TYSON DELI, INC.

KIM SCHERBER
CIVIL ENGINEERING
IOWA STATE UNIVERSITY

COMPANY BACKGROUND

Tyson Foods, Inc. is a major producer of chicken, beef, and pork products for consumers globally. The company has more than 400 facilities and offices worldwide. In Cherokee, Iowa, Tyson Foods has a Tyson Deli plant that employs 745 team members to receive and process raw meat into ready-to-eat products by adding spices, smoking, and cooking the meat. Some of the products that the Tyson-Cherokee plant manufactures are hotdogs and shaved beef, pork, and turkey lunchmeat.

PROJECT BACKGROUND

Tyson Deli-Cherokee currently uses about 411,000 gallons of water per day, or 3 to 4 million gallons per week. Due to a recent corporate initiative, all Tyson plants that use more than 1 million gallons per week must reduce water consumption by 10 percent. Thus, the goal of this project was to reach or exceed these standards. The intern completed a water audit to pinpoint areas of opportunity for water and energy savings and outlined improvements to meet the reduction goal.

INCENTIVES TO CHANGE

If Tyson Deli-Cherokee were to reduce water consumption by at least 10 percent, the plant has the possibility to save hundreds of thousands of dollars in costs associated with water, pumping, heating, and treatment. In addition, complying with corporate initiatives will improve Tyson Deli-Cherokee's position within the prepared foods division.

RESULTS

Reconfigure Rotary Screen Nozzles: Tyson currently uses 36,000 gallons per day of 140° F hot water through spray nozzles on a rotary screen in the pretreatment wastewater room. If Tyson were to fix the solenoid valve on the screens and allow for cold water to clean the screen through the spray nozzles, more than 13 million gallons of water could be conserved each year along with 2.5 million kWh. This could save the company $51,519 per year in utility costs. Furthermore, switching from hot water to cold water will preserve the integrity of the rotary screen and prevent screen blinding from occurring.

CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN METRIC TONS

TOTAL FOR ALL SECTORS							
CO_2	SO_2	CH_4	N_2O	CFC	NO_x	VOC	PM_{10}
58.05	0.11	383.13	200.69	0.57	0.90	0.31	0.82

Eliminate Pretreatment Wastewater Hose: A hot water hose runs beneath the rotary screen to wash away meat that has fallen from the auger. A modification and adjustment to the auger would ensure the meat all falls into its intended hopper resulting in a reduction of 3,705,137 gallons of water and 711,266 kWh per year, saving the company $14,648 in associated costs.

Replacement of Hydraulic Power Packs: Seven percent of Tyson's daily water consumption is run through five power packs that cool the hydraulic fluid before it enters the processing equipment. Installing air-cooled power packs could reduce water usage by 11,137,914 gallons per year, saving $17,590 in water costs.

Stack Economizer: An economizer installed on the boiler would capture the heat off the boiler stack and could be used to heat water. An economizer could heat 62.5 gallons per minute at 127° F for plant hot water purposes, saving Tyson Deli 7,982,790 kWh a year and $110,751 in energy costs.

Roll Table Conversion: A stainless steel table utilizes a stream of water to slide meat logs from a casing machine. A partial-gravity roller-table would allow meat logs to move on rollers without the use of water, reducing water consumption by 717,468 gallons per year, saving $925 in annual water costs.

Turn off Unneeded Water: Turning off excess water used in equipment like constant-flush urinals would amount to a savings of $674 per year and a reduction of 501,569 gallons. The simple payback period for installing waterless urinals is less than six months.

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
RECONFIGURE ROTARY SCREEN NOZZLES	$51,519	13,032,000 GALLONS 2,503,103 KWH	IN PROGRESS
ELIMINATE PRETREATMENT WASTEWATER HOSE	$14,648	3,705,137 GALLONS 711,266 KWH	IN PROGRESS
REPLACEMENT OF HYDRAULIC POWER PACKS	$17,590	11,137,914 GALLONS	IN PROGRESS
STACK ECONOMIZER	$110,751	7,982,790 KWH	RECOMMENDED
ROLL TABLE CONVERSION	$925	717,468 GALLONS	RECOMMENDED
TURN OFF UNNEEDED WATER	$674	501,569 GALLONS	RECOMMENDED