



Water Quality & Waste Management

Food Recovery & Waste Reduction *A Guide for Businesses and Institutions*

Increasingly, food service managers are choosing to recover and reuse food scraps and other organic materials instead of throwing them away. This publication was developed to assist businesses and institutions with food recovery and waste reduction efforts. Businesses that could benefit include restaurants, bakeries, grocery stores, caterers, food distributors and vendors, produce markets, food processing plants, and any business or institution operating a cafeteria, such as hospitals, prisons, adult homes, colleges or schools, hotels, and ski resorts. Food recovery methods discussed include donating edible food to donor programs, giving food scraps to local livestock farmers, composting, and vermicomposting.

Why Businesses Should Reduce Food Waste

The U.S. Department of Agriculture estimates that in 1995, 96 billion pounds of food were disposed of by food retailers (supermarkets, convenience stores, and other retail outlets), consumers, and food service establishments. This figure represents 27 percent of all edible food available in the United States.

Commercial food services and households wasted 27.2 billion pounds of fresh fruits and vegetables; 17.4 billion pounds of fluid milk; 14.6 billion pounds of grain products; 11.9 billion pounds of sweeteners; 10.1 billion pounds of eggs, nuts, beans and nonfluid dairy products; 8.2 billion pounds of meat; and 6.8 billion pounds of fats and oils. Retailers discard food mostly because of overstocking, over-trimming, improper stock rotation, postholiday discard of seasonal

items, and perishable items reaching "sell-by" dates. Nonperishable foods get discarded because of damaged packaging and expired shelf dates.

However, the majority of food wasted (91 of the 96 billion pounds) is by consumers and food service establishments. Consumer, or household, food losses are the result of overpreparation, food preparation waste, table scraps, cooking losses, spoiled leftovers, and package failure and spillage. Food service businesses throw food away because of overpreparation, expanded menu choices, plate waste, and fluctuations in food sales beyond the control of food service operators (such as sudden weather changes). The USDA estimates that if just five percent of retail, consumer, and food service food losses were recovered (instead of discarded as solid waste), it would provide one day's food for 4 million people and save \$50 million

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**North Carolina
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dollars a year in solid waste disposal costs. Following are reasons why more businesses are implementing food recovery programs.

Save money. Food recovery and waste reduction efforts can decrease waste collection and disposal fees. Since food scraps and other organic materials can be as much as 90 percent of a facility's total waste stream, diversion of these materials could result in reducing the size of a facility's dumpsters and lengthening the time between waste pickups. Furthermore, if businesses compost or vermicompost their food scraps on-site, they can use the finished compost on their grounds and save landscaping costs.

Protect the environment. Food waste can affect the environment in several ways. For example, food scraps discarded in dumpsters can cause odor and generate methane at disposal facilities and increase biological oxygen demand (BOD) and chemical oxygen demand (COD) levels in landfill leachate. BOD and COD use up oxygen in water, so oxygen levels become too low to support aquatic life. Food waste flushed down sinks and garbage disposals wastes water and contributes to increased levels of BOD, COD, total suspended solids (TSS), and oil and grease (O/G) at wastewater treatment plants.

Comply with state laws. In North Carolina, legislation passed in 1989 and amended in 1991 and 1996 set a 40-percent solid waste reduction goal by June 30, 2001. It also established a hierarchy of strategies for managing solid waste. In order of desirability, the strategies are source reduction (eliminating or reducing waste); recycling and reuse; composting; incineration with energy recovery; incineration without energy recovery; and disposal in landfills. North Carolina is not unique; most states have enacted similar waste management legislation. The legislation also banned yard wastes from landfills as of 1993; this was the beginning of organic materials waste management, and food waste reduction efforts are a continuation of this trend. Businesses and individuals need to reduce the amount of waste (including food) discarded to help the state meet the 40-percent goal.

Present a "green" image. Widespread interest in waste reduction has compelled many businesses to present a "green" image to the public—that is, to demonstrate that they are environmentally responsible. For example, hotels are discovering that their environmentally responsible practices can attract convention and conference business.

How Businesses Can Reduce Food Waste

Businesses can save purchasing, treatment, and disposal costs by following the government's waste management hierarchy of source reduction, reuse, recycling, and composting.

Step One: Source Reduction

The first step businesses should take to keep food out of the waste stream is source reduction, which means preventing waste in the first place. One method of source reduction is to buy less food; this involves keeping track of the amounts of different types of food that are consumed and buying and preparing less of them the next time. For example, a computer program can monitor food inventories and provide an instant estimate of preparation and food losses. Since the Boston Market restaurant chain began using this type of computer program, their food loss has decreased from five percent to one percent of food inventories.

