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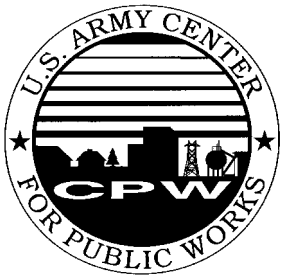
1 DECEMBER 1994

WASTE REDUCTION METHODS FOR FOOD SERVICE PERSONNEL AT ARMY INSTALLATIONS



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DEPARTMENT OF THE ARMY
U.S. Army Center for Public Works
7701 Telegraph Road
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FACILITIES ENGINEERING
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OFFICE WASTE REDUCTION METHODS AT ARMY INSTALLATIONS

1. Purpose. The purpose of this Public Works Technical Bulletin (PWTB) is to transmit the U.S. Army Construction Engineering Research Laboratory's (USACERL) Waste Reduction Methods for Food Service Personnel at Army installations. The USACERL publication outlines the principle of Waste Reduction Methods and offers several management tools to reduce waste.

2. Applicability. This PWTB applies to all U.S. Army Facilities Engineering/Public Works activities.

3. References.

a. AR 420-47, Solid Waste Management, 1 Jan 1985.

b. Policy Letter CEHSC-FU-S, Subject: Army Policy for Solid Waste Management, 29 Mar 1993.

c. TN 420-47-02, Installation Recycling Guide, 1 Sep 1991.

d. PWTB 420-47-3, Decision Makers Guide, 3 May 1993.

e. PWTB 420-47-4, Solid Waste Options, 30 Sep 1993.

f. PWTB 420-47-5, Source Reduction Planning, 1 Aug 1994.

4. Discussion.

a. Many areas of the country are seeing a dramatic increase in the complexity and costs of managing their waste. Today more and more costumers are taking environmental consideration into account when purchasing product and services. The Army is incorporating waste reduction principles into their daily operations. Waste reduction includes all actions taken to reduce

the amount and toxicity of waste requiring disposal. It includes source reduction, recycling, composting, and the purchase and manufacture of goods that have recycled content or produce less waste.

b. AR 420-47 prescribes responsibilities, standards, and procedures for the efficient and economical collection, recycling, and disposal of solid waste. The Army SWM Policy Letter is a summary of proposed revisions to AR 420-47 and requires the installation to develop a ISWM plan. Additional solid waste references include TN 420-47-2 which contains guidance for implementing solid waste recycling programs at Army installations. PWTB 420-47-3 provides guidance for ISWM planning, analysis and implementation of all SWM options. PWTB 420-47-4 is a computer software package developed for evaluating and selecting SWM options.

c. The enclosed USACERL pamphlet, "Waste Reduction Methods for Food Service Personnel at Army Installations", sponsored by the U.S. Army Environmental Center will assist food service personnel at Army installations on reducing waste in compliance with Army and federal regulations. An ongoing education and incentive program for dinning facility personnel is vital to the success of a waste reduction plan. The incentive should encourage personnel not only to monitor waste on a regular basis, but also to suggest alternatives to wasteful practices. This pamphlet describes how to establish a task force and implement education and training programs for waste reduction at Army installations.

5. Point of Contact. Questions and/or comments regarding this subject, which can not be resolved at installation level, should be directed to U.S. Army Center for Public Works, CECPW-ES, 7701 Telegraph Road, Alexandria, VA 22315-3862, at commercial (703) 806-5194 (DSN 656).

FOR THE DIRECTOR:

FRANK J. SCHMID, P.E.
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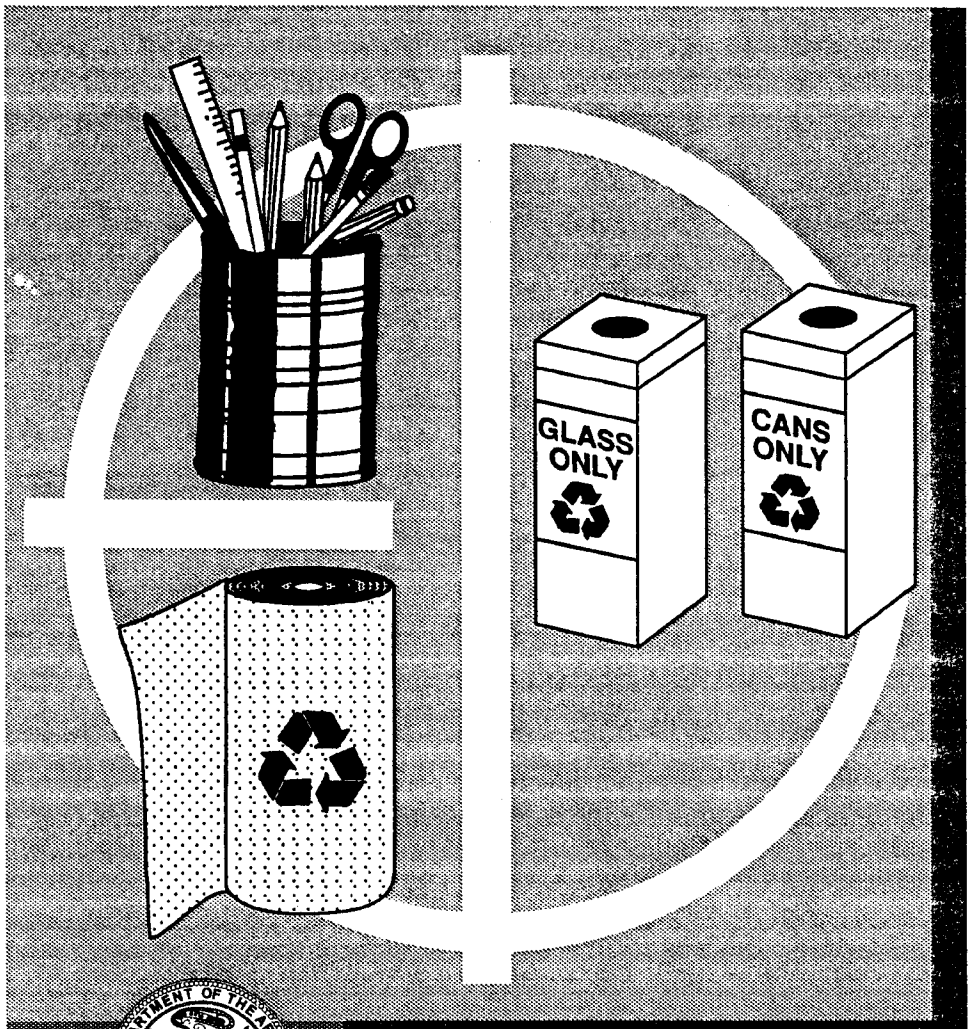

