



Lamb Weston / RDO Frozen



Micah Calderon

Mechanical Engineering,
North Dakota State University

Company Background

The Lamb Weston/RDO Frozen Foods plant in Park Rapids produces quality potato products that are distributed to restaurants and retail grocery stores throughout North America. The plant, which employs 480, was originally constructed in 1981 and has been expanded several times.



“The MnTAP internship was a great opportunity to combine school with valuable real-world experience. Building project management, communication, and troubleshooting skills were just a few of the benefits” - MC

Project Background

This project contributes to efforts aimed at water, energy and GHG emissions reductions for Lamb Weston. The intern worked with MnTAP and Lamb Weston/RDO Frozen staff to evaluate the potato blanching process for potential improvements. An additional aspect of this project assessed opportunities to optimize the use of processing aids.

Incentives To Change

Efficient resource usage reduces costs and allows the plant to engage in larger opportunities. The potato blanching process is one of the larger water users in the plant. Using hot water more efficiently reduces demand on well-water supply, boilers and the wastewater treatment system. The MnTAP intern project objectives of improving the efficiency of water, chemical and energy usage align well with Lamb Weston/RDO Frozen’s sustainability goals.



“From our experience, having a MnTAP internship really opened our eyes to potential opportunities that we had not previously recognized or improved. Additionally, learning how the MnTAP internship partnerships worked increased our future dynamics with internships! We look forward to more opportunities with MnTAP.”

*~ Justin Mitteness
Plant Quality Manager, Lamb Weston/RDO Frozen*

Solutions

Optimize Blancher Flush Rates

The blanching process uses hot water to remove excess starches and sugars from the cut potatoes. The intern monitored turbidity of multiple stages of the blancher water with the quality assurance team. Flush rates of the system were varied and additional data was collected on a wide variety of products. These tests show that flow rates could be varied on select products which would save nearly 10 million gallons of hot water a year. An automated sensor and control system is also possible, however additional testing will be required.

Optimize Sanitizer Stations

Foaming foot-sanitizing stations operate at each of the 10 entry points to the production areas. The intern monitored and adjusted the length of time the foam was applied and the time between applications. Optimizing the settings assured suitable foam coverage and minimized the use of sanitizing chemicals. This change minimized the amount of chemical being washed to the on-site wastewater treatment plant and reduced the time mixing and delivering the materials to the stations.

Return Product Samples to Production Line

Currently, product in 5 or 6 lbs packages is taken off of the production line to run the quality assurance tests. Testing only requires 4 pounds which leaves 1 or 2 lbs left over to be sent off-site as cattle feed. Procedures were proposed to reintroduce left over samples to the production line with estimated savings of 42,000 lbs valued at \$13,000.

Install LED Lighting

The plant has 374 high bay lighting fixtures that could be upgraded to LED technology. Options were researched with the help of the electric utility, consultants and the company electrical contractor. Several sample fixtures were installed and one selected for locations requiring enclosed fixtures suitable for cleaning in the food process cleaning areas. New LED light fixtures would save 33% on the electricity costs and reduce demand as they are usually on 24/7, however the reduced maintenance cost of labor is very significant in justifying the change.

Install VFD on Boiler Feed Water Pump

The current 150 horsepower boiler feed water pump runs at one speed. When the water demand drops, the excess water is recirculated to the de-aerator tank. Studying the water demand, measuring amperage required to pump only the amount needed, and calculating the potential savings results in 340,000 kWh. Motor control center and automation programming costs require further analysis in order to justify the change.

Reuse RO Reject Water

The current reverse osmosis (RO) filtration system operates at a 3:1 efficiency and rejects 6,300,000 gallons of water per year. Rejected water has a high mineral content and high conductivity. It is currently sent to the on-site wastewater treatment plant. Alternative uses for this water were evaluated. The potato receiving area is the most likely opportunity for reject water reuse, however, the cost of piping and additional disinfection limit the cost effectiveness of this suggestion at this time. Additional analysis is required.

Recommendation	Annual Reduction	Annual Savings	Status
Optimize blancher flush rates	59,000 therms 9,900,000 gallons	\$41,000	Recommended
Optimize sanitizer stations	3,200 gallons 5,000 lbs of chemical	\$11,000	Implemented
Return product samples to production line	42,000 lbs of product	\$13,000	Recommended
Install LED lighting	246,000 kWh 240 labor hours 300 lbs lamps/ballasts	\$41,000	Recommended
Install VFD on feed water pump	340,000 kWh	\$31,000	Investigating
Reuse RO reject water	6,300,000 gallons	\$11,000	Further investigation needed

MnTAP Advisor: Paul Pagel, Senior Engineer