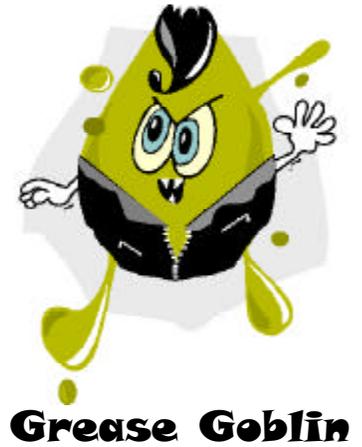


A FACT SHEET FOR Best Management Practices for Fats, Oils, and Grease



Residual fats, oils, and grease (FOG) are by-products that food service establishments must constantly manage. Typically, FOG enter a facility's plumbing system from ware washing, floor cleaning, and equipment sanitation. Sanitary sewer systems are neither designed nor equipped to handle the FOG that accumulates on the interior of the municipal sewer collection system pipes. Over 30% of North Carolina's 1999 sanitary sewer overflows were the result of pipe blockages from FOG accumulation from residential, institutional and commercial sources. The best way to manage FOG is to keep the material out of the plumbing systems. The following are suggestions for proper FOG management.

Dry Clean-Up

Practice dry cleanup. Remove food waste with "dry" methods such as scraping, wiping, or sweeping before using "wet" methods that use water. Wet methods typically wash the water and waste materials into the drains where it eventually collects on the interior walls of the drainage pipes. Do not pour grease, fats or oils from cooking down the drain and do not use the sinks to dispose of food scraps. Likewise it is important to educate kitchen staff not to remove drain screens as this may allow paper or plastic cups, straws, and other utensils to enter the plumbing system during clean up. The success of dry clean up is dependent upon the behavior of the employee and availability of the tools for removal of food waste before washing. To practice dry clean up:

- Use rubber scrapers to remove fats, oils and grease from cookware, utensils, chafing dishes, and serving ware.
- Use food grade paper to soak up oil and grease under fryer baskets.
- Use paper towels to wipe down work areas. Cloth towels will accumulate grease that will eventually end up in your drains from towel washing/rinsing.

Spill Prevention

Preventing spills reduces the amounts of waste on food preparation and serving areas that will require clean up. A dry workplace is safer for employees in avoiding slip, trips, and falls. For spill prevention:

- Empty containers before they are full to avoid spills.
- Use a cover to transport interceptor contents to rendering barrel.
- Provide employees with the proper tools (ladles, ample containers, etc.) to transport materials without spilling.

Maintenance

Maintenance is key to avoiding FOG blockages. For whatever method or technology is used to collect, filter and store FOG, ensure that equipment is regularly maintained. All staff should be aware of and trained to perform correct cleaning procedures, particularly for under-sink interceptors that are prone to break down due to improper maintenance. A daily and weekly maintenance schedule is highly recommended.

- Contract with a management company to professionally clean large hood filters. Small hoods can be hand-cleaned with spray detergents and wiped down with cloths for cleaning. Hood filters can be effectively cleaned by routinely spraying with hot water with little or no detergents over the mop sink that should be connected to a grease trap. After hot water rinse (separately trapped), filter panels can go into the dishwasher. For hoods to operate properly in the removal of grease-laden vapors, the ventilation system will also need to be balanced with sufficient make-up air.



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- Skim/filter fryer grease daily and change oil when necessary. Use a test kit provided by your grocery distributor rather than simply a “guess” to determine when to change oil. This extends the life of both the fryer and the oil. Build-up of carbon deposits on the bottom of the fryer act as an insulator that forces the fryer to heat longer, thus causing the oil to break down sooner.
- Collect fryer oil in an oil rendering tank for disposal or transport it to a bulk oil rendering tank instead of discharging it into a grease interceptor or waste drain.
- Cleaning intervals depend upon the type of food establishment involved. Some facilities require monthly or once every two months cleaning. Establishments that operate a large number of fryers or handle a large amount of fried foods such as chicken, along with ethnic food establishments may need at least monthly cleanings. Full-cleaning of grease traps (removing all liquids and solids and scraping the walls) is a worthwhile investment. Remember, sugars, starches and other organics accumulate from the bottom up. If sediment is allowed to accumulate in the trap, it will need to be pumped more frequently.
- Develop a rotation system if multiple fryers are in use. Designate a single fryer for products that are particularly high in deposits, and change that one more often.

