

Old Dutch Foods: Chipping Away at Water Conservation

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Driven to DiscoverSM

Company Background

- **Old Dutch Foods**
 - **Snack food manufacturer**
 - **HQ: Roseville, MN**
 - Potato chips in a variety of types and flavors
 - **Happy's: St. Anthony, MN**
 - Corn chips and popcorn
- **Why this project at this company**
 - **Need to quantify water use in each step of production**
 - **Reduce water use in washing and processing of raw materials**



Overview

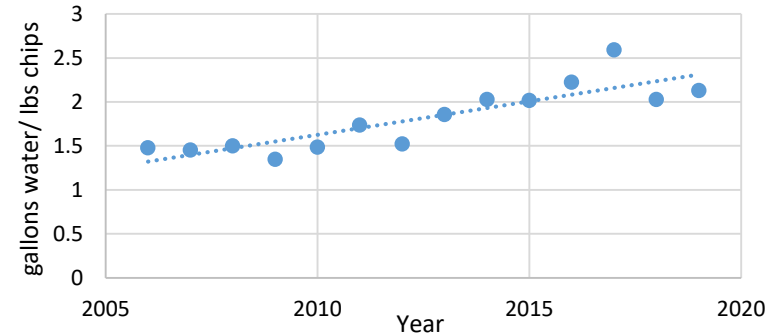
Happy's Potato Chips

- The high price of city water is incentive for water use reduction
- Total water use is less visible than Roseville location

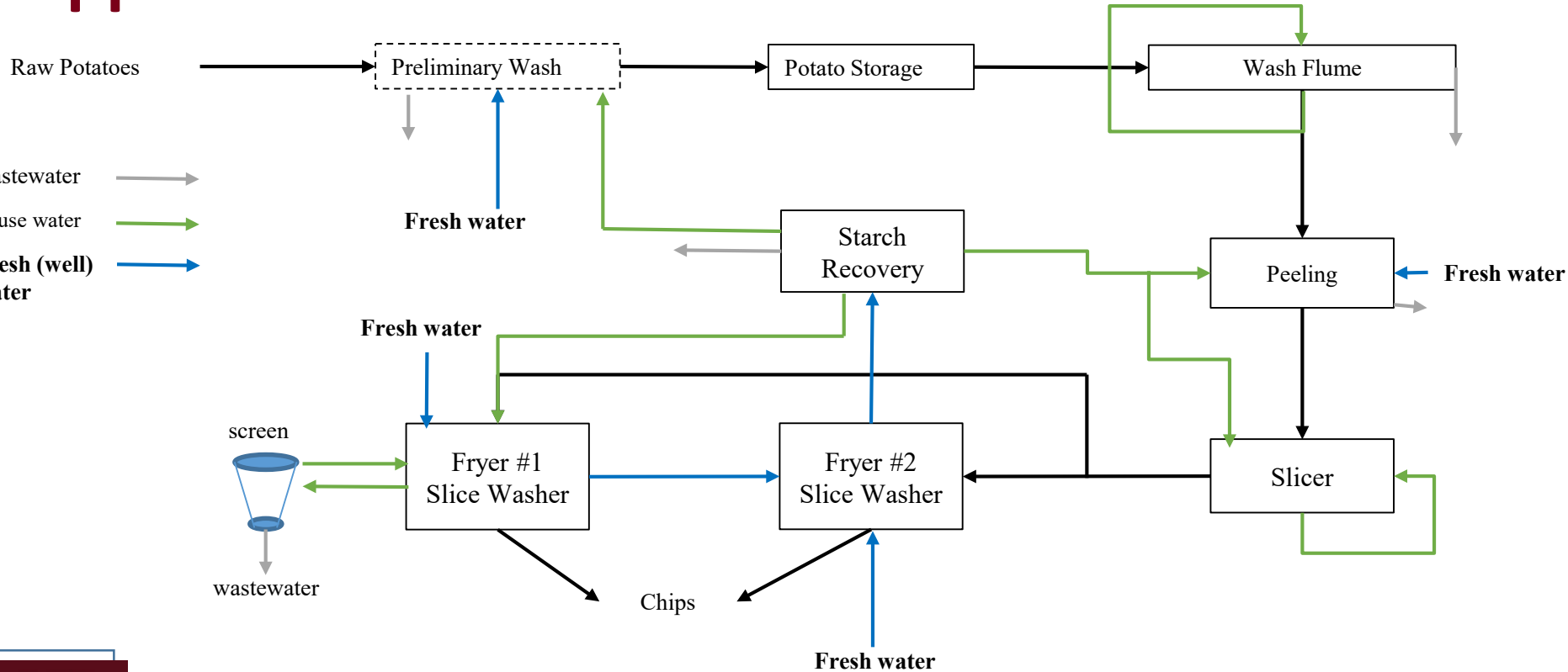
Old Dutch Foods

- Motivation for reduction is to slow increasing usage cost of water disposal
- Water is used to process and wash potatoes in several steps