Waste Reduction Methods for Food Service Personnel at Army Installations

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13. ABSTRACT *(Maximum 200 words)*

This pamphlet is intended for Army personnel who work in food service preparation. This pamphlet will help Army personnel use the EPA solid waste management program to plan and implement food service waste reduction programs within their working environment.

14. SUBJECT TERMS
Integrated Solid Waste Management in the Food Preparation Environment, Reduction, Reuse, Recycling, Incineration, Landfilling, Composting

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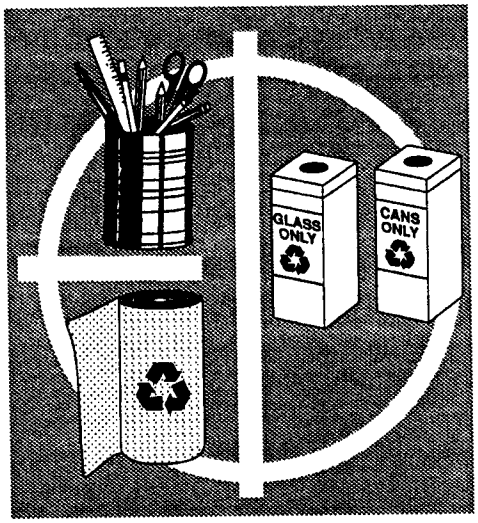

Waste Reduction Methods for Food Service Personnel at Army Installations

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UPDATES TO:

Waste Reduction Methods for Food Service Personnel at Army Installations

Page 5 - E.O. 12873 rescinded, replaced by E.O. 13101

Page 5 - AR 200-1 was updated in 1997

Page 5 - AR 420-47 consolidated into AR 420-49 in 1997

Page 8 – Replace Department of Defense (DoD) Directive 6165.60 with DoD Instruction 4715.4

Page 17 -- Replace AR 30-1 with AR 30-22

Page 28 - Acronym "AEHA" is now CHPPM

Page 28 - Acronym "AEHSC" became "ACPW", now disestablished

Table of Contents

Overview

This pamphlet provides information to help food service personnel at Army installations reduce waste in compliance with Army and federal regulations. It explains the solid waste issues facing the Army and the country and offers several management tools to reduce waste.

The information contained in this pamphlet is organized into an introduction and three broad areas, as summarized below.

☞ *Justifications for Waste Reduction*

Effective solid waste management focuses on reducing waste, not on locating additional landfill space. Installations are increasingly turning to waste reduction for a variety of reasons: to improve the environment, to save money, to comply with regulations, and to set an example of effective waste reduction.

☞ *Methods of Waste Reduction*

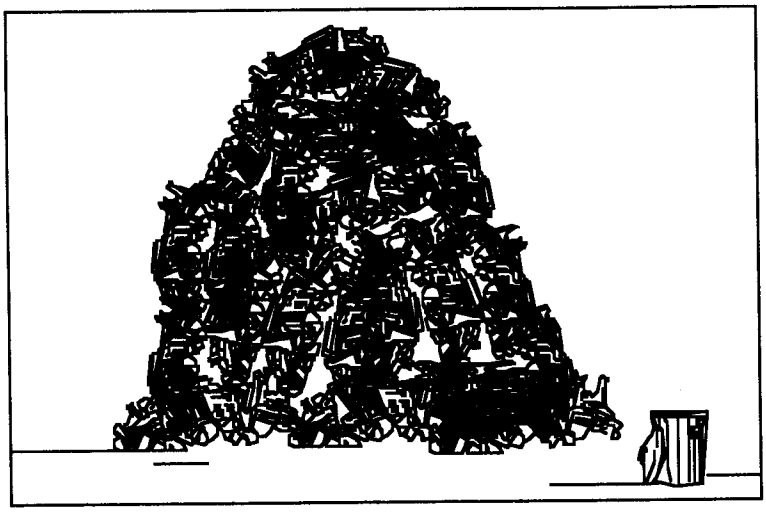
You have several waste reduction methods at your disposal. This pamphlet outlines options for reducing waste and provides examples of several methods: source reduction, reuse, recycling, and food waste disposal.

☞ *Need for Education*

An ongoing education and incentive program for dining facility personnel is vital to the success of a waste reduction plan. The incentives should encourage personnel not only to monitor waste on a regular basis, but also to suggest alternatives to wasteful practices. Also important is a solid waste task force to organize and monitor the program. This pamphlet describes how to establish a task force and implement education and training programs.

Introduction to Solid Waste Management

Every day Americans throw away millions of pounds of garbage—plastic wrappers, furniture, soda cans, clothing, scrap wood, cardboard, tires, and much, much more. In fact, if all of the nation's garbage were brought to the New Orleans Superdome, the Dome would be filled twice a day, every day of the year.



The amount of trash produced is exceeding our ability to contain it

Most of the things we throw away end up in a landfill, buried under tons of dirt. The US has historically relied on landfills as the final location for about 73% of its unwanted materials. Approximately 14% is burned in incinerators, and 13% is recycled. The recycling rate, however, has been increasing steadily in the last five years.

