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Organization Background

Kemps, LLC is a dairy manufacturing and supplying company that originated in Minneapolis, Minnesota. At Kemps-Farmington, they produce sour cream, cottage cheese, and yogurt, which come in a variety of flavors. Currently, 132 employees work at the facility.



“I had a wonderful opportunity to work at Kemps-Farmington and learned a lot about dairy production. I had a great time working with various employees at Kemps in understanding the water usage of the facility. I am glad I was able to apply my knowledge and skills to be able to reduce water usage. I am grateful to MnTAP for giving me this wonderful opportunity and Kemps-Farmington for their support during my project.” ~ SR

Project Background

In 2021, Kemps-Farmington used about 131 million gallons of water for various processes in the facility. The objective of this project is to quantify the water usage and make recommendations to conserve water based on the water usage. Additionally, energy savings from water recommendations were considered.

Incentives To Change

Kemps values continuous improvement in many aspects of their facilities. Specifically, Kemps-Farmington set a goal to reduce water usage by 7% by the end of 2022. Additionally, the facility is taking precautions against the drought occurring in Minnesota.

SOLUTIONS

Install a Condensate Pump

Condensate within the steam loop is unable to reach the condensate recovery tank and is going the drain. The installation of a condensate pump will ensure that the condensate reaches the condensate recovery tank, and later heated back to steam. The pump would save 7,000,000 gallons of water, 34,000 therms, and 2,450 kWh per year, totaling an annual savings of \$74,150.

Tighten Leaks

Leaks occur for various reasons such as poor condition of the hose, gasket, or pipe. Tightening the leaks would save 116,000 gallons of water and 65 kWh, summing up to \$668 per year.

Improve Product Rinse

When switching between pasteurizing sour cream and yogurt, the pasteurized milk loop (PML) needs to be directed to the drain and rinsed out with softened water, which removes any product and avoids contamination. However, once the water is clear of any product, the PML is redirected to its original configuration. Currently, the redirection is accomplished by operators later than when the water is clear, sending excess water to the drain. The product rinse process can improve with the installation of a three-way valve attached with an optic sensor, which would record the clearness of water and control the direction of the flow based on the presence of product or not. The addition of the three-way valve with an optic sensor would save 365,000 gallons of water and 200 kWh, with an annual savings of \$2,100.

“Our main goal for the year was to minimize water waste and increase water conservation here at Kemps. With Sai’s help we were able to go above and beyond our goal. Sai was thorough, intuitive, hardworking and a true asset to Kemps. He was able to focus on our areas of biggest waste and has made a significant impact at our plant.”

Peter Stollberg, Kemps Quality Assurance, Sanitation, and Compliance Supervisor

Solutions

Switch to Conductivity-based Rinses

The facility uses Clean In-Place (CIP) systems for intensive sanitation in large equipment or pipelines. Each CIP cycle goes through caustic and acid washes, which are followed up with rinses to clear out the chemicals from the wash. At the moment, nine out of 11 CIP systems operate on a preset time schedule, which causes the rinses to run for longer than needed. The recommendation is to switch to conductivity-based rinses, which would stop the rinse when the water's conductivity is at normal level. By switching from time-based rinses to conductivity-based rinses, water usage would be reduced by 5,860,000 gallons of water and 3,300 kWh per year, saving \$33,600 annually.



Install Scrubber

The reverse osmosis (RO) reject water and softener regeneration water could be reused after necessary polishing, which can be accomplished by installing a scrubber. In doing so, 23,650,000 gallons of water each year could be reused, saving 7,300 kWh and \$138,500 annually. Currently, the results for a water sample of the softener regeneration water is pending and the type of scrubber needs to be investigated further.

Recommendation	Annual Reduction	Annual Savings	Status
Install Condensate Pump	7,000,000 gal water 34,000 therms 2,450 kWh	\$74,150	Implemented
Tighten Leaks	116,000 gal water 65 kWh	\$668	Implementing
Improve Product Rinse	365,000 gal water 200 kWh	\$2,100	Recommended
Switch to Conductivity-based Rinses	5,860,000 gal water 3,300 kWh	\$33,600	Recommended
Install Scrubber	23,650,000 gal water 7,300 kWh	\$138,500	Needs further analysis

MnTAP Advisor: Kevin Philpy, Senior Engineer