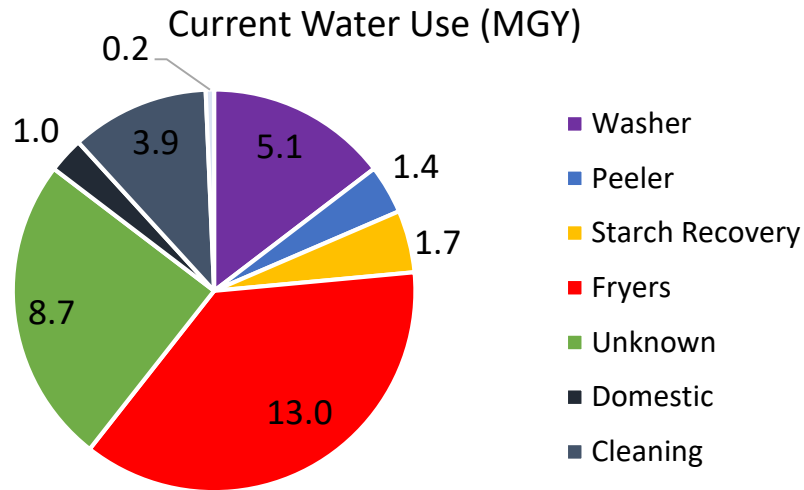
Water Consumption



Approach: Old Dutch Foods



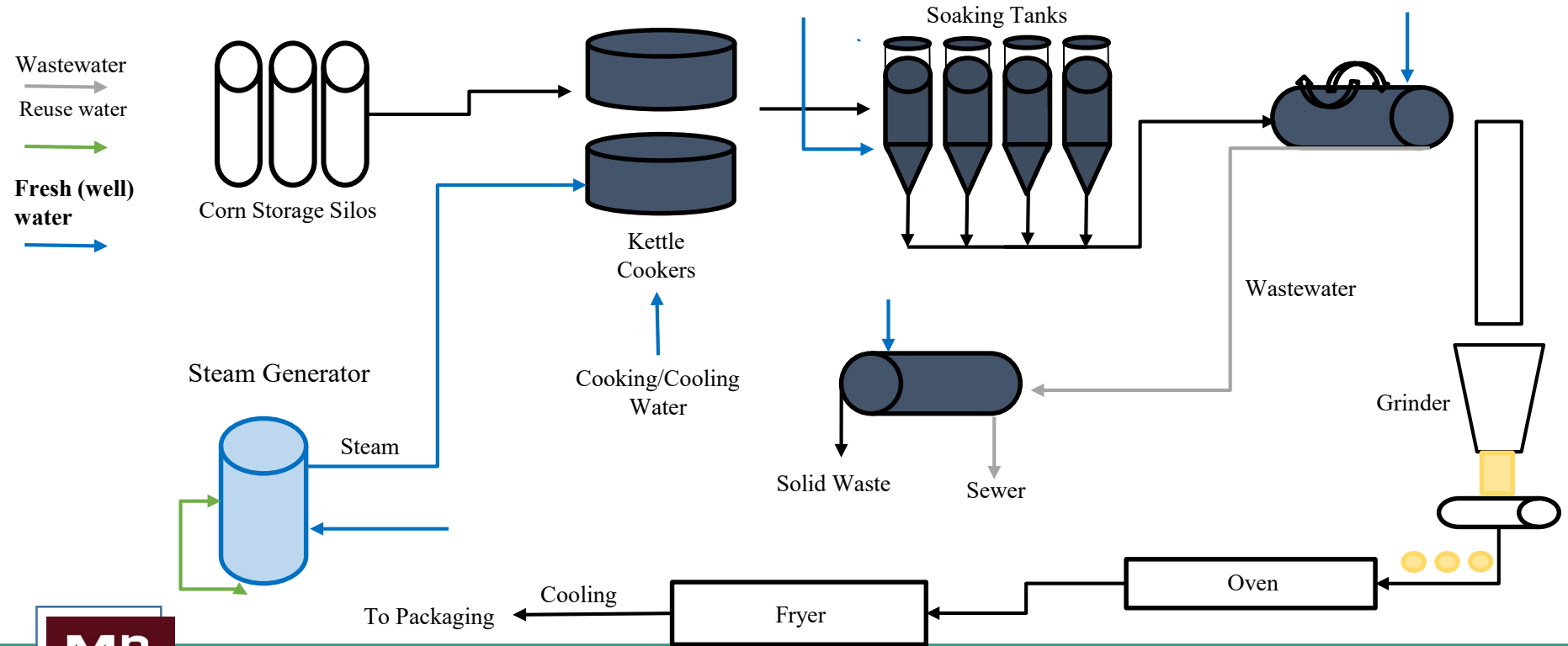
Approach: Old Dutch Foods



Areas of Emphasis

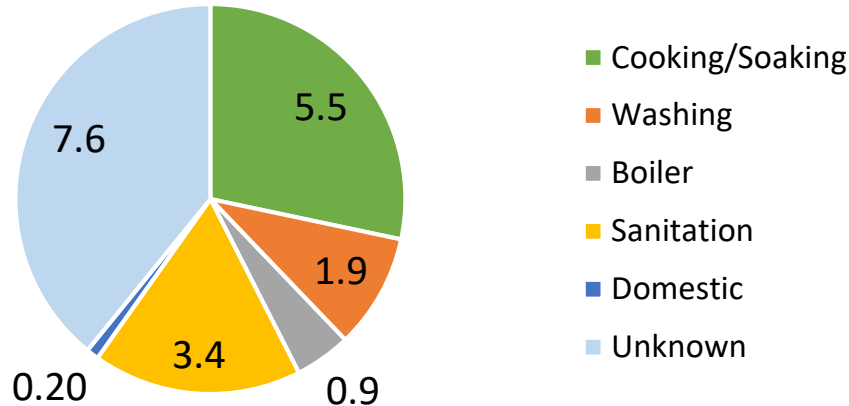
- Fryers
- Washer
- Starch Recovery
- Peeler

Approach: Happy's Potato Chip Co.



Approach: Happy's Potato Chip Co.

Current Water Use (MGY)



Areas of Emphasis

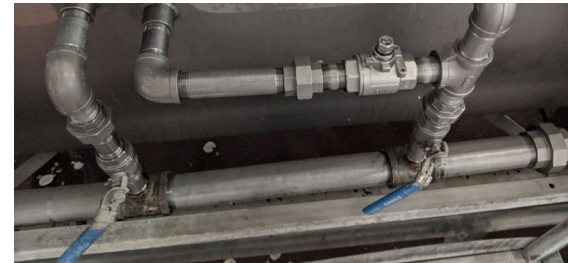
- Washing
- Water disposal and recycling

Reduce Sprayer Flow

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Fryer 2a: Locking valves	2,500,000 gallons	\$400	\$10,000	2 weeks	Implementing

The flow rate and water consumption can be reduced by 33%

- **Implemented with new globe valves**



Solutions (examples below)

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Washer 1: Valve for water reduction	460,000 gallons	\$1,000	\$1,800	10 months	Planned
Washer 2: Replacement nozzles	600,000 gallons	\$500	\$2,000	3 months	Investigating
Washer 3: Variable Frequency Drive	950,000 gallons 37,000 kWh	\$6,000	\$5,000	1.2 years	Recommended
