

INTRODUCING FOOD WASTE INTO COLLECTION PROGRAMS AND OPERATIONS TO MAXIMIZE LOCAL ORGANICS RECYCLING

MRC PRE-CONFERENCE WORKSHOP, PORT HURON, MICHIGAN

APRIL 30, 2024 – 1:00 TO 5:00 PM

Adding food waste to a composting operation is an excellent way to increase the volume and nutrient quality of the end product. Get expert guidance to grow your business by attracting institutional, commercial, and municipal waste generators through collaborative partnerships that minimize collection and hauling costs, lower GHG impacts, and utilize and grow local composting infrastructure and processing options. Learn how customized services such as certified compostable foodservice ware, cart and dumpster rental, container washing, training on in-house collection procedures, ease of use, and odor minimization can develop a long term sustainable program for generators, as well as a consistent and quality supply of organics to composters. Learn about the impacts of composting food waste or, more specifically, adding food waste to an already successful yard waste composting operation. Explore and assess needed capacity, the regulations around and potential cost of adding food waste to operations, maintaining low odor operations, and characterizing, collecting, and processing food waste.

INSTRUCTOR:



Nicole Chardoul, P.E., CHMM, CCP, a licensed professional engineer, certified hazardous materials manager, and certified compost professional, is Principal and Vice President at Resource Recycling Systems, a circular economy consulting firm headquartered in Ann Arbor, MI. Nicole has trained compost site operators since 2002 and serves on local and national compost regulatory review committees to encourage composting and food waste diversion from the landfill. She served as Chair of the Washtenaw County, Michigan, Food Policy Council for 5 years and is actively working with private companies, municipalities, universities, and healthcare to conduct assessments, conduct training and build capacity for waste

reduction, donation and composting of waste from the food system to support the local economy and healthy food and soil. She has also managed the design, construction and implementation of numerous material recovery facilities, transfer stations, drop-off stations, and compost sites. Nicole utilizes her background working in food and beverage, healthcare, international development, non-profit, university and municipal settings to implement green and sustainable initiatives to reduce costs, maximize landfill diversion, and improve efficiencies, awareness, compliance and public health. Nicole received a Bachelor of Science in Civil and Environmental Engineering from the University of Michigan.

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Food Waste Generation Reference Table*

Residential	Food Waste Generated
Residential	350 lbs/household/year

Commercial	Food Waste Generated
Food Service Sector (Restaurants & Caterers)	8 lbs/employee/day
Hospitality (Hotels)	3 lbs/employee/day
Food Wholesalers & Distributors	0.005 tons/thousand \$ revenue/year
Grocers & Markets	10.00 lbs/thousand \$ revenue/year
Food Manufacturing & Processing	0.095 lbs/sales \$/yr

Institutional	Food Waste Generated
Healthcare (Hospital Patients, Nursing Homes)	1.8 lbs/bed/day
Hospital Cafeterias	0.5 lbs/meal/day
Correctional Facilities	1 lbs/inmate/day
Colleges & Universities	0.55 lbs/student/day OR 0.44 lbs/student/meal
K-12 Schools	0.35 lbs/student/day
Events & Recreation Facilities	0.31 lbs/visitor/year

* Source: EPA 2019 Waste Food Report or Resource Recycling Systems, Inc.