A second method is to redesign menu cycles to improve opportunities for secondary use of food. For example, if leftover chicken has a 3-day life in the cooler, then chicken sandwiches, chicken casserole, and chicken soup could be planned for one meal per day for the next three days after the initial serving.

A third method of source reduction comes as a result of technological advances in food processing and food byproduct development. For example, many food parts that food processors would have discarded in 1987 are now being used as raw materials to create other products such as livestock feeds, pharmaceutical products from cow and goat milk, juice products and vinegar from apple peels, biodiesels from vegetable oils and animal fats, fertilizers with calcium added from egg shells, and adhesives and solvents from citrus oils. Other source reduction methods include the following:

- improving inventory control to reduce excess and out-of-date inventory
- offering smaller portions for those who want to eat less
- ordering supplies in bulk
- refusing samples that will become waste
- working with suppliers to return packaging and shipping materials
- improving labeling of materials so that contents, expiration date, and storage and handling are clearly indicated
- offering self-serve condiments

Jelly Tally and Napkin Count

Breadman's Restaurant in Chapel Hill began several waste reduction strategies when they moved into a new facility in 1995. Instead of serving breakfast with side jelly packets and extra napkins, Breadman's placed jelly packet and napkin dispensers at each table. As a result, jelly use dropped by 40 percent and napkin use by 20 percent.

Step Two: Reuse (Donations to the Needy)

Donating food to the needy should be the first step for handling excess food. In addition to achieving environmental and cost savings, businesses can feel good about helping feed people who otherwise might have gone hungry. In 1996, more than four million pounds of food was donated to North Carolina food rescue programs. There are three kinds of charitable food donation programs, described below.

Food banks. Traditional food banks focus primarily on distributing large volumes of nonperishable (canned, dried, or prepackaged) food. Food banks usually work with the food industry to distribute surplus food inventories or with institutions or organizations that hold "food drives" for the needy. *Second Harvest* (1-800-532-FOOD) coordinates a national network of local food banks which distributed 811.3 million pounds of food in 1995. In North Carolina, there are six food banks affiliated with *Second Harvest*; these are strategically located to cover the state. A list of organizations that can provide more information on food reuse and reduction programs is provided on pages 6 and 7.

Prepared and perishable food programs (PPFPs).

Also called food rescue programs or surplus food distribution programs, PPFPs redistribute freshly prepared foods and perishables. An increasing number of restaurants, hotels, and companies with cafeterias have been using PPFPs to donate surplus food to the needy. Most PPFPs offer free pick-up on a daily, weekly, or on-call basis; provide trained food handlers who inspect food for safe transport to the receiving agency; and provide donors with publicity materials to alert customers of the company's participation. Businesses that decide to donate to a PPFP should ensure that the food is within the expiration date, keep food at a safe temperature (below 40 or above 140 degrees Fahrenheit), and check food for signs of

spoilage. Many food programs will not accept foods that spoil easily, such as mayonnaise salads and raw meat. Check with a local PPFP to see what kinds of food they will accept and how to store food for collection. *Foodchain* (1-800-845-3008) provides a listing of local organizations that accept prepared and perishable food for distribution. In 1996, more than 100 million pounds of food was collected from *Foodchain's* 119 member organizations in 42 states and distributed to 7,000 social service agencies.

Produce distribution facilities. *From the Wholesaler to the Hungry* is a project that helps produce markets donate fresh fruits and vegetables to produce distribution facilities that then redirect the food to low-income people. Thousands of pounds of produce are collected each week by operations in cities throughout the United States. Produce distribution programs are not limited to produce markets; they also tap wholesalers, retailers, and correctional facilities with large-scale gardens. Often these programs run in conjunction with local PPFPs. Contact *From the Wholesaler to the Hungry* at (213) 342-2613.

Laws to protect food donors. To protect food donors, "Good Samaritan" laws that specifically address food donations have been enacted in all fifty states and the District of Columbia. The language of the laws varies with each state; however, most of the Good Samaritan laws provide some level of protection from civil or criminal liability unless injury is caused by gross negligence, recklessness, or intentional misconduct of the donor. Many food rescue programs provide food donors with letters of indemnification or a "hold harmless" letter, which helps protect them against potential lawsuits. North Carolina's Good Samaritan law was enacted in 1989 and revised in 1991.

