



Old Dutch Foods



Madison Best

Bioproducts & Biosystems Engineering
University of Minnesota Twin Cities

Company Background

Old Dutch Foods is a snack food manufacturing company located throughout the upper Midwest and Canada. The Roseville, MN facility produces multiple varieties of potato chips while the St. Anthony, MN facility produces corn chips and popcorn. These facilities process raw materials such as field potatoes and dent corn into valuable products, package, and distribute them to customers.



“Our intern was extremely focused and results orientated. She identified several items that we will be implementing in the near future. There is always opportunity and room for improvement in every process, so by having our MnTAP intern dedicating their time analyzing them good things happen.” ~ Bob Erkkila, Plant Manager

“Working as an Intern at Old Dutch was a great opportunity for me to gain experience working in a food manufacturing environment. Seeing what goes into the implementation of sustainable solutions on such a large scale was a beneficial experience, and I was able to learn a lot about the intersection of engineering, business and sustainability. The internship greatly influenced my choice to pursue a future career in which I can utilize my engineering and communication skills to influence manufacturing practices.” ~ MB

Project Background

Old Dutch consumes approximately 35 million gallons of water per year at its Roseville location and 20 million gallons of water at its St. Anthony location. A major goal of the project was to identify and quantify the water intensive steps in production and identify opportunities for reduction or reuse. Recommendations were developed based on these findings to lower overall water usage.

Incentives To Change

Over the past several years, the company has noticed increasing water usage and operational costs at its Roseville location which is a primary motivator for water reduction. The cost of water at the St. Anthony location is the primary motivation for reductions at this facility. Old Dutch understands the importance of making investments that will benefit not only the company but also the environment in the long run.



SOLUTIONS

Add Valve on Washer Pump

Water is continuously supplied to the washer as potatoes pass through, but the water is not completely turned off between potato unloading shifts. A valve can be installed on the potato washer to eliminate unnecessary water use when potatoes are not being unloaded. This can lead to 460,000 gallons of water and \$1,800 in savings every year.

Replace Potato Washer Nozzles

There are currently 17 high-pressure nozzles used to wash incoming potatoes and 9 use a higher flow rate than the others (2.3 gpm instead of 1.5 gpm). By exchanging these nozzles for ones of lower capacity, 600,000 gallons of water can be saved every year along with \$2,000.

Install Variable Frequency Drive on Washer pump

A reciprocating pump moves water to the washer and is operating at full capacity. Lowering the motor speed by 35% with a VFD can lower pump water use by 950,000 gallons and electricity use by 37,000 kWh every year. These savings have a \$5,000 yearly financial benefit.

Solutions

Recycle Water to Peeler

Both fresh water and recycled water from the recovery station are used to spray potatoes. By adding a new spray bar supplied with recycled water, the fresh water spray bar can be replaced. This will allow 890,000 gallons to be conserved, saving \$3,600 annually.

Eliminate Freshwater Fryer Hose

A hose was discovered supplying fresh water to clean a pan on one of the fryers. By eliminating this hose and replacing it with a hose that uses recycled water instead, 3,000,000 gallons and \$12,000 will be saved every year.

Add Locking Valve and Increase Recycled Water Use at Fryer

The water used to wash the potato slices before frying can be reduced by 50% by installing a locking valve on the freshwater supply and supplementing with recycled water. These two actions would save 3,750,000 gallons and \$16,000 per year.

Add Hydrocyclones to Water Recycling System

An additional 1,250,000 gallons of water can be saved by installing filters (hydrocyclones) to the fryer sprayer effluent. This will reduce the starch content in the water

so more recycled water can be used to replace fresh water, saving an additional \$4,000 every year.

Automate Water Recycling System

By accurately changing the amount of recycled water that is processed and sent to various parts of the facility, more recycled water will be utilized, reducing the incoming freshwater stream. These updates could save 3,000,000 gallons of water and \$29,000 annually.

Install Centrifuge at St. Anthony Location

A water recycling system can be implemented at Happy's by installing a disk stack centrifuge to clean wastewater. By removing a majority of dissolved solids and testing for the proper levels of contaminants water can be recycled to wash and soak corn to reduce fresh water use by 5,000,000 gallons leading to a cost savings of \$100,000 annually.

Replace Nozzles at St. Anthony Location

The water used to wash corn after soaking can be reduced by switching to low flow nozzles. The current nozzle flow rate is 1.4 gpm but a 0.85 gpm model also exists and can be used instead. Lower capacity nozzles have the potential to save 750,000 gallons and \$15,000 per year.

Recommendation	Annual Reduction	Annual Savings	Status
Add valve on washer pump	460,000 gallons	\$1,800	Planned
Replace potato washer nozzles	600,000 gallons	\$2,000	Investigating
Install variable frequency drive on washer pump	950,000 gallons 37,000 kWh	\$5,000	Recommended
Recycle water to peeler	890,000 gallons	\$3,600	Recommended
Eliminate freshwater fryer hose	3,000,000 gallons	\$12,000	Implemented
Add locking valve and increase recycled water use at fryer	3,750,000 gallons	\$15,000	Implementing
Add hydrocyclones to water recycling system	1,250,000 gallons	\$4,000	Recommended
Automate water recycling system	3,000,000 gallons	\$29,000	Recommended
Install centrifuge at St. Anthony location	5,000,000 gallons	\$100,000	Recommended
Replace nozzles at St. Anthony location	750,000 gallons	\$15,000	Recommended

MnTAP Advisor: Brent Vizanko, Associate Engineer

2020 | MnTAP SOLUTIONS | www.mntap.umn.edu