In the last 30 years, rates of garbage generation have increased as the use of packaging materials and the consumption of durable and disposable goods has increased. This additional volume of garbage has overburdened US landfill capacity in nearly all 50 states. Landfills are closing as they reach their capacity. New sites are difficult and expensive to construct because of stricter federal, state, and local environmental regulations, and active citizen opposition.

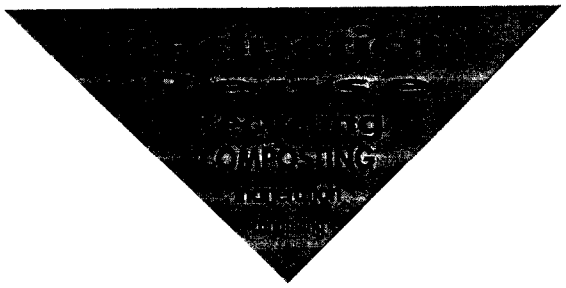
The Army Environmental Hygiene Agency (AEHA) estimated that by October 1993 approximately 50% of Army landfills may have closed because of new Environmental Protection Agency (EPA) regulations. After 1993, new requirements under 40 CFR 258 will be imposed on landfills that are already operating and on those that are being closed. These new regulations may increase the cost of disposal.

As landfills close, the cost of hauling and dumping garbage to remaining landfills increases. The average cost for dumping garbage at a US landfill is $30/ton. In many states this cost exceeds $100/ton (EPA 2).

Because the amount of garbage is increasing while suitable disposal sites are decreasing, many governmental agencies are reexamining their solid waste disposal practices. In 1989 EPA established an integrated solid waste management program of waste reduction and disposal methods. Most states, cities, and large institutions (such as the Army) are adopting this program as a tool for waste reduction.

The integrated solid waste management program includes six processes, shown below in order of preference, with source reduction being the most desirable and landfilling the least.

Integrated Solid Waste Management Hierarchy



❶ Source Reduction: Procuring items that generate less waste and toxicity in their use or that were manufactured in a way that minimizes waste and toxicity.

❷ Reuse: Reducing waste by using a product or package (without remanufacturing) after its original purpose has been achieved.

❸ Recycling: Collecting and sorting used materials to be remanufactured into new products.

❹ Composting: Nature's recycling; allowing organic wastes to decompose into usable mulches or soil additives.

❺ Incineration: Controlled burning of those materials that can't be reduced, reused, recycled, or composted.

❻ Landfilling: Burying garbage in pits designed and monitored to minimize leakage and methane gas migration; landfilling is used only for garbage left over from the above processes.

The Army encourages the processes that emphasize reduction. For instance, reduction strategies are outlined in the Army Policy Memorandum for Obtaining Utility Services. Several regulations also promote waste reduction.

☞ *Solid Waste Management: Federal and Army Regulations*

In October 1989, the Secretary of Defense mandated that the Department of Defense be the federal leader in environmental compliance and protection. The Resource Conservation and Recovery Act (RCRA), amended in November 1984, is the primary federal statute on solid waste. Its major goal is to reduce waste and conserve energy and natural resources. Subtitle D specifically relates to solid waste management. The Federal Facilities Compliance Act of 1992 (FFCA) waives federal immunity from these laws, thus requiring compliance by installations.

Three other laws regulate solid waste management on Army installations and provide assistance in planning a waste reduction program:

- Executive Order 12873 (1993) requires federal agencies to establish reduction and recycling programs for all operations. The order also stipulates that recycled products be purchased whenever practical.
- AR 200-1 (updated in 1991) outlines source reduction and recycling methods and describes how to allocate funds received through the sale of recyclables.
- AR 420-47 provides implementation guidance that describes the responsibilities, requirements, and procedures for solid waste management at Army installations.

Justifications for Waste Reduction

To Improve the Environment

- The number and capacity of disposal sites (such as landfills) is decreasing.
- Minimizing the volume of garbage that must be incinerated or landfilled reduces environmental problems and extends the life of landfills.
- Fewer health risks are associated with waste reduction, especially when toxic materials are eliminated or replaced with non–toxic alternatives.

To Save Money

- Costs for traditional disposal methods are increasing.
- Through wise use and disposal of natural resources, the Army can minimize liabilities at its own and at local landfills. Reduced liabilities means reduced costs for the installation.
- Significant cost savings can be realized by purchasing fewer products and using them more efficiently through reuse and repair.

To Comply with Regulations

- The Army must cooperate and comply with local, state, and federal regulations that require careful and effective management of natural resources.
- FFCA waives military immunity from compliance with federal statutes on solid waste.

To Set an Example of Effective Waste Reduction

- The Army strives to be a leader in environmental management by:
  (a) practicing conservation of natural resources on every installation;
  (b) demonstrating innovative technologies; and
  (c) educating both its own personnel and surrounding communities about resource conservation.
- The waste reduction approach (as opposed to tapping into shrinking landfill resources) is more consistent with the Army's overall mission to protect and defend the natural, cultural, and human resources of the US.
- Practicing waste reduction in compliance with local regulations fosters an image of the Army as a "good neighbor."
- Army personnel learn new skills when they incorporate recycling processes into their daily operations.

☞ Your Role in Solid Waste Management

As Food Service Director, you may become responsible for implementing waste reduction methods in your installation's dining facilities. You will need to know *what* and *how* to reduce, reuse, and recycle. This pamphlet, based on the EPA integrated solid waste management program, will help you reduce garbage in dining facilities at your installation by up to 50%.

The most effective way to incorporate solid waste management into daily operations is to involve staff at all levels of implementation. To ensure successful waste reduction, you should work with cooks, KP, garbage collectors, and administrative personnel.