Oil & Grease Collection/Recycling & Food Donations

FOG are commodities that if handled properly can be treated as a valuable resource.

- Begin thinking of oil and grease as a valuable commodity. Some rendering companies will offer services free-of-charge and others will give a rebate on the materials collected. Note that these companies must be properly permitted by the Division of Waste Management, Solid Waste Section at 919.733.0692, in order to remove FOG from a facility. A list of grease collectors can be found in the *Directory of Markets for Recyclable Materials* at www.p2pays.org/DMRM or by calling DPPEA at 1.800.763.0136.
- Use 25-gallon rendering barrels with covers for onsite collection of oil and grease other than from fryers. Educate kitchen staff on the importance of keeping outside barrels covered at all times. During storms, uncovered or partially covered barrels allow storm water to enter the barrel resulting in oil running onto the ground and possibly into storm drains, and can “contaminate” an otherwise useful by-product.
- Use a 3-compartment sink for ware washing. Begin with a hot pre-wash, then a scouring sink with detergent, then a rinse sink.

- Make sure all drain screens are installed.
- Prior to washing and rinsing use a hot water ONLY (no detergent) prerinse that is separately trapped to remove non-emulsified oils and greases from ware washing. Wash and rinse steps should also be trapped.
- Empty grill top scrap baskets or scrap boxes and hoods into the rendering barrel.
- Easy does it! Instruct staff to be conservative about their use of fats, oils and grease in food preparation and serving.
- Ensure that edible food is not flushed down your drains. Edible food waste may be donated to a local food bank. Inedible food waste can be collected by a local garbage feeder who will use food discards for feeding livestock. Food donation is a win-win situation. It helps restaurants reduce disposal costs and it puts the food in the hands of those who can use it. Check the *Directory of Markets for Recyclable Materials* for a list of food waste collectors.

Grease Traps

- For grease traps to be effective, the units must be properly sized, constructed, and installed in a location to provide an adequate retention time for settling and accumulation of the FOG. If the units are too close to the FOG discharge and do not have enough volume to allow amassing of the FOG, the emulsified oils will pass through the unit without being captured. For information on properly locating, constructing, and sizing grease traps, contact your local county and city representatives and examine EPA guidance documents.
- Ensure all grease-bearing drains discharge to the grease trap. These include mop sinks, woks, wash sinks, prep sinks, utility sinks, pulpers, dishwashers, prerinse sinks, can washes, and floor drains in food preparation areas such as those near a fryer or tilt/steam kettle. No toilet wastes should be plumbed to the grease trap.
- If these suggested best management practices do not adequately reduce FOG levels, the operator may consider installing a second grease trap with flow-through venting. This system should help reduce grease effluent substantially.

Consumer Tip

Buyer beware! When choosing a method of managing your oil and grease, ensure that it does what the vendor says it will do. Some technologies or “miracle cures” don’t eliminate the problem but result in grease accumulations further down the sewer line. “Out of sight” is not “out of mind.” Check the vendor’s references.



The **Grease Goblin** is the mascot for DPPEA's Oil and Grease Management Program. He serves as a reminder to keep grease out of sinks and drains before it becomes a nuisance.

A FACT SHEET FOR

Managing Food Materials



Grease Goblin

This fact sheet is provided to encourage businesses such as food service providers, processors, distributors, and merchandisers to eliminate waste and recover/recycle food materials. Food waste can produce several environmental impacts. For example, food materials discharged to a wastewater treatment plant will contribute to increased levels of BOD (biological oxygen demand), COD (chemical oxygen demand), TSS (total suspended solids), and O/G (oil and grease). Examples of these food materials include preparation wastes, uneaten portions, grease, batter waste, dairy products, beverages containing sugar, and dressings. Also, food materials discarded into the solid waste stream contribute to odor and methane generation at disposal facilities and to increased BOD and COD levels in landfill leachate.

Food materials are excellent candidates for reduction, recovery, and reuse. Reducing materials at their source, coupled with recovery, reuse, and recycling prevents pollution and reduces, and in some cases eliminates, treatment and disposal costs. A successful waste reduction program can result in cost savings and possible generation of revenues. These activities also contribute to a positive public image for the company, benefits to the community, and protection of the environment.