Organics Parameters Reference Table

	Nitrogen (dry weight %)	C:N	Carbon	Moisture Content (%)	Bulk Density Loose	Bulk Density Compacted
AD solid digestate	0.96%	52:1	50	73%	206 lbs/CY	
Ag Residual/Dry Straw	0.70%	80:1	80	15%	150 lbs/CY	350 lbs/CY
Biosolids	1.90%	20:1	20	80%	1100 lbs/CY	1600 lbs/CY
Brush	2.00%	35:1	35	70%	500 lbs/CY	1100 lbs/CY
Coffee grounds, filters and paper towel	3.00%	20:1	20	70%	600 lbs/CY	900 lbs/CY
Compost					600 lbs/CY	NA
Corrugated Cardboard	0.10%	550:1	550	8%	100 lbs/CY	300 lbs/CY
Cow Manure	2.40%	19:1	19	80%	1250 lbs/CY	1700 lbs/CY
Fish Waste	10.60%	4:1	4	75%	800 lbs/CY	1200 lbs/CY
Food Waste (FW)	3.10%	15:1	15	70%	600 lbs/CY	900 lbs/CY
Fruit Waste	1.40%	40:1	40	80%	800 lbs/CY	1200 lbs/CY
Grass clippings	3.40%	15:1	15	80%	800 lbs/CY	1200 lbs/CY
Ground Food Waste					1480 lbs/CY	NA
Horse Manure	1.60%	30:1	40	70%	1200 lbs/CY	1600 lbs/CY
Leaves	0.90%	60:1	60	40%	425 lbs/CY	500 lbs/CY
Mixed YW					250 lbs/CY	640 lbs/CY
Pig Manure	3.10%	14:1	14	80%	1200 lbs/CY	1600 lbs/CY
Potatoes					1121 lbs/CY	
Poultry Manure	2.70%	14:1	14	40%	800 lbs/CY	1000 lbs/CY
Sawdust	0.20%	500:1	500	40%	400 lbs/CY	500 lbs/CY
Soil bulk density					2000 lbs/CY	NA
Soiled Paper	0.20%	150:1	150	20%	250 lbs/CY	600 lbs/CY
Teabags/Leaves	2.00%	70:1	70	70%	550 lbs/CY	800 lbs/CY
Vegetable Waste	3.50%	12:1	12	70%	550 lbs/CY	800 lbs/CY
Waste (MSW)	1.00%	50:1	50	80%	350 lbs/CY	600 lbs/CY
Wood Chips, green	0.10%	600:1	600	50%	473 lbs/CY	500 lbs/CY
Yard Waste	2.50%	20:1	20	50%	350 lbs/CY	1000 lbs/CY

Web Resources

FOOD WASTE MANAGEMENT TOOLS AND RESOURCES

SUSTAINABLE FOOD MANAGEMENT TOOLS

- [Food Waste Audit Log \(PDF\)](#) (2 pp, 158.60 K) - worksheets that help you record and track your food waste generation and causes
- [Food Waste Management Cost Calculator](#) estimates the cost competitiveness of alternatives to food waste disposal.

SUSTAINABLE FOOD MANAGEMENT PUBLICATIONS AND GUIDES

SUSTAINABLE FOOD MANAGEMENT BASICS

1. Through EPA's [Food Recovery Challenge](#), businesses commit to reducing the food they send to landfills. EPA provides technical assistance to help businesses save money, support their community, and reduce their environmental impact as well as recognizes leaders in food recovery.
2. California's [Food Scraps Management Resources](#) page offers resources for businesses and households to reduce the amount of food that is wasted.
3. EPA's [Putting Surplus Food to Good Use: A How-To Guide for Food Service Providers \(PDF\)](#) (2 pp, 213.95 K) helps food service providers start a food waste reduction and recovery program at their facilities.
4. A dated but valuable reference of EPA's Waste Reduction Record-Setters [Don't Throw Away That Food: Strategies for Record-Setting Waste Reduction](#) provides case studies from several communities for recovery of food discards.
5. The North Carolina website for [Organic Recycling and Composting](#) is dedicated to providing resources for both individuals and businesses including the food service industry.
6. Northeast Recycling Council's [Guidance for Special Event Food Waste Diversion \(PDF\)](#) (102 pp, 2.07MB) describes food waste diversion pilots in Connecticut, Massachusetts, New Hampshire, and Vermont. These pilots demonstrated different methodologies for designing and implementing diversion programs for pre- and post-consumer food, as well as compostable service ware, and soiled paper. Research and results from the project contributed to development of this guidance document.
7. Massachusetts Department of Environmental Protection's [Supermarket Recycling Resources](#) help guide supermarkets in diverting materials from landfills to comply with the Food Material Disposal Ban. Information on composting and food donation are provided.
8. EPA's [Recycle on the Go Resource Guide for Venues](#) includes tips for convention centers, parks, shopping centers, special events, stadiums, and transportation.
9. The Northeast Recycling Council's [Clean Your Plate: An Event Planner's Guide to Composting](#) (4 pp, 346K) guidance provides best management practices and models for source reduction, recycling, and composting at special events.
10. While dated, the EPA's [Working with Concessionaires and Vendors Resource Guide](#) helps venues set up successful recycling programs as concessionaires and vendors are vital to the success of a program.

