Thesis Project Portfolio

Design of a Non-Alcoholic Beer and Alcoholic Kombucha Manufacturing Process

(Technical Report)

Non-Alcoholic Beer: Relapse or Rehab

(STS Research Paper)

An Undergraduate Thesis

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

Christopher Adam Griffis

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Department of Chemical Engineering

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Sociotechnical Synthesis

Introduction

Social drinking has a widespread influence that largely impacts most individuals (especially college students). As cultures develop, newer generations move on to different forms of social drinking that companies are beginning to capitalize on. Some examples of these novel forms of social drinking are hard seltzers, hard kombucha, and non-alcoholic (NA) beverages. These drinks are manifestations of the thoughts and ideologies of newer generations. For example, many alternative alcoholic beverages tend to be lower in calories which appeals to the increasingly health-conscious decisions that younger generations are making. Non-alcoholic beverages also maintain the same appeal as these drinks taste similar to that of alcoholic alternatives but contain less ethanol (<0.5% ABV).

The demand for these beverages is undeniably growing which has caused me to wonder about both the viability of a scaled-up procedure for producing these alternative beverages as well as resolving some of the ethical dilemmas that a product being associated with alcohol necessarily brings forward.

Capstone Deliverable and STS Topic

The technical portion of my thesis revolves around a large-scale process which creates two products: NA beer and hard kombucha. This process is meant to synthesize these two beverages in one process in order to increase efficiency. This would be done by extracting the alcohol from beer and injecting it into kombucha.

Simulating such a massive process allows for a wide swathe of creative direction which is both a benefit and a downside. By allowing for many paths forward, our group would never feel stuck behind a certain unit operation which may not pan out. However, by having a plethora of

different paths to go down, our group had to narrow down our options and make certain key decisions. The most vital decision was the method for alcohol extraction. Our group chose reverse osmosis as the method of extraction since this method sacrifices flavor the least. Other decisions are detailed in the technical thesis. The purpose of this project was to determine the theoretical viability of a process which extracts ethanol from one beverage to inject into another.

The STS portion of my thesis focuses on the ethics of non-alcoholic beer consumption in the context of rehabilitation from alcoholism. I did so by first analyzing the current research and academic understanding of using NA beverages as a coping method. Then, I discussed my ethical framework in which prescriptive claims would be made under. In this case, utilitarianism was selected. Next, I analyzed various ethical dilemmas faced by individuals suffering from alcoholism in the context of utilitarianism in order to provide various, general prescriptive conclusions. Lastly, I analyzed the societal stigma surrounding such a sensitive subject. The ultimate goal was to help clear up a lot of the confusion presented by two seemingly conflicted sides of a topic.

Conclusion

The technical portion of the research is utilized to determine the viability, improvements, and downsides of a novel process which creates NA beer and hard kombucha. On the other hand, the STS portion of the research is crucial for analyzing potential societal and individual impacts of such a process in the form of NA beer and its relation to alcoholism. It is important to make sure that even if a process is viable, it still does not breach any ethical lines. In combination, these two segments work off of each other to investigate a field which will undeniably see more growth in the near future. These results can be used to add to the underlying debate surrounding the subject matter and, hopefully, to achieve progress in both a technical and STS sense.

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