NJ Clean Air Council Annual Public Meeting

Tackling Food Waste through the Food System: Focusing on Schools

Sara Elnakib, PhD, MPH, RDN
Department Chair/ Associate Professor
Family & Community Health Sciences

RUTGERS UNIVERSITY
Cooperative Extension
New Jersey Agricultural Experiment Station

What is Rutgers Cooperative Extension

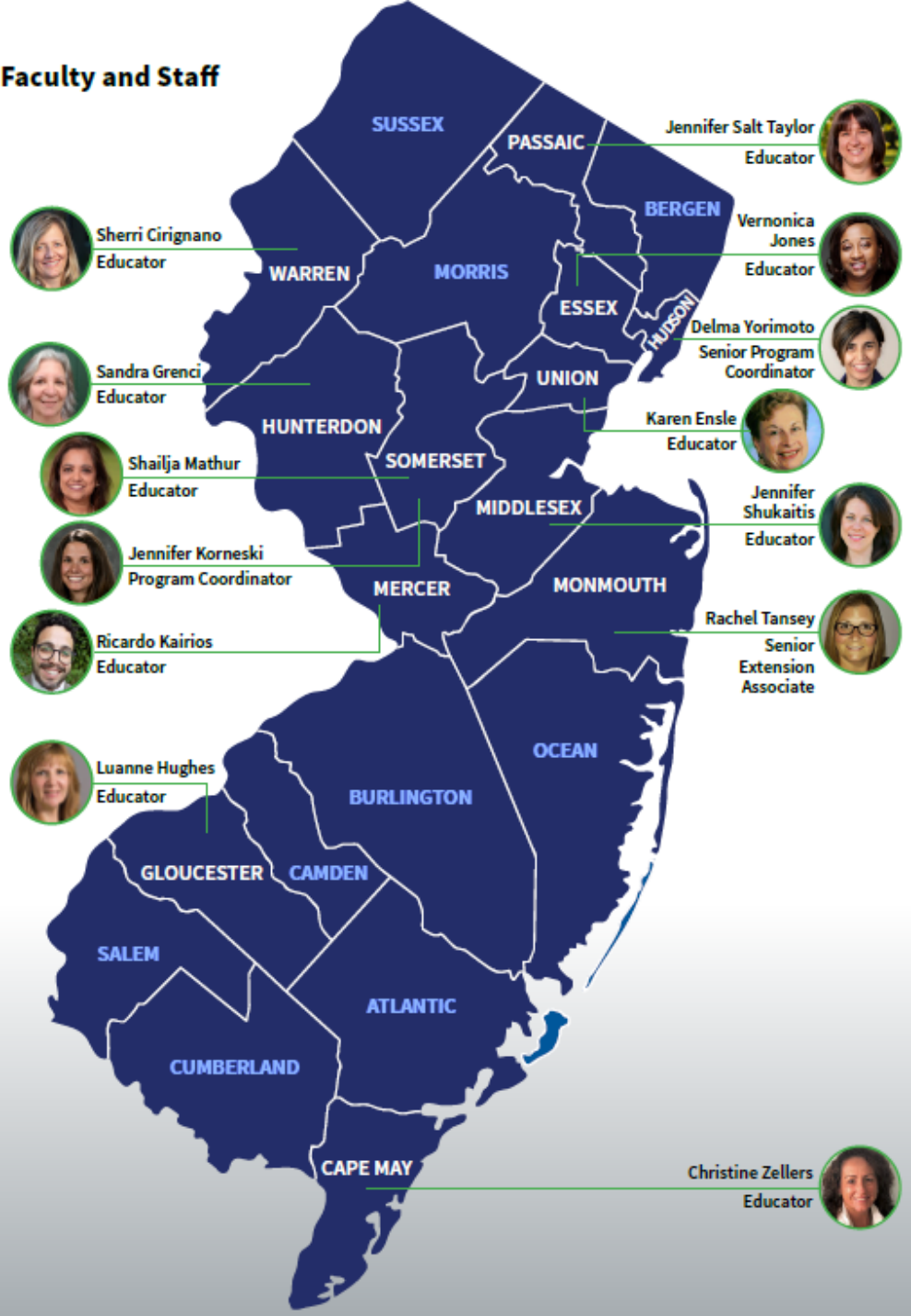
Rutgers Cooperative Extension is the outreach arm of Rutgers University, and we provide education and outreach to all 21 counties of NJ.

Who We Are

There are 3 main departments of Rutgers Cooperative Extension

- 4-H: Youth Development
- Agriculture and Natural Resources
- Family & Community Health Sciences

FCHS Faculty and Staff



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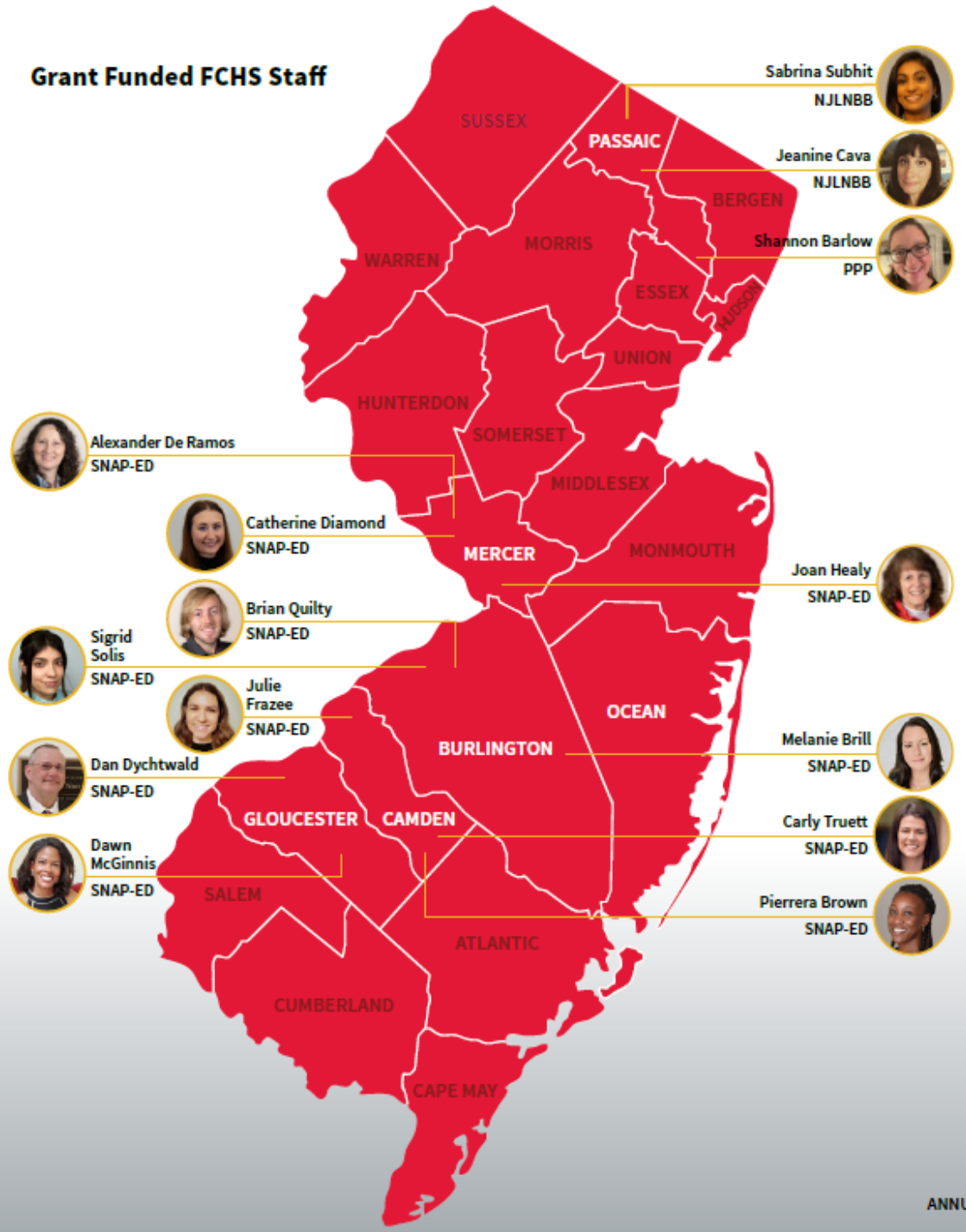