Reduction at the Start: Ordering and Inventory Controls

Perhaps the most effective method for reducing waste is to prevent it in the first place. Proper control of raw goods,

final products, and the waste streams associated with food preparation is an important source reduction technique. Improved ordering and inventory control significantly affect the three major sources of waste resulting from improper inventory control: excess, out-of-date, and obsolete raw goods. Below are options for reduction at the start.

- Order bulk supplies.
- Terminate useless packaging from the vendor.
- Refuse samples that will become waste.
- Work with suppliers to return shipping materials and packaging.
- Purchase reusable items.
- Purchase durable items such as air hand dryers that are designed to reduce waste.
- Purchase only the amount of raw goods needed for a set period of time. This practice will help eliminate out-of-date and excess goods and products.
- Develop a review and approval procedure for all raw goods and products purchased. The primary purchaser can regulate the quantity of materials purchased by other personnel to reduce excess and out-of-date inventory.
- Clearly label all materials. Labels can indicate contents, storage and handling, and expiration dates.

Donations, Sales, and Composting of Food Material

Food preparation businesses seeking to reduce food waste should look for opportunities to work closely with poten-

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tial reusers such as food donor programs. After donating edible food to reusers, food businesses may work with facilities such as grease renderers, animal food manufacturers, local farmers, or composters who can collect food materials and use them in their operations. Composting is also an option for managing solid food waste. Table 1 lists North Carolina renderers, animal food manufacturers, and composting facilities. Tables 2 and 3 list North Carolina and national food bank/food donor programs.

Segregate Food Wastes for Beneficial Uses

To increase their recyclable potential, food materials should be clean and free of trash such as paper, glass, and plastic. Also, depending upon the requirements of recyclers, solid food wastes should be separated from liquid food wastes to enhance their recyclability.

- **Excess edible food** should be kept separate from waste food and routed to a local food bank or food donor program. North Carolina's model "Good Samaritan Law" was enacted in 1989 and revised in 1991. This law protects any good faith donor from civil or criminal liability unless injury is caused by gross negligence, recklessness, or intentional misconduct of the donor. The local health department

can provide handling and storage procedures applicable to your area. Currently, more than four million pounds of food materials are donated each year to North Carolina food rescue programs alone.

- **Solid food waste** should be segregated from waste oils and greases. Hog, cattle, and poultry producers are interested in collecting food waste to use as animal feed. Dairy and bread waste may be fed to hogs without further handling, but other food waste or mixed food waste must be cooked before being fed to hogs. Farmers who use other or mixed food materials must be licensed garbage feeders. Zylphia Smith of the U.S. Department of Agriculture, Animal Plant Health Inspection Services (APHIS) at (919) 856-4170 can provide information about state regulations and a list of licensed garbage feeders. Local cooperative extension agents also may assist with locating markets for waste food.
- **Waste oils and grease**
 - Free grease is that used for or generated by cooking and has not been mixed with water. It is generated from pots, pans, grills, and deep fat fryers and comes from butter, lard, vegetable fats and oils, meats, nuts, and cereals. Free grease should be kept out of the drains and handled separately. Rendering facilities may

Table 1. North Carolina Renderers and Composting Facilities for Food Waste

Food Waste Service	Company/Address	Contact/Telephone/Fax
Composter	Brooks Contractor 1195 Beal Road Goldston, NC 27252	Dean Brooks (919) 837-5914
Renderer	CBP Resources (Offices statewide) P.O. Box 20687 Greensboro, NC 27420	Charlie Cheek (919) 333-3034 or (919) 378-0435
Renderer	Enterprise Rendering Company 28821 Bethlehem Ch. Rd. Oakboro, NC 28129	Carrol Braun, Jr. (704) 485-3018 or (704) 485-2222
Composter	McGill Environmental Systems 1100 Herring Road Rose Hill, NC 28458	Annette Tyson (910) 532-2539 (910) 532-2542
Renderer	East Coast Resources P.O. Box 5066 Cary, NC 27512	Wallace Woodall (919) 387-1906 (800) 6-GREASE
Renderer	Valley Proteins, Inc. P.O. Box 718, Highway 52 Wadesboro, NC 28170	Michael Boling (704) 694-3701 (704) 694-6145

purchase free grease and meat wastes and provide storage and collection. The market price depends upon factors such as volume, quality, and hauling distances. The rendering services will process free grease by sampling it for pesticides and other chemicals and filtering and volatilizing impurities before reselling it, where prices may range from one to three cents per pound. If the volume of the wastes generated from one restaurant or cafeteria is too small for the rendering facility, businesses should ex-

