

A Pollution Prevention Guide for Food Processors

Three Rs for the 90s: Reduce, Reuse, Recycle

Delaware Department of Natural Resources and Environmental Control

Companies in the business of processing food may produce a variety of wastes. Much of the waste is in the form of waste water, but there may also be solid wastes as well as emissions to the air. Some examples of food processing wastes are given by the following:

- process wastewater
- sludge
- off-spec product
- waste oils
- spent and dirty filters
- empty raw materials containers
- outdated inventory
- damaged pallets

All of these wastes have one thing in common: they all represent a loss of resources and a loss of money.

Businesses throughout the country have implemented waste reduction programs and found that there are many benefits to be gained from such an approach to the management of resources. Reducing the amount of waste your business generates can help you:

- reduce operating costs
- reduce waste disposal costs
- reduce long-term liability
- help sustain environmental quality
- improve workplace safety and health
- project a positive public image

The most effective way to minimize the losses associated with waste is to avoid producing the waste in the first place. This is the concept behind DNREC's Pollution Prevention Program, which has produced this guide to assist you and others in the food processing business to reduce your losses while at the same time improve the environment.

Getting Started

A comprehensive waste audit is the essential first step in developing a waste reduction strategy. The waste audit should evaluate opportunities in the areas of improved operating procedures, process and equipment modifications, and reuse/recycling.

Here are the steps to follow in conducting a waste audit:

1. List all wastes being generated.
2. Identify the composition and source of each waste.
3. Identify options to reduce the generation of these substances, focusing on those wastes that are most hazardous and those techniques that are most easily implemented.
4. Compare the technical and economic feasibility of the options identified.
5. Evaluate the results and schedule period review of the waste reduction program.

Improved Operating Procedures

Improving the facility's operating procedures is often the easiest and least expensive way to reduce waste. No expensive equipment or materials are involved -- only small changes in the way things are done. This includes improvements in housekeeping, inventory control, material handling, and actions taken to prevent spills, leaks, or equipment breakdowns. Here are a few examples of good operating procedures that can reduce waste:

- Keep storage and work areas clean and well organized and keep all containers properly labeled.
- Inspect materials upon delivery, and immediately return unacceptable materials to the supplier.
- Keep accurate records of raw material usage so that you can measure reductions in use. Mark the purchase date on each container and adopt a "first in, first out" policy so that older materials are used up before new ones are opened; assign someone to distribute and keep track of raw materials.
- Practice preventative maintenance to avoid future losses. Periodically inspect containers and equipment for leaks.
- Keep all containers covered to prevent evaporation, contamination, spillage, or drying out of contents.
- Keep waste streams separate for reuse; recycling, or treatment. Keep nonhazardous materials from becoming contaminated.
- Keep Waste Streams separate for food, paper and wood.

Production Process and Equipment Modifications

Often a process can be modified, or the equipment used can be improved or upgraded, so that the process will run more efficiently and produce less waste. Some examples of production process and equipment changes that may help you reduce waste are:

- **Improved scheduling.** Sequential scheduling of the products that use the same production line or equipment can reduce cleaning requirements. For example, scheduling the use of light dyes before dark dyes through the same machine or production line eliminates the need for cleaning between batches.
- **Maximizing the dedication of process equipment.** This can reduce equipment cleaning frequency and waste generated.
- **Minimizing the amount of cleaning solution used.** If water is the cleaning agent, use sprays or jets of water to clean tanks or equipment. Where possible, small amounts of concentrated waste collected should be recycled or used as a raw material. Rinse machinery and tanks less often.
- **Avoiding use of the wastewater stream as a “conveyor”.** Transfer solids and particulate matter by mechanical means (eg. augers or conveyors) or manually. This helps minimize loadings to the wastewater treatment system.
- Substituting less toxic or non-toxic substances as cleaning agents.
- **Conserving water.** Use automotive shutoffs on hoses and at wash stations. Use high pressure, low volume washing systems. Incorporate water conserving equipment into process lines.
- **Minimizing the loss of product.** Prevent product from becoming waste when it hits the floor. Provide catch pans under problem areas of production lines.
- **Utilizing “dry cleanup” methods.** Scrape up and scoop up particulate matter before wash down. This technique prevents the unnecessary addition of waste to the wastewater stream.