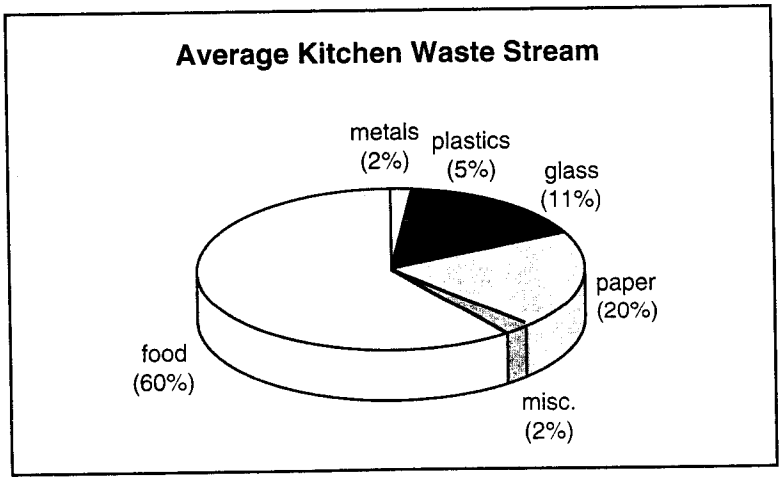
Waste Audit

Before you can make plans to reduce kitchen waste, you must identify the components of your waste stream. In other words, take a look at your trash to see what and how much you throw away. This process is called auditing your waste.

Perform a waste audit

A waste audit will tell you as much about your usage habits as it will about the components of your garbage. To perform a waste audit you will need to examine trash from several containers on different days. It is a good idea to check several waste containers in the kitchen as well as the central collection point. (That central location is often the dumpster out back.)

Although the results of a waste audit may vary from kitchen to kitchen, the waste stream of the average food service facility contains about 60% organic (food) waste, 20% paper, 11% glass, 5% plastics, 2% metals, and 2% miscellaneous items (Rabasca 78).



Once you have identified the components of your own kitchen waste stream, you can process them according to the EPA hierarchy.

Source Reduction

Department of Defense (DoD) Directive 4165.60 established the Army's commitment to minimizing waste through source reduction whenever possible. Source reduction—the design, manufacture, purchase, or use of materials in a fashion that reduces the amount and toxicity of garbage—helps minimize waste handling and disposal costs by avoiding the expense of recycling, composting, incinerating, and landfilling. Source reduction conserves natural resources and reduces pollution, creating financial and environmental benefits at local and global levels. It is a long–term commitment to waste management, not a one–time action. The following sections explain a variety of ways in which kitchen and dining facility managers can implement source reduction.

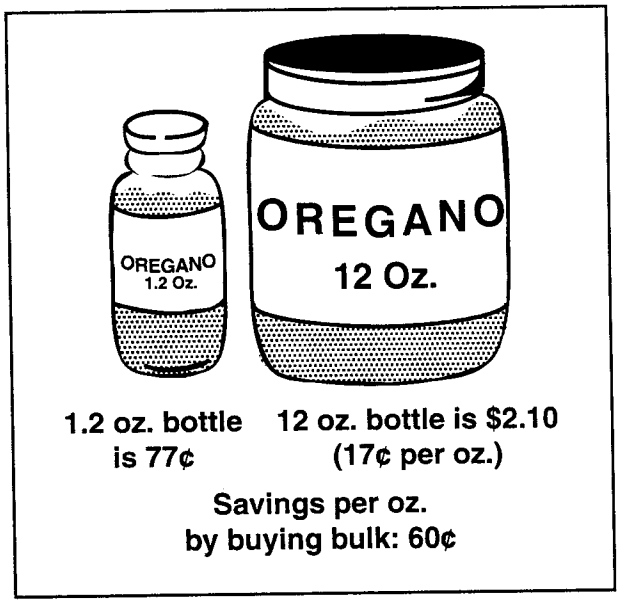
☞ *Source Reduction of Food Waste*

- **Purchase food, especially canned and dry foods, in bulk and large sizes whenever practical.**

  Bulk quantities usually cost less and generate less packaging waste than small sizes and items that are individually wrapped. For example, one large salad dressing jar with a pump dispenser uses less plastic than numerous individually–wrapped packets.

  Using cafeteria–style dispensers for milk and other beverages also helps eliminate the amount of trash in a dining facility. (The dispensers are filled from bulk–size beverage containers.)

Although purchasing in bulk may seem more expensive initially, the cost is actually less expensive, ounce for ounce. For example, the following illustration shows the savings realized when purchasing oregano in bulk.



Reduce waste and cost by buying in bulk

- **Refill serving–size containers (9– to 12–ounce bottles) from bulk sizes whenever possible.**

  For example, instead of supplying individual packages, put refillable shakers of sugar, sugar substitutes, salt, and pepper on dining room tables or on the condiment table.

  Fill squeezable or pump bottles with ketchup, mustard, soy sauce, and salad dressings and put them on the condiment table instead of offering individually–wrapped packages of these items.

  The General Services Administration (GSA) catalog offers plastic and glass refillable containers, ranging in price from $.45 to $4.87 each.

- **Post signs at the condiment table to remind diners to take only what they can eat and to eat what they take.**

  AR 30–1 states that food waste should be minimized by encouraging personnel to take only an appropriate amount of food. To encourage this practice, whenever possible present food in a manner that allows individuals to take only what they need.