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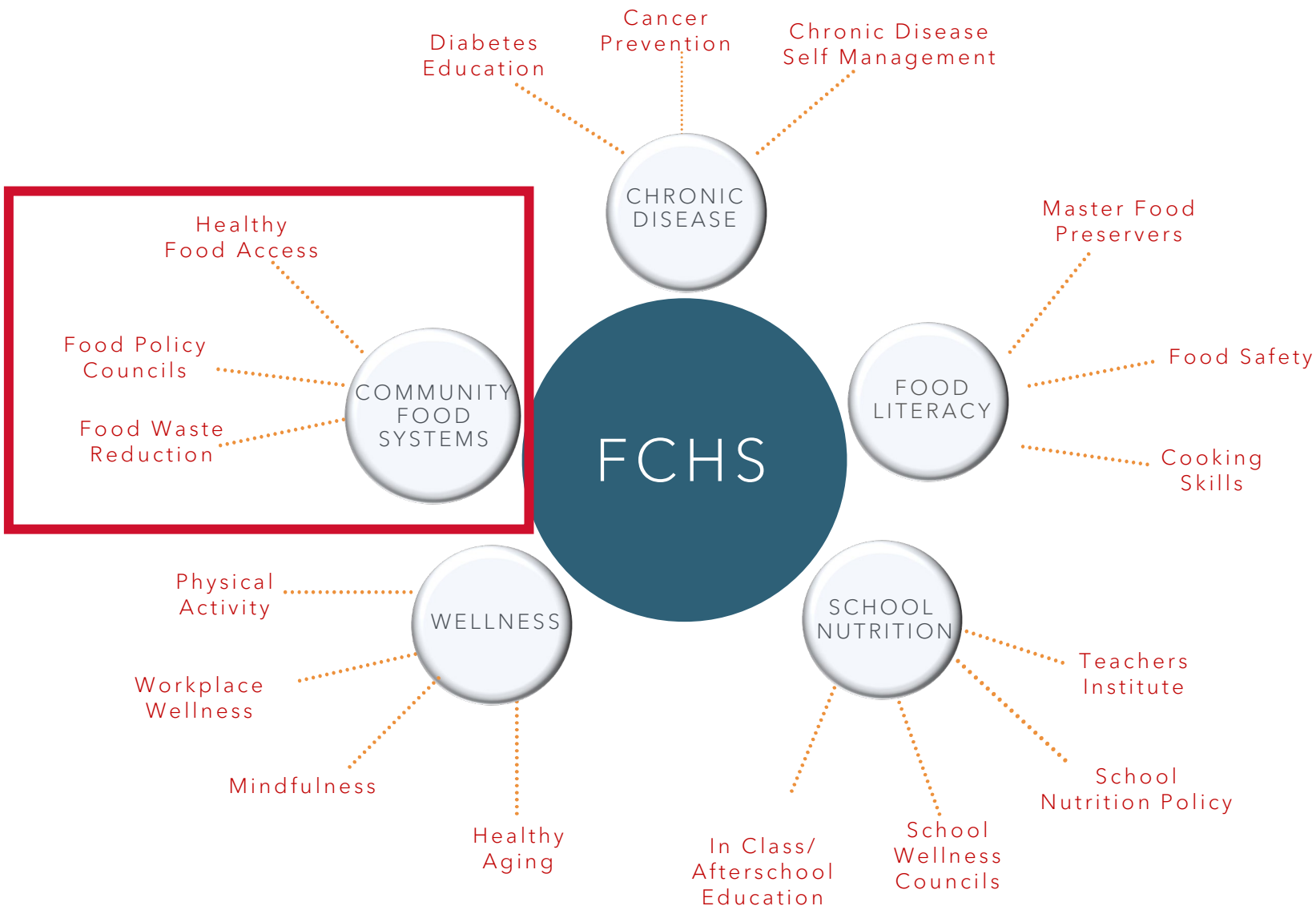
CURRENT FOCUS AREAS



Rutgers Cooperative Extension Food Waste Team

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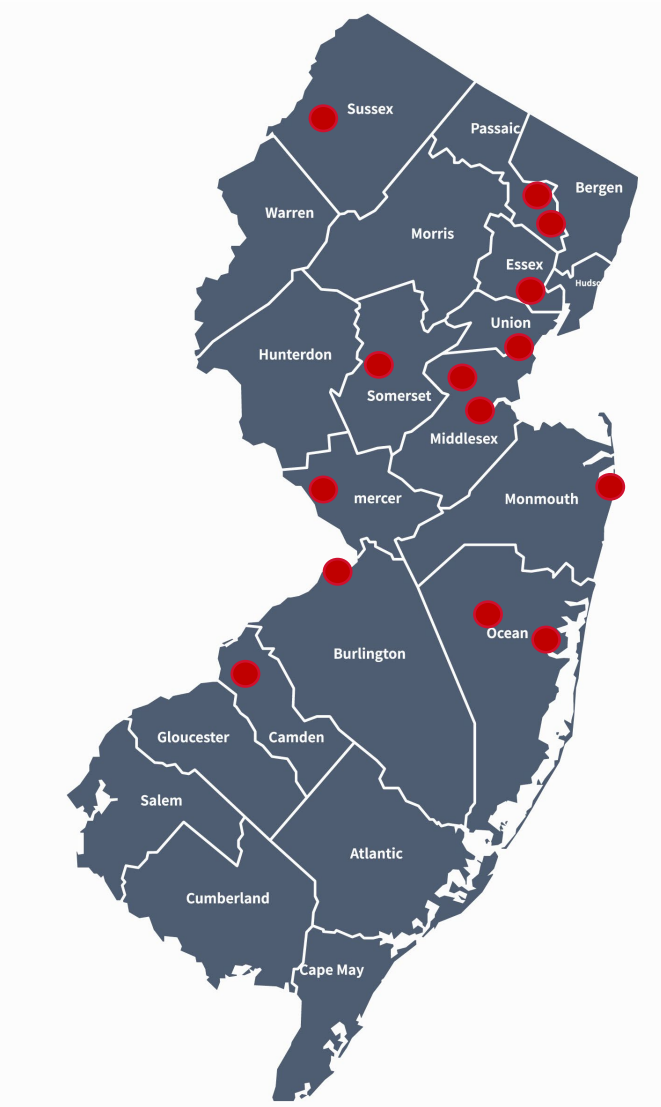
Jennifer Shukaitis, MPH
FCHS Educator

