Lean, Energy & Environment (LE2) Assessment for Byrne Ultra Dairy

**Client**
The main product is processed milk with extended shelf life (60 to 90 days) which is then packaged in various sizes of polyethylene terephthalate (PET) milk containers. A unique bottling plant featuring in-line production of the PET containers allows very high efficiency of production at this location. The plant also produces paper milk containers of various sizes to meet customer requirements. Many local farms are supported by this operation by having a growing processing company to purchase their milk.

**Opportunity Areas**
Ultra Dairy has needs for reduction in energy usage and waste disposal costs. The milk processing operation involves heavy electricity and natural gas demand for the ultra-high temperature pasteurization process. Moreover, there is significant liquid waste, currently directed to drains which flow to the publicly-owned treatment works (POTW) and is high in biological oxygen demand (BOD). Because of the high strength of the liquid waste, significant sewer use surcharges are paid. The solid waste produced at several unit operations is generally field spread at local farms, at significant cost to the facility.

**Objectives**
Identify energy, disposal cost and environmental impact reduction opportunities within Ultra Dairy’s East Syracuse, NY plant. Apply innovative or underutilized technologies to achieve measureable reductions in one or more of these areas.

**Work Performed**
Electricity, natural gas and water use rates were analyzed from 2009 and 2010. Waste characterization data were obtained for the plant waste water effluent, dissolved air flotation (DAF) system sludge, and ultra-filtration/ultra-osmosis (UF/UO) concentrate. These various data sources were used to conduct analyses of water re-use and heat recovery options, as well as to estimate the potential benefits of an on-site anaerobic digestion facility.

**Results**
By implementing the recommended improvements, the following annual reductions are estimated:
- $17,000 in water by re-use of cooling water for milk pre-packaging holding tanks
- $120,000 in POTW waste surcharge for high-BOD waste water effluent
- $300,000 - $400,000 in solid waste disposal costs, including waste currently generated at Ultra plant in the City of Syracuse
- Un-quantified biogas production from the anaerobic digester, which could directly offset present in-plant natural gas demand

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