☞ *Source Reduction of Other Kitchen Wastes*

- **Substitute plastic divided serving trays for paper plates in field kitchens, especially during short–term training exercises.**

  Disposable dishware may be necessary during long–term training exercises when it is not possible to use a dishwasher. However, disposable paper plates are expensive and constitute the majority of food–related waste generated during field training. By investing in a reusable dishware option whenever possible, you can minimize cost and waste. The following chart compares the total cost between disposable paper dishware and reusable plastic dishes:

Item	Cost Per Year (per person)	Total Cost Per Year (for 1,000 personnel)
Disposable paper plate/cup	$93.08	$93,080.00
Reusable plastic plate/cup	$5.83	$5,830.00
Total savings from purchasing reusable dishware	$87.25	$87,250.00

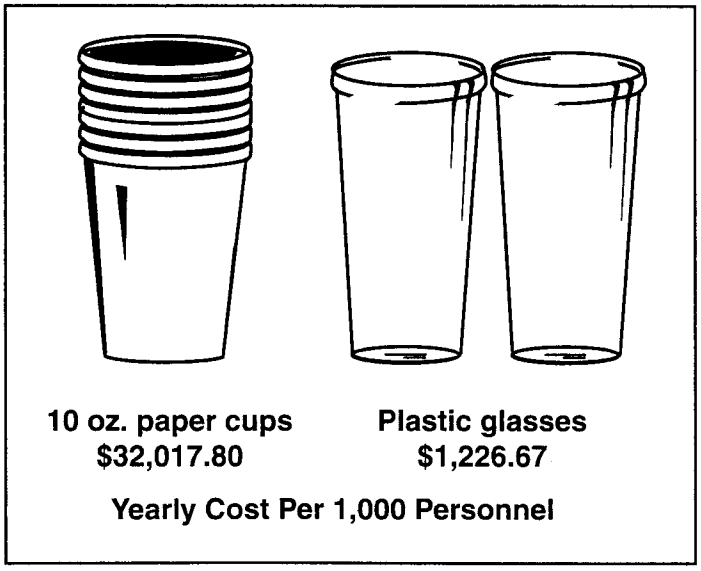
The reusable trays are guaranteed to last up to six years and undergo minimal breakage. They are stackable, which minimizes the amount of storage

space needed, and can be washed easily and efficiently in a dishwasher (at up to 180°F). Using washable dishes may increase costs for KP labor, energy use, soap, and water, but these extra costs should have a minimal effect compared to your overall savings.

- **Substitute reusable plastic glasses for disposable paper cups in field kitchens.**

  These unbreakable glasses can be brought back to the dining facility kitchen to be washed after training exercises.

  As shown in the illustration below, the yearly cost of using paper cups is nearly 25 times that of plastic glasses. By substituting plastic glasses for paper cups, you will save enough money over 14 days to pay for a year's supply of plastic glasses.



Cost comparison between disposable cups and reusable glasses

- **Use plastic divided trays instead of china in training dining facilities.**

  Often a large number of personnel must be fed in a short amount of time in training dining facilities. The fast pace of these kitchens can result in significant breakage of china, adding cost and waste to a kitchen operation.

  However, GSA offers a plastic divided tray that can be used in training kitchens. It is slightly larger than a field tray since it does not have a divided portion for utensils.

  The financial and environmental benefits of using plastic trays in basic training dining facilities are the same as those described for plastic trays used in field kitchens. Check the GSA catalog for current styles and prices.

- **Purchase plastic rather than glass cups for use in training dining facilities.**

  Again, plastic cups resist breakage and still provide the same service as glass cups.

- **Minimize use of disposable take–out trays. If dining facilities must use disposables, use paper plates and cups.**

  The following chart lists the various impacts paper and plastic dishes can have on the environment:

Environmental Impact	Paper Dishes	Plastic Dishes
Air pollution created during manufacturing process	Yes	Yes
Water pollution created during manufacturing process	Yes	Yes
Energy intensive to produce	Yes	Yes
Comes from a renewable resource	Yes	No
Is being recycled at this time	No	Rarely
Degrades naturally	Yes	No
Adds volume to landfills	Yes	Yes

As you can see, neither has a clear environmental advantage. However, paper products come from a renewable resource (trees), while plastic ones do not. You may need to consider costs and diner preferences to make a final choice.

- **Purchase dishwashing detergents in concentrated, biodegradable formulas that can be mixed with water as needed.**

  Concentrates can be purchased in five–gallon containers and mixed with water in smaller pump bottles (one gallon or less) to reduce packaging material. Concentrates often cost less than other detergents because they contain less water and are therefore cheaper to transport. When using concentrates, always mix them according to the manufacturer's instructions. Using more concentrate than necessary costs more, does not clean any better, and defeats the environmental benefits.

  Check your GSA catalog for the current availability of bulk detergents. GSA also offers petroleum– and phosphate–free detergents that are safe to the environment. Look for these kinds of cleaners, highlighted in green ink, in the GSA catalog or in the *Environmental Products Guide* (formerly *Recycled Products Guide*).

- **Minimize the use of cleaners that come in aerosol cans, such as oven cleaners.**

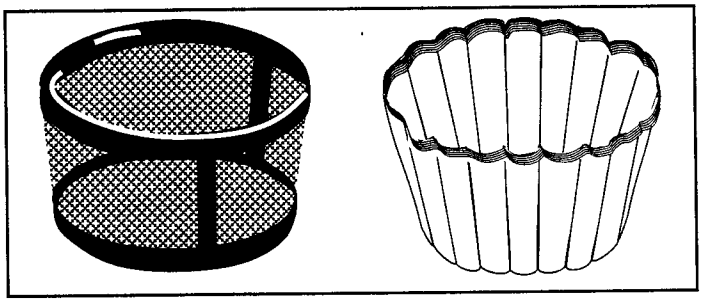
  Instead, dispense detergents in pump containers and use abrasive brushes to clean heavily–soiled equipment. This alternative not only reduces the number of aerosol cans in the waste stream, but also eliminates harmful propellant chemicals frequently found in aerosols.

- **Purchase a booster (a water heating element) to be installed on pipes used for the final rinse cycle in the pot and pan cleaning area.**

  A booster eliminates the need to purchase toxic chlorine bleaches and dispose of their plastic containers. This simple piece of equipment cleans as effectively as chlorine bleach by rinsing dishes in super–heated water, which reduces the toxicity of the cleaning process by eliminating chlorine. The booster can pay for itself by eliminating the cost of bleach.

Contact the Directorate of Public Works (DPW) or the Directorate of Engineering and Housing (DEH) for information about purchasing boosters for dining facilities.

