

# 3<sup>RD</sup> GLOBAL FOOD SECURITY, FOOD SAFETY & SUSTAINABILITY CONFERENCE

May 21-22, 2018 | New York, USA

## **The quantification of the food water and energy nexus and cost analysis associated with resource consumption and reduction within a milk processing facility**

**Carly Rain Adams**

University of Nebraska-Lincoln, USA

The Food, Energy, and Water Nexus (FEW) are the inseparable connection that links these three commodities. We are faced with a unique opportunity to co-manage these resources, as conservation of one is directly linked to the conservation of its counterpart. This project focuses on uncovering points in fluid milk processing where tangible conservation steps can be taken to reduce water and energy consumption. Baseline information allowed for determining alternative actions that would lead to energy and water reductions. Collaboration with a Midwest dairy plant allowed for exploration of FEW within a processing facility. . Every gallon of pasteurized milk produced, within the partnering facility, energy demands of 0.13 kWh, 0.02 Therms, and freshwater requirements of 0.87 gallons. For every gallon of milk produced 0.59 gallons of wastewater was created. The partnering facility consumed 53% of water and 22% of electricity during the cleaning operations. Therefore, this research focuses on the cleaning operations as an area with great potential for resource reduction. This consumption of resources places a large financial strain on producers. Annually the production of pasteurized milk cost the partnering research plant, more than \$47,000 in energy and water utilities. In addition, the treatment of wastewater places heavy strains on producers. The economical demand and outcome of resource reduction determines the plausibly of recovery methods. Therefore, this research immediately addresses both resource reduction and the economic factors tied with it. This research will lead to tangible impacts on the water and energy crisis our food system is faced with.

Cadams@huskers.unl.edu

**Notes:**