Amy Rowe, PhD
ANR County Agent
Extension Department Head

Sabrina Subhit, MPH, RDN
FCHS Research Program Coordinator

- An interdisciplinary team of Cooperative Extension agents came together to work on food waste
- Started our work in 2017 in Paterson Public Schools
- Have expanded to 11 of the 21 NJ Counties

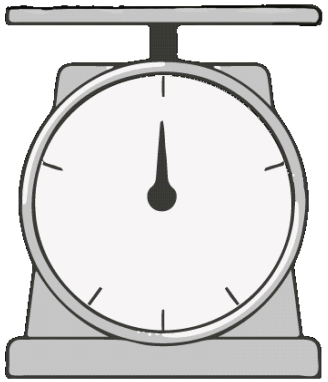


Background on Food Waste

In the US we waste

30%-40%

of our food system.

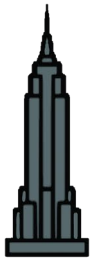


On average, each person wastes more than

20 pounds of food per month

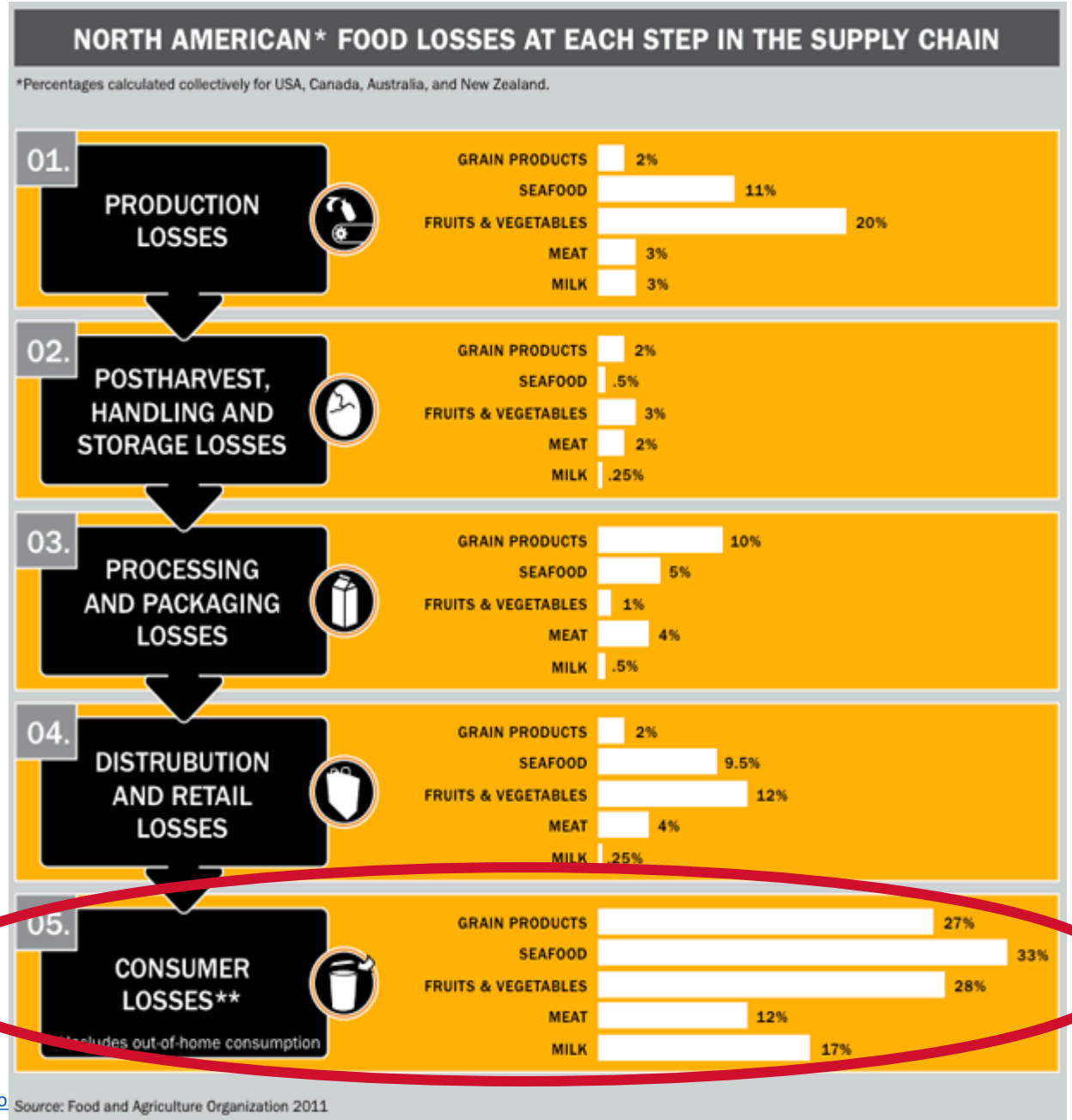
80 billion pounds each year

Enough to fill the Empire State Building 1,000 times.



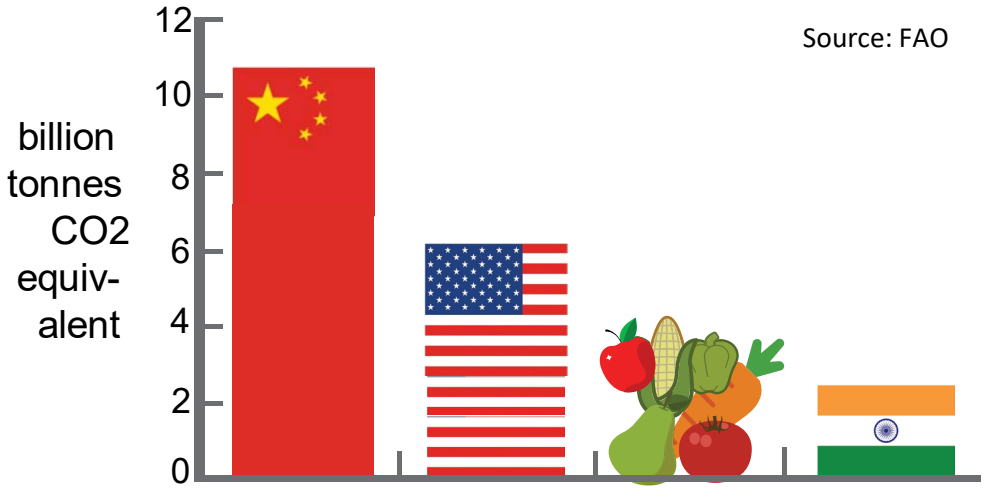
Waste 360 Lets talk Turkey… And Food Waste Beyond the Thanksgiving Table (Retrieved May 13, 2020)
https://www.waste360.com/marketing-and-public-relations/let-s-talk-turkey-and-food-waste-beyond-thanksgiving-table/gallery?slide=1
How Can We Support Affordable, Nutritious Diets? Reduce Wasted Food USDA (Retrieved May 13, 2020)
https://www.usda.gov/media/blog/2015/10/20/how-can-we-support-affordable-nutritious-diets-reduce-wasted-food

Where Does Food Loss & Food Waste Happen?