- **Replace disposable paper coffee machine filters with stainless steel or reusable cloth filters.**



One reusable filter replaces hundreds of throwaways

Stainless steel filters work as well as paper filters, yet they can be washed and used many times. They are often guaranteed to last a lifetime. Reusable filters eliminate the use of paper and keep resources out of a landfill.

GSA has been researching sources of reusable stainless steel and cloth filters; check with your GSA representatives for current availability.

If stainless steel or cloth filters are not available, purchase recycled, unbleached paper filters from GSA. Bleached filters are whitened with chlorine, a toxic substance. Moreover, whitening is an unnecessary step in the manufacturing process.

- **Store food in areas and containers that maintain appropriate storage conditions to minimize food loss due to spoilage or container failure.**

  For example, condiments that are individually packaged in plastic envelopes can expand and break open if stored in warehouses or kitchens that are too hot. To reduce this kind of loss, put containers in a cooler location (i.e., a refrigerator) or install fans in warehouses or kitchens. (Better yet, discourage the use of individual condiment packages.)

  Another way to minimize food loss is to store bread in reusable plastic containers, which decreases spoilage.

- **Write Unsatisfactory Material Reports and submit them to the Defense Logistics Agency (DLA) when you or dining facility managers encounter wasteful packaging or poor packaging design.**

  Wasteful packaging includes items that are double–wrapped, large packages that surround small items, or individually–wrapped items. You can initiate Army–wide improvements in kitchen operations by notifying DLA about such conditions.

- **Establish a waste reduction incentive program that encourages dining facility managers and enlisted personnel to provide ideas about reducing waste.**

  For further information, see the subsection on incentive programs (p. 25).

Reuse

Reuse is a simple method of solid waste management that extends the life of a product or package by using it after its original purpose has been achieved. Reuse does not require any kind of remanufacture or alteration of the product in any significant way.

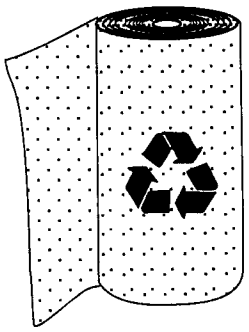
☞ *Suggestions for Reuse*

- **Reuse food containers such as metal cans and large plastic jars whenever possible.**

Offer five–pound metal cans (#10 fruit and vegetable cans) to installation personnel for reuse as cigarette butt holders, parade markers, or storage containers for small items. The cans are especially useful in school classrooms or for children's group projects. Find new uses for glass jars and plastic containers as well. Announce the availability of these containers by writing a short notice in your installation's daily bulletin several times a year.

- **Work with your Contracting Office to find a linen service to provide washable, reusable hand towels for use by kitchen personnel.**

The cost of the linen is balanced by the savings realized by not buying and disposing of paper towels. (TB Med 530 allows staff to use cloth hand towels.)



If a linen service is not available and kitchens must use paper towels, encourage kitchen managers to use unbleached, recycled paper towels with postconsumer paper content. The GSA catalog offers recycled paper towels with a minimum of 40% postconsumer content at prices that are competitive with non–recycled towels. Recycled paper towels are highlighted in green ink in the GSA catalog.

- **Design daily menus to incorporate food reuse and reduce waste.**

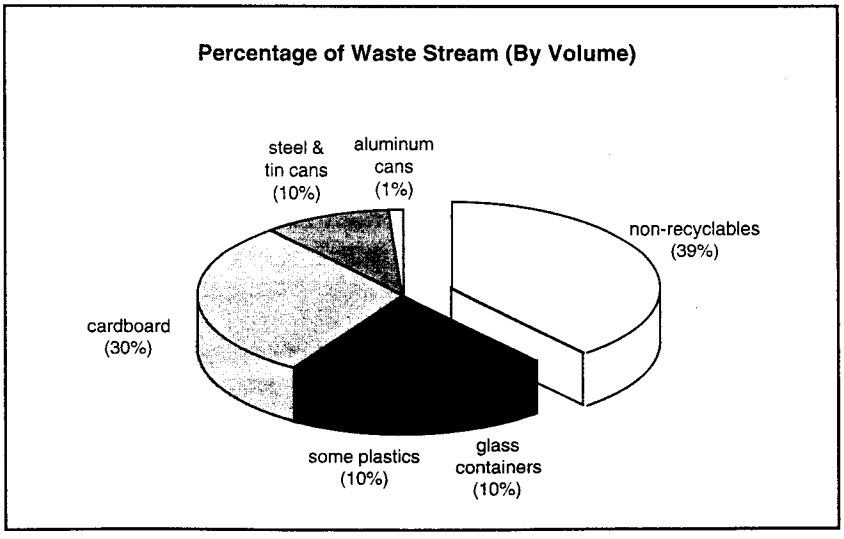
For example, if baked chicken is offered at Monday dinner and there is leftover meat, offer chicken soup for Tuesday lunch. (Observe any health or sanitation regulations as defined in AR 30–1 and TB Med 530.)

Recycling

After you have reduced and reused as much waste as possible, you can begin to look at what is recyclable in your kitchens. Recycling, the production of new products from used materials, helps the environment in many ways:

- Manufacturing products with used instead of new materials generates less air and water pollution.
- Melting or remanufacturing materials to create new products requires less energy than extracting ores or harvesting trees.
- Natural resources are conserved instead of being burned or buried.
- Landfill life is extended when recyclables are diverted from the waste stream.

Several materials generated in Army kitchens are potentially recyclable in most parts of the US. The following chart shows what can be recycled and what percent of the total waste stream each maintains (by volume):



Whether or not these items can be collected and sold depends on the availability of local markets (manufacturers) that will accept your recyclables. You will need to work with other offices on post to establish a dining facility recycling program.

> *Do not assume it is okay for you to directly market your materials off base.* Any materials purchased with appropriated funds must be recycled through DRMO unless prior approval has been given to do so.

The U.S. Army Center for Public Works (USACPW) at Ft. Belvoir, Virginia, has published the Installation Recycling Guide (TN 420–47–02, September 1, 1991) for establishing a recycling program. The section below summarizes the steps you can take to implement your own dining facility recycling program.

