



Shelly Tippelt

Melrose Dairy Proteins

Reducing Product Loss During Shutdown

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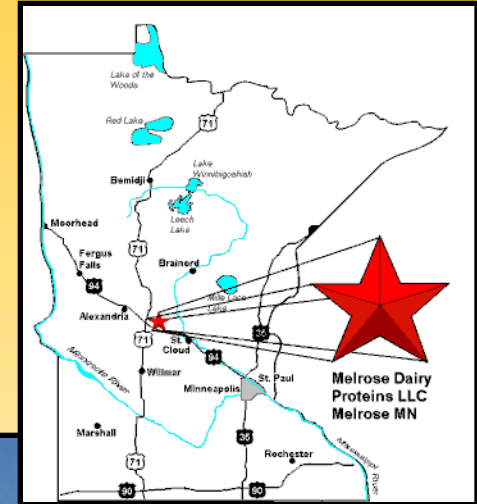


UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

MDP Overview

- First started cheese in 1968 as Kraft
- Joint venture of Land O'Lakes & Dairy Farmers of America since 2001
- 126 employees



MDP Overview

- Whey Protein Concentrate (WPC)
 - Kraft Foods
 - Land O'Lakes
 - Bongards' Creamery
- Concentrated Whey & Milk Permeate
 - Proliant Dairy
- Cheese Production (CM and AM)
 - Land O'Lakes
 - Kraft Foods
 - DairiConcepts



Motivations for Change

- Significant amount of AM product is lost during shutdown due to cleaning and sanitizing thin film evaporators
- Reduce overall waste/increase product yield
- Cost savings from process improvements

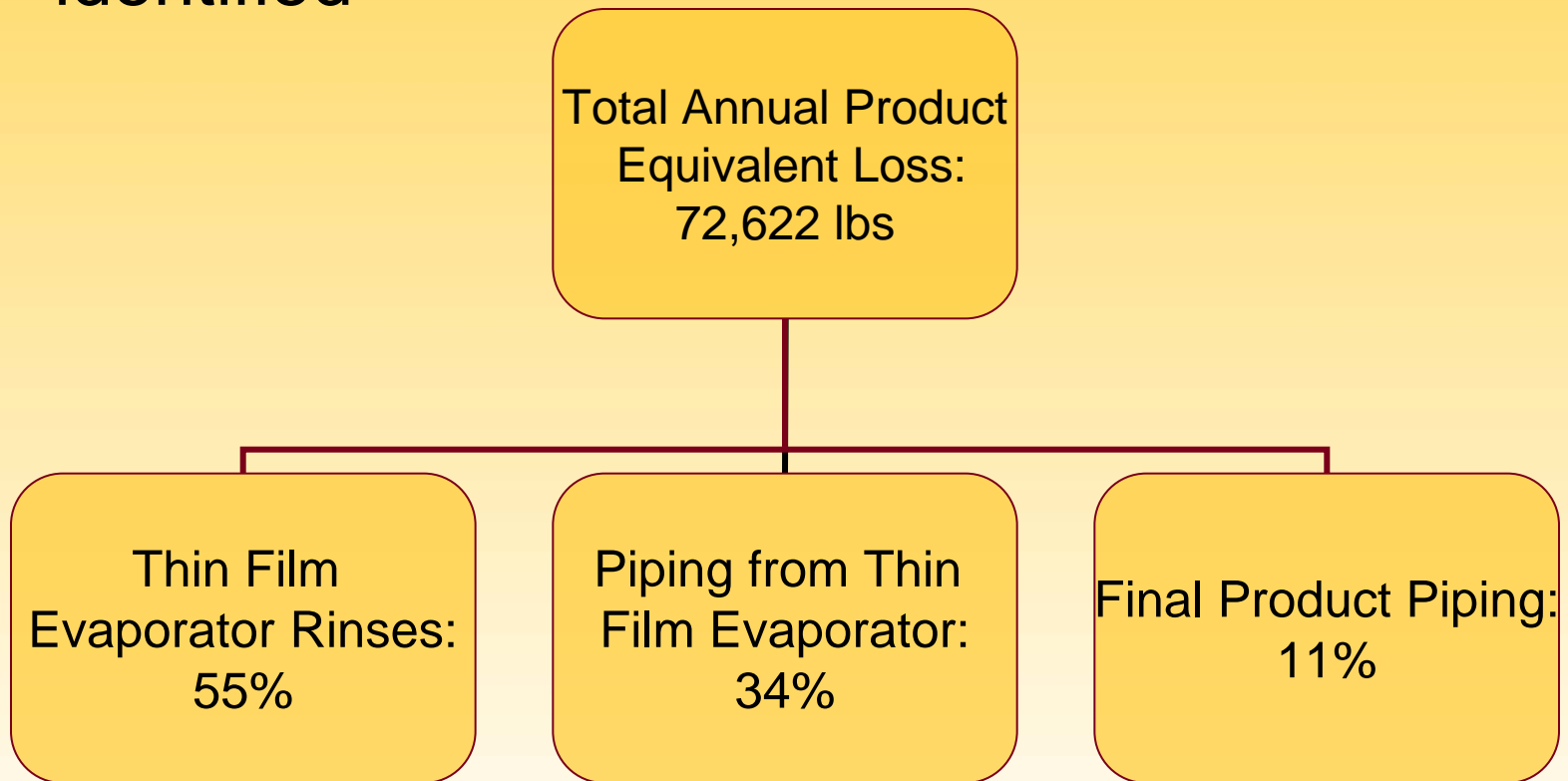


Reasons for MnTAP Assistance

- Projects tried in the past were unsuccessful—need more time
- Fresh outlook needed
- Cost effective resource that doesn't add headcount

Approach

- Total lost product was quantified and sources identified



Determining Inefficient Processes

- Process observation
- Product loss analysis
- Quality analysis of lost product
- Discussions with management and operators
- Solution trials

Solids Lost in Pipe Cleaning

- Background
 - Final product piped from evaporator to barrel filler
 - Evaporator shutdown every other day for cleaning
 - Flow stopped with product in pipes & pipes have to be cleaned
- Problem
 - Product is lost
- Possible Solutions
 - Use different pipe material to enable easy clean out
 - Install a pigging system

Solids Lost in Shutdown Rinse

- Background
 - Thin-film evaporator is flushed out before Clean In Place (CIP)
 - Rinsings go to animal feed or drain
- Problem
 - Product is lost
- Possible Solutions
 - Change flow rate, timing, and/or temperature of flush to reduce dilution of product
 - Collect rinsings, heat treat, & add back into process



Successful Implementation

- Pigging system being implemented
 - Estimated 32,000 lbs product recovered annually adding up to over \$42,000
 - Approximately \$3,000 in equipment (~1 month payback)
 - Improve operator's working conditions



Promising Recommendations

- Collect thin-film evaporator rinsings and add back into process
 - Estimated 40,000 lbs product equivalence recovered annually adding up to over \$52,000
 - Increase process yield
 - Reduce raw material quantities
 - Improve sanitation and working conditions
 - Decrease potable water usage
 - Reduce effluent loading

Personal Benefits

- Real world experience
- Networking opportunities
- Process exposure