Food and Agriculture Organization of the United Nations-Sustainability Pathways http://www.fao.org/nr/sustainability/food-lo
Gunders, Dana. (2012). *Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*. Retrieved from Washington, D.C.

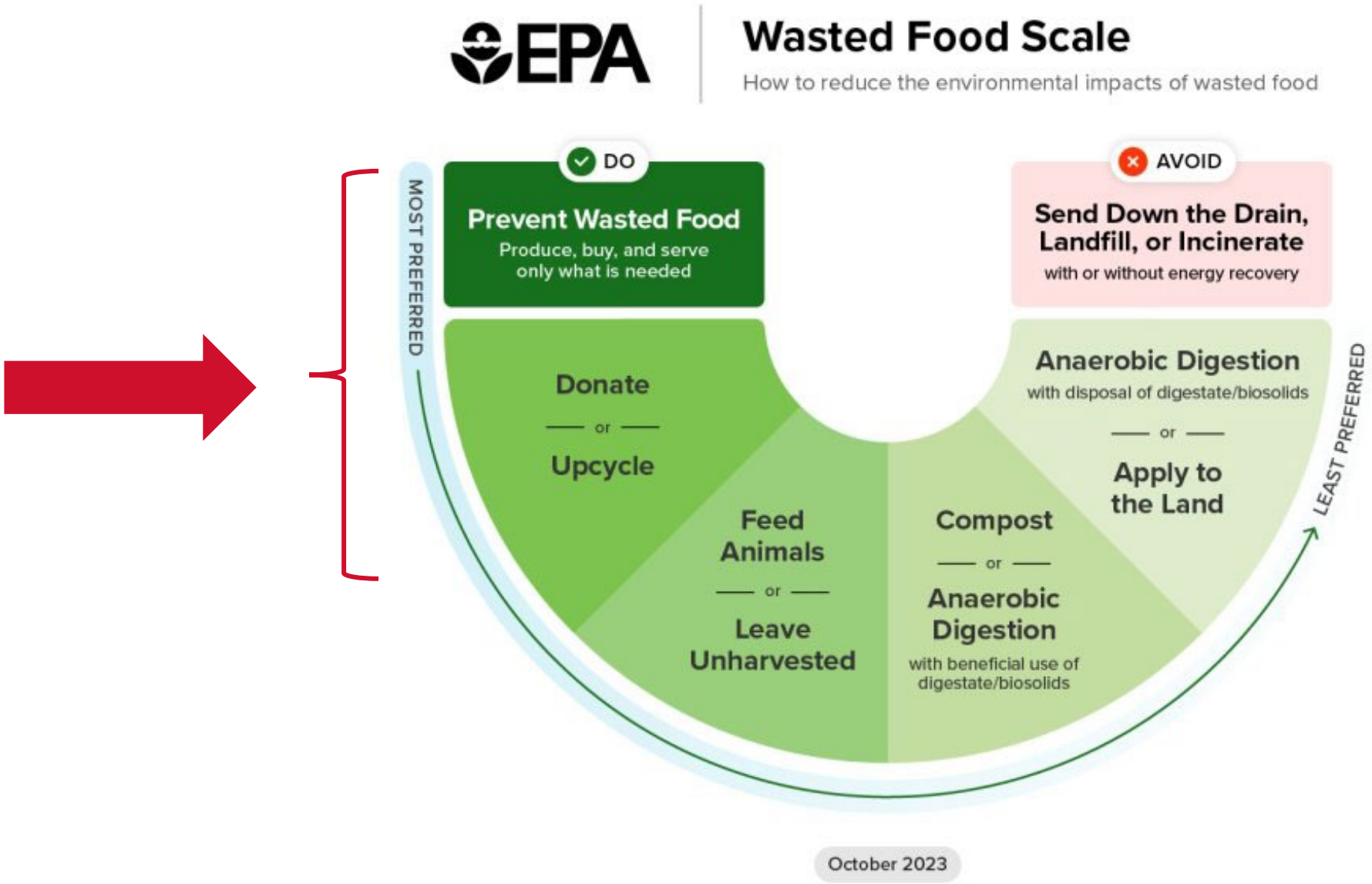
Why Food Waste Matters



Source: FAO

Environmental Impact	The FAO estimates that if FW globally were a country it would be the **3rd largest emitter** of greenhouse gas after China and the US.
Economic Impact	Wasting 30-40% of the food we grow in the US is equal to throwing away **$161-$218 billion** per year.
Social Impact	**10.5% or 13.7 million** U.S. households were **food insecure,** yet we throw out food that is very nutritious.

How to Reduce Food Waste?



EPA Food Waste Scale https://www.epa.gov/sustainable-management-food/wasted-food-scale

National & State Food Waste Reduction Goals

In September 2015, the first-ever national food loss and waste goal in the United States was launched, calling for a 50% reduction by 2030.

In August 2017, the first Food Waste legislation in New Jersey was passed. Bill S3027 establishes that NJ will reduce its Municipal Solid Food Waste by 50% come 2030

USDA Food Loss and Waste Retrieved on May 13, 2020 https://www.usda.gov/foodlossandwaste

New Jersey Department of Environmental Protection https://www.nj.gov/dep/dshw/food-waste/

Focus on School Food Waste

USDA –Reducing Food Waste at K-12 Schools https://www.usda.gov/foodlossandwaste/schools

New Jersey Department of Environmental Protection- Food Waste https://www.nj.gov/dep/dshw/food-waste/

Strategies to Reduce Food Waste In Schools

Cafeteria Environment Modifications

Training Food Service Staff

Meal Schedule Modifications

Improving Food Redistribution Process

Educational Programming Interventions to K-12 Schools

Connecting Food Waste Generators with Food Security

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Paterson Public Schools 2017

- Total Schools = 15 Paterson Public Schools

  Total lunch trays measured = 9,258 trays

- Food waste reduction intervention:
  - Trained food service workers on Lunchroom Strategies: Improve the lunchroom atmosphere, Focus on fruit, Vary the vegetable, Move more milk

- After food waste reduction interventions:
  - 350 pounds of food waste saved, which equals
    - 90,720 pounds of food waste saved for the district for the year

International Journal of Environmental Research and Public Health

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Article

Food Waste in Schools: A Pre-/Post-Test Study Design Examining the Impact of a Food Service Training Intervention to Reduce Food Waste

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Citation: Elnakib, S.A.; Quick, V.; Mendez, M.; Downs, S.; Wackowski, O.A.; Robson, M.G. Food Waste in Schools: A Pre-/Post-Test Study Design Examining the Impact of a Food Service Training Intervention to Reduce Food Waste. *Int. J. Environ. Res. Public Health* **2021**, *18*, 6389. https://doi.org/10.3390/ijerph18126389

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Abstract: This study aimed to assess change in school-based food waste after training and implementing the Smarter Lunchrooms Movement (SLM) strategies with school food service workers. This non-controlled trial was implemented in a random sample of 15 elementary and middle schools in a Community Eligibility Program school district in the Northeast, the United States. Baseline and post-intervention food waste measurements were collected at two different time points in each school (n = 9258 total trays measured). Descriptive statistics, independent t-tests, and regression analyses were used to assess SLM strategies' impact on changes in percent food waste. The mean number of strategies schools implemented consistently was 7.40 ± 6.97 SD, with a range of 0 to 28 consistent strategies. Independent t-tests revealed that at post-test, there was a significant ($p < 0.001$) percent reduction (7.0%) in total student food waste and for each food component: fruit (13.6%), vegetable (7.1%), and milk (4.3%). Overall, a training session on food waste and the SLM strategies with school-based food service workers reduced school food waste. However, the extent of the training and SLM strategies to reduce food waste varied on the basis of the consistency and type of strategies implemented.

