Wells' Dairy

CASE SUMMARY 22

WELLS' DAIRY, INC.

Le Mars, Iowa
Plymouth County

Intern: Andrea Rogers
Major: Civil Engineering
School: The University of Iowa

The Company

Wells' Dairy, Inc. is a major producer of dairy products including ice cream, yogurt, milk, cottage cheese, chip dips and more, with approximately 2,500 employees. Wells' operates three plants in Le Mars, Iowa, which is considered the ice cream capital of the world. Wells' also operates a milk plant in Omaha, Nebraska, and an ice cream plant in Saint George, Utah.

Incentive for Change

Wells' has a continuous drive for improvement. It has established a health, safety and environment department to comply with standards and promote environmental stewardship. The main force behind Wells' water conservation efforts is to reduce the water load on the city water and wastewater facilities as they approach maximum capacity.

Results

1. **Evaporator system**

The evaporator system converts raw milk into cream, condensed skim milk, and leftover water, which is commonly called "cow water." A recommendation was made to use the water the evaporator produces for the make up water in the cooling tower and boiler. The cooling tower is in close proximity to the evaporator and runs on the same schedule as the evaporator. This project has a yearly saving of $34,700 and approximately two million gallons of water per year. Another option is to mix cow water with water currently going to the rinse cycles of the clean in place units.

2. **Water conservation**

The tanks in the clean in place rooms have two options for water conservation. By modifying the hanging baskets there is potential savings of 75,000 gallons of water per year and $825 in chemical and water costs. Another option is to wash the small parts in a commercial dishwasher and remove the hanging baskets from the tanks completely. This option would save approximately $6,000.

3. **Surge tanks**

There are two portable 30 gallon mixing tank styles. The older model includes a heated water jacket and agitator, while the new model has a small plastic scrapper and no

heating element. Due to the lack of heating element, hot water has to be continuously circulated to maintain a certain temperature in the newer units. Installing units with heating elements is recommended.

4. **Water conservation class**
Employee awareness of water conservation and wastewater reduction is a viable option to improve the current water usage trend. The purpose of the class was to have employees realize that water is a valuable raw material. About 35 employees participated in the conservation class.

5. **Sensors on product lines**
The process to clean the molds of bar machines includes a rinse, wash, scrub, sanitize and vacuum phase. The suggestion was made to automatically shut off the rinse cycle. However, the variance in products and rinse time periods makes this system difficult to automate. Another option is to have operators type in the number of revolutions needed for a particular product, and the water and steam would automatically shut off after the rinse was completed.

6. **Trash bag liners**
The plastic received with raw materials from two of the production lines are large enough to reuse as trash bag liners. Using these liners on production lines would save time necessary to rinse out the trash barrels and large trash containers. The estimated savings would be about $350 and 26,000 gallons of water a year.

7. **Reduction of water through homogenizer**
The flow through the homogenizers at all of the plants in Le Mars was too fast for optimal heat exchange to occur. By slowing down the flow, the homogenizer has a higher heat transfer, resulting in higher efficiency. The savings are approximately $8,000 and 3.1 million gallons of water.

8. **Air compressor**
Geothermal cooling of the air compressor system was researched as an opportunity to reduce water use. This project is not viable for financial and spatial reasons. A cooling tower option is currently undergoing feasibility analysis. The estimated annual water savings would be 24 million gallons and annual cost savings would be $61,000 if the air compressor loop was closed.

Project Summary Table

Project	Annual Cost Savings	Gallons water (1,000/year)	Status
Cow water recovery in cooling tower and boiler	$34,700	2,080	Suggested
Cow water recovery mixed with whey	$3,000	3,120	Suggested
COP basket modification	$825	754	Implemented
COP commercial dishwasher	$6,000	175	Suggested
Surge tanks	$6,500	600	Suggested
Water conservation class	$5,300	2,080	Implemented
Sensor for product lines	$300	26	Suggested
Trash bag liners	$350	26	Implementing
Homogenizers	$8,000	3,100	Implemented
Air compressor	$61,000	24,000	More research needed
Totals	$125,975	35,961 kgal	