

# Dairy Product Conservation and Waste Minimization at Kemps

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**Driven to Discover<sup>SM</sup>**

# Company Background

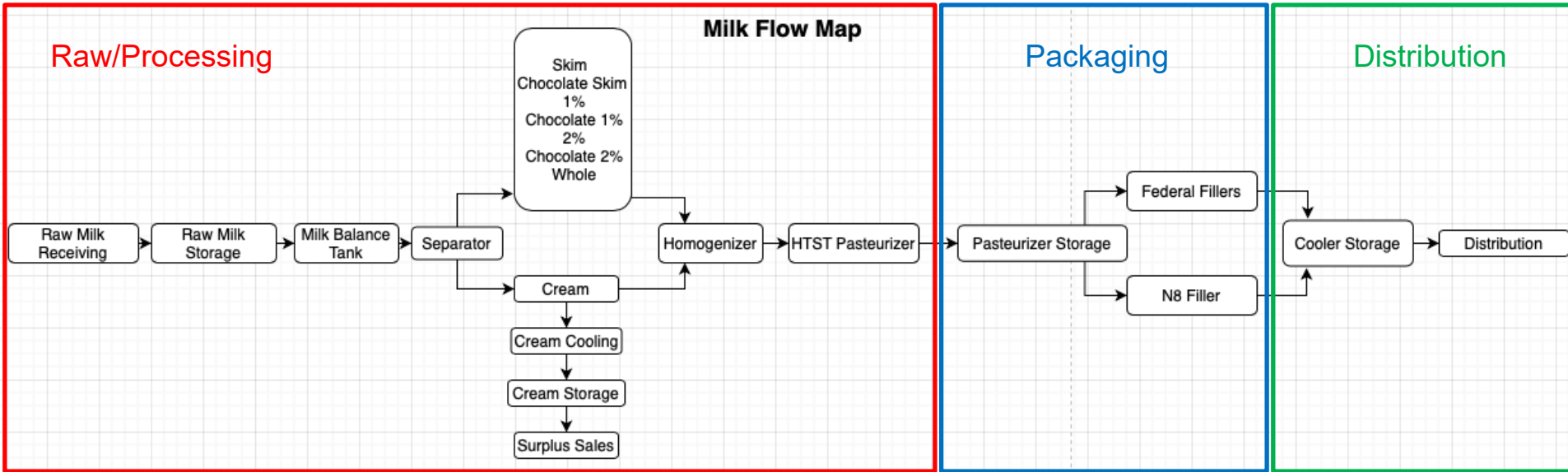
## Kemps - North Minneapolis

- Manufacturer of Packaged Milk and Cream
- Built in 1887, Kemps in 1979
- 120 employees + 60 drivers
- 51,000,000 gal of milk annually (165,000 gal per day)



## Raw/Processing

### Milk Flow Map



# Incentives to Change

## Dairy Product Conservation

- **Reduce product lost to wastewater**
  - Average Shrink of 2%
  - Shrink: 100 jugs made, 98 jugs make it to distribution
- **Evaluate key processes for milk loss**
- **Decrease MCES strength charges resulting from milk loss to drain**



# Rework in Cooler Room

**Rework: reprocessing into saleable product**

**Human Food By-Product (Slop): Reprocessing into animal feed**

- Rework becomes slop if within 7 days of expiration
- Trucking and disposal





# Rework in Cooler Room

## Current Process

- Product for rework stored throughout cooler rooms
  - Marked by bottle flipped over
- Rework moved once a week
  - More often if time
- Any product unable to be reworked is sent to human food by-product



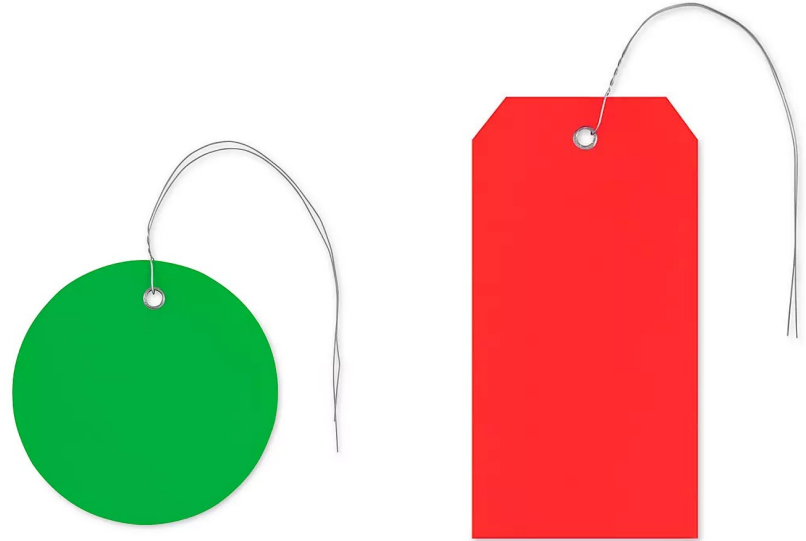
# Recommendations for Rework

## Proposed Solution

- Implement reusable red and green tags to mark rework and slop
- Allows rework to be easily distinguished from slop
- Cost: \$140 per year

## Potential Savings

- 233,000 gallons of milk
- \$284,000 in revenue



# Recommendations for Rework

## Proposed Solution

- Additional employee to pick up product for rework
- Prevents rework from being missed and sent to slop
- Cost: \$98,000

## Potential Savings

- 233,000 gallons of milk
- \$123,000 of costs in slop transport
- 1.24 metric tons of CO<sub>2</sub>





# Federal Fillers

Rotary filler for half and full gallon jugs

- **Start Up:**
  - Milk is run through to rinse out sanitizer
  - Milk flow is shut off manually once sanitizer is removed
- **Shut Down:**
  - At end of run, remaining milk is discharged to floor drain
  - Bowl and lines are rinsed before cleaning



# Recommendations for Federal Fillers

## Proposed Solution for Start Up

- Implement an inline conductivity sensor before bowl of filler
- Eliminates operator variability in shutoff time
- Cost: TBD

## Potential Annual Savings

- 94,000 gallons of milk
- \$114,000 in revenue
- \$38,000 in strength charges



# Recommendations for Federal Fillers

## Proposed Solution for Shut Down

- Best practice sharing between operators
- Reduce milk left in bowl before filler is shut down
- Cost: \$1,000

## Potential Annual Savings

- 29,000 gallons of milk
- \$35,000 in revenue
- \$11,700 in strength charges



# Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Implement tags to distinguish rework and slop	233,000 gal milk 1.24 metric tons of CO <sub>2</sub>	\$140	\$123,000 + \$284,000 product saved	1 day	Recommended
Designate employee to oversee rework management	--	\$98,000	--	3 months	Recommended
Implement best practice for filler shutdown	29,000 gal milk	\$1,000	Revenue: \$35,000  Strength Charges: \$11,700	2 weeks	Recommended
Install conductivity probe prior to filler bowl	94,000 gal milk	TBD	Revenue: \$114,000  Strength Charges: \$38,000	TBD	Recommended



# Future Savings Opportunities

- **Implement pressure relief valve and use air blower to clear raw lines**
- **Evaluate process for line leaks**
- **Capture sanitizer milk mixture from fillers and send to digester**



# Personal Benefits

- Experience working in industry with professionals
- Gained knowledge about dairy facilities
- Discovered ways to promote conservation

