

# Schroeder Milk Saves \$400,000 through Product Savings and Water Conservation

*Case Study, Minnesota Technical Assistance Program, University of Minnesota*

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## Dairy's Pollution Prevention Team Identifies Process Improvement Opportunities

**Company:** Schroeder Milk Co., St. Paul, Minnesota

**Industry:** Dairy processing

**Goal:** Waste reduction and product conservation

**Change:** Reduced water use and product loss by improving maintenance and reevaluating existing process techniques.

**Benefits:** Schroeder saves \$400,000 and 13 million gallons of water every year

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## Background

Schroeder Milk Co., St. Paul, produces a variety of dairy and other beverage products. The family-run operation employs 80 people and has been in business since 1884. They process 90,000 gallons of milk daily and 8,000 gallons of orange juice weekly.

In 1996, the public wastewater treatment facility was going to assess Schroeder with a \$200,000 sewer access charge (SAC). Driven to look for opportunities to reduce its wastewater, Schroeder formed a pollution prevention team comprised of production personnel, warehouse workers, engineers, consultants and vendors to reduce waste and improve process efficiency.

Since then, Schroeder has saved over \$400,000 through water and product savings, and in reduced industrial fees.

## Product Savings

Schroeder found ways to ensure that more of its product ends up on the retail shelves, instead of down the drain.

- Due to increased production needs, Schroeder needed to install a second pasteurizer. Dedicating this pasteurizer exclusively for white milk reduces the

- number of changeovers between chocolate milk, white milk, orange juice and other beverages. This saves \$180,000 in product annually and 8,600 gallons of water a day.
- An antifoam ingredient was added to the chocolate milk to prevent foam overflow as it moves through the storage silo. Reduced product loss resulted in annual savings of \$187,000.

### **Small Leaks Add Up**

Improving maintenance and tightening up existing systems significantly reduced product loss and water use.

- A quarter-inch hose leaking orange juice was fixed, saving 1,440 gallons of product daily.
- Repairing leaky connections and valves saves 4,860 gallons of water a day.
- Repairing leaky hoses saves 226 gallons of water every day.

### **Turn It Off**

In certain processes the team determined that a continuous water flow was unnecessary.

- Previously, the washer for cleaning the cases which hold Schroeder's returnable cartons ran continuously. A valve was added so the spray bar runs only when cases are present. This saves 2,400 gallons of water a day.
- Occasionally a carton gets stuck, tears open and clogs the conveyor of the carton filling machine. In the past, a spray nozzle was left on all day to wash spilled milk off the machine. Now the nozzle is triggered only when a carton gets stuck. This saves 7,000 gallons of water a day.

### **Use Less**

The team identified processes where water use could be cut down without affecting product quality.

- The sanitizing stage in the clean-in-place tank (a system for cleaning plumbing without requiring its disassembly) was reduced from four minutes to three, saving 1,250 gallons of water a day.
- The manufacturer recommended reducing the water flow in the separator bowl (a centrifuge that separates cream from milk) from 180 gallons per hour to 30. This saves 3,000 gallons of water a day.
- The carton washer was changed from using shower heads and spray bars to smaller nozzles and mist sprays. Instead of running continuously, the washer now only runs when needed. These changes save 5,340 gallons of water a day.

## Reuse It

Schroeder had many opportunities for recirculating water and chemicals, instead of immediately discharging them down the drain.

- Excess water from cleaning returnable plastic cartons is now sent to the washer that cleans the cases that hold them. This reduces the total amount of fresh water, chemicals and heat needed, saving 4,200 gallons of water a day.
- Expired milk returned to Schroeder is used as animal feed, instead of pouring it down the drain. This reduces biological oxygen demand and chemical oxygen demand (BOD/COD) loading to their wastewater by 300 pounds a day.
- The filling machines were cooled with water used only once. Schroeder switched to a recirculating water system. This saved a total of 10,000 gallons of water a day.
- In the sanitizing stage of the clean-in-place tank's operation, the chlorine rinse was replaced with an acidic one. The acidic rinse is now recollected and used as prewash for the next cleaning cycle. This saves 100 gallons of chemicals and 500 gallons of water every day.

## Conclusion

Using a pollution prevention team, Schroeder Milk Co., identified opportunities for process improvement. **According to Carl Schroeder Jr., over \$400,000 and 13 million gallons of water are saved every year. In the process, Schroeder has become a cleaner, more competitive facility.**

## More Information

For additional information on waste reduction in the dairy industry or pollution prevention teams, call John Polanski, MnTAP, at 612/627-1906.

MnTAP has a variety of technical assistance services available to help Minnesota companies reduce and manage their industrial waste. If you would like assistance, call 612/624-1300 or 800/247-0015 from greater Minnesota.