☞ *Establishing a Recycling Program*

- **Contact your installation's DRMO, DPCA, DEH, or DOL to determine the feasibility of collecting and marketing recyclables.**

  DEH, DPCA, and DOL usually have the final management responsibility for a recycling program. When you set up a recycling task force, include representatives from these offices. See "Need for Education" (pp. 24–25) for information about organizing a solid waste task force.

- **Coordinate a recycling program with the appropriate agencies suggested above and with the Contracting Office.**

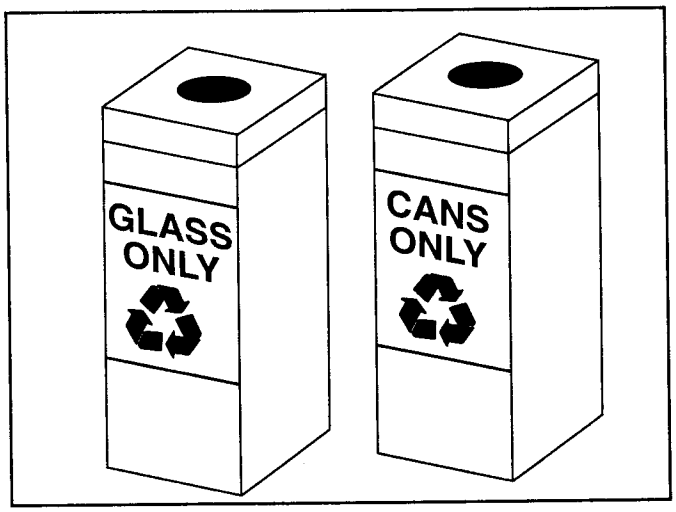
  The Contracting Office can find contractors who will collect and market your recyclables.

- **Train dining facility managers to keep recyclables separate from food waste and garbage.**

  Ongoing training and monitoring are necessary to ensure that recyclables remain uncontaminated.

- **Install signs that identify recycling containers in the kitchen.**

  Recyclables need to be kept clean and separate. Label both the collection container and, if possible, the wall behind the container or some other appropriate space to minimize confusion.



Separate recyclables

- **Publicize the implementation of the dining facility recycling program.**

  Write an announcement for the installation's daily bulletin to inform personnel of dining facility recycling and reduction programs. Post signs in each dining facility to educate personnel that kitchen waste is being reduced through recycling.

Food Waste Disposal Options

About 10–15% of the total waste stream in large kitchens is food waste—both the scraps left over from food preparation and table waste (uneaten prepared food); most of this food waste is landfilled. Landfilling is not, however, the best method for food waste disposal because:

- Food waste usually has a high moisture content. Liquids contribute to the formation of leachate, a potentially hazardous liquid. The moisture content of food waste also makes it difficult to maintain the high temperatures needed in case the waste must be incinerated.
- Food waste creates odor problems at the source, during transportation to the landfill, and at the landfill itself.
- Food waste attracts bugs and other pests looking for food at all points in the disposal process.
- Food waste is a nutrient–rich material that can be used for other purposes.

The following disposal methods offer alternatives to landfilling food wastes:

- **Use garbage disposals.**

  Wastewater treatment managers recommend that organic waste be put in garbage disposals whenever possible because biodigestion microorganisms need the nutrients to function properly. Often the resulting sludge is spread on farmland. Because it contains food waste and other organic by–products, this sludge adds nutrients to the soil.

  However, some installations have antiquated plumbing systems. In such cases, food waste may contribute to the deterioration of already weakened pipes. The garbage disposals themselves may be old and break down frequently. You should ask the staff at the Building and Grounds Department or DOL to make sure that your kitchens' garbage disposals are in good working order.

- **Recycle used cooking oil.**

  Used cooking oil can be difficult to dispose of. Landfills may not accept used oil in liquid form, and most water treatment facilities request that oil be kept out of the plumbing system. Grease traps, which divert used oil from the plumbing system, require expensive and time–consuming maintenance.

  Recycling is the best way to dispose of used oil. (Used cooking oil is the raw ingredient for a variety of new products, including soaps, detergents, and cosmetics.) Many institutional kitchens store deep–fat cooking oil outside the kitchen in special containers or 55–gallon drums until a contractor collects it.

  If you are not collecting used cooking oil, contact the Contracting Office to investigate this food waste disposal option.

- **Collect meat scraps and bones for rendering.**

  Renderers collect meat by–products such as bones, fat, and inedible meat scraps, then "render" (cook) them at high temperatures for manufacture into new products such as soaps, pet food, and cosmetics.

  Ask your Contracting Office to investigate the feasibility of establishing contracts with rendering companies.

- **Use food waste as swine feed.**

  Historically, feeding hogs with food scraps has been an important solid waste disposal method.

  Currently, many institutional and commercial kitchens separate food waste from garbage and sell it to private contractors who cook the food at high temperatures to kill bacteria, then sell it as swine feed.

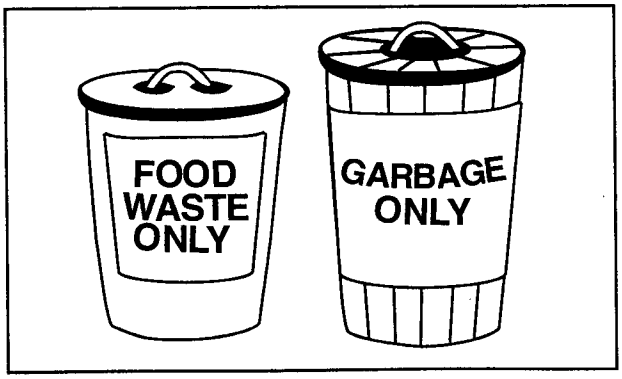
For example, kitchen personnel in hotels along the Las Vegas strip separate food wastes for hog farmers. Ben and Jerry's, an ice cream manufacturer in Vermont, routinely hauls dairy by–products to nearby hog farmers.

