SINGLE-PHASE CLEANING CASE STUDY

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Cheese Manufacturer Increases Capacity While Reducing Water Use Through Single-Phase Cleaning

Challenge

A large cheese manufacturer processing approximately 3.8 million pounds of milk per day was preparing for future production growth. However, the facility was operating near the capacity of its onsite wastewater treatment system, creating concerns about water usage, wastewater volume, and available production time. The company wanted to:

- Increase production without major capital investment
- Reduce water consumption and wastewater loading
- Shorten CIP cycles to gain more production time
- Simplify sanitation operations and chemical handling

Solution

Working with Hydrite, the facility implemented a single-phase cleaning strategy across multiple CIP systems, including raw intake, HTST, DMM, and select whey processing circuits. The program was designed to reduce or eliminate traditional acid wash steps while maintaining sanitation performance and minimizing water consumption.

The alternative single-phase cleaning program centered on Millennium No. 254 for selected alkaline wash applications, supported by Hydrite acidified sanitizer technology:

Millennium No. 254: A complete formulated alkaline cleaner that combines caustic alkalinity, DTPA-based chelation, specialty chelants for hard-water and calcium oxalate scale control, defoaming agents, and surfactants.

Chelation Package: Maintains mineral control during the caustic phase so mineral deposits can be addressed without always requiring a separate acid wash.

Surfactant System: Improves surface wetting and soil removal while supporting foam control during high-flow CIP circulation.

Concentrated Formulation: Reduces the need for additional product storage, manual additions, and frequent chemical deliveries.

Acidified Sanitizer Step: Used selectively as a low-pH rinse or sanitizer step to support sanitation performance while avoiding a full hot acid wash in validated applications.

The solution was validated through ATP testing, rinse-water analysis, thermophile monitoring, visual inspections, and ongoing performance verification.

Results

By reducing water usage, wastewater loading, and CIP-related downtime, the facility created additional production capacity without expanding its wastewater infrastructure.

Increased Production Capacity

By shortening sanitation cycles and improving equipment availability, the facility unlocked additional production capacity without major capital investment.

The gains translated into an average increase of 25 cheese vats per month, or approximately **3.6 to 3.7 million pounds of additional cheese production each year.**

Faster CIP Cycles

Single-phase cleaning reduced sanitation time across several critical systems:

Area	Time Savings
HTST Systems	Up to 45 minutes per cycle
DMM Systems	40-48 minutes per cycle
Intake CIP Operations	Up to 580 minutes of cumulative sanitation time reduction

Significant Water Savings

The optimization project generated measurable water reductions across multiple production areas, with more than **10.5 million gallons of projected annual water savings.** Key contributors included:

- **Intake operations:** ~4.0 million gallons/year
- **DMM and line circuits:** ~4.2 million gallons/year
- **Milk HTST systems:** ~1.0 million gallons/year
- **Whey plant operations:** ~1.3 million gallons/year

The facility also reduced wastewater flow from approximately 350,000 gallons per day to 270,000 gallons per day, helping create capacity for future growth.

Operational Improvements

The facility also realized several operational benefits:

- Reduced chlorine use in targeted CIP applications
- Reduced acid consumption
- Approximately 7,800 gallons less chemistry usage annually
- Less manual chemical handling
- Reduced maintenance associated with chemical delivery systems
- Improved employee safety by minimizing chemical exposure

Additionally, mineral scale control improvements allowed the plant to extend descaling frequency from approximately monthly to every two months, reducing maintenance downtime.

HYDRITE Providing Creative Solutions

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