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For more information, see www.wastereductionpartners.org and the NC Department of Environmental Quality's [Use the Food NC](#) campaign.



HOW TO REDUCE FOOD WASTE: SELF-ASSESSMENT GUIDE FOR NC BUSINESSES

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WHO CAN USE THIS GUIDE



RESTAURANTS

According to the National Restaurant Association, food costs can be as much as 30-35% of a restaurant's annual budget. Reducing food waste keeps these costs to a minimum, saves the labor costs associated with preparing too much food, and saves waste disposal costs.

CATERERS

Caterers are often in a unique position to donate unserved food to local charities that feed needy people.

DINING HALLS

Going tray-less can reduce food waste by 20%.

FOOD MANUFACTURERS

Finding opportunities for food by-products to become an ingredient in another edible food, drink or other consumer product will reap the most savings for manufacturers.

FOOD DISTRIBUTORS

Cold chain monitoring and efficient logistics are the key to keeping food fresh.

GROCERY STORES

According to ReFED, a national food waste reduction non-profit, alerting consumers to discounts on food that is approaching its shelf life through stickers, signs or smart phone apps is one of the best opportunities to reduce food waste in retail stores.

This Self-Assessment Guide is intended to provide resources and general strategies for NC businesses. If further help is needed, customized assistance can be gained by contacting [Waste Reduction Partners](#) and requesting our free technical assistance.

FOOD WASTE IN NORTH CAROLINA

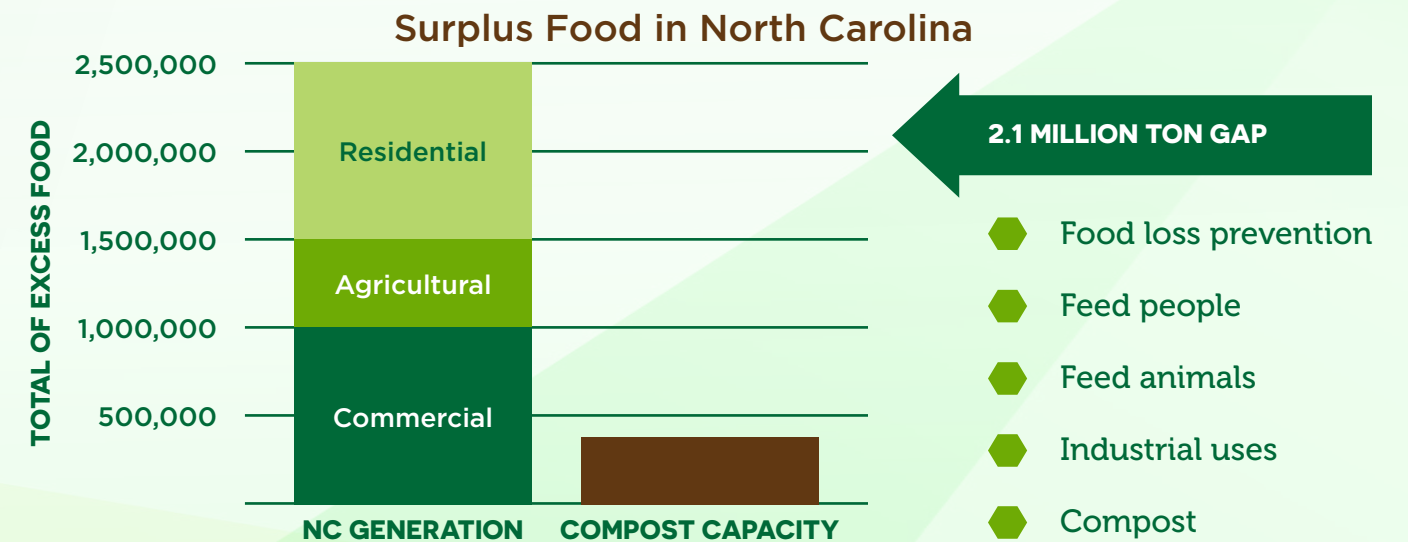


THE DILEMMA

In North Carolina, approximately 5.2 billion pounds of food is wasted each year. Meanwhile 1.2 million North Carolinians are hungry with more than 394,300 of those being children. The cost of our wasted food in just the foodservice, retail and manufacturing sectors is over six billion dollars. Additionally, the three sectors spend over 23 million dollars annually in disposal fees. There are environmental costs as well. The breakdown of food waste in landfills creates methane gas. Methane gas has 25 times more global warming potential than an equal amount of carbon dioxide. Diverting food waste from the landfill through waste reduction and composting is a critical

step in lowering greenhouse gas emissions, not only by reducing methane emissions, but also by reducing the emissions associated with growing and transporting the food that was not used as intended.

