A STUDY ON FORMULATION AND ACCEPTABILITY OF ANTI-COLD MOCKTAILS WITH VITAMIN C ENRICHED INGREDIENTS

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Received: 10 July 2018, Revised and Accepted: 25 July 2018

ABSTRACT

Objectives: Common cold is a widespread respiratory infection among all age groups. This creates a great nuisance and discomfort making a person feels ill. Common cold can also be treated with home-made remedies. The study gives attention to develop and formulate Mocktail drinks with Vitamin C enriched ingredients to fight against cold.

Method: Developed Mocktails are tested for the presence of vitamins, and evaluated with sensory evaluation among 50 panelist members, feedback data collected are analyzed with statistical software SPSS (21.0).

Results: The study exhibits that the formulated recipes of Mocktails are identical in aroma analysis with one-way ANOVA test proves, the recipes are significantly different in taste and appearance. The Freidman’s test shows that the Mocktail with pineapple juice (Code C) is more preferred by panelist members.

Conclusion: The developed Mocktail recipes are rich in Vitamin C and significantly different in their organoleptic parameters furthermore preferably acceptable.

Keywords: Acceptance, Cold, Ingredients, Mocktails, Vitamin C.

INTRODUCTION

Nowadays, youngsters are more aware that healthy living can be achieved only by a well-organized and healthy diet practice constituting an elaborate range of healthy ingredients in their food habit. Beside routine juices and packaged drinks, the Mocktail, a blended non-alcoholic drink of fresh fruit juices with squashes, flavored water, herbs, or spices [1] are more preferred for their healthy properties.

Mocktails recipes are more oriented toward the mixture of herbs and spices with fresh juice extracts from the fruits such as mangoes, pineapple, orange, and pomegranate rich in antioxidants and vitamins.

Consumption of these drinks improves their immunity [2]. These drinks are less expensive, more colorful and unique in taste which can be also consumed by children and pregnant ladies [3].

The bartenders at present scenario act as an expert mixologist formulating the recipes with more nutritive and medicinal ingredients as their guest are more knowledgeable and responsive to what they drink [4]. The space for these non-alcoholic drinks are more projected at the food and beverage outlets as the customer’s preference for herbal and health-based Mocktails are gradually increasing [5]. Alcoholics consume these drinks to reduce their strong alcohol consumptions and make their following days fresh for work [6]. Formulating the recipes for Mocktail depends on the expertise, skill, and innovative thinking of the food and beverage personnel.

The study involves the formulation and standardizing of three anti-cold Mocktail recipes with fruit juices rich in Vitamin C such as papaya, orange, and pineapple, and good source of Vitamin C [7], Vitamin C acts as an alternative medicine for common cold, a gram per day decreases the symptom around 8% in adults and 18% in children [8]. The other commonly available anti-cold ingredients such as Indian borage (Plectranthus amboinicus) [9], honey [10], and ginger [11] are also used in the preparation of Mocktails. Mint leaves [12] and Strawberry [7] another rich source of Vitamin C and help to fight cold [13] is used for garnishing the drinks.
added to the shaker and shaken well and then garnished with a sliced strawberry and chopped mint leaves. Mocktail prepared with orange juice is coded as CODE A, with papaya is coded as CODE B, and with pineapple juice is coded as CODE C. The ingredient for three Mocktail recipes is exhibited in Table 1.

**Bottling and storage of fruit juices and extractions**
Once the juices and extracts are prepared, they are stored separately. Refrigeration of the juices and extract should be avoided. It is advisable to blend the Mocktail once the juice and borage have been prepared for an exceptional taste and effective result.

**Qualitative analysis of vitamins**

**Test for Vitamin A**
Dissolve quantity equivalent to 10–15 units in 1 ml of chloroform and add 5 ml of antimony trichloride solution, a transient blue color is produced immediately.

**Test for Vitamin C**
Dilute 1 ml of 2% w/v solution with 5 ml of water and add 1 drop of freshly prepared 5% w/v solution of sodium nitroprusside and 2 ml of dilute sodium hydroxide solution. Add 0.6 ml of HCL dropwise and stir, the yellow color turns blue.

**Test for Vitamin D**
Dissolve a quantity equivalent to about 1000 units of Vitamin D activity in chloroform and add 10 ml of antimony trichloride solution, a pinkish-red color appears at once.

**Test for Vitamin E**
500 mg of the sample powder was macerated with 10 ml of ethanol for 5 min and then filtered. Few drops of 0.1% ferric chloride in ethanol and 1 ml of 0.25% of 2’2’-dipyridyl to 1 ml of the filtrate. Bright-red color was formed on a white background. The background gradually assumes a pink [14].

**Sensory evaluation test**
The sensory evaluation is always important to be conducted when developing a new recipe to check the acceptance of the targeted population [15]. The sensory evaluation test was conducted among the 50 panelist members, randomly selected students from the Department of Catering and Hotel Management, Biochemistry, and Bioinformatics for the study to be more reliable. The panelist was divided into five groups with 10 members, in five sessions all three Mocktails were served together among the panelist giving a perfect interval of time for the best result. The protocol was approved by the Institutional Human Ethical Committee and informed consent was obtained from the participants.

