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MONOGRAM QUALITY FOODS

DENISON



COMPANY PROFILE

Monogram Quality Foods is a food manufacturing company that specializes in bacon production. The company produces cured pork bellies that are processed, smoked, pressed, sliced and packaged for retail and food services. The Denison, Iowa, facility has 110,000 square feet of manufacturing space with six high speed slice lines and one automatic bacon layout line. The Denison facility is also the majority supplier of pressed belly slabs for the Monogram Prepared Meats plant in Harlan, Iowa, where it is processed into ready to eat bacon. Monogram Quality Foods is a major employer in Crawford County with 300 employees over three shifts, divided into two shifts for production and one for sanitation.



sent to the landfill, increase the amount of inedible by-product, which is a marketable commodity, and improve effluent water quality. Improving effluent quality during onsite pre-treatment will reduce chemical and energy use at DMU and reduce wastewater utility charges, increasing Monogram Quality Foods' economic savings.

RESULTS

A baseline assessment was conducted on the wastewater pre-treatment system. The pre-treatment system was evaluated using flow rates, solid waste generation, energy consumption, raw material, and maintenance. Solid waste from the production floor is the largest contributor affecting the efficiency and quality of the DAF system. The solid waste found in the wastewater stream decreases pipe and pump efficiency, increasing the amount non-organic solid waste being landfilled.

PROJECT BACKGROUND

The focus of Monogram's project was to optimize the efficiency of the wastewater pre-treatment process and improve the quality of effluent water sent to Denison Municipal Utilities (DMU). Monogram uses a dissolved air flotation system (DAF) to separate and remove solids from the wastewater produced at the plant. Testing of the wastewater was needed throughout the process to understand the incoming effluent quality and assess the efficiency of the DAF system. Optimizing the efficiency of this process could reduce chemical usage and loading levels of the effluent water.

INCENTIVES TO CHANGE

Environmental sustainability is a driving force for Monogram Quality Foods. The company's goal is to limit environmental impact while maximizing profits. There are multiple benefits to reducing solids in the wastewater stream. Filtering the wastewater stream will decrease the non-organic solid waste

A third party is hired by Monogram to clean and sanitize the facility each night after the second shift of production. Equipment is rinsed with water to remove any solids and then sprayed with foam chemicals to sanitize the equipment. Improving the dry and wet clean-up processes during sanitation could reduce the solids in the wastewater and improve the efficiency of the DAF system. Since a third party is contracted for this process, incentives and monitoring should be a part of the implementation to ensure continued compliance.

The intern made two recommendations based on the premise that solid waste is quantifiable and has the potential to be reduced. The recommendations are to implement a solid waste reduction plan and shut off the DAF system. Reducing the solid waste found in the wastewater stream will reduce Monogram Quality Foods' environmental impact from the

source, optimize the DAF system, and improve the quality of effluent water. Shutting off the DAF system is projected to generate the largest economic savings while reducing energy and chemical consumption.

Solid Waste Reduction Plan: It is recommended that Monogram implement a two-phase solid waste reduction plan. Phase one consists of a third-shift cleanup supervisor, new third-shift standard operating procedures for the dry and wet cleanup processes, and an employee cleanup incentive program. Phase one will allow Monogram to standardize their dry and wet cleanup processes and to quantify and reduce the number of solids found in the wastewater stream. Phase two consists of total drain replacement for older drains throughout the facility. Phase two would allow Monogram to capture the waste solids from production before entering the wastewater stream and minimize clogging in the drains of the facility. Implementation of both phase one and two of the solid waste reduction plan are necessary to improve the wastewater quality and optimize the DAF efficiency to gain the most impactful results.

DAF Shut Off: Currently, the DAF system runs continuously, consuming energy and chemicals. Effective collection of solids prior to entering the wastewater could allow for the DAF system to be shut down, saving money on operational, maintenance, and labor costs. DMU has the capacity to treat Monogram Quality Foods' effluent wastewater. Reducing solids and improving the wastewater quality at the source could allow the company to send the wastewater directly to DMU for final treatment. Additionally, Monogram Quality Foods would reduce their environmental impact by reducing energy and chemical use. Prior to shutting off the DAF system, Monogram Quality Foods must ensure compliance with DMU's quality standards. This would include testing the influent water for biochemical oxygen demand, total suspended solids, total kjeldahl nitrogen and quantities of fat, oil, and grease.



PROJECT	ANNUAL COST SAVINGS	ANNUAL ENVIRONMENTAL RESULTS	STATUS
SOLID WASTE REDUCTION PLAN	-	134 tons of solid waste	IN PROGRESS
DAF SHUT OFF	\$227,799	158,411 kWh 72,605 lbs. of coagulant 5,508 lbs. of flocculant 33,048 lbs. of NaOH 5,508 lbs. of H ₂ SO ₄ 2,400 hours of labor DAF Maintenance Cost	IN PROGRESS