A federal law, the Bill Emerson Good Samaritan Food Donation Act (within the Child Nutrition Act of 1996), strengthens state Good Samaritan laws by providing national liability protection to food donors and encouraging the donation of food and grocery products to nonprofit organizations for distribution to the hungry. The federal law specifically limits liability to individuals or gleaners who donate and distribute food to the needy, as well as to nonprofits that distribute food to needy individuals. However, state Good Samaritan laws may provide more protection for food donors beyond that guaranteed in the federal statute.

Passage of the federal law has had a positive effect on several major companies. Pizza Hut and Southland Corporation, which operates 5,400 7-Eleven stores, responded to the law's passage by donating more food

to the hungry. To increase awareness and interest in food donation programs, American Express enclosed a copy of the Child Nutrition Act in a newsletter to restaurants.

Donating the Very Best

Hallmark's headquarters in Kansas City, Missouri has a cafeteria that serves 8,000 employees daily. Since 1991, they have been giving surplus cafeteria food to a PFP that is a local branch of *Foodchain*. Hallmark currently donates 20,000 pounds of perishable food each year. Hallmark employees feel good about helping their community, and the company has enjoyed positive public relations.

Since 1987, Coca-Cola's headquarters in Atlanta has been donating its surplus food to a local branch of *Foodchain*. In addition to excess food from Coke's cafeteria, which serves 4,000 employees, leftovers from banquets and special events are donated to the needy. An average of 200 pounds of perishable food per week is stored in containers provided by the PFP and frozen or refrigerated until pick-up day, which is once a week.

Both of these companies cited concerns over liability as a stumbling block when considering a donation program for prepared and perishable food. However, after checking into federal and state Good Samaritan laws, both companies felt confident in moving forward with food donation programs. Other corporations that have formed partnerships with community-based food recovery programs include Boston Market, Kentucky Fried Chicken, Kraft Foods, Inc., Marriott International, Northwest Airlines, and United Airlines.

Step Three: Recycling and Composting

In addition to donating edible food to donor programs, businesses may choose some or all of the following methods of handling excess food: donating food to local livestock farmers, composting and vermicomposting on- or off-site, and selling or donating fat and oil to grease renderers and food to animal food manufacturers.

Donating food to livestock farmers. Collecting food scraps for use as animal feed is an option that does not require much effort. Hog, cattle, and poultry producers are often interested in collecting food waste to use as animal feed. Food service workers simply separate their food scraps from other waste materials, including oils and grease, and keep the food covered and stored

in a cool place until a farmer picks it up. Farmers often provide businesses with reusable airtight containers for storing food scraps. Farmers may not accept certain foods, such as coffee grounds and food with high concentrations of salt, because they can be harmful to livestock.

Before setting up a food scrap collection program for animal feed, businesses should consider the following points.

Quantity of food scraps - Before contacting a farmer, estimate the volume of food scraps generated daily or weekly. Some farmers may be willing to accept any amount of food, whereas others may not collect small quantities.

Quantity variations - Evaluate the frequency in which food scraps are produced, as it may vary on a daily basis. These figures will help determine if a food scrap collection for animal feed program is feasible and when the food scraps should be collected by a farmer.

Freshness of food scraps - Arrange a pick-up schedule that allows food scraps to be kept fresh. If the food is not picked up daily, ask the farmer how to take additional precautions to keep the food fresh.

Adequate storage - Designate storage space in a refrigerator or cool place. Factor space availability into pick-up arrangements with a farmer.

Permits and regulations. Businesses are not required to have a permit for donating food scraps; however, farmers must have a permit to accept food scraps from businesses for feeding to livestock. Federal regulations require farmers to cook any food scraps containing meat before feeding them to livestock. Nonmeat food scraps are regulated by individual state laws; some states, like North Carolina, require that scraps be boiled and others impose no regulations. Contact the county health department before embarking on a food scrap collection program for animal feed. For more information, also call the state office of the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture at (919) 856-4170.

Following are suggestions for locating a farmer to take commercial food scraps.

- Contact your county center of the North Carolina Cooperative Extension Service.
- Get assistance from the state veterinarian.
- Call the municipal or county solid waste management office.
- Ask around at the local farmer's market.
- Place an advertisement in the local newspaper.

Saving Scraps for Animal Snacks

3M in St. Paul, Minnesota, which serves thousands of meals daily to its 12,000 employees, found that disposing of food preparation waste was costly and messy. The company located a nearby farmer who would take their food scraps and process them for hog feed. During the first two years of diverting food scraps for hog feed, 3M saved more than \$30,000, and they diverted 90,000 pounds of food from disposal.