A hedonic scorecard rating (Table 2) and a simple paired questionnaire (Table 3) is prepared and distributed among the panelist to register their feedback about the three Mocktails. From Table 2, the panelists were asked to evaluate the organoleptic qualities of the Mocktails such as color, taste, aroma, appearance, and their overall acceptance. The scale was ranging from 1-(dislike extremely) to 9-(like extremely). Table 3 was used to bring out preference of the Mocktail among the panelist. All feedbacks were received, and data are segregated for further statistical analysis.

**Nutritive value calculation**
The nutritive values of the Mocktails are calculated as per the ingredients nutritive values. The book is referred to as the reference of nutritive values of the ingredients.

**Statistical analysis**
The data received from the panelists were fed and analyzed with the SPSS (21.0) statistical tool. Data were checked for reliability and descriptively analyzed. The organoleptic qualities of three coded Mocktails were correlated (Pearson correlation test) and analyzed with One-Way ANOVA test to check whether there exists any relation in sensory parameters. The Mocktails were also ranked using the Friedman Test [16].

**RESULTS AND DISCUSSION**
The sensory evaluation data for the organoleptic parameters of the three Mocktails were correlated (Pearson correlation test) among each other to check whether there exists any interrelation among the organoleptic parameters.

<table>
<thead>
<tr>
<th>CODE A</th>
<th>CODE B</th>
<th>CODE C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Part orange juice</td>
<td>3 Part papaya juice</td>
<td>3 Part pineapple juice</td>
</tr>
<tr>
<td>1 Part Indian Borage Extract</td>
<td>1 Part Indian Borage Extract</td>
<td>1 Part Indian Borage Extract</td>
</tr>
<tr>
<td>1 Part ginger extract</td>
<td>1 Part ginger extract</td>
<td>1 Part ginger extract</td>
</tr>
<tr>
<td>Organic honey−20 ml</td>
<td>Organic honey−20 ml</td>
<td>Organic honey−20 ml</td>
</tr>
<tr>
<td>Strawberry and mint leaves(to garnish)</td>
<td>Strawberry and mint leaves(to garnish)</td>
<td>Strawberry and mint leaves(to garnish)</td>
</tr>
</tbody>
</table>

**Table 2: Sensory evaluation sheet for evaluating Mocktail recipes**

<table>
<thead>
<tr>
<th>Sample-hedonic score card rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:  Panelist Name:  Mocktail code:  Panelist No</td>
</tr>
<tr>
<td>Please taste the given coded Mocktail and mark (✓) how much you like or dislike it on the point in the scale which bests describes your opinion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S. no.</th>
<th>Hedonic score</th>
<th>Color</th>
<th>Taste</th>
<th>Aroma</th>
<th>Appearance</th>
<th>Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dislike extremely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dislike very much</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Dislike moderately</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Dislike slightly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Neither like nor dislike</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Like slightly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Like moderately</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Like very much</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Like extremely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
With regard to color, CODE A and CODE C correlates each other \( r=0.279 \) and significant at 0.5 level showing that the color of CODE A and CODE C resembles each other.

### Aroma
The aroma of the three Mocktails is, moreover, identical as they correlate with each other (Table 4). This may be due to the strong aroma of Indian Borage being added as an ingredient. The strong aroma of Indian Borage has suppressed the aroma of fruits.

### Taste
The analysis with one-way ANOVA test for the parameter (taste) shows \( F \text{-value} = 5.53872 \) significant at \( p=0.004796 \) that there is no significant relation in taste among the three coded Mocktails.

### Appearance
There exists no positive correlation between the Mocktails. The ANOVA test also shows that the appearance is significantly different from each other with \( F \text{-value} = 7.4701 \) and significant at \( p<0.05 \) level.

The feedback from the panelist also summarized that the consistency level and the taste of all three Mocktail recipes were significantly differed from one another.

### Friedman test
Friedman test exhibits the ranking preferences of the three Mocktail drinks. From the below Tables 5a and b, the Chi-square value \( (18.230) \) is high showing that there exist distinct differences among the three Mocktails. Among the three Mocktail recipes, CODE C is more preferred and ranked first with mean ranking value \( (1.56) \).

### Panelist’s preference feedback
Panelist has been issued with a paired comparison questionnaire to evaluate the three Mocktail drinks. Fig. 1 exhibits the feedback of the panelist member which shows that among the 50 panelists only 2 members felt that the all three Mocktails are alike besides 28 panelist members have marked that the Mocktail drink CODE C is better than other two drinks.

### Analysis for vitamins
The laboratorial test proves the presence of vitamins in formulated Mocktails, Table 6 shows their levels of concentration according to the table there exist a high concentration of Vitamin C, besides there other vitamins such as Vitamin A, Vitamin D, and Vitamin K are also present in the formulated drink.

### CONCLUSION
Mocktails are internationally known drink being preferred by all customers, the study concludes that the three Mocktail drinks are significantly different, nutritive and best alternative medicine for cold. The study suggests that the innovative thinking in formulating these Mocktail recipes with traditional and healthy ingredients makes the drink more value-added and preferred by the customers and commercially successful.

### ACKNOWLEDGMENT
Authors thank the department head of hotel and catering management and the panelist member from hotel management and other department to make the research work successful. Vels Institute of Science, Technology and Advanced Studies, Chennai, has sponsored by providing grant to publish this article.

### AUTHORS’ CONTRIBUTIONS
A. Arun and X. Desalu considered and designed the study. Chef. M. Murali performed the experiment data collection. The manuscript was done and revised by A. Arun.

### CONFLICTS OF INTEREST
There exist no conflicts of interest among any authors. Authors effectively participated in the practical study and composition of manuