A Novel Solution to Combat Brewery Waste Utilizing Hermetia illucens

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America is the second leading producer of beer in the world, producing more than 211.17 million hectoliters per year (Conway 2021). Breweries are gaining notoriety as ecologically friendly due to their resourceful nature of utilizing each portion of grain in brewing. However, when looking at the sustainability of beer production what is often overlooked is the amount of brewery waste that is introduced into the environment. For every 1 gallon beer, 7-10 gallons of organic brewery waste is produced, and oftentimes the waste ends up dumped into the local waterways and arable land (The U.S. Beer Industry 2020). This improper disposal of waste can cause numerous problems, including eutrophication, increased soil acidity, and increased potable water production costs (Qin 1). Hermetia illucens, a native fly to Texas is well known for its ability to compost a variety of organic matter, from meat to vegetables, however little is known about its ability to bioconvert acidic substances and alter the pH level of those substances to a basic pH. Though the larvae bioconverted all samples, it was determined through One-Way Analysis of Variance (ANOVA) that the rate of consumption was the highest for the population of H.illucens which were fed a heterogeneous mixture of brewery waste and unpolished barely and was of statistical significance($p<.05$). This finding can be used to model new alternatives to manage brewery waste which can lessen negative environmental impacts while also striving to achieve the UN's goal of sustainability in agricultural practices.

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