- o explore the feasibility of setting up a cooperative collection among similar businesses.
- o Trap grease is that collected in a grease trap. Because fats coat, congeal, and accumulate on pipes and pumps and sometimes obstruct sewer lines, some food service establishments may be required by their local government to maintain grease traps. Specific information about trap maintenance is presented below. Some rendering services and local septage haulers will service or pump out these traps for a fee, and some

Table 2. North Carolina Food Bank and Food Donor Programs	
Organization/Address/Contact/Telephone	Organization/Address/Contact/Telephone
¹ Albemarle MANNA P.O. Box 1704 Elizabeth City, NC 27906-1704 Debbie Fox, (919) 335-4035	² Inter-Faith Food Shuttle 723 W. Johnson St. Raleigh, NC 27603 Jill Staton Bullard, (919) 829-0056
¹ Cape Fear Community Food Bank P.O. Box 2009 Fayetteville, NC 28302 Walter Hair, (910) 485-8809	^{1,2} MANNA Food Bank 627 Swannanoa River Road Asheville, NC 28805 (704) 299-3663
¹ Food Bank of NC 4701 Beryl Road Raleigh, NC 27606 Greg Kirkpatrick, (919) 833-9027	¹ Metrolina Food Bank Inc. P.O. Box 33264 Charlotte, NC 28233 Anne Register, (704) 376-1785
¹ Food Bank of Northwest NC 3655 Reed Street Winston-Salem, NC 27107 Nan Holbrook Griswold, (910) 784-5770	² North Carolina Harvest, Inc. 2910 Selwyn Ave., No. 127 Charlotte, NC 28209 Bonnie West, (704) 342-3663
² Good Shepherd House 511 Queen Street Wilmington, NC 28401 Tom Whiteside, (910) 251-1124	² Second Helpings 3655 Reed Street Winston-Salem, NC 27107 (910) 784-5770
^{1,2} Greensboro's Table - Greensboro Urban Ministry 305 West Lee Street Greensboro, NC 27406 Faye Ellison, (910) 271-5975	¹ = Food Bank ² = Food Rescue Program

Table 3. National Organizations
<p><i>Second Harvest</i>, 1-800-771-2303. National nonprofit organization that coordinates packaged and nonperishable food donations to food banks.</p> <p><i>Food Chain</i> - 1-800-845-3008. National nonprofit organization that coordinates prepared and perishable food donations.</p>

services may reduce the pumping fee if the restaurant is a free grease customer.

Dry Cleanup To Keep Wastes Out of the Drain

Food preparation facilities should develop dry cleanup procedures to the greatest possible extent. Some municipalities will charge (surcharge) for any discharge of BOD, COD, TSS, and O/G above a certain level. For a restaurant that uses 3,000 gallons of water per day, serves seven days a week, and has an average BOD of 1,250 milligrams per liter (mg/L), an annual surcharge could be as much as \$1,173.¹ Dry cleanup procedures will reduce the amount of food waste that enters the drains and, thus, help reduce the possible surcharges.

- ✓ **The “first pass”** in equipment and utensil cleaning should be made with scrapers, squeegees, or absorbents to prevent the bulk of food materials from going down the drain. Studies have shown that for a fast food restaurant, 93 percent of the oil and grease discharged to the wastewater treatment plant is generated from ware washing. For a full service restaurant, 75 percent of the oil and grease discharged to the wastewater treatment plant is generated from the pot sink. Waste collected on this “first pass” could be set aside for rendering or, possibly, composting.
- ✓ **Spills.** Dry cleanup can be applied also to spills in the kitchen. Spills of dry ingredients should be swept up or vacuumed to prevent them from being washed down the drain.
- ✗ **Garbage Disposals.** Businesses that use garbage disposals to dispose of food waste are simply transferring disposal from a landfill to a wastewater treatment plant. Disposal of food waste via the sewer system is more costly than landfill disposal and acts as a disincentive to reduce generation of food waste or to separate food for donations, rendering, animal feed, or composting.