In NC, there are 2.5 million tons of excess food generated, but less than 500,000 tons are currently managed by NC's permitted composting facilities. That leaves a more than 2 million ton gap. This gap must be filled not only by expanding composting in NC, but also by helping food waste generators with strategies to avoid waste and access donation networks to feed food insecure people.



BENEFITS OF FOOD WASTE REDUCTION

- ◆ Save money and time associated with food waste.
- ◆ Reduce your employees' time handling food that doesn't get purchased.
- ◆ Lessening food scraps in the dumpster means reduced trash hauling fees.
- ◆ Achieve Greenhouse Gas (GHG) reductions.
- ◆ Improve employee satisfaction that food isn't wasted at their workplace.

GETTING STARTED

SETTING UP A TEAM

The team approach is always the best approach when trying to streamline your operation and avoid waste. Whether your business is a small restaurant or a large food product manufacturer, start your food waste diversion program by building a cross functional team by inviting employees from a variety of staffing locations to participate.

TRACKING

The next step is to set a baseline and implement a tracking system. Yes, measurement is the key to understanding. Some facilities start by doing a waste sort to understand how much of your waste stream is avoidable, donatable, or compostable. The waste sort may also reveal why food was being discarded in the first place. The EPA has an excellent guide for this process: [A Guide to Conducting and Analyzing a Food Waste Assessment](#).



Planning Checklist for a Waste Sort:

- Determine the overall goals: The main goal is to separate compostable and recyclable material from trash in order to weigh and measure these, but there may be additional needs. Do you need to better understand how much food scraps are pre-consumer versus post-consumer? Are you just interested in measuring the volume of compostables?
- How much of a sample size is reasonable to sort? Do you want to collect a day's worth of material, or is a week's worth a reasonable amount for your facility?
- Convene a team.
- Decide location (if the location is outside but not under a cover, consider shade tents).
- Set a date.
- Decide how sorted material will be managed/disposed of after the sort.
- Develop contingency plans, in case they are needed.
- Gather supplies: containers, portable scales, batteries, gloves, eye protection, tarp or plastic film, clip board, worksheets.

Another way to start is simply to begin to set aside your food waste, whether it be prep scraps at a restaurant or byproducts at a food manufacturing facility that for one reason or another, are not suitable for human consumption. By separating out your food scraps and seeing how much accumulates in an average week, even if you will temporarily continue to send this material to a landfill, your business can make volume projections that will be needed to hire service providers, determine the size of containers needed, plan the frequency and other logistics of transportation, and project disposal cost savings.

Tools and Resources

- Massachusetts has a [Food Waste Estimation Guide](#) that includes guidance for a variety of sectors, including assisted living facilities, colleges and universities, correctional facilities, hospitals, hotels, restaurants, grocery stores, and venues and events.
- The US EPA offers sample log sheets and food waste management cost calculators - [Tools for Assessing Wasted Food | Sustainable Management of Food](#).
- The following software programs can also be used to help track the metrics associated with your waste reduction program:
 - [Leanpath Food Waste Prevention Technology and Solutions](#)
 - [Phood](#)
 - [Winnow](#)
 - Some food service distributors provide their own proprietary food waste tracking software for their clients:
 - [Waste Not 2.0 Compose Group USA](#)
 - Aramark's ENABLE
 - Sodex's Waste: Not On My Watch
- If your organization is interested in tracking the environmental savings associated with your food waste reduction program, the following tools can help calculate avoided greenhouse gases and, in the case of ReFED, other metrics as well:
 - [ReFED - Impact Calculator](#)
 - [Waste Reduction Model \(WARM\) | US EPA](#)

SELF-ASSESSMENT

FOR RESTAURANTS, CATERERS AND DINING HALLS



Use this checklist to determine whether your organization is already doing a great job with food waste reduction or if there is room for improvement.

Planning and measuring:

- ◆ Have a plan when ordering food. Adjust your plan as you measure your waste.
- ◆ Measuring waste will help you notice items that are less popular with your customers. Adjust the menu and eliminate food items your customers are not ordering.

Creative purchasing:

- ◆ Buy imperfect produce.
- ◆ Buy frozen when appropriate. It has a longer shelf life.

Receive and store food carefully:

- ◆ Use FEFO — *First Expired, First Out* storage methods where items that are approaching shelf-life expiration date are used first.
- ◆ Label the date the item entered the kitchen.

