
North Carolina Cooperative Extension Service



**Water Quality &
Waste Management**

**Water and Wastewater Management in a Dairy
Processing Plant**

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"Let's not wash our profits down the drain"

This slogan, used by the Giant Foods ice cream plant in its employee training program, reflects the fact that an effective waste and water management program can cut food processing costs. A plant's waste

load can be decreased substantially by controlling the amount of water used and reducing the amount of product lost into the sewer. Stopping pollution at its source is less expensive and more practical than end-of-pipe waste treatment.

Some municipalities impose sewer surcharges when the level of contaminants in a plant's wastewater is excessive. The possibility of saving money on surcharges makes a water and wastewater management program even more attractive. Because Giant Foods was faced with limits on biochemical oxygen demand (BOD5) and suspended solids (SS) for its pretreatment facility, implementing a water and wastewater management program became a necessity. We can learn much about waste control from the program used by Giant Foods.

Conserve Water and Curtail waste

Did you know that 1 pound of pollutants, in the form of BOD5, is directly equivalent to a gallon of milk lost down the drain? If you know the BOD5 level in your plant's wastewater, you can use this information to get a reasonably accurate idea of how much product (and money) you are pouring down the drain. A plant's water use and the volume and strength of its waste stream are strong indicators of how efficiently the plant is operating.

To initiate a water and wastewater management program in your plant, first make sure that members of your top management team are committed to reducing the volume and strength of the plant's wastewater. Then appoint a "water-waste supervisor" to help find ways to reduce product losses and monitor wastewater concentration. If your dairy is not large enough for someone to be devoted full time to this task, assign the responsibility to a supervisor who has an interest in this field.

To help in finding ways to cut water use and product loss, conduct a survey of the plant's water uses. Install water meters throughout the plant and read them daily. List all water uses and the amount used each day. If boiler and condenser water are not metered, consult the literature for guidance in estimating usage. Balance the amount of water used with the incoming water supply.

After completing the water use survey, conduct a product waste study. Have the water-waste supervisor and each production supervisor observe operations closely and list all the waste that occurs. Take pictures of leaks, spills, and other situations in which waste occurs to make slides for use in employee training.

When you have collected enough information, plan a dinner meeting with the plant manager and all the supervisors. Discuss each supervisor's waste findings and plan ways to reduce waste. This type of meeting will convey the importance of waste control and help in obtaining the management team's full commitment to waste reduction.

Giant Foods Program Stresses Employee Involvement

Employee training was an important part of Giant Food's water and wastewater program. Without the commitment of all employees the program could not have been successful. The training phase can be completed in one or two employee meetings.

Employees were asked to think about waste prevention and to bring their suggestions to the first meeting. The meetings were conducted on company time and limited to 90 minutes. The plant manager opened the first session by explaining that reducing waste and water use is necessary both economically and legally if the plant is to continue to operate and expand. He also reviewed the county's pretreatment ordinance.

A set of slides introduced employees to the concept of waste treatment, and the plant's pretreatment facilities were discussed. The session centered on the company's abatement program, entitled "Washing Our Profits Down the Drain." It demonstrated that the plant's waste was made up entirely of ice cream, water, and cleaning compounds.

Employees were told the objective of waste treatment: to decompose the organic matter with bacteria and oxygen before it reaches public waterways so that it will not steal the stream's oxygen and kill the fish. Each bacterium in the trickling filter and activated sludge system was portrayed as a "Pac Man" eating his way along the trail. The two "ghosts" that can "knock him out" are the ghosts of high pH and the ghost of excess food. The new pH monitoring system at Giant Foods, it was explained, helps eliminate the ghosts of high pH, but employees must help eliminate the ghosts of excess food.

After another slide presentation showing plant waste being generated, employees were encouraged to contribute ideas on waste reduction in their own work areas. Their suggestions were posted and acted upon.

The employees developed a slogan for their efforts to cut waste and reduce water use: "Let's eat it instead of treating it." This slogan reminds them of the advantages of recovering product rather than allowing it to reach the drains, where it becomes a pollutant.

Reduced Pollution and Water Consumption

The Giant Foods program was very effective. BOD5 loading was cut by one-third and water consumption by one-fourth when water and waste reduction efforts were implemented. Collecting any unusable material in barrels for use as animal feed was found to be one of the best methods for preventing pollution.

The treatment plant is monitored once a week by testing the BOD5 and suspended solids levels of the raw waste and the final effluent. Results are reviewed by the plant manager, who notifies supervisors if excessive pollutant levels are found in the raw waste so that they can take corrective action.

Controlling waste in the Giant Foods plant has directly involved all personnel. Each person recognizes that waste treatment is a vital part of plant operations and that his or her efforts have a direct bearing on the efficiency of the treatment facility.

The water-waste program in this plant has resulted in daily savings and a minimum amount of waste. The full cooperation of the company's employees in reducing waste and water use has resulted in more efficient operation - and money going into the bank rather than down the drain.

Bank or drain: Which is your choice?

Elements of a Successful Water and Wastewater Management Program

- Obtain full management commitment and understanding.
 - Appoint a water-waste supervisor.
 - Survey waste production in the plant.
 - Survey water use in the plant.
 - Conduct a management meeting;
 - Train employees.
 - Solicit ideas from employees.
 - Monitor performance and maintain records.
 - Implement the best ideas immediately; if suggestions will not be implemented right away or are rejected, let the employees know the reason.
 - Ensure continued commitment of all employees.
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Other publications of interest to dairy processors include:

- [Liquid Assets for Your Dairy Plant](#) (CD-21)
 - [Cut Waste to Reduce Surcharges for Your Dairy Plant](#) (CD-26)
 - [Dairy CEO's: Do You Have a \\$500 Million Opportunity?](#) (CD-29)
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