

Knucklehead Craft Brewing Seeks to Improve the Environmental Footprint of the Brewery



Knucklehead Craft Brewing

Knucklehead Craft Brewing (Knucklehead) is a community brewpub that has become a staple in the Webster, NY community. They have grown over the previous five years and have incorporated a tasting room and kitchen to go along with their brewery operations.

Challenge

Knucklehead wants to understand and potentially lessen the environmental Knucklehead Craft Brewing (Knucklehead) is a local craft brewer with a welcoming atmosphere and an awesome team. It is a family-owned craft brewery with a fantastic kitchen. Based on their success, they have become a staple in the Webster community but their business model is to remain local, small, and focus on providing a great craft brewery to the local community.

Knucklehead wishes to improve its sustainability as part of its commitment to environmental stewardship. In 2019, Knucklehead had a water-to-beer ratio of 38.2 gallons: 1 gallon. This ratio is high because it includes water used for the kitchen, tasting area, and two apartments located at the brewery because Knucklehead has no onsite metering. This makes it difficult to determine the amount of water going into the beer. Finding ways to decrease water and energy consumption could save knucklehead money and reduce their environmental impact.

Knucklehead already sends spent grains to farmers to minimize solid waste as well as reuses yeast before disposing of it. Knucklehead also utilizes a manual clean-in-place (CIP) system, which effectively reduces chemical use. Knucklehead also sources electricity from a community-solar provider, supplying the brewery with clean energy. Finally, Knucklehead utilizes LED lights, which use up to 75 percent less energy than traditional incandescent lighting.

Solutions

The New York State Pollution Prevention Institute (NYSP21) collaborated with Cornell University to help evaluate and identify any opportunities to reduce Knucklehead's environmental footprint. NYSP21 conducted a site visit to collect baseline metrics and identify pathways for improving Knucklehead's existing

Challenge

- Knucklehead Brewing Company wanted to further improve its sustainable practice and decrease its overall environmental footprint. Knucklehead Craft Brewing wanted to further improve sustainability practices in the brewery and decrease their environmental impact.

Solution

- NYSP21 collaborated with Cornell University and conducted a site visit and a collection of baseline metrics to help evaluate and identify any opportunities to reduce Knucklehead's environmental footprint.

Results

- Recycling the dirty caustic solution and water from cleaning tanks to clean the brewery floors may lead to a drastic reduction in the brewery's water consumption.
- Utilizing the final rinse solution of one cleaning cycle in the CIP for the first rinse of the next would reduce water consumption.
- It was determined that a heat exchanger could be used to recover heat from the wort process and further conserve energy consumption.

sustainability practices.

Results

The work performed by NYSP2I and Cornell University led to key findings to support Knucklehead with their pursuit for a decreased environmental footprint through the reduction of water and energy consumption.

- Recycling the dirty caustic solution and water from cleaning tanks to clean the brewery floors may lead to a drastic reduction in the brewery's water consumption and improve its water-to-beer ratio.
- Knucklehead staff was advised to consider and test the use of low-flow spray nozzles and tank spray balls in the brewing process, kitchen, and tasting room. These fixtures would lower the water consumed during critical processes and as a result lower overall costs for water use and discharge.
- Since Knucklehead maintains records of how much water is used in their product, by contacting Monroe Country Water Authority, Knucklehead should be eligible to receive credit for the water they do not send to the sewer. This would result in a decrease of the cost for water discharge.
- Utilizing either a press or small centrifuge to separate out the solids from the waste stream would result in the recovery of wort.
- Utilizing the final rinse solution of one cleaning cycle in the CIP for the first rinse of the next would reduce water consumption, as well as save money on chemicals as cleaning solution would last longer.
- It was determined that a heat exchanger could be used to recover heat from the wort process and further conserve energy consumption. When the wort is boiled in the direct-fire brew kettle, the evaporated water could be chilled and used to heat water for cleaning, or preheat the next batch of wort.

- Utilizing either a press or small centrifuge to separate out the solids from the waste stream would result in the recovery of wort.

Knucklehead Craft Brewing

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