Offer menu options on portion sizes such as “full” and “half” so guests can customize based on their appetite.

Let customers split entrees and/or sides.

Serve smaller portions of side dishes with “bottomless” or “refill” options.

- Let customers choose the sides they prefer.
- Monitor leftover food on plates to see which portions can be reduced.
- Set up a donation program:
 - ◆ Designate a donation coordinator who will find partners in the community that need surplus food and learn the types of food preferred, the schedule of when donations are accepted, and other parameters that will ensure a smooth hand-off of the donation.
 - ◆ Follow food safety protocols.
 - Remember to keep food out of the temperature danger zone, 41°F-135°F, when bacteria multiply fastest. Hot foods must be brought below 70°F within two hours, and to 41°F or below within the next four hours.
 - Always hold refrigerated food below 41°F and frozen food at 0°F or below.
 - Your donation partner might have additional food safety protocols for you to follow.
 - ◆ Gather and analyze donation data. Tracking the weight and frequency of your donations will help you spot trends that in turn will help you adjust your buying and prep routines.
- Compost the rest, with both back-of-house and/or front-of-house collection.

Count how many boxes you checked off and circle the corresponding meter to determine how your organization is doing.



1 - 3 practices in place:
a lot of opportunities



4 - 7 practices in place:
doing well and can improve



8 - 10 practices in place:
doing great!

SELF-ASSESSMENT

FOR FOOD MANUFACTURERS



Use this checklist to determine whether your organization is already doing a great job with food waste reduction or if there is room for improvement.

- Use LEAN manufacturing strategies to avoid waste in the first place and optimize your production process.
- Identify production line design flaws.
- Modify production schedules to minimize changeovers.
- Upgrade outdated equipment to more efficient models that generate less waste.
- Look for opportunities to “upcycle” food waste as a raw material in another product.
- Seek out and build relationships with partners that can use surplus food items and those that are close to their shelf-life. The following are overstock food buyers that can purchase surplus items.
 - ◆ [Marvell Food](#),
 - ◆ [Wham Closeout Foods](#), and
 - ◆ [Mid-America Food Sales](#)

- Make sure best by date labels are easy for consumers understand. Work with other manufacturers to standardize these labels.
- Optimize transportation and delivery logistics.
- Seek out markets for animal feed.
 - ◆ Use your local Cooperative Extension Office to connect to NC livestock farmers. NCSU Extension Agents can also help you analyze the nutritional content of food by-products.
 - ◆ Search for milling operations that can convert food by-products into poultry or pet food.
- Compost the rest, both for production areas and employee break locations.

Count how many boxes you checked off and circle the corresponding meter to determine how your organization is doing.



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SELF-ASSESSMENT FOR GROCERY STORES AND FOOD DISTRIBUTORS



Use this checklist to determine whether your organization is already doing a great job with food waste reduction or if there is room for improvement.

- Expand purchase specifications to help reduce food waste at the farm.
 - ◆ Allow for variations in color, shape and size.
 - ◆ Provide an area for shoppers to find imperfect produce at a discount.
 - ◆ Partner with other distributors who specialize in imperfect produce sales.
- Optimize receiving, transportation and delivery logistics.
- Use cold chain monitoring technology and practices.
- Reduce warehouse handling at distribution hubs.
- Have a food donation plan in place for when supplies exceed orders and food needs a destination fast.
- FEFO — *First Expired, First Out*; use items that are approaching shelf-life expiration date first.
- Utilize networks to sell imperfect produce and other foods.

- Cook, freeze, juice, or otherwise process foods that are approaching the end of their peak freshness to prolong their useful life.
- Use mark-down alerts — find ways to alert customers to discounts for food that is approaching their best by date.
- Seek out ways to divert material from landfills through animal feed, composting and anaerobic digestion.

Count how many boxes you checked off and circle the corresponding meter to determine how your organization is doing.



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SUCCESS STORIES

APPALACHIAN STATE UNIVERSITY

Thanks to the hard work and collaboration between Campus Dining, Facilities Operations, and the Office of Sustainability, Appalachian State University in Boone, NC has been able to divert over a third of their waste from the landfill. First and foremost, food waste is avoided as much as possible through strategic efforts such as trayless dining, flash freezing food that can be saved for future use, and donating unserved food to the Hunger and Health Coalition. Most of the unavoidable food scraps are then composted at the University's on-campus Composting Facility. The facility produces approximately 260 tons of compost each year. The University is able to use this compost as a valuable soil amendment in their landscaping services, the campus gardens and the App State Sustainable Development Farm.



