CIP optimization of oat-based milk substitutes process

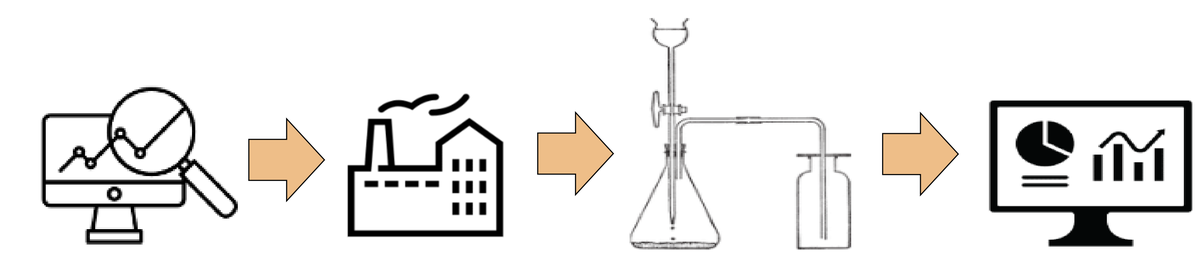
Roosa Pelkonen, Doc. Oskar Laaksonen[1] and Krister Kumpulainen[2]
Department of Life Technologies, University of Turku[1], Raisio[2]
FOOD DEVELOPMENT

1 Introduction

The popularity of plant-based foods has grown interested in nutritional, environmental and climate reasons. With the development of oat-based milk substitutes, a new factory was opened, the washing processes of which were not sufficiently optimized at the time of opening. The purpose of the research is to optimize CIP (Clean In Place) washing of oat-based milk substitutes by reducing water consumption. The goal of the work is to make financial savings and reduce the environmental burden caused by production.

