COLLEGE OF HEALTH & HUMAN SCIENCES
COLORADO STATE UNIVERSITY

Tea Infused Beer Consumer Acceptance Study

ABSTRACT

A consumer hedonic study was performed to explore the potential for the use of tea in beer production. There is limited literature of the role tea could have in beer. However, of the studies that are published there is a tendency to stray away from a hot side addition of tea due to the potential for undesirable levels of bitterness (Rong,2016). In adherence with this, the tea beer for this study was prepared by steeping three 5-gallon doses of Firsdtea's Organic Jasmine tea (Control, 1lbs/bbl, 2lbs/bbl) directly into finished Gilded Goat's Cashmere Cream Ale. A 130-person hedonic Survey was conducted to find if there was a statistically significant preference for one of the doses. The ANOVA and a couple T-Tests was performed on the data determining that there was no statistical preference among consumers.

INTRODUCTION

- Tea (typically *Camellia sinensis)* is the second most popular beverage in the world (second to water) and functions as an important dietary source of antioxidants and polyphenols for humans (McKay,2002).
- Beer is the most widely consumed alcoholic beverage on the planet.
- Many tea beers have been produced but industrial standards, scholarly research, and universal methods require further research.
- The merging of these beverages into a single successful product has massive marketing and creative potential.
- Our goal for this project was to gather customer preference sensory data on of tea infused beers. Also selecting and utilizing a common method of separate doses to provide future brewers with helpful guidelines to achieve customer satisfaction.

CONCEPTUAL MODEL

The most important aspect of tea we are aiming to extract into our beer is the tortal polyphenol content (TPC) which includes metal chelation content and antioxidant levels while reducing bitterness or oxidation in the final product (McKay, 2002).
Method: We utilized cold infusion of the tea into the beer over a period of 24 hours.

- The oil-based polyphenol content lends itself to the cold infusion of tea into beer to gain the flavor, aroma, and antioxidant levels we want (Goman, 2019)).
- We decided against tea introduction on the "hot side" of the brewing process to reduce risk of unwanted bitterness and obtain a more efficient flavor extraction without volatile loss due to boiling (Horn, 2022).

MATERIALS AND METHODS

Materials

- 1x ½ barrel keg of Cashmere Cream Ale generously donated by gilded goat
- 5x Cornelius kegs Cleaned and Sanitized
  - 0.5 lbs of Organic Jasmine Bouquet Tea ->
  - 5lbs CO2 Canister
  - 3x Taps and lines
  - 600x 4 oz. Sample cups

Photo of FirsdTea's Jasmine Tea sourced from Firsd Tea

Methods

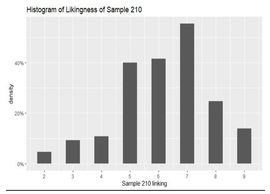
Consumer Study
- -Google Form QR code Accessibility
- -Consent
- -9 point hedonic scale
- -Demographic questions
  - -Age/Gender
  - -Tea Consumption
  - -Beer Consumptoon
- -100-150 participants
- -Encoded samples:
  - **Control- 210**
  - **1 lbs/bbl- 867**
  - **2lbs/bbl- 422**

Data Analysis
- -Two Sample T-Test
  - -Comparing Sample's means
    - 210-422
    - 867-422
- -Analysis of Variance (ANOVA)

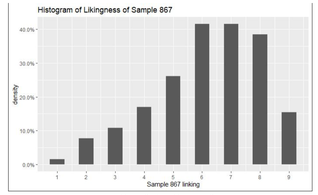
PHOTOS!!

Photo of FirsdTea's Tea Fields sourced from Firsd Tea

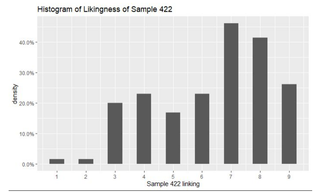
RESULTS



Graph 1: from Henrique Rio



Graph 2: from Henrique Rio



Graph 3: from Henrique Rio

Two Sample T-Test Results

Samples	t	df	p-Value	95% Confidence Interval	
210-422	-1.0999	23.759	0.2824	-2.213486	0.675024
867-422	0.52705	23.997	0.603	-1.121538	1.890768

Table 1: from Henrique Rio

Analysis of Variance Test Results

df	Sum Sq.	Mean Sq.	F-Value	Pr(>F)
2	2.63	1.3154	0.3983	0.6718

Table 2: from Henrique Rio

-130 respondents (129 used as 1 did not consent to use of their data)
-It was found that many participants neglected to respond with age, and that the distribution of those who had responded was not very even (with the majority of people being between 25-35. Therefore age correlation was ruled out.
- Though the tests suggested that there seemed to be no statistically significant difference among the samples, there was some suggestion of preference among people who preferred black and green teas. No such correlation was found for beer style preference.

CONCLUSION

The results of both the ANOVA test and T-Test Indicate that there is no correlation among the 130 consumer responses collected between Tea dosing and Consumer acceptance. However this does suggest that consumers are just as accepting of tea in beer as not.
Unintended Variables that may have affected the survey:
-no palette cleansers -unknown level of inebriation of respondents
-confusion for whether the scale was relative or absolute
Suggestions for further study:
-Larger Consumer size -Exploration of different tea/beer combinations
-Exploration of different infusion methods -more control of testing site

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