Executive Chef Jules Bott competing in the preliminary round of North Carolina Restaurant & Lodging Association's Chef Showdown.

MADRONA

Madrona Specialty Foods, an artisan crispbread cracker manufacturer in Huntersville, NC since 2011, has worked hard at waste reduction. Madrona implemented a process in 2023 that allows them to capture and reuse most of the product versus having to dispose of it into the landfill. Still, not all of the product gets captured. For these materials, Madrona Foods partners with a company that produces feed for hogs. They even bake off-spec dough that is not able to be made into crackers so that the material can be diverted to animal feed and kept out of the landfill. Within 2023 alone, Madrona was able to eliminate 3.5 percent of this waste from going to the landfill.



Our food rescue efforts support Food Lion's commitment to sustainability. L-R: Store Manager Bri Scott, Store #133 in Winston-Salem, NC, and Jeff Verdell, volunteer of New Jerusalem Missionary Baptist Church Food Pantry.

FOOD LION

Food Lion has impressive sustainability goals for its grocery stores, and they are succeeding in their commitments to avoid food waste, donate near-date food to charities and divert organics from the landfill. Food Lion stores across its 10-state footprint avoid food waste through cold chain management, demand forecasting tools, and inventory management best practices. They partner with Feeding America to share fresh and shelf stable foods with those in need. From what remains, Food Lion strives to recycle as much as possible. In 2023 alone, Food Lion diverted more than 37 million pounds of food waste from the landfill through various recycling streams such as animal feed, composting, and anaerobic digestion.



SMASH EVENTS CATERING

Smash Events owners Ashley and Nestor Teran have been intentional in creating a nearly zero-waste, sustainable business model. With a deep understanding of how events work and what clients want, they anticipate how much each group is likely to consume then order food carefully, planning for special-event portion control to minimize leftovers.

Even the system they have in place for serving food — staff members dish out portions to diners, offering side items first — is with an eye to minimizing waste. Diners can come back for seconds, but this serving style keeps folks from putting too much on their plates that might go to waste.

Smash Events also freezes and saves any excess meat, cheese, bread, and sauces. Prepared foods still untouched at the end of an event are offered to guests and staff. Anything that's not consumed on site or taken home by the customers is made available to [Food Connection](#) at the end of each weekend for distribution as delicious meals to folks seeking food assistance.

Left over food that cannot be donated gets scraped into a bin for their farm animals. Food and drinks are served in washable or compostable cups, and even the used cooking oil goes to [Blue Ridge Biofuels](#) to live a second life as a fuel source. There's almost no garbage at the end of a Smash event!

ACCESSING DONATION NETWORKS IN NC

WHAT TYPE OF SURPLUS FOOD IS APPROPRIATE TO DONATE?

Most food banks prefer shelf stable foods like canned vegetables, uncooked pasta, unopened sauces, and bread that has not exceeded its sell by date. However, some charities that feed needy people can accept fresh food surplus that has not yet been served, provided that is donated promptly and handled safely. For example, caterers and university dining halls that prepared more trays of food than were needed at a meal can donate the unserved trays. Food that has been served to a consumer cannot be donated. These food scraps would be appropriate for composting.



LIABILITY PROTECTION- FEDERAL AND STATE

The Bill Emerson Good Samaritan Food Donation Act (Emerson Act) was signed into law in 2006 to encourage the donation of groceries and food for distribution to those in need. The law protects donors from civil and criminal liability provided that the donations are made to a non-profit organization which then donates the food to needy recipients. The donated food must be “apparently wholesome” or “apparently fit grocery product” and meet all quality and labeling standards imposed by federal, state and local laws and regulations. Direct donations from the donor to needy individuals are not protected under the Emerson Act. The other type of donations that are not protected involve those involving “gross negligence” or “intentional misconduct.” Gross negligence involves “voluntary and conscious conduct, including failure to act” by a person or organization that knew the donation could have harmful health impacts. Intentional misconduct is when a person donates “with knowledge” that the donation could harm the health of another person. For more information, see the [Legal Fact Sheet for North Carolina Food Donation](#).

The Food Distribution Improvement Act (FDIA) was signed into law in January 2023 and builds on the Emerson Act by expanding liability protection in two additional ways. First, liability protection is extended to donations offered by non-profits to recipients at a Good Samaritan reduced price (allowing the non-profit to recover no more than its

costs for processing and delivering the food) rather than only if the food is received for free. Second, donors may now give to needy individuals directly and qualify for liability protection, whereas previously protection was available only if food was given to non-profits to distribute the food. These additional protections will facilitate food distribution by increasing the scope of protection and potential recipients. For more information, see the [Federal Liability Protection for Food Donation Legal Fact Sheet](#).