Reusing and Recycling Other Wastes

Good waste reduction plans address all of the waste streams being generated by a particular business or industry. Try to find ways to apply the three R's to all of your plant's waste, including such things as waste paper, empty containers, lubricating fluids, etc. Here are some tips for these types of materials:

- Reuse or recycle excess, off-specification materials and samples taken for quality control testing. For example, off-spec material can be added to an often already existing waste stream that is used for animal feed. Some organic waste products that are not suitable for use as animal feed may be suitable for composting operations.

- Find as many ways to reuse paper as you can (as note pads; poster paper, etc.). When paper has been reused as much as possible, recycle white paper and computer paper. Recycle other office wastes, such as aluminum cans.
- Recycle lubrication oils.
- Find ways to recycle water. Recycling water can consist of simply screening the water and reusing, or recycling may consist of a complex cleaning and filtration process. The specific process must be evaluated before a decision can be made.

Getting the Job Done

Accomplishing the goals of a waste reduction program requires the cooperation of every employee of the company. Top management must make a commitment to pollution prevention, but it will be the workers themselves who will make the program succeed.

Management can demonstrate its commitment to waste reduction by:

- Providing employees with training in waste reduction techniques and practices -- including periodic “refresher courses” to increase employees’ awareness of the important of waste reduction
- Involving the employees in designing and implementing waste reduction measures.
- Organic waste products may be suitable for animal feed
- Establishing incentives to encourage workers to use waste reduction techniques and to suggest changes in design or operating procedures that would further reduce waste generation.

Following Up

As long as wastes are being produced, there is the potential for waste reduction. Less-polluting materials, equipment, and procedures are constantly being developed, so that wastes that are difficult or costly to control today may be easily eliminated tomorrow. Stay alert for such developments.

When buying new equipment, look for equipment that will minimize both the amount of toxic materials used and the amount of waste produced.

Reassess the company’s operations and waste handling practices periodically with an eye to avoiding the temptation of slipping back into old more wasteful ways of doing things and to identifying additional waste reduction possibilities.

Publicize the firm’s commitment to waste reduction. Customers will feel good about doing business with a company that is environmentally responsible.

Sources of Additional Help

This Guide is not intended to be comprehensive list of all the techniques that could be used to reduce waste in a food processing company. Each facility is unique, with its own challenges and opportunities for minimizing waste; therefore, each waste reduction program will be unique. There are a number of resources available to help Delaware businesses develop and implement programs that meet their individual needs:

- A Waste Reduction Self-Evaluation Manual has been developed by the Department of Natural Resources and Environmental Control to assist small and medium-sized business in implementing waste reduction programs. The manual includes information specifically targeted for food processors. Copies of the manual can be obtained by calling the Department at **(302) 739-3822**.
- The Delaware Pollution Prevention Program in the Department of Natural Resources and Environmental Control **(302) 739-3822** provides technical assistance, information resources, as well as assistance with other services that are available to your business.
- The Mid-Atlantic Food Processors Association has many members from the food processing industry that includes but is not limited to regulatory agencies, food processors, and engineering firms. The association holds yearly meetings and publishes a monthly newsletter. The association's offices can be reached at **(410) 546-5854**.
- The Delmarva Poultry Industry can provide information to companies directly in the poultry industry and related businesses. This organization holds its annual meeting in October and publishes a bimonthly news letter. For more information, their offices can be reached at **(302) 856-9037**.
- The Delaware Manufacturing Alliance is a private, non-profit corporation which is dedicated to improving the quality, productivity, and profitability of Delaware manufacturers, and to serving as a prime service resource for the state's new and existing manufacturers. The DMA can be reached at **(302) 452-2520**.
- The Northeast Industrial Waste Exchange may be able to help you find companies that can use your wastes. You can call the Exchange directly at **(315) 422-6572**.

This publication is one of a series of pollution prevention guides for various types of businesses. For more information on this and other pollution prevention or waste minimization programs, contact the Department of Natural Resources and Environmental Control at **739-3822** or **739-6400**.

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