Keywords: food waste; plate waste; school lunch; cafeteria interventions; sustainability

1. Introduction

Food waste is a significant issue in the United States. The United States Department of Agriculture (USDA) estimates that over one-third of food produced is being wasted annually, which equates to 133 billion pounds and USD 161 billion [1,2]. In 2012, food waste contained an estimated 1217 calories and 33 g of protein per capita per day and many vital nutrients such as dietary fiber, vitamin D, and calcium [3]. In addition to the economic and nutritional cost of food waste, it also has a severe environmental cost [4]. The resources used to produce food such as land, water, and transport are not often factored into the cost of food waste [1], nor are the greenhouse gases that are released during the production, processing, transportation, and refrigeration of wasted food [1]. Thus, the negative impacts of food waste are environmental, nutritional, and economic, leading to the federal government's focus on this issue [1,5].

In 2015, the USDA created a Food Waste Challenge jointly with the Environmental Protection Agency (EPA) to reduce food waste nationally [6]. This Food Waste Challenge

Elnakib, S., Downs, S., Quick, V., Wackowski, O., Mendez, M., Robson, M. "*Food Waste in Schools: A Pre-/Post-Test Study Examining the Impact of a Food Service Training Intervention to Reduce Food Waste.*" International Journal of Environmental Research and Public Health's special issue on Green Environment: Effluent Reuse and Waste Recycling, 2021 18(12), 6389. http://doi.org/10.3390/ijerph18126389

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New Brunswick Public Schools 2018-2019

- Total Schools= 3 New Brunswick Public Schools
- Food waste reduction intervention: Trained food service workers, teachers, and students on

Share Tables

- After food waste reduction intervention:
  - 3,871 pounds of food was recovered
  - Food collected was donated to a local soup kitchen and redistributed back into the community

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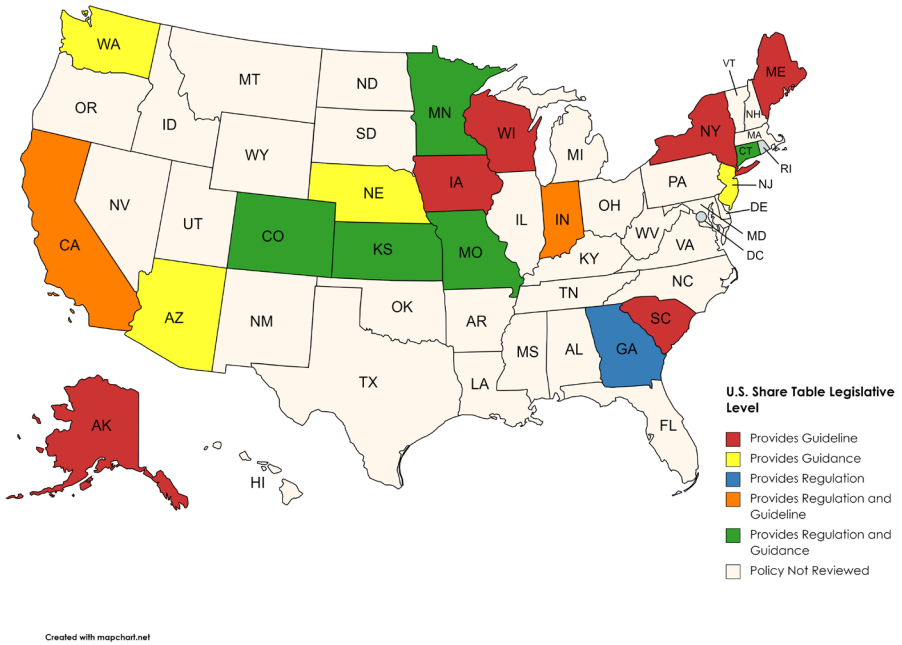
Share Table Expansion

- Recognizing that Share Table Guidance in NJ was limited, our team evaluated the best practices of Share Table Food Safety Standard Operating Procedures across the US.



Kunick, L., Shukaitis, J., Elnakib, S. "*Best Practice Standard Operating Procedures for Share Tables.*" Journal of the National Extension Association of Family & Consumer Sciences, 2022. 88-92.

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FLPC FOOD LAW and POLICY CLINIC
HARVARD LAW SCHOOL

Legal Fact Sheet

New Jersey Food Donation: Liability Protections

Created by the Harvard Law School Food Law and Policy Clinic, November 2021

Businesses (including farms) and nonprofits that provide or receive donated food are generally well-protected by laws designed to provide immunity from liability related to donations. The federal Bill Emerson Good Samaritan Food Donation Act provides liability protection for food donors, and New Jersey's "Food Bank Good Samaritan Act" provides robust additional liability protection to food donors, distributors, and landowners who allow gleaning.

The Bill Emerson Good Samaritan Act

The Bill Emerson Good Samaritan Food Donation Act (the Emerson Act) provides a federal baseline of protection for food donors and distributing organizations.[1] The Emerson Act covers individuals, businesses, non-profit organizations, and the officers of businesses and non-profit organizations. It also covers gleaners—individuals that harvest donated agricultural crops to the needy or to a nonprofit organization that distributes to the needy.[2] Donating individuals and businesses are protected when they donate qualifying types of food in good faith.

- **Qualifying Food**: The donated food must be "apparently wholesome" or an "apparently fit grocery product" and meet "all quality and labeling standards imposed by Federal, State, and local laws and regulations," even if it is not "readily marketable due to appearance, age, freshness, grade, size, surplus, or other conditions."[3]
- **Exception for Reconditioned Food**: Even if a food does not meet all applicable standards, the donor can be protected by the Emerson Act if (s)he follows all of the Act's reconditioning procedures,[4] which include:
  1) The donor informs the nonprofit of the nonconforming nature of the product;
  2) The nonprofit agrees to recondition the item so that it is compliant; and
  3) The nonprofit knows the standards for reconditioning the item.

The Emerson Act protects most but not all donations of qualifying food. In order to get protection, the transaction must be structured such that:[5]

1) The donor donates to a non-profit organization.[6]
2) The non-profit organization that receives the donated food distributes it to needy populations. Direct donations from the donor to needy individuals do not seem to be protected by the Act.
3) The ultimate recipients do not pay for this donated food. However, if one nonprofit donates food to another nonprofit for distribution, the Act allows the first nonprofit to charge the distributing nonprofit a nominal fee to cover handling and processing costs.

If these criteria are met, the Emerson Act is quite protective of donors, and does not hold a donor liable unless the donor acts with gross negligence or intentional misconduct.[7]

- **Gross Negligence** involves "voluntary and conscious conduct (including a failure to act)" by a person or organization that either failed to follow local and state safety regulations, or knew at the time of donation that the food was likely to have harmful health impacts.
- **Intentional Misconduct** is when a person or organization donates "with knowledge . . . that the conduct is harmful to the health or well-being of another person."

Essentially, an individual or organization should not donate or facilitate the distribution of donated food that the individual or organization knows is likely to be harmful or dangerous. Unfortunately, the Act gives little guidance on what activities are gross negligence or intentional misconduct. However, the House of Representatives Report associated with the Emerson Act indicates that each case must be analyzed individually, and that, for example, donating food past the sell-by date generally will not impact liability protections because such labeling is not federally required and generally does not correspond to food safety.[8] The lack of court cases interpreting the Emerson Act suggests how protective the Act is of donors; research does not reveal a single case related to food donation liability.[9]

Legal Fact Sheet

New Jersey Food Donation: Food Scraps for Animals

Created by the Harvard Law School Food Law and Policy Clinic, November 2021

Societies have incorporated food scraps into animal feed for centuries.[1] This practice declined in the 1980s, when state and federal laws tried to limit the feeding of food scraps to animals following several disease outbreaks linked to animal products in livestock feed. Many laws refer to the practice of feeding leftovers to animals as "garbage feeding," but today many groups use the terms "food scraps" or "food residuals," which have less negative connotations.[2]

Recently, there has been renewed interest in the practice of feeding safe, properly treated food scraps to animals. Using food scraps as animal feed in a safe, resource-efficient way can be an environmentally friendly and energy-efficient alternative to exclusively feeding livestock crops grown for that purpose. Repurposing otherwise wasted food has multiple benefits for regional farmers and food scrap generators, such as retailers, restaurants, and educational institutions. These entities can partner to enhance the sustainability of their operations and reduce feed and disposal costs. Incorporating food scraps into animal feed can also reduce the demand for commercial feeds and the land, water, and other resources needed to produce them.

Federal and New Jersey state laws regulate the use of food scraps in animal feed. This guide will examine both types of law.

Federal Laws on Feeding Food Scraps to Animals

The federal government regulates the use of food scraps in animal feed by setting requirements which largely concern the type of animals that may be fed food scraps and the kind of food scraps that may be fed to animals. The federal regulations function as a floor that allows state regulations to go beyond them. The American Association of Feed Control Officials (AAFCO) is the appropriate regulatory body. Relevant federal laws include:

- **The Federal Swine Health Protection Act (SHPA)**[3] mandates that, before being fed to swine, food scraps—called "garbage" in the law—containing meat and animal byproducts must be heat-treated (212 degrees Fahrenheit/100 degrees Celsius at sea level) for at least 30 minutes by a licensed facility.[4] Food scraps containing only certain processed items—including industrially processed and rendered animal products, bakery waste, candy, eggs, domestic dairy products, and certain types of fish—need not be heat-treated.[5] SHPA requires feeders to keep swine away from untreated food scraps, and to keep treated food separate from untreated food.[6] But SHPA does not prevent a household from feeding kitchen scraps to its own pigs on the same premises where the household is located, including those scraps containing untreated meat.[7]
- **Transmissible Spongiform Encephalopathy (TSE)/Ruminant Feed Ban Rule**[8] prohibits the feeding of any protein-containing portion of mammalian animals to ruminants in order to prevent TSE ("Mad Cow Disease).[9] Ruminants are animals that have a stomach with four chambers, such as cattle, sheep, and goats.[10]
- **The Preventive Controls Rule for Animal Food in the Food Safety Modernization Act (FSMA)**[11] regulates animal feed that consists of human food byproducts,[12] which are defined as foods fit for animal but not human consumption, such as culls, peels, trimmings, and pulp from vegetable manufacturing or processing.[13] As some of these foods will overlap with the SHPA, compliance with both is required. In general, facilities processing food that will be fed to animals must (1) establish current good manufacturing practices (CGMPs), (2) develop and implement Hazard Analysis and Risk-based Preventive Controls (HARPC), and, if the facility receives food from a supply chain, (3) coordinate with other entities in the chain to control identified hazards.[14] But not all facilities must comply with all three requirements. Some facilities are completely exempt from the rule, including certain farms and other facilities that are not required to register with the Food and Drug Administration (FDA).[15] Other facilities, such as those in compliance with the Preventive Controls rule for human food, are subject to modified requirements.[16]
- **The Food, Drug, & Cosmetic Act (FDCA)**[17] asserts that animal feed,[18] like human food, cannot be filthy or decomposed, packaged or held under unsanitary conditions, or contain any poisonous or deleterious substance.[19] Moreover, food labels cannot be false or misleading in any way, and they must comply with certain, sometimes product-

Legal Fact Sheet

New Jersey Food Donation: Tax Incentives

Created by the Harvard Law School Food Law and Policy Clinic, November 2021

Federal tax incentives provide important financial incentives that make food donation more cost-effective and economically beneficial. These tax incentives have been extraordinarily successful in motivating food donation. In the past, federal tax incentives for food donations were limited to C-corporations.[1] Tax incentives for donations were temporarily expanded to cover more businesses in 2005, and Congress made this expansion permanent in 2015,[2] providing all businesses with added incentive to increase food donations and prevent food waste. At the federal level, tax incentives are available in the form of general or enhanced deductions, each of which are discussed in this fact sheet.

In addition to the federal tax incentives, a number of states have enacted state-level tax incentives. As of October 2021, however, New Jersey does not provide a state-level tax credit for food donations.

Federal Tax Incentives

How are the tax incentives calculated?

General (non-enhanced) tax deduction: Businesses that donate inventory may claim a tax deduction in the amount of the property's basis,[3] which is usually the value of the property's cost to the business, and is often lower than the fair market value (the value at which goods can be sold). Businesses other than C-corporations— including S-corporations,[4] sole proprietorships,[5] and some LLCs[6] — cannot deduct more than either 30% or 50% of the business' total taxable income each year, depending on the type of organization to which the business is donating.[7] C-corporations generally cannot deduct more than 10% of their taxable income each year.[8]

Enhanced tax deduction: The enhanced tax deduction provides an extra incentive for donation by allowing the donating business to deduct the lesser of (a) twice the basis value of the donated food or (b) the basis value of the donated food plus one-half of the food's expected profit margin (if the food were to be sold at fair market value).[9] Under the enhanced deduction, all businesses may deduct up to 15% of their taxable income for food donations.[10]

> *Example: A grocery store donates potatoes with a fair market value of $100. The basis value of these potatoes was $30. The expected profit margin is the fair market value minus the basis value ($100 - $30), which is $70. Under the enhanced deduction, the grocery store is eligible to deduct the smaller of:*
>
> *(a) Basis Value x 2 = $30 x 2 = $60, or (b) Basis Value + (expected profit margin / 2) = $30 + ($70 / 2) = $65*
>
> *The enhanced deduction would be $60, which is substantially higher than the general deduction (the $30 basis value).*

Businesses that do not account for inventories and are not required to capitalize indirect costs will have the option to calculate the basis value at 25% of the products' fair market value.[11] Businesses also have the option to calculate the fair market value of certain products—i.e., those that cannot be sold because of failure to meet internal standards, lack of a market, or similar reasons—by using the price of the same or substantially similar, saleable food items.[12]

How can a donating business know if they are eligible for a tax deduction?

