Zero Waste Alliance

Sustainable Practices in Food Manufacturing

Case Study #1

Focus Areas

- Develop in-house expertise at CLIENT to evaluate yield losses and waste streams
- Develop solutions to reduce environmental impacts and associated charges.

Approach

1. Evaluate water use and reduce related charges- specifically, Total Suspended Solids (TSS) and Biological Oxygen Demand (BOD)- associated with organics in the process sewer outfalls.
2. Identify large waste streams with potential for resource recovery and reuse- specifically High Density Polyethylene (HDPE).
3. Develop understanding of process parameters responsible for container overfill (to meet USDA guidelines).

Results

1. Educated staff on evaluating the actual process-derived contributions/sources of organics in sewer outfalls and reducing hot water use for floor cleaning. Potential savings: to be determined, expected to result in reduced water use (est. thousands of gallons of hot water/week) and $10-20K per year in organics charges.
2. Manage post-consumer HDPE exiting the facility every year. Potential revenue: $20K+ per year.
3. Introduced Statistical Process Control (SPC) to help improve process yields. Potential savings: est. 2-3%. Savings ~ $1M per year.

Case Study #2

Focus Areas

- High city water use and sewer disposal charges associated with single-pass cooling of noodles
- Product losses (est. ~ 3%) associated with microbial contamination.

Approach

Identify opportunities for process improvements to reduce charges by the Portland Water Bureau and low cost approaches to reduce contamination and improve yield.

1. Define current charges associated with city water use and discharges to city sewers.
2. Define details of a recycled chilled water loop system for noodle cooling.
3. Define process improvements, primarily training, to reduce microbial contamination.

Results

1. Loop cooling will lead to reduction in charges by the city's Water Bureau of ~$5000 per year (2010-2011 fiscal year) associated with a decrease of ~280,000 gallons water used and discharged to sewer.

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2. Increased training for manufacturing line staff will reduce contamination and improve yield. Focus: consistent use of manufacturer's guidelines for cleaning and sanitizing chemicals.
3. Identified credits (~$1900 per year) for water in product.

NOTES

Developed successful GREEN GRANT application ($25,000 award) for equipment purchases. Estimated savings associated with loop cooling will be ~ $16,500 (40 hours/week production) per year due to a decrease of ~1,000,000 gallons of city water discharged into city sewers.

Case Study #3

Focus Areas

- Reduce charges associated with water use and sewer disposal of high organics in wastewater.
- Identify new uses for the soybean residue (*Okara*) generated during the manufacture of tofu.

Approach

Identify process improvements to reduce impacts to natural resources and charges by the Portland Water Bureau and demonstrate viable uses for *okara* in higher value food products.

1. Review fresh water use and identify primary sources of high organics in tofu wastewater.
2. Develop options for reducing organics in tofu wastewater and rapid tofu cooling options to reduce single-pass cooling using fresh city water.
3. Review Asian culinary uses for okara and partner with local food manufacturers to show that *okara* is a high protein and high fiber content material suitable for inclusion in human foods.

Results

1. A chilled water system (~ 2 Ton capacity) will lead to ~10-20% reduction in Water Bureau charges associated with a decrease of ~200,000- 400,000 gallons water used and discharged to sewer. Return on investment period for chilled water cooling of tofu is expected to be less than 2 years.
2. Flocculating agents and dewatering-filtration system will reduce organics in tofu wastewater. Preliminary work suggests this approach can reduce organics in sewer discharges by ~ 50%.
3. *Okara* is a high-protein, high-fiber (i.e., prebiotic) soybean product with profit potential. Taste tests using *okara* in commercially prepared bread products indicated that consumers like these products. High protein content powders and other food supplements can also be made with *okara*.