Although these protections preempt state law such that states cannot provide less protection than the Emerson Act, the State of North Carolina provides additional immunity for donated food under NCGS 99B-10 by providing protection from civil damages or criminal penalties for the donation of food to a non-profit unless the injury is caused by gross negligence, recklessness or intentional misconduct of the donor, tracking some of the language of the Emerson Act. For more information, see [NC Statute 99B-10](#).

HOW TO FIND DONATION OUTLETS

- ◆ [Feeding America](#)
- ◆ [MealConnect](#)

FOOD SCRAPS TO LIVESTOCK AND POULTRY

Feeding livestock and poultry with food scraps and food manufacturing byproducts can be beneficial in some cases, but there are parameters to follow to ensure that this practice is safe for the animals and humans. Restrictions on feeding food scraps to animals are in place because disease outbreaks have been attributed to these practices. Households are allowed to feed their own food scraps to their own animals, but feeding food scraps from restaurants, grocery stores and food manufacturers requires following federal and state regulations.

For example, feeding food scraps to hogs is legal in North Carolina, but the owner must have a “garbage feeding license” from the United States Department of Agriculture (USDA) which has multiple requirements including heating food scraps to 212°F prior to feeding. More information about the Swine Health Protection Act can be found at this [USDA Fact Sheet](#).

It is also prohibited to feed mammalian protein scraps to cows, sheep, and goats in order to prevent mad cow disease.

Because they follow Food and Drug Administration (FDA) regulations, facilities that produce human food and beverage products may have an easier time sending food byproducts to animals. This includes by-products from bakeries, breweries, and candy-manufacturers.

Fortunately, the Harvard Food Law and Policy Clinic has an extensive Guide entitled, [Leftovers for Livestock: A Legal Guide for Using Excess Food as Animal Feed](#), that helps to navigate the laws associated. This guide explains what type of surplus food is suitable to feed animals and the laws that are set up to protect the health and safety of those animals.



North Carolina State University Livestock and Poultry Agents are another great resource. Businesses that have food scraps or byproducts that are suitable for animal feed can look up their county extension office for assistance and connections to interested farms. NC extension agents can be found at [Animal Agriculture | NC State Extension](#).

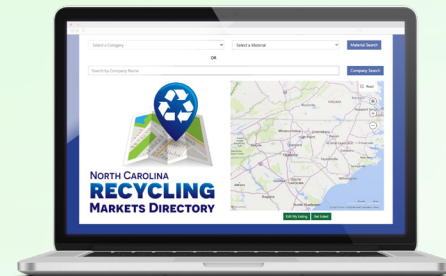
For food manufacturers with by-products that may be suitable for poultry feed, NCSU Feed Milling Staff can help. Visit the following website - [Meet Our Staff - Feed Milling, NC State Extension](#), or contact the following mills directly:

- ◆ Bakery Feeds , Marshville NC
- ◆ Deal-Rite/Union Grove Milling, Union Grove NC
- ◆ G&M Milling, Statesville NC
- ◆ Bartlett Milling , Statesville NC
- ◆ Diamond Pet Food, Gaston SC
- ◆ Carolina Prime Pet, Lenoir NC

ACCESS TO STATE AND NATIONAL RESOURCES

STATE RESOURCES

- ◆ In 2022, NCDEQ launched [Use the Food NC](#), a statewide food waste reduction campaign that provides information and resources to a variety of audiences including consumers, businesses, and local governments.
- ◆ To find out about composting service providers, anaerobic digesters, renderers and other, visit NC DEQ web page: [Composters and Other Processors](#).
- ◆ Visit the NCDEQ [Recycling Markets Directory](#) that helps businesses find options for their food scraps and food by-products.
- ◆ Lastly your organization can contact [Waste Reduction Partners](#) for help. Our staff of retired engineers and scientists can help your business search for beneficial reuse options in North Carolina. WRP's technical assistance and consulting services are provided at no cost to our clients funded by government-sponsored grants.



NATIONAL RESOURCES

- ◆ [ReFED - Food Waste Solutions - Reduce Food Waste, Food Recycling & Recovery](#)
- ◆ [EPA's Reducing Waste Food and Packaging; A Guide for Food Services and Restaurants](#)
- ◆ [EPA's Resources for Conducting Food Waste Sorts - A Guide to Conducting and Analyzing a Food Waste Assessment](#)
- ◆ [National Restaurant Association's Managing Food Waste in Restaurants](#)

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