

**Development of Liquor-Based Canned Cocktails: Healthy, Bubbly, & Yummy**  
(Technical Paper)

**Psychological Effect of the Environment in the Fine Dining Industry**  
(STS Paper)

A Thesis Prospectus  
In STS 4500  
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By  
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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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## Prospectus

### Introduction

You are sitting in a dimmed room, impeccable service all around and your food has just arrived. You take the first bite and you cannot believe how good the food is. All of these qualities help encapsulate your experience in a fine-dining restaurant. You are enjoying everything around you, unaware of the truth happening behind the scenes. You do not see the amount of perfectionist pressure that is placed on the restaurant staff. While not all restaurants are like this, many fine-dining restaurants have a darker side to them. These conditions in the work environment can lead to many problems for their mental health. In the movie, *Boiling Point*, one of the bakers in the high-end restaurant is seen with cuts all along his wrists, likely due to the amount of stress in the kitchen (Baratini). By shedding light on this uncharted situation, a discussion can begin about a potential change in the industry. The proposed STS research paper will discuss how this environment psychologically affects the workers.

The second proposed project in this prospectus is a technical topic that will focus on the creation of liquor-based canned cocktails. The market for different hard seltzers has grown rapidly, and many companies are creating different variants for competition. Large companies like White Claw and Truly are expanding their business by releasing unique flavors, and many smaller companies have joined the competition as well. However, a common problem for these seltzers is the use of malt bases creating an unsettling aftertaste (gwegner, 2021). Many of other companies have tried implementing vodka-based or gin-based canned cocktails and have seen success, specifically High Noon seeing the largest increase in shares by 6.3% in competing seltzer companies (Backbar, n.d.). Additionally, many people have shifted from going out to drink at home. Creating a premium product that is more palatable in this growing market could potentially yield an overall profit.

## **Technical Topic**

### **Motivation**

Hard seltzer sales, such as White Claw, are growing at a much faster rate than beer sales, due to its popularity among Generation Z and Millennials who have established a drinking culture with seltzer brands. Trends such as the Smirnoff Ice challenge and colloquialisms such as “No laws when you’re drinking Claws,” contribute to the growing sales of canned seltzers and the expansion of product lines to include flavored seltzers (Goldfine). The trending drink in correlation with the onset of the pandemic has further skyrocketed sales. The pandemic contributed to a heightened apprehension to consume alcohol in public spaces, such as bars and clubs, and generated a shift towards at-home drinking as well as online food and beverage shopping to avoid viral exposure. Despite the decrease in social distancing procedures with increased vaccine availability, consumers are still driven to consume convenient alcoholic beverages that can easily fit into busy lifestyles (*Ready To Drink Cocktails Market Size Report, 2022-2030*, n.d.). Thus, canned cocktails have high market potential and potential for growth due to their established pandemic popularity and convenience. Furthermore, canned cocktails have largely marketed themselves to health-conscious populations and the gluten-free community who are shifting towards drinking low-alcohol fruit-flavored beverages (*Ready To Drink Cocktails Market Size Report, 2022-2030*, n.d.).

As people have grown accustomed to drinking canned cocktails in the comfort of their homes, there is a growing desire for more sophisticated liquor-based products that can offer a better-tasting bar cocktail adjacent beverage. Most common seltzers have a lingering aftertaste from the malt-base that many consumers find unsettling. The team’s product aims to improve the taste by using a distilled liquor base instead. While this change will increase production cost,

many consumers would be willing to pay a premium to remove the unpleasant aftertaste and our product will remain competitive. Additionally, in developing a liquor base there is broad versatility and a wide range of products that can be marketed from a more streamlined process. Different flavorings can be added to the liquor base and sold as different cocktails. We envision this product being consumed both at home and at formal events, where a more polished, mobile drink can replace live mixing of cocktails that may cause anxiety about the transmission of covid.