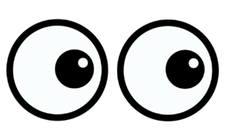
2 Materials and Methods

Process



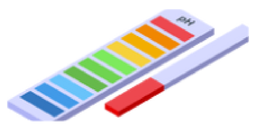
Analysis of samples

Physical

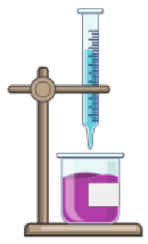


Visual

Chemical



PH



Titration

Electrical conductivity

Microbiological

E.Coli

Coliform

Enterococci

Micro-organism 22 ˚C, 36 ˚C

Yeast

Moulds

Data Analysis

MS Excel

PlantMaster and Trend-programs

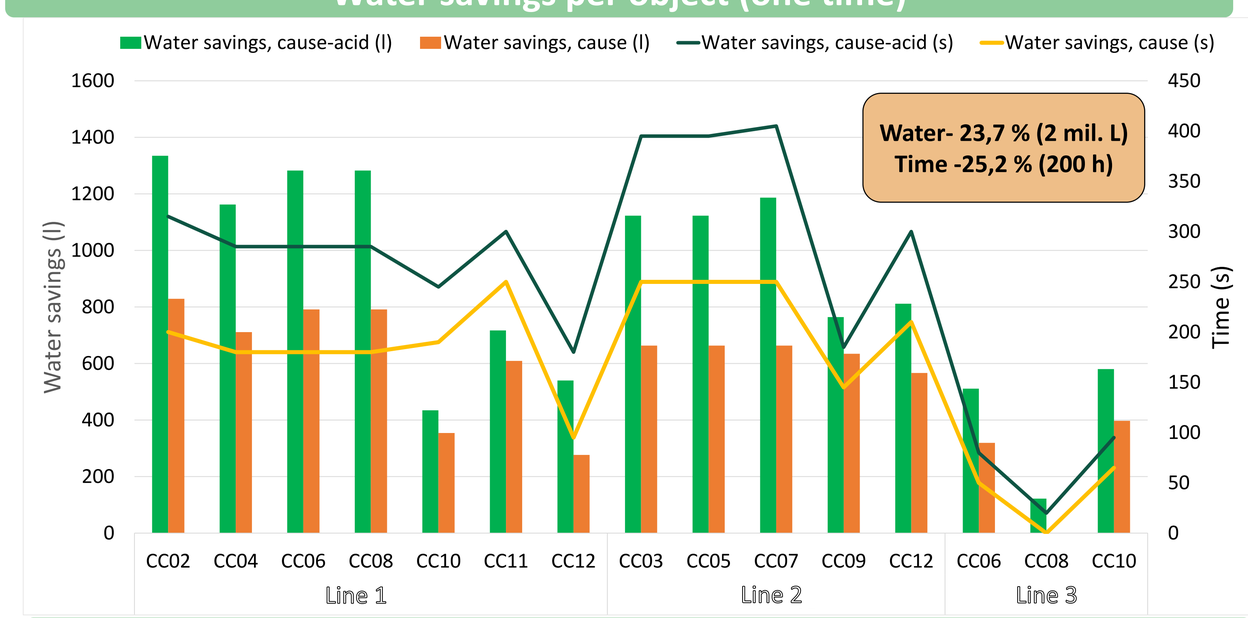
3 Results and Discussion

Example cause wash, line 1 CC02 (tank)

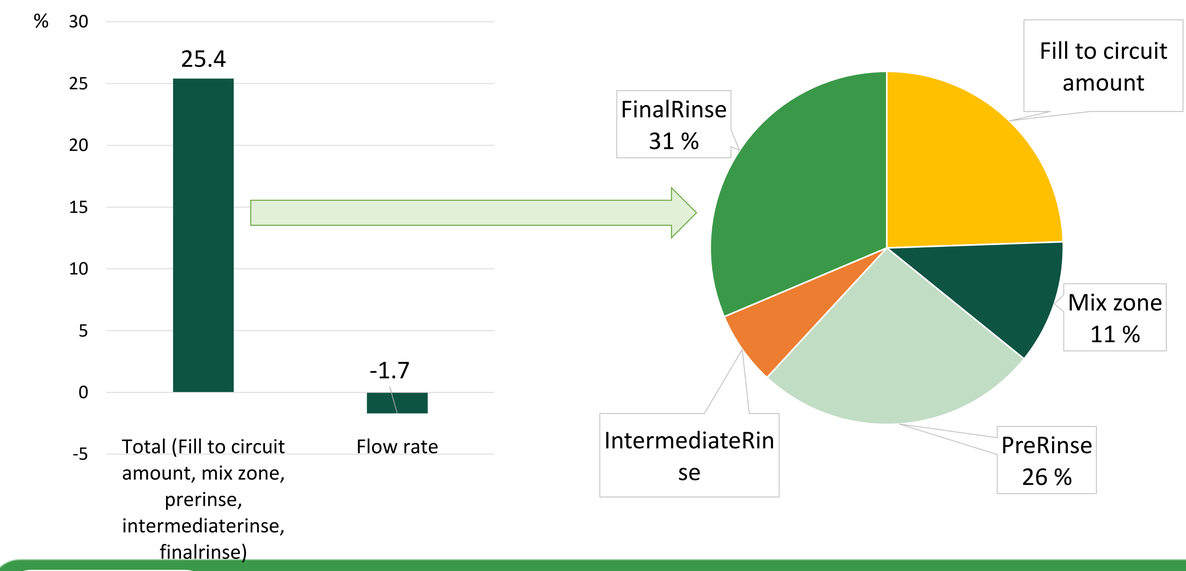
Fill circuit Amount and back up time	270L/60s	→	180 L /40 s
Mix zone amount and back up time	200L/60s	→	150 L /30 s
PreRinse	60 s	→	25 s
FinalRinse	60s	→	15 s

Figure. PreRinse & FinalRinse, Electrical conductivity, Cause wash, Wash & Optimization areas.

Water savings per object (one time)



Water savings of parameter changes effect



4 Conclusions

It was possible to reduce the water consumption of CIP washes, especially by shortening the rinsing phase. The work achieved financial savings, but also promoted the company's environmental goals.