General tax deduction requirements: In order for a charitable contribution to qualify for a federal tax deduction, the donation must be used for charitable purposes and given to a qualified organization as laid out under section [illegible] Internal Revenue Code (IRC).[13]

Enhanced tax deduction requirements: In order to qualify for the enhanced tax deduction, a business [illegible]

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SUSTAINABLE JERSEY • CERTIFIED •
A Better Tomorrow, One Community at a Time

Sustainable & Scalable Food Waste Solutions for Schools 2021-2023

- Total program enrollment= 1,750 students in 3 public schools
- Food waste reduction interventions: Trained Food service workers, teachers, and students on Lunchrooms Strategies and Share Tables

- Before food waste reduction interventions:
  - 62,150 pounds of food waste / school year
- After food waste reduction interventions:
  - 34,036 pounds of food waste / school year – 45% reduction
  - 31,680 pounds of food waste composted – 92% of waste
  - 21,300 pounds of food recovered through share tables

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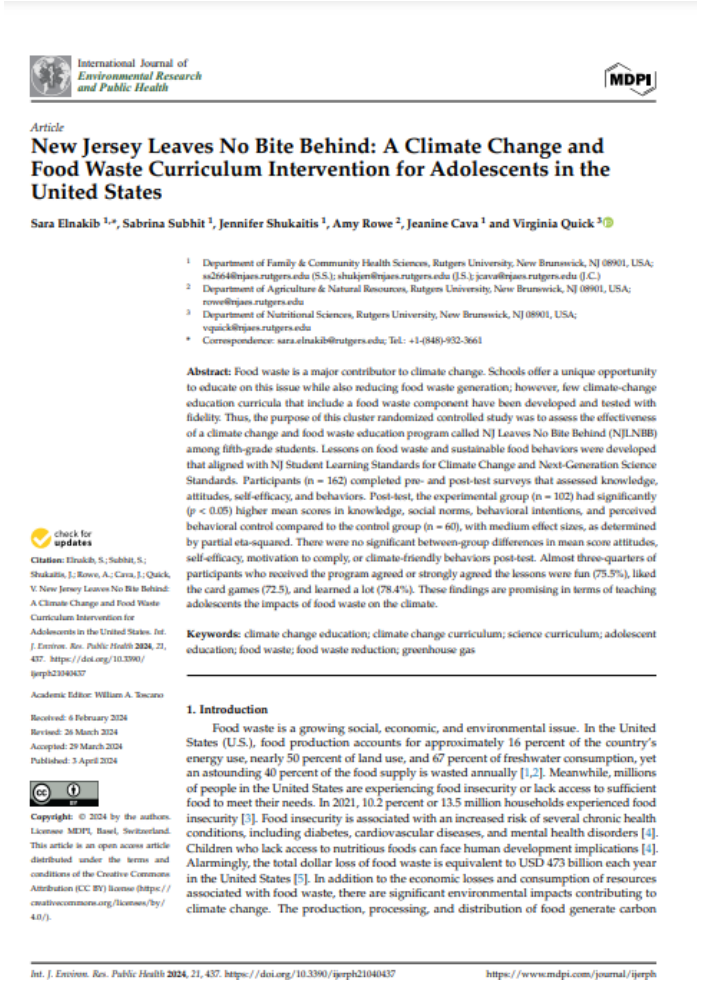
New Jersey Leaves No Bite Behind 2022-2024

- Total program enrollment=162 students in 4 public schools
- Food waste reduction intervention: NJLNBB climate change and food waste educational curriculum taught to students
- Food waste reduced by 58% reduction after educational intervention
- This would equal 1,135 pounds of food saved in one school year amongst 5th graders alone



International Journal of Environmental Research and Public Health

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Article

New Jersey Leaves No Bite Behind: A Climate Change and Food Waste Curriculum Intervention for Adolescents in the United States

Sara Elnakib [1,*], Sabrina Subhit [1], Jennifer Shukaitis [1], Amy Rowe [2], Jeanine Cava [1] and Virginia Quick [3]

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Abstract: Food waste is a major contributor to climate change. Schools offer a unique opportunity to educate on this issue while also reducing food waste generation; however, few climate-change education curricula that include a food waste component have been developed and tested with fidelity. Thus, the purpose of this cluster randomized controlled study was to assess the effectiveness of a climate change and food waste education program called NJ Leaves No Bite Behind (NJLNBB) among fifth-grade students. Lessons on food waste and sustainable food behaviors were developed that aligned with NJ Student Learning Standards for Climate Change and Next-Generation Science Standards. Participants (n = 162) completed pre- and post-test surveys that assessed knowledge, attitudes, self-efficacy, and behaviors. Post-test, the experimental group (n = 102) had significantly ($p < 0.05$) higher mean scores in knowledge, social norms, behavioral intentions, and perceived behavioral control compared to the control group (n = 60), with medium effect sizes, as determined by partial eta-squared. There were no significant between-group differences in mean score attitudes, self-efficacy, motivation to comply, or climate-friendly behaviors post-test. Almost three-quarters of participants who received the program agreed or strongly agreed the lessons were fun (75.5%), liked the card games (72.5), and learned a lot (78.4%). These findings are promising in terms of teaching adolescents the impacts of food waste on the climate.

Keywords: climate change education; climate change curriculum; science curriculum; adolescent education; food waste; food waste reduction; greenhouse gas

check for updates

Citation: Elnakib, S.; Subhit, S.; Shukaitis, J.; Rowe, A.; Cava, J.; Quick, V. New Jersey Leaves No Bite Behind: A Climate Change and Food Waste Curriculum Intervention for Adolescents in the United States. *Int. J. Environ. Res. Public Health* **2024**, *21*, 437. https://doi.org/10.3390/ijerph21040437

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1. Introduction

Food waste is a growing social, economic, and environmental issue. In the United States (U.S.), food production accounts for approximately 16 percent of the country's energy use, nearly 50 percent of land use, and 67 percent of freshwater consumption, yet an astounding 40 percent of the food supply is wasted annually [1,2]. Meanwhile, millions of people in the United States are experiencing food insecurity or lack access to sufficient food to meet their needs. In 2021, 10.2 percent or 13.5 million households experienced food insecurity [3]. Food insecurity is associated with an increased risk of several chronic health conditions, including diabetes, cardiovascular diseases, and mental health disorders [4]. Children who lack access to nutritious foods can face human development implications [4]. Alarmingly, the total dollar loss of food waste is equivalent to USD 473 billion each year in the United States [5]. In addition to the economic losses and consumption of resources associated with food waste, there are significant environmental impacts contributing to climate change. The production, processing, and distribution of food generate carbon