FOOD DONATION

- [Bill Emerson Good Samaritan Act](#) is the federal law that protects food donors from liability as long as they donate in "good faith."
- [Food Donation Connection](#)
- Learn more from Food Donation Connection about how to ensure [Food Safety](#) when donating food.
- Learn more about the potential [Tax Benefits](#) from donating food to those in need.

- [Tax Benefits - I.R.C. Section 170\(e\)\(3\)\(B\)](#)
- [The Federal Food Donation Act of 2008](#)
- The dated guideline, [Waste Not/Want Not: Feeding the Hungry and Reducing Solid Waste Through Food Recovery](#) (59 pp, 1.4MB), developed in conjunction with the US Department of Agriculture, details what businesses and individuals can do to ensure good food doesn't go to waste. Similar resources can be found on the [EPA Food Recovery Hierarchy](#) page.

FEEDING ANIMALS

- [Federal Swine Health Protection Act](#)

COMPOSTING

- [NextCycle Michigan](#) will have a new FLOWS accelerator track in 2024.
- [NextCycle Michigan's 2023 Gap Analysis](#)
- Michigan's known organics processing sites and facilities, both EGLE-registered facilities and non-registered facilities are displayed in the map found here: <https://nextcyclemichigan.com/organics-base-map>
- [Closed Loop Partner's Compostable Packaging Disintegration at Composting Facilities report](#)
- [Closed Loop Partner's Contamination at Compost Facilities report](#)
- Want to expand your feedstocks and make a bigger impact? Check out the USCC's Target Organics Hub. Our expert-led resource will guide you through every step of the process. <https://hub.compostingcouncil.org/>
- The Center for EcoTechnology (CET), in partnership with BioCycle, [recently released a toolkit](#) provides guidelines and recommendations for how to add food scraps to yard trimmings composting sites.
- [MI EGLE Composting website with Part 115 rules and factsheets.](#)
- Use [Find-A-Composter](#) to find a composting facility in your area.
- [Best Management Practices \(BMPs\) for Incorporating Food Residuals into Existing Yard Waste Programs \(PDF\)](#) (34 pp, 2.01MB) assists yard waste composting facilities in expanding operations to include food residuals.
- Massachusetts' [Supermarket Composting Handbook \(PDF\)](#) (78 pp, 1.37 MB) is a guide to help supermarkets establish composting programs.
- Oregon's [Commercial Food Waste Composting Study Project Report](#) presents the findings of a study comparing different methods of composting.

ANAEROBIC DIGESTION

- [American Biogas Council](#)
- California's [Anaerobic Digestion Basics](#) webpage provides basic information on anaerobic digestion.
- EPA's [Co-Digestion Economic Analysis Tool \(CoEAT\)](#) helps wastewater treatment plants determine the initial economic feasibility of co-digesting food waste and fats, oils, and grease.

GHG EMISSIONS AND IMPACT TOOLS

- EPA's Waste Reduction Model of [WARM Tool](#) provides high-level comparative estimates of the potential GHG emissions, energy savings, and economic impacts of materials managed in baseline and alternative materials management practices, including source reduction, recycling, composting, anaerobic digestion, combustion, and landfilling.
- ReFED's Insight Engine [Impact Calculator](#) quantifies the impacts of wasted food based on its generation source and destination.