ANDERSON ERICKSON DAIRY

DES MOINES

BRETT FRINK
MECHANICAL ENGINEERING
THE UNIVERSITY OF IOWA

COMPANY PROFILE
Anderson Erickson (AE) Dairy is a privately owned company which supplies milk and dairy products to the Midwestern United States. AE Dairy currently employs more than 400 people and is the largest private dairy in the state. The company's headquarters and production plant have been located in Des Moines since its creation in 1930.

PROJECT BACKGROUND
At Anderson Erickson Dairy, water is used to clean and sanitize food processing equipment and to clean product containers before shipment to consumers. An optimized water use and reuse program could allow AE Dairy to reduce water consumption and utility costs for the production plant. Additionally, expansions to the company's preventative maintenance programs would provide the company additional opportunities to reduce water usage and extend the life of equipment.

INCENTIVES TO CHANGE
AE Dairy is committed to reducing the environmental impacts of its operations by reducing the water used in their production processes. Reducing water demands and reusing water streams in the dairy plant will reduce the company's operating costs while allowing the company to make strides toward its sustainability goals.

RESULTS
Automate Container Rinses: Products packaged in bottles and cartons are transported on conveyors and pass beneath water spray manifolds to rinse any milk residue from the containers. These sprays are operated by manual valves, requiring water to flow from the manifolds continually throughout production runs. Installing sensors to trigger water flow only when containers are present could save $33,400 and 4 million gallons of water annually.

ESTIMATED CONVENTIONAL AIR POLLUTANTS DIVERTED IN METRIC TONS
For Recommendations in Recommended Status

TOTAL FOR ALL SECTORS						
CO_2	NH_3	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC
99.93	0.01	0.15	0.04	0.02	0.19	0.16

ESTIMATED GREENHOUSE GASES DIVERTED IN METRIC TONS

TOTAL FOR ALL SECTORS			
$MTCO_2e$	CH_4	N_20	CFC
431.67	33.92	5.56	0.51

Reuse Homogenizer Coolant: All homogenizers at AE Dairy use water as a lubricant for pistons. Three of the homogenizer units also utilize water in single-pass, non-contact component cooling systems. Modifications could be made to the cooling water flow to reduce the water demand of the homogenizers without disrupting performance. Additionally, effluent cooling water from the units could be collected for reuse as boiler feedwater or to rinse container crates. These modifications could save 1.69 million gallons of water and $14,000 annually.

Low Flow Nozzles: Throughout the plant, hoses are used for cleaning and sanitation purposes. While many of these hoses have nozzles installed, there are several hoses that do not. Installing nozzles on all hoses in the plant, and replacing current nozzles with low flow nozzles, will save 1.03 million gallons per year and $8,500 annually.

Leak Repairs and Detection: Leaks account for 1.2 million gallons of water loss every year at AE Dairy. Most leaks occur at faulty valves or as pipe joints become corroded. Quickly documenting leaks as they occur will allow staff to maintain the piping throughout the plant to minimize losses. Two additional preventative maintenance recommendations include reporting leaks via maintenance orders through the maintenance software already in use on site, or conducting a monthly leak audit throughout the plant.

Case Wash Maintenance Program: While observing tunnel washers used to clean the milk crates in the plant, it was observed that float-activated valves allow water to flow while the equipment is shut down. Scheduled maintenance and adjustments to these valves could save 94,000 gallons of water annually and increase the life of the flooring in the case wash room.

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
AUTOMATE CONTAINER RINSES	$33,400	4,000,000 GALLONS	RECOMMENDED
REUSE HOMOGENIZER COOLANT	$14,000	1,690,000 GALLONS	RECOMMENDED
LOW FLOW NOZZLES	$8,500	1,030,000 GALLONS	RECOMMENDED
LEAK REPAIR AND DETECTION	$9,500	1,200,000 GALLONS 1680 THERMS	RECOMMENDED
CASE WASH MAINTENANCE PROGRAM	$780	94,000 GALLONS	RECOMMENDED