the data collected, and offers food waste prevention ideas. | K–12 |
| New Jersey Department of Agriculture - "Offer Versus Serve" Guidance | Guidance for the National School Lunch Program and the School Breakfast Program | K–12 |
| USDA - Market Your Meals Guidance | Ideas for school cafeterias to enhance student interest in food provided, reducing waste. | K–12 |

| Resource | Description | Grade Level(s) |
|---|---|---|
| Healthy Kids Collaborative | The Culinary Institute of America's Healthy Kids Collaborative is a year-round, invitational initiative designed to both accelerate innovation and deepen technical and professional expertise in K–12 school food. | K–12 |
| Higher Education and Food Waste: Assessing Current Trends | An international study was conducted, including a sample of 52 higher education institutions, to provide pieces of evidence of current trends. Solutions provided. | Higher Education |

**Food Waste Recycling Resources**

| Resource | Description | Instructions |
|---|---|---|
| Class C Commercial Composting Exemption Form | NJDEP form for declaring an exemption from the Class C Commercial Composting permit. The exemption certifies that the material being composted is generated and reused on site by each individual school and therefore does not require a Class C permit (Exemption #2 on the form). | Send the completed form to exemptrecycling@dep.nj.gov with the county solid waste coordinator, county recycling coordinator, county health agent, and the municipality's zoning officer copied.<br><br>Any questions about the permitting process for a school composting operation can be sent to exemptrecycling@dep.nj.gov.<br><br>The exemption form can be found at: www.nj.gov/dep/dshw/resource/notifyexempt.pdf |

# Appendix B

## Implementing a Food Recovery Program

*Guidance from the New Jersey Department of Health*

### Donation Guidance

There are many ways for schools to participate in food recovery programs including donating excess prepared food, produce, packaged foods and canned goods to food banks. The following specifies the requirements of each of the reasonable parties for safely implementing a school food recovery program.

### Definitions

**Donate** means to provide food free of charge or for a fee sufficient enough to cover the cost of storing, transporting or otherwise handling the food.

**Donor school** means a public or nonpublic school, or an institution of higher education that provides food for donation to a *food distribution organization* or *receiving facility*.

**Food bank** means a nonprofit food clearinghouse that solicits, stores and distributes combinations of edible but unmarketable surplus food. The food is then distributed to nonprofit organizations that feed those in need.

**Food distribution organization** means an organization that accepts donated food and directly distributes it to needy consumers or, in some cases, distributes donated food to a receiving facility which will then directly distribute it to the consumer. *The food distribution organization* and the *receiving facility* may be one and the same.

**Food recovery** means the collection of wholesome food for distribution to people in need.

**Nonprofit organization** means an organization incorporated under the provisions of Title 15 or Title 16 of the Revised Statutes of NJ, an organization exempt from taxation under section 501(c)(3) of the Internal Revenue Code or an entity to which charitable contribution as defined under subsection (C) of section 170 of the IRS code is deductible under section 170.

**Excess prepared food** means any extra, wholesome, unwrapped, ready-to-eat food that was prepared for service, but not served to students or offered for service to students from a buffet or other self-service setting. Such foods may include but are not limited to cooked meats, poultry, pasta, vegetables, starches, deli trays and vegetable trays.

**Person in charge** means the individual present at a retail food establishment who is responsible for the operation at the time of inspection.

**Receiving facility** means a nonprofit organization such as food bank, food pantry or soup kitchen that accepts donated food and directly distributes it to the consumer.

**TCS (time/temperature control for safety) food** means a food that requires time and/or temperature control to limit pathogenic microorganism growth or toxin formation. TCS food includes animal food that is raw or heat-treated; plant-based food that is heat-treated; raw seed sprouts, cut melons, cut leafy greens, and cut tomatoes.

## Regulatory Requirements

***The Bill Emerson Good Samaritan Food Donation Act***

The federal Bill Emerson Good Samaritan Food Donation Act asserts that covered parties engaging in covered donation activities "shall not be subject to civil or criminal liability arising from the nature, age, packaging, or condition" of the donated items if requirements stated by the Act are met by donors. These include:

- The donated items must be apparently wholesome food.
- The covered party must donate the items in good faith.
- The donation must be made to a nonprofit organization.
- The nonprofit must distribute the donated items to needy individuals.

*New Jersey's Retail Food Rules N.J.A.C. 8:24-1 "Chapter 24: Sanitation in Retail Food Establishments and Food and Beverage Vending Machines"*

In New Jersey, donor schools, food distribution organizations and receiving facilities are classified as retail food establishments. As such they are subject to regulation and inspection under the provisions of N.J.A.C. 8:24-1 et seq. *"Chapter 24: Sanitation in Retail Food Establishments and Food and Beverage Vending Machines"* (*aka* Chapter 24 rules). The Chapter 24 rules are enforced by the State and/or local health department.

