KRAFT FOODS GLOBAL INC.

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CHEMICAL ENGINEERING, IOWA STATE UNIVERSITY

MASON CITY

COMPANY BACKGROUND

Kraft Foods was founded in 1903 and is the largest food and beverage company headquartered in North America and the second largest worldwide. After its acquisition of Cadbury plc, net revenues topped $49 billion in 2010. Kraft Foods produces many leading food brands, including Cadbury®, Philadelphia®, Nabisco®, Trident®, Jell-O®, Oscar Mayer® and many more. The company employs approximately 127,000 people worldwide. Kraft's Mason City, Iowa plant is a producer of Jell-O ready-to-eat dessert cups and employs 274 people.

PROJECT BACKGROUND

Currently, Kraft Foods of Mason City treats wastewater using a dissolved air flotation (DAF) process before it goes into the city sewer system. The plant pays the city wastewater fees to do this, and also pays to have a by-product of the process land applied. These costs and the desire for sustainability improvements are prompting an examination of a micro-filtration system for the facility's wastewater.

INCENTIVES TO CHANGE

As water and wastewater treatment costs continue to rise, curbing these expenses becomes more attractive and can result in measureable sustainability benefits. Kraft plans to continue reducing its water use, and looks for ways to improve its wastewater processing systems, as well.

RESULTS

Microfiltration Wastewater Treatment: If a microfiltration system with alternative treatment chemicals was used instead of the current DAF treatment system, it may be possible to clean water to the point where it can meet direct discharge limits and enable the use of the dry sludge that is produced for animal feed. This would divert some by-product from land application and reduce wastewater costs. Additional opportunities are being evaluated to reuse the cleaned wastewater, which will reduce water use. The intern will assist with additional testing of the microfiltration system, as well as identifying cost reductions and alternate uses for the water and by-product.

Cooling Tower Bleed Controls: Cooling towers use evaporative cooling to exhaust unwanted heat from process equipment in the plant. As water in the cooling towers evaporates, minerals within that water are left behind and can create scaling problems if some water is not removed from the tower and replaced with clean makeup water.

Currently, valves for the facility's cooling towers are manually controlled, resulting in excess water use due to removing too much water. Automatic controls use conductivity to measure mineral content and trigger valves to keep mineral concentrations at acceptable levels. The intern will be evaluating the feasibility and savings potential of installing these automatic controls.

Additional Flow Metering: To identify opportunities to save water, it is important to know how water is being used. The plant currently tracks much of its water use. However, installing several additional meters in the plant would help further pinpoint future opportunities. The intern will identify processes where additional monitoring and use information would most likely provide opportunities for improvement.

Low-Flow Hose Nozzles: Throughout the plant, hoses are used for general cleaning purposes. Current hose nozzles have a flow rate of 7 gallons per minute. Installing lower-flow nozzles would reduce water use and associated costs without compromising cleaning ability.

Boiler Economizers: Plant use of multiple boilers fluctuates at any given time. When the boilers were originally installed, each was equipped with feed water economizers that used waste heat from their exhaust gases to preheat boiler feed water. Today, the economizers are no longer operational. The company could save natural gas use and energy costs by reinstalling economizers on the boilers. The intern is evaluating the feasibility and savings potential of reinstalling economizers.