



FILLER STARTUP AND SHUTDOWN



Overview

Many food and beverage manufacturers' operations include the filling of bottles, cartons, or cans of some variation. However, the nature of filling is such that leaks and spills can be common during the startup and shutdown processes. Spilled raw materials can lead to product and cost losses. Depending on the size of the spill, they can also generate pollution in wastewater; violate local, state, or federal regulations; and incur fines or strength charges for the parties responsible.

Startup Pollution Prevention

During a MnTAP intern project at the Kemps facility located in Minneapolis, Minnesota, the following steps taken by the rotary filler operators were observed:

- Start fillers by running sanitizer through the filler.
- Follow the sanitizer with milk as a rinsate.
- Manually test to confirm when sanitizer is no longer present in the milk pouring out of the filler.
- Turn off the pump for the filler manually once the operator has verified that all sanitizer has been fully removed.

Pollutant Reduction:
94,000 gallons of product

Cost Savings:
\$152,000

Status:
In Progress

MnTAP intern and staff members have recommended that Kemps install an inline conductivity probe prior to the filler bowl. This probe would automatically stop milk from being pumped into the filler bowl if the probe detects any remaining sanitizer.

Installing probes on the lines leading to the four rotary fillers would lower milk loss to floor drains by 94,000 gallons a year, increase profitability by \$114,000, and decrease high-strength wastewater discharges by \$38,000.

NAICS Code: 3115**
Industry Sector: Dairy
Product Manufacturing
EPA Region 5

About MnTAP

The Minnesota Technical Assistance Program (MnTAP) is a confidential, no-cost, and non-regulatory program at the University of Minnesota that provides technical assistance focused on pollution prevention to organizations in Minnesota.

For Assistance, Please Contact:

Kevin Philpy, Senior Engineer
philp029@umn.edu



Shutdown Pollution Prevention

Pollutant Reduction:

74,000 therms

Cost Savings:

\$52,000

Status:

Implemented

A common challenge for filling operations is reducing the amount of product left in the line and bowl prior to the end of a filling run. The MnTAP internship at Kemps also found that best management practices (BMPs) around preventing excess product from being sent to the drain were not being clearly communicated between experienced employees, new employees, and management.

Therefore, the MnTAP intern and staff recommended that staff members from all levels and across all shifts should have access to semi-annual training sessions. These sessions will provide opportunities for staff members to share BMPs, improve communication, build solidarity around minimizing product waste, and create and maintain a standardized process. If implemented, this recommendation would lower milk loss to floor drains by 29,000 gallons a year, save \$35,000 in product, and decrease high-strength wastewater discharges by \$11,700.

Pollutant Reduction:

51,000 gallons of product

84,000 lbs. of COD

18,000 lbs. of TSS

Cost Savings:

\$9,200

Status:

Proposed

MnTAP staff members went on to recommend sharing BMPs with another Minnesota beverage manufacturer that was facing wastewater compliance challenges. If this facility carries out similar training sessions, it would have the potential to reduce the product loss to the drains by approximately 51,000 gallons, reduce 83,000 pounds of chemical oxygen demand (COD) and 18,000 pounds of total suspended solids (TSS) being discharged to wastewater, and save \$9,200 in strength charges annually.

Conclusion

Following MnTAP's investigation and reporting, both facilities gained a clearer picture of the opportunities for raw ingredient saving and wastewater load reduction. Proper filler startup and shutdown procedures and BMPs can improve raw ingredient usage, reduce wastewater loading, and reduce costs. MnTAP has used the learnings from these studies in subsequent investigations of other food and beverage manufacturers in Minnesota.