In 1993, Bell Atlantic in East Orange, New Jersey, which feeds 600 employees daily, began donating food scraps from its cafeteria to farmers. Cafeteria employees simply separate food scraps from other cafeteria trash and place them in covered barrels—no extra time or work is necessary. In 1994, Bell Atlantic donated 10,000 pounds of food scraps as animal feed.

Composting. Food scrap composting is becoming increasingly common throughout the United States. The smallest-scale projects are at schools and institutions that compost kitchen preparation waste (vegetable and fruit trimmings, coffee grounds, and baked goods) on-site using low-tech methods. As they become more experienced, and if their state and local laws allow it, they will expand to plate scrapings, soups and sauces, and soiled paper.

Larger-sized projects use more complex composting methods to process pre- and postconsumer food scraps on-site. These large-scale composters include prisons, universities, military bases, zoos, and some industries. The biggest projects are facilities that accept food scraps from other waste generators. These operations include commercial sites, farms, municipal facilities, and food processors.

A 1997 nationwide survey of food composting reported that out of 214 projects, almost half were conducted on-site at institutions. More than one-third of the total projects were commercial operations that accepted food scraps from other generators.

Organic products that can be diverted from the waste stream and composted include the following:

- produce-trim or spoiled fruits and vegetables
- frozen food
- bakery products—spoiled, day-old, or excess batter
- coffee grounds, filters, and tea bags
- egg shells and paper cartons
- floral waste and plant trimmings
- leftovers that cannot be served again
- dairy, seafood, and meat products (although these may attract rodents and other animals)

- waxed or wet paper and corrugated cardboard
- paper towels, plates, napkins, trays, cups, and food wrappers
- biodegradable “plastic” service ware (flatware, plates, cups, bags, trays)

For more information about composting, contact your county center of the North Carolina Cooperative Extension Service Center or the Solid Waste Section, Division of Waste Management, N.C. DENR at (919) 733-0692 ext. 253.

Correctional Composting

In April 1997, the Connecticut Department of Correction began a food scrap composting project involving four prisons with a combined inmate population of 2,610. The prisons generated 1,086 tons of waste each year at a total disposal cost (including transportation) of \$106,833. Food scraps (mostly bread, vegetables, fruits, soups, desserts, and pasta), generated at a rate of one pound per inmate per day, are mixed with yard trimmings and wood chips from trees provided by a local utility company and the Department of Transportation. The compost cures for six weeks, after which it is used as a soil amendment and mulch on prison grounds. During the project's first three months, an average of 5.6 tons of food scraps per week were recovered for composting, for a total of 73.6 tons, which would have cost \$4,784 in disposal costs. The project's benefits include (1) diverting waste from the landfill, (2) saving money on disposal costs, (3) providing job training to inmates, (4) conserving water by reducing the need for garbage disposals, (5) reducing organic loading (nitrogen and BOD) at the local wastewater treatment facility, (6) improving public perception of the prison system, and (7) providing compost for better and less expensive landscaping.

Kids Can Compost, Too

Since 1992, Cape Cod Hill School (K-6 student population of 218) in New Sharon, Maine has been composting postconsumer food scraps from students' lunch trays. About 200 pounds of food scraps are collected weekly by fifth grade students and composted. It takes about a year to produce finished compost, which is then used in the school's yard and flower gardens.

Vermicomposting. More and more businesses and institutions are using worms to solve their food waste problems. Through a process called vermicomposting,

food scraps are fed to worms and transformed into a nutrient-rich compost for plants and gardens. Vermicomposting systems are easy to operate; employees and school children can run the operations. Vermicomposting programs can be found on-site at schools, hospitals, prisons, universities, businesses, sports stadiums, zoos, farms, and at municipal facilities.

Putting Worms to Work

In 1996, the National Institute of Environmental Health Sciences (NIEHS) in Research Triangle Park, North Carolina, set up a vermicomposting system to handle their cafeteria's food preparation scraps (the excess cooked food is donated to a local PFPF). Staff volunteers take turns bringing 10 to 20 pounds of food scraps plus shredded paper and other organic materials each day to two worm bins located outdoors next to the facility. When the worm bins are harvested every two to three weeks, about 100 to 150 pounds of vermicompost is available for NIEHS to use for landscaping on their grounds or to give to employees.

The Seattle Kingdome stadium also decided to expand their already successful recycling program by putting worms to work. About 18,000 worms in 12 containers eat 50 pounds of food scraps (or 30 percent of the stadium's total food waste) per week. Vermicompost is used on the Kingdome's flower beds.

National, State, and Local Contacts

National Organizations

Cooperative Extension Service (CES). Comprises USDA-affiliated programs at land-grant universities in each state. CES helps diverse agencies and community-based groups work together to establish local hunger programs, promote food safety and proper nutrition, and administer food recovery programs. Contact CES at a local county office or at the state's land-grant university.

Foodchain. Nonprofit organization that coordinates prepared and perishable food rescue programs throughout the United States and Canada. Provides a listing of local organizations that accept donations and distribute them to those in need. 1-800-845-3008.

From the Wholesaler to the Hungry. Helps launch fresh produce recovery programs and connects them with distributors to low-income people. 1-213-342-2613.

Second Harvest. National nonprofit organization that coordinates packaged and nonperishable food donations to food banks. Provides a nationwide listing of food programs. 1-800-532-FOOD.

Share Our Strength. Provides information on "Good Samaritan" laws as well as referrals to local groups that can use food donations. 1-800-969-4767.

U.S. Department of Agriculture. Hotline provides information on food recovery and how to volunteer or donate food. 1-800-GLEAN-IT.

State Agencies (North Carolina)

North Carolina Cooperative Extension Service, Biological & Agricultural Engineering Department, North Carolina State University, Box 7625, Raleigh, NC 27695-7625. Telephone Rhonda Sherman about food recovery, composting, and vermicomposting options (919) 515-6770; fax (919) 515-6772; e-mail <sherman@eos.ncsu.edu>; www.bae.ncsu.edu/people/faculty/sherman

Solid Waste Section, Division of Waste Management, North Carolina Department of Environment and Natural Resources, 401 Oberlin Road, Suite 150, Raleigh, NC 27605. Telephone Ted Lyon about composting facilities (919) 733-0692 ext. 253; fax (919) 733-4810.

Division of Pollution Prevention & Environmental Assistance, North Carolina Department of Environment and Natural Resources, P. O. Box 29569, Raleigh, NC 27626-9569. Telephone the agency about food recovery and composting at (919) 715-6500 or (800) 763-0136; fax (919) 715-6794.

Animal & Plant Health Inspection Service, U.S. Department of Agriculture, 2 West Edenton Street, Raleigh, NC 27601. Telephone Zylphia Smith about state regulations and a list of farmers licensed to feed their animals food scraps (919) 856-4170.

Local Resources - North Carolina Food Bank and Food Donor Programs

Key: FC=Foodchain (distribution of prepared and perishable food); SH=Second Harvest (food bank); WH=From Wholesaler to the Hungry (fresh fruits and vegetables)

Asheville

MANNA Food Bank (SH) - 627 Swannanoa River Road, Asheville, NC 28805. (704) 299-3663.

Charlotte

Metrolina Food Bank, Inc. (SH) - P.O. Box 33264, Charlotte, NC 28233. (704) 376-1785.

Community Food Rescue (FC) - 2910 Selwyn Avenue, No. 127, Charlotte, NC 28209. (704) 342-FOOD (3663).

Elizabeth City

Albemarle MANNA (SH) - P.O. Box 1704, Elizabeth City, NC 27906-1704. (919) 335-4035.

Fayetteville

Cape Fear Community Food Bank (SH) - P.O. Box 2009, Fayetteville, NC 28302. (910) 485-8809.

Greensboro

Greensboro's Table- Greensboro Urban Ministry (FC) - 305 West Lee Street, Greensboro, NC 27406. (910) 271-5975.

Raleigh

Food Bank of NC (SH) - 3808 Tarheel Drive, Raleigh, NC 27609. (919) 875-0707.

Inter-Faith Food Shuttle (FC) (WH) - 216 Lord Anson Drive Raleigh, NC 27610. (919) 250-0043.

Wilmington

Food Bank of Coastal Carolina (SH) - P.O. Box 1311, Wilmington, NC 28402. (910) 251-1465.

Good Shepherd House (FC) - 511 Queen Street, Wilmington, NC 28401. (910) 251-1124.

Winston-Salem

Food Bank of Northwest NC (SH) - 3655 Reed Street, Winston-Salem, NC 27107. (910) 784-5770.

Second Helpings (FC) - 3655 Reed Street, Winston-Salem, NC 27107-5428. (910) 784-5770.

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