### **Process Overview**

This Capstone project will design a process to ferment and distill cane sugar-based liquor for use in low-calorie carbonated canned cocktails. Our initial step is to produce a high concentration of ethanol within our mash. Sugar and water will be added with Safspirit C-70 yeast in a fermenter to produce ethanol and carbon dioxide (Smith, n.d.). Yeast nutrients will be fed to help further the reaction. The fermenter would be connected to a heat exchanger, keeping the fermentation temperature around 25°C-33°C, the ideal range for the yeast strain used. The yield of ethanol produced will be kept around 10-15% ethanol purity, as too much ethanol would kill the yeast and inhibit further fermentation. The ethanol mash will then be transported to scrubbing and filtering units to remove any impurities and eventually sent through a continuous feed distillation process (Holl, 2022). This process consists of a distillation column, reboiler, condenser, and reflux drum. Steam will be used in conjunction with the heat exchange units to control the temperature of the columns. The ethanol mash will be injected into the column and vaporize on the trays traveling up the column where it will recondense and vaporize into a purer product. The bottoms product will consist almost entirely of water and other byproducts due to their higher boiling points (*DISTILLATION OF MASH AND RECTIFICATION OF ALCOHOL*, n.d.).

As ethanol is continuously distilled, the alcohol percentage/purity will increase to reach a goal of 80% purity. Fruit flavorings will be purchased and combined with the purified ethanol, water, stevia, and preservatives (sodium citrate) to create a product of 4-7% ABV (alcohol by volume) (*How Is Hard Seltzer Made?*, n.d.). Once thoroughly combined, the drink will then be carbonated with food-grade carbon dioxide and sent to canning. We intend to sell 3-4 flavors in a mixed pack of 12 canned cocktails. The general outline of the block flow diagram is seen below.

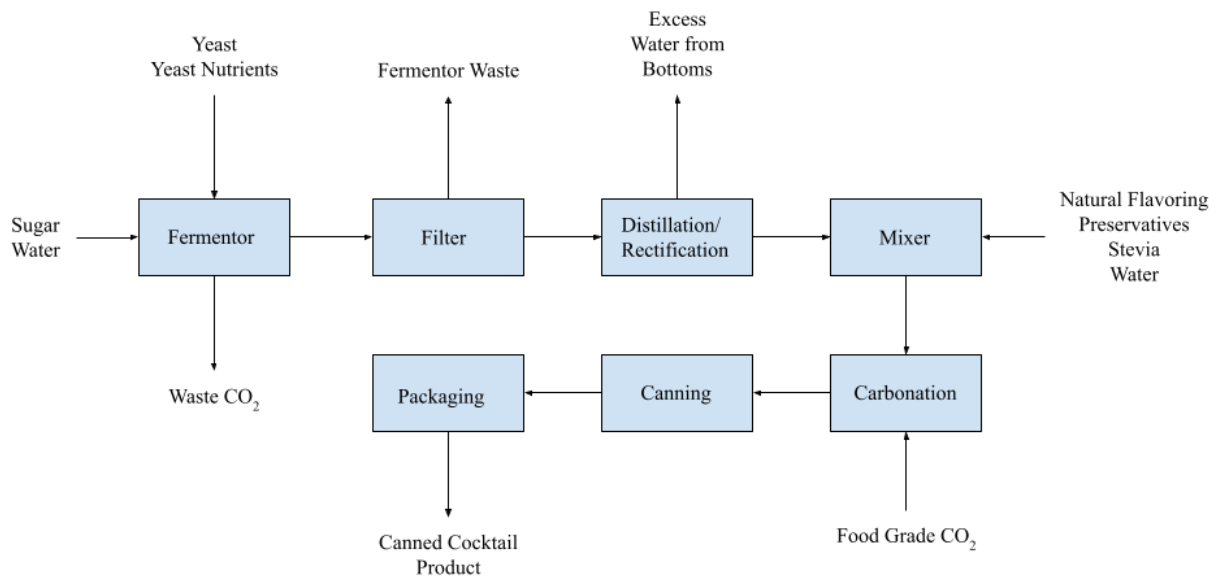


Figure 1. General Block Flow Diagram of Creating Canned Cocktails

(Adapted from Holl, 2022)