Recently, new questions about sanitation and health risks associated with this disposal method have been raised, causing many governmental agencies to re–examine the safety of this practice. Some states have passed laws that minimize or restrict hog feeding because some collectors were not properly processing the food before selling it to farmers.

The option of using a swine feeding program is directly controlled by state laws. Contact your state's Department of Agriculture for regulations relating to the feeding of food waste to swine.

- **Compost food waste.**

  Many states and institutions are investigating composting as a means of turning food wastes into a useful product—nutrient–rich humus or soil additives. A YMCA camp in New York, several prisons in the east, and an elementary school cafeteria in Vermont are all keeping food waste separate from other garbage and composting it (Watson 45).



Separate food waste for composting

Under controlled conditions, food waste is allowed to decompose naturally at a specified location, usually near a landfill. It will degrade into a high–quality soil additive in about six to twelve weeks. The end product can be marketed both on or off post.

Food scraps should be kept in separate collection containers which are put outside for daily collection by a contractor.

If your installation is composting yard waste (grass, leaves, and brush), the yard waste site may be able to accept organic food waste as well.

Contact staff at DEH, DPW, or a similar office to determine the feasibility of composting food waste on post.

- **Landfill food waste.**

  If the above disposal options are not feasible at your installation, the last option is to landfill food waste. To minimize leakage at all points in the collection process, first drain as much liquid as possible before the waste is bagged. Then, double bag your garbage to reduce bag breakage and spills.

Need for Education

To help maintain a high–quality waste reduction program, you will need to establish a program that encourages communication among all levels of dining facility operations. You can do several things to educate personnel about waste reduction efforts:

- **Establish a waste reduction task force to help identify and correct areas of kitchen waste.**

  Include representatives from DRMO, DEH or DPW, DPCA, and DOL. Also include a staff member from Troop Issue Support Activity (TISA), yourself (as the Food Service Director), at least two dining facility managers/mess sergeants, and a staff member from both the Contracting Office and the KP Contracting Office.

The task force should be responsible for:

- setting goals for the types and volumes (or percentage) of waste to be reduced
- setting a schedule for regular meetings
- establishing a training program for kitchen personnel

- **Offer ongoing training sessions with dining facility managers/mess sergeants to maintain quality control of all aspects of waste minimization.**

Provide training and information

Ask these managers for feedback to update and improve the programs. Make announcements through your installation's daily newspaper about waste reduction achievements when appropriate.

- **Establish a waste reduction incentive program to encourage the development of new reduction ideas.**

  Develop a mechanism that encourages dining facility staff, diners, and procurement personnel to suggest waste reduction ideas.

  Publicize suggestions that are implemented with an announcement in your installation's daily bulletin.

  Investigate the possibility of offering cash awards or leave time to personnel whose ideas are adopted.

Closing Thoughts

The Army Policy Memorandum for Obtaining Utility Services and AR 200–1 encourage reducing the volume of the Army's solid waste stream. Training and Doctrine Command (TRADOC) has set a goal to reduce every installation's landfilled solid waste by 50% by the year 2000. Forces Command (FORSCOM) likewise has set goals to reduce its waste stream by 25% in 1992, 35% in 1994, and 50% by the year 2000 (AEPI 36). Show your support of these goals by practicing reduction, reuse, and recycling in your kitchens and dining facilities. And take your waste reduction habits home with you. Many of the suggestions in the pamphlet can be easily implemented at home.

Additional Sources for Information

GSA Catalog
Environmental Products Guide (formerly *Recycled Products Guide*)
Marketips

Contact the Local GSA Customer Service Director at (817)334–5215 to obtain these publications (phone number current as of October 1993).

Solid Waste Terms and Definitions

Biodegradable: A material that can readily be broken down or composted through natural processes. For example, a biodegradable detergent is one that microorganisms can digest and turn into natural components like oxygen, water, or carbon dioxide.

Composting: Nature's recycling; allowing organic wastes to decompose into usable mulches or soil additives.

Incineration: Controlled burning of those materials that can't be reduced, reused, recycled, or composted.

Integrated Solid Waste Management: The complementary use of a variety of disposal methods to handle wastes safely and effectively, including source reduction, reuse, recycling, composting, incineration, and landfilling.

Landfilling: Burying garbage in pits that are designed and monitored to minimize leakage and explosions; landfilling is used only for garbage left over from the other waste reduction processes.

Nonrenewable Resource: A resource that cannot be replaced once it has been depleted. For example, it takes 100 million years for petroleum to be made through natural processes.

Postconsumer Content: The portion of a recycled product that is made of materials recovered after consumer use.

Recyclable: A product that can be collected and remanufactured into a new product.

Recycled: A product that already contains some used materials.

Recycling: Collecting and sorting used materials, which are remanufactured into new products.

Renewable Resource: A resource that can be replaced naturally once it has been harvested, like trees.

Reuse: Reducing waste by using a product or package (without remanufacturing) again after its original purpose has been achieved.

Solid Waste: All non–liquid garbage generated by household, commercial, and industrial sources.

Source Reduction: Procuring items that generate less waste and toxicity in their use or that were manufactured in a way that minimizes waste and toxicity.

Acronyms

AEHA	Army Environmental Hygiene Agency
AEHSC	Army Engineering and Housing Support Center
AR	Army Regulation
DEH	Directorate of Engineering and Housing
DLA	Defense Logistics Agency
DoD	Department of Defense
DOL	Directorate of Logistics
DPCA	Directorate of Personnel and Community Activities
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
EPA	Environmental Protection Agency
FFCA	Federal Facilities Compliance Act
FORSCOM	Forces Command
FPMR	Federal Property Management Regulations
GSA	General Services Administration
RCRA	Resource Conservation and Recovery Act
TISA	Troop Issue Support Activity
TRADOC	Training and Doctrine Command
US	United States

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