Elnakib S, Subhit S, Shukaitis J, Rowe A, Cava J, Quick V. New Jersey Leaves No Bite Behind: A Climate Change and Food Waste Curriculum Intervention for Adolescents in the United States. *International Journal of Environmental Research and Public Health*. 2024; 21(4):437. https://doi.org/10.3390/ijerph21040437

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New Jersey Leaves No Bite Behind

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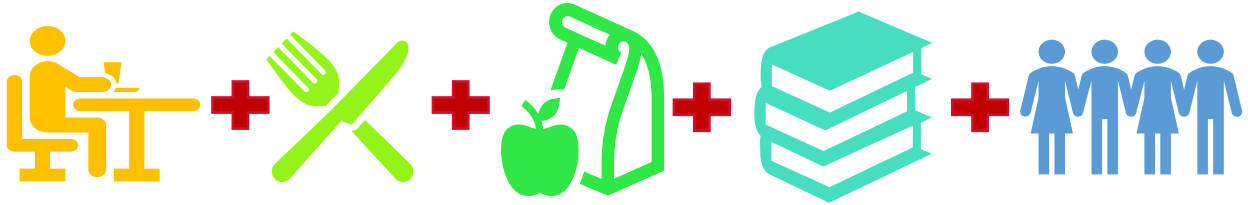
Expansion of Climate Education in K-12 Schools

- Working with AmeriCorps program to expand the reach of this educational program to 12 schools in 8 counties through the NJ School Climate Corps Program



- Working with a NJ Health Foundation grant & Rutgers University's Graduate School of Applied and Professional Psychology (GSAPP) to add four modules on reducing climate anxiety in youth to the existing educational programs
  - Modules will focus on evidence-based behavioral activation to:
    - Improve students' attitude, intentions, and behavioral change related to climate change and food waste reduction
    - Enhance meaning-focused coping and reduce psychological burden
    - Reduce emotional distress (anxiety, depression symptoms)

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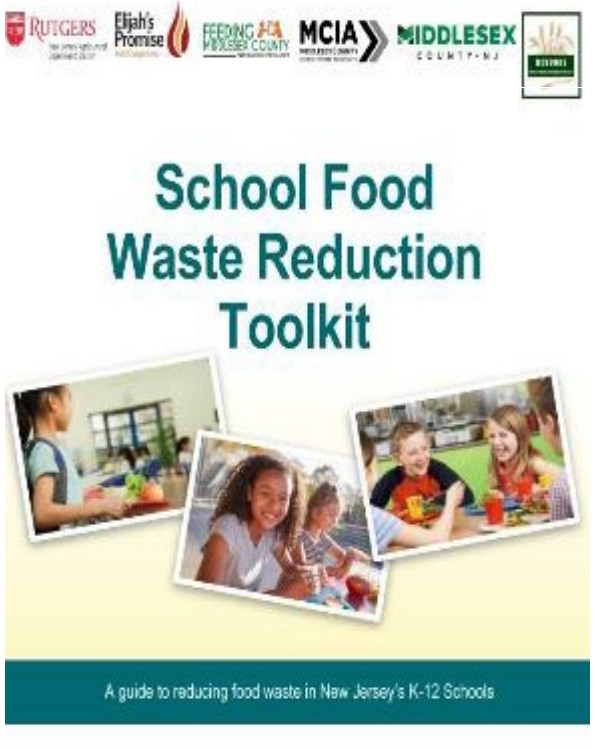
Our Goals for 2030

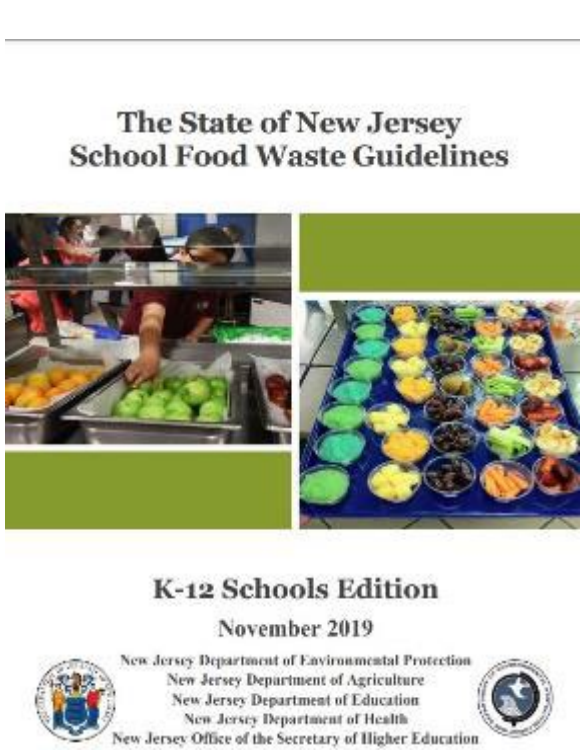
1. Install a Share Table in EVERY School in New Jersey
2. Strengthen New Jersey guidance to schools and restaurants on safe food donations
3. Support policy improvements to allow for school food waste composting
4. Establish a stronger partnership between municipal health inspectors and food donation sites
5. Expand Climate Change Education in K-12 schools that focuses on food waste
6. Work with Colleges and Universities to innovate in food waste reduction efforts that support food security

Great Resources

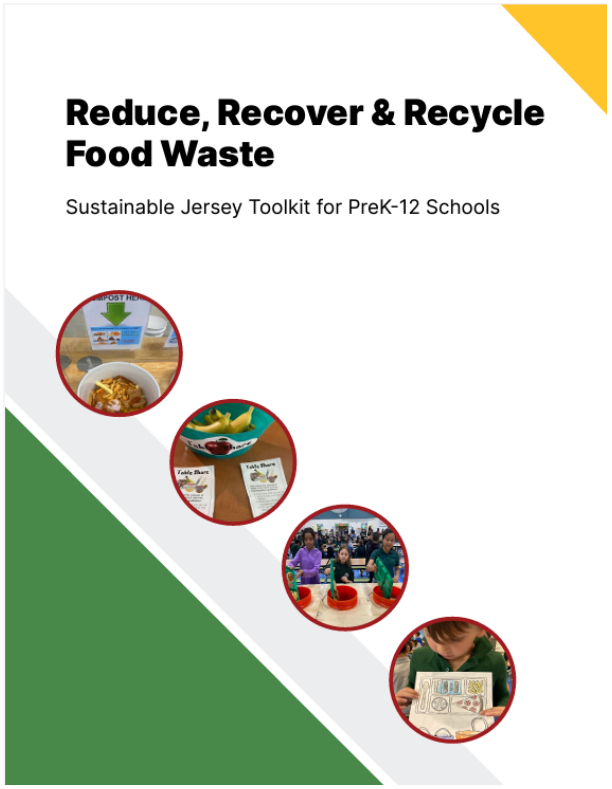
School Food Waste Reduction Summit



School Food Waste Reduction Toolkit



NJDEP School Food Waste Guidelines



Reduce, Recover & Recycle Food Waste Toolkit for PreK-12 Schools

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Thank you for your time.
What Questions Do You Have?

Contact Information
For questions, comments, and inquiries

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