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COMPANY PROFILE

Headquartered in Greeley, Colorado, JBS USA is a food processing company and a subsidiary of JBS S.A., the world's largest meat processing company, by sales. The company mainly produces meat products and byproducts of beef, poultry, pork, and lamb, with more than 200,000 employees worldwide. The JBS facility in Marshalltown, Iowa, is a pork-based facility that employs more than 2,000 people and processes 20,000 hogs daily.

JBS USA has a commitment to provide safe, sustainable products produced with a respect for our natural resources and the environment.

PROJECT BACKGROUND

Water conservation and reducing wastewater contaminant levels are top priorities and a constant focus of JBS' sustainability commitment. A state-of-the-art wastewater treatment facility was recently completed and is coupled with an onsite activated sludge plant (ASP), making JBS very effective at removing contaminants from the plant's wastewater effluent. This project was aimed at determining where and when various contaminants enter the wastewater streams and recommending ways to reduce contaminants in the effluent prior to onsite wastewater treatment. While evaluating the process flow, the intern was also able to recommend process improvements that could further reduce water usage.

INCENTIVES TO CHANGE

JBS USA has a commitment to provide safe, sustainable products produced with a respect for our natural resources and the environment. In line with this commitment, the company has a 2020 corporate environmental goal of 10 percent reduction in water usage from a 2015 baseline. The 2019 project will position the facility for the next steps to employ source reduction and pollution prevention methodologies in effectively reducing water usage, loading levels, and associated costs.

RESULTS

Increased Blood Capture: JBS considers it an obligation to maximize the use of every product they produce. Amino acids, tallows, and grease are all processed into marketable products. Blood meal is one of these valuable byproducts that is used in animal feed and fertilizers.

After the hogs are slaughtered and dehaired, they move through various initial processing stages. In these initial processing areas blood is collected in catch pans, which then funnel it to the drain and to wastewater. Pumping the collected blood back to the rendering area to be processed into dried blood meal could generate additional revenue and increase the value derived from each processed hog. Further, removing the blood from the wastewater process could reduce byproduct waste, decrease effluent contaminants, and decrease costs and treatment chemicals. Implementing this recommendation is relatively inexpensive, and next steps would include ordering and installing both the pump and piping required to reroute the blood to Rendering.



Tank Farm Grease and Lard Recycle: Grease and lard of various grades are also collected from the hogs. They are transported to storage tanks which are then emptied into shipping containers. Each day, a worker drains the excess water and solid material that settles in the bottom of the tanks. This residual is currently sent down the drain where the grease is recovered from the wastewater for processing. Pumping the residual from the storage tanks directly back to the rendering area would allow a purer form of the grease to be recovered and processed, providing a higher grade grease from this source point. In addition to the added revenue potential, the wastewater load and associated costs would be reduced. Much of the piping from the storage tanks to Rendering is in place so there would be minimal cost to implement this change. A quote has been obtained to complete the piping, so installation could be started, pending approval.

Air Cooled Condenser: A Rendering cooker takes inedible solids from production and converts them into various marketable products. The moisture is evaporated from the inedible solids in the cooker, then taken to two heat exchangers where it is condensed back into a liquid. These heat exchangers are water cooled and generate a significant amount of hot (140°F) water as a byproduct. The hot water is used throughout the plant for sanitation, but not all of the water can be used and eventually exceeds the capacity of the storage tanks. The excess hot water is sent to wastewater and is treated with the process water coming from the other areas of the plant. Switching the two water-cooled heat exchangers to an air-cooled condenser would eliminate the water associated to cool the heat exchangers, which could also eliminate the excess flows and associated treatment costs in wastewater. This could result in a significant reduction of 140°F water generated at the plant. A quote for the air-cooled condenser has been obtained. This project would require capital investment so project approval and budgeted funds would be required for implementation.

Wastewater Solids Collection: In the wastewater facility, solids from production wastewater effluent are collected by rotor screens and subsequently pumped to Rendering to be



processed. Water must be added to allow the solids to be successfully pumped, and the added water is then screened back out in the rendering area. The Rendering system was not designed with the capacity to screen the high volume of excess flow generated by this process. When its capacity is exceeded, the excess water and solids overflow into the drain and get pumped back to wastewater, which creates a costly cycle. Using an incline auger to collect these solids in bins at the wastewater facility, and physically transporting those bins to the rendering area, would eliminate the additional water for the solids to be pumped. It could also alleviate the overflow in the rendering area and water required to pump the material, and could eliminate the excess maintenance and cleanup costs incurred when the wastewater system becomes overloaded. To implement this recommendation, the next steps would be to obtain budget approvals, review the quote obtained for the incline auger and order equipment and plan the installation process.

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
Increased Blood Capture	\$199,099	17,430 lbs TKN 5,817 lbs TSS	Recommended
Tank Farm Grease and Lard Recycle	\$15,446	9,972 gallons grease 3,324 gallons lard	Recommended
Air Cooled Condenser	\$794,670	127,000,000 gallons	Recommended
Wastewater Solids Collection	\$123,488	15,581,250 gallons	Recommended