## **Process Modeling and Calculation Methods**

Our group will follow previous literature and current plant designs to help guide our design process. The project will be advised by Eric Anderson, Professor at the University of Virginia. We will model our fermentation process using MatLab and Excel and will switch to Aspen Plus V11 for distillation. This modeling will begin with the introduction of sugar for our fermentation process and finish with our ready-to-drink canned cocktail. All inputs, outputs, side products, byproducts, and waste will be considered and properly accounted for so no stream or material is without a source and sink. This modeling will include factors such as scale, size of the plant, cost of operation, ingredients, and disposal. Additionally, to accompany our process modeling we will also consider and report any safety hazards or risks associated with our plant and the chemicals involved. Our team will write a Design Basis Memorandum in the Fall of 2022 and finish the technical design in Spring of 2023.

## **STS Topic**

When customers go to a fine dining restaurant, they are expecting more than high-quality food. Good service, elegant food presentation, and a sophisticated ambiance, are all factors that contribute to what a patron would expect (Alonso & O'Neill, 2010). This expectation can be traced back to the creation of fine dining, or Haute cooking, which was cooking for royalty in the 1800s (Larson). The idea was to differentiate the dining experience for the upper class with higher-quality ingredients and meticulous attention to detail (*A History of French Cuisine*, n.d.). This foundation of Haute cooking is seen in fine dining restaurants today. Many cooks who enter this industry are required to go to culinary school as well as internships to build experience before starting in the kitchen. These chefs are trained to have a level of perfection in school and whatever restaurant they work in. The working conditions are physically taxing, sometimes

working 16-20 hours every day. (Jake Talks Food, 2021) These long workdays contribute to the restaurant's goal of having notoriety as well as serving the consumers good food. While these work conditions may seem not as detrimental to a regular person, the combination of these 'labor requirements', as well as the need to be perfect builds a mental strain on a person. This problem is prevalent in this industry, which many patrons are not generally aware of. This research paper will examine the effects of this industry on the workers.

To better map out this problem, using the Actor-Network Theory (ANT) is the best framework to analyze this problem. This theory describes defining a network, which is “a group of unspecified relationships among entities of which the nature itself is undetermined” and connects them to actors, which are “entities that do things” (Callon, 1993, p. 263). This theory claims that everything can be connected through a series of relationships after mapping the network. I plan to use the fine dining industry as a network built off different actors to help frame this problem. While this theory is beneficial for this research, there have been many critiques of this framework. There is confusion about whether ANT is a theory or a method, which builds the question of what it is practiced to use. (Gad & Jensen, 2010, pg. 59) There is also criticism where ANT explains everything but leaves no room for explaining the “other” (Lee and Brown 1994).

Even with these critiques, ANT can still be a strong framework to investigate the toxicity in the fine dining industry.

Research Question: How do the fine dining industry's infrastructure and environment psychologically affect the workers?

To approach this question, I plan to use network analysis to analyze the fine dining network and the relevant actors consisting of the history behind the fine dining industry, culinary

school, the workers in the restaurants, the critics, and the consumers. With this methodology, I plan to build these actors by using documentary analysis through TikTok, blogs, and other social media to build connections of these actors. I will conduct an interview with Jacob Potashnick, a chef who has experience in this industry. A documentary analysis will be used to build a background on how these actors were created and the effect they have, as well as talk about the general experience. By using the interview methodology, I plan to interview a chef who has worked in this industry to understand the anecdotal situations I cannot find in the documentary analysis. These anecdotal situations will dive into specifics on what happens in the kitchen, how the workers are treated, what lasting psychological effects a cook might have, and if this environment was beneficial.

## **Conclusion**

For the proposed technical project, we aim to manufacture a process to produce liquor-based canned cocktails created from cane sugar. By using cane sugar, there would not be the typical unpleasant malt-based aftertaste. The drink will be on the healthier side, while also tasting comparable to other seltzers. We hope that it will target crowds that still enjoy cocktails, however, do not want to go out to bars. For the STS research paper, I aim to understand how the environment of the fine dining industry psychologically affects its workers by applying the Actor-Network theory framework. Using network analysis, I aim to break down each actor in this network through interviews and documentary analysis and to build a general understanding of these effects, as well as create awareness from this.



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