## Food Safety Concerns for Handling Donated Foods

It is essential that the foods donated to the needy are safe for consumption. Donated foods are often served to persons with weakened immune systems such as very young children, the elderly and people receiving medical treatment. These individuals are highly susceptible to foodborne illness.

The Food and Drug Administration has identified the following five "foodborne illness risk factors" that contribute to foods becoming unsafe to eat:

1. Food from unsafe sources.
2. Poor personal hygiene (i.e. ill food workers; failure to wash hands; and bare hand contact with ready-to-eat food).l
3. Failure to cook animal-based foods to safe temperatures.
4. Holding time/temperature control for safety (TCS) foods at improper temperatures.
5. Contaminated equipment (i.e. failure to clean and sanitize food prep equipment).

To ensure the safety of donated foods, the above conditions need to be controlled at every point of food production, distribution and service.

### Suitability of Foods for Donation

Most foods are suitable for donation if they are handled properly. Perishable and excess prepared TCS foods may be donated if the *donor school*, the *food distribution organization,* and the receiving facility

can provide the equipment necessary to maintain the foods at required temperatures throughout preparation, storage, holding, transport and serving.

Examples of the different classifications of foods and corresponding food safety controls are listed below:

- Commercially Packaged Non-perishable foods
  **Examples:** Shelf-stable packaged foods, canned goods, canned or bottled beverages, packaged chips, snack foods and candy.
  **Controls:** Packaging intact, canned goods not rusted or severely dented.
- Perishable foods
  **Examples:** Baked goods without cream fillings, bread rolls, raw, whole, uncut fruits and vegetables.
  **Controls:** Product protected from contamination and not visibly spoiled.
- Commercially Packaged TCS Foods
  **Examples:** Prepackaged milk, yogurt, cheese, deli meats.
  **Controls:** Product maintained at 41°F or below; packaging intact.
- Excess Prepared Foods (Cold)
  **Examples:** Sandwiches, vegetable salads, pasta salads, protein salads, fruit cups.
  **Controls:** Timely handwashing/no bare hand contact; foods prepared in a sanitary manner, product maintained at 40 °F or below.
- Excess Prepared Foods (Cooked)
  **Examples:** Cooked meats, fish, poultry, gravy, soup, vegetables and pasta.
  **Controls:** Timely handwashing/no bare hand contact; foods prepared in a sanitary manner, foods cooked to required temperatures; hot foods maintained at or above 135 °F; foods rapidly chilled (frozen) by the donor school prior to pick up by the food distribution organization; product maintained frozen until reheated; and product properly reheated at the receiving facility.
- Foods Not Suitable for Donation
  - Prepackaged TCS foods that have been held out of temperature control.
  - Excess prepared foods that have been held out of temperature control.
  - Excess prepared foods that have been served to students.
  - Excess prepared foods that have been offered for self-service to students (i.e. through a salad bar or open buffet).
  - Exposed perishable foods that have been served to students.
  - Rusted or severely dented cans.

## Roles and Responsibilities

It is essential for the donor school, food distribution organization and receiving facility to work together to establish operational policies and procedures to ensure that donated foods are handled in accordance with the Chapter 24 rules. The polices should address the following:

- Key contacts: Names, addresses, email addresses and phone numbers.
- The types of foods to be donated.
- The food transport arrangements including:
  - Who will transport food from the donor school to the receiving facility.
  - The type of vehicle(s), temperature-holding equipment that will be used.
  - Distance in miles and time between the donor school and the receiving facility.
  - Anticipated frequency, times and dates for pickup of donations.
  - Contingency plan in case of vehicle breakdown or emergency.

# Text Versions of Diagrams

## Food Waste in the US Diagram

Today we waste 50 percent more food than we did in the 1970's. This costs Americans over 218 billion dollars per year, while 42 million Americans are food insecure.

Food production uses:

- about 50 percent of U.S. land;
- 16 percent of the U.S. energy budget; and
- 67 percent of U.S. freshwater consumption.

These stats are cited from the NRDC's 2017 Wasted: How America is Losing Ups to 40 Percent of Its Food from Fork to Landfill report.

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## The EPA Wasted Food Scale Diagram

Pathway showing the most preferred food waste management action to the least preferred based on environmental impact. The shades of green are the most saturated at the beginning of the pathway (most preferred action) and get less saturated as you travel to the end. The least preferred action is red and labelled "avoid."

Management options in order from most preferred to least:

- Prevent wasted food,
- Donate or upcycle,
- Feed animals or leave unharvested,
- Compost or anaerobic digestion,
- Anaerobic digestion (with disposal of digestate/biosolids) or apply to the land, and
- Send down the drain, landfill, or incinerate with or without energy recovery (in red indicating that, out of all of the management options, this is the one to avoid).

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