Intern: *Arsen Slonsky*
Major: *Mechanical Engineering*
School: *University of Nebraska-Lincoln*

Company Background:

WholeStone Farms currently operates in Fremont, Nebraska and was established in 2017 by more than 220 independent farmers in the Midwest. Collectively, farming nearly 400,000 acres of cropland and raising about 12 million pigs per year. WholeStone takes pride in the pork supply chain they created which supplies various products throughout the United States. WholeStone Farms also takes a great interest in proper environmental and animal care, where the highest standards are met to create a safe and reliable food source while helping reduce negative environmental impacts.

Project Description:

In 2019, WholeStone Farms began designing a wastewater treatment plant to reuse water and improve the quality of water going back to the city of Fremont, Nebraska. To become more environmentally friendly, WholeStone teamed up with the University of Nebraska-Lincoln's Partners in Pollution Prevention (P3) program to find ways of reducing water consumption and wastewater in their facilities. The intern, Arsen Slonsky, assessed various aspects of the building and made several recommendations to supplement current means of improving the processing plant.

Pollution Prevention Benefits:

Large reduction in greenhouse gases released into the atmosphere accompanied by a reduction in amenity consumption to include compressed air and natural gas while simultaneously reducing utility usage. Recommendations range in cost from tens of dollars to hundreds of thousands of dollars and have a payback period of less than two years. Most suggestions are easy to implement and require little to no effort to maintain, a few will require a more specialized set of skills but can easily be controlled and maintained after installation

Project Results:

Recommendations were provided to help WholeStone reduce utility consumption, *Table 1* below is organized in descending order from highest annual savings to lowest.

Table 1: Results of pollution prevention calculations for WholeStone Farms

Project	Implementation Cost	Annual Savings	Payback Period	Metric Tons of CO_2 Equivalent ($MTCO_2E$) reduced
Install VFDs on ammonia compressor motors	$1,100,000	$220,000	60 months	188
Make Air Compressors More Economical	$240,000	$165,000	17.5 months	1,800
Eliminate leaks in compressed air pipes	$3,600 - $5,000 (based on number of days on-site)	$ 80,000 – 120,000 (based on EPA estimates)	N/A	835 -1,250
Installing electric hand dryers	$67,000 (in-house) - $72,000 (outsourced)	$50,000	16-17 months	42
Minimize water usage	$ 0	$22,000	Instant	160
Replace ball valves with squeeze valves on hoses	$1,500	$8,500	2 months	.20
Altering skim tank schedule	$0	N/A	N/A	N/A
Total	~ $1,418,500	~ $585,500	N/A	~3,333

Additional Indirect or Intangible Benefits:

- Decrease the need for future maintenance on various machinery
- Reduce greenhouse gases released into the environment
- Significantly reduce utility consumption
- Reduce solid waste produced
- Increase company/employee awareness for current water consumption