



Water Conservation at Michael Foods Inc.

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UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Company Background

**MICHAEL
FOODS** INC.

- **Nation-Wide Manufacturer**
 - Egg, potato, and dried-meat products
 - 17 plants and 9 farms
- **Chaska Plant**
 - South-West Metro
 - 369 employees
 - Hashbrowns, diced and mashed potatoes
 - 259 million pounds produced per year



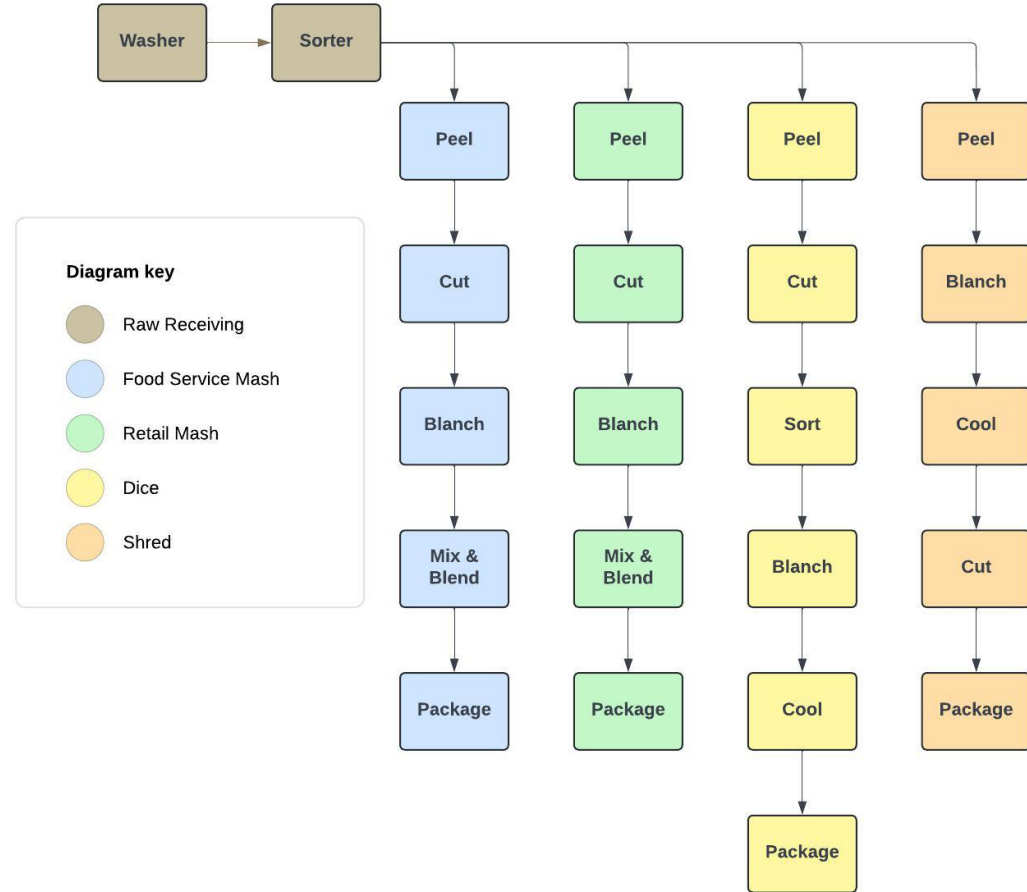
Incentive to Change

- **Corporate Goal:**
 - Waste minimization
 - Water conservation
- **Plant Goal:**
 - Water-intensive process
 - Switch from well to municipal water
 - 160 million gallons used annually

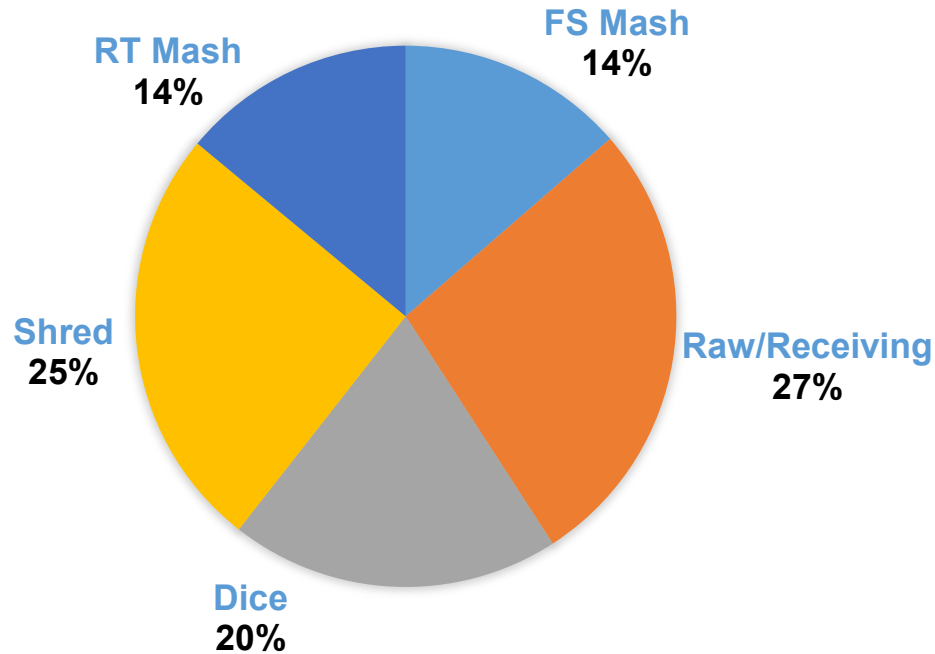


General Process

- **Raw Receiving**
 - Washing, sorting, storing
- **Peel/Cook**
 - Peeling, brushing, cutting, cooking
- **Clean Room**
 - Flavoring, cooling, packaging



PROCESS WATER USE



*Excludes water from Utility Room, Waste Room, CIP

Approach

- Flow Mapping
- Understanding Equipment
- Researching Options
- Recommending

Raw Receiving

- **80,000 gallons daily**
 - 25 million gallons annually
 - 27% of annual water use
- **Washer**
 - Uses majority of water in Raw/Receiving
 - Washer fill + sprayers
 - Conveyor system to move potatoes



Washer Recommendations

- **Install sprayer flow restrictor**

- Implementation Cost:

- <\$100

- Annual Savings:

- 3.6 million gallons

- \$38,000

- **Automate sprayer shut off**

- Implementation Cost:

- \$1,000

- Annual Savings:

- 520,000 gallons

- \$5,000



Peel Starch Separators

Background

- Large rotating drum
 - Require 5 GPM
 - Removes peel
- Lines 2, 3, and 4
 - Running almost 24/7
 - Using over 10 GPM

Recommendations

- Install flow restrictors
 - Implementation cost:
 - <\$500
 - Annual Savings
 - 4.7 million gallons
 - \$49,000



Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Install Flow Restrictors on Peel Starch Separators	4.7 million gallons	<\$500	\$49,000	4 days	Recommended
Install Flow Restrictor on Washer Sprayers	3.6 million gallons	<\$100	\$38,000	1 day	Recommended
Automate Raw/Receiving Sprayer Shut Off	520,000 gallons	\$1,000	\$5,000	2 months	Recommended
Automate FS Mash Water Shut-Off	180,000 gallons	\$5,000	\$2,000	2.5 years	Tentatively Recommended
Install Nozzle on USDA Hose	75,000 gallons	<\$100	\$800	2 months	Recommended
Insulate Steam Pipes	54,000 kWh	\$5,000	\$6,500	9 months	Recommended

5.7% water reduction if all recommendations are implemented

Personal Benefits

- Opportunity to apply concepts from coursework
- Experience in an industrial setting
- Problem solving skills
- Data collection skills
- Sample product from R&D