Maintaining Grease Traps

Food preparation facilities that discharge to a municipal sewer should contact the local wastewater treatment plant (WWTP) for any requirements concerning the need for interceptors and grease trap management. The most important management procedure for grease traps is that a company representative be present during any cleaning, pumping, or skimming performed by a contractor. This safeguard

permits management to respond appropriately to any questions about the services performed.

- ✓ **Pump out schedules** should be properly established and strictly followed to prevent overflows, downstream blockage, excessive oil and grease, and BOD loading to wastewater. It is important that these pump outs are complete, i.e., the grease caps removed, the sides scraped or hosed down, and the trap refilled with water. The contractor should indicate whether the trap is refilled with clean water or water from the trap.
- ✓ A food preparation facility should **never “hot flush”** (continuously run hot water) the grease trap as the heated, liquefied grease will be flushed down the sewer. While hot flushing may divert the need for pumping, the facility is liable for any costs associated with clogs caused by the flushing.
- ✓ **Skimming services** are available to skim grease traps on a regular basis. These facilities will reprocess the grease collected and notify owners when complete grease trap pump outs are necessary.
- ✓ **Bioaugmentation**, the addition of selected microorganisms (primarily bacteria) to the trap for improved operation, should be evaluated for each case. The bioaugmentation process is basically a passive treatment system to facilitate grease digestion and control buildup of the grease cap. The effectiveness of bioaugmentation is determined by a variety of factors including retention time in the trap, temperature of the wastewater, strength of the wastewater, and contact surface area. Some information indicates that for completely effective bioaugmentation, a retention time of one to five days is needed; however, a typical grease trap is designed for only one day of hydraulic retention. Since these parameters vary with location, an evaluation of each case should be made. The local WWTP should be contacted before any additives are used.
- ✓ **Alternative grease trap designs.** Some grease trap systems are designed to periodically heat the trap to de-solidify grease so that it can be automatically skimmed and collected. The high-quality grease collected from these systems may have high reuse potential. These grease traps, which may also be smaller than standard traps, can be located under a specific device above ground (i.e., the pot sink).

¹In this example, total pounds for the year are 1,000 mg/L BOD x (3,000 gpd/1 million) x 365 days x 8.34 = 9,132.3 lbs/yr. The surcharge would be 9,143.3 x \$128.40/1,000 = \$1,172.59 per yr.

Composting Food Wastes

Compost Facilities. Businesses interested in diverting wastes to composting could open their own compost facility or investigate the possibility of using local government or private compost facilities already in operation. North Carolina has a compost demonstration program for individuals interested in composting. For regulatory information or a

list of pilot or permanent composting facilities for organic materials, contact Ted Lyon of the Solid Waste Section (SWS) of the N.C. Division of Solid Waste Management at (919) 733 0692, ext. 253. Both the SWS and the Division of Pollution Prevention and Environmental Assistance can provide information and technical assistance to businesses interested in establishing and managing a composting program.

Facility Waste Reduction Program

Management Commitment. The most critical step to successful waste reduction is commitment by the owner(s)/managers of a facility to a waste management plan. A detailed waste reduction program should be developed that outlines policies and procedures for dealing with waste and assigns individual responsibilities for all waste related activities.

Employees will be aware of the degree of commitment by management and will rise or fall to the level that is expected or allowed. It is, therefore, important to have realistic goals that can be achieved, recognized, and rewarded.

Employee training is a significant component of a waste reduction program, and all employees from managers to the clean-up crew should be included. The training sessions, which should be repeated on a regular basis, should teach waste awareness, the impact of various food wastes on the wastewater stream, proper waste handling methods, and the importance of keep-

ing non-food garbage out of food waste containers. Contact the Division of Pollution Prevention and Environmental Assistance at (919) 715-6500 for assistance with setting up training programs.

An Employee Suggestion/Awards Program should be established to maintain employee motivation. Employees can be rewarded for proper waste handling practices. Current incentive programs ("employee of the month") can also incorporate employee waste handling practices as evaluation criteria. An employee awareness program should be highly visible, and managers and supervisors must strongly support these programs.

Also, **employees should be solicited** for ideas/suggestions for conducting efficient dry cleanups, segregating food wastes, or recycling other solid waste products. Employees also may have ideas about methods to generate less food waste or more effectively manage inventory. The most effective waste reduction programs make use of a team concept in which employees at all levels make contributions.



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