Peeler: Recycle water	890,000 gallons	\$500	\$3,600	2 months	Recommended
Fryer 1: Eliminate fryer hose	3,000,000 gallons	\$0	\$12,000	Immediate	Implemented
*Fryer 2a: Locking valves	2,500,000 gallons	\$400	\$10,000	2 weeks	Implementing
Fryer 2b: Incorporate recycled water	3,750,000 gallons	\$1,500	\$15,500	1 month	Implementing

*Savings are not additive

Solutions (continued)

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
*Fryer 2c: Hydrocyclones	5,000,000 gallons	\$70,000	\$20,000	3.5 years	Recommended
*Starch Recovery 1a: Automated supply	1,250,000 gallons	\$3,200	\$11,000	4 months	Recommended
*Starch Recovery 1b: Automated distribution	3,000,000 gallons	\$7,000	\$28,000	3 months	Recommended
Happy's: Centrifuge	1,800,000 gallons	\$350,000	\$100,000	3.5 years	Recommended
Happy's: Corn washing nozzles	750,000 gallons	\$100	\$15,000	1 week	Recommended

*Savings are not additive



New Experiences and Personal Benefits

- Exposure to manufacturing environment
- Combination of independent research and team collaboration
- Importance of communication
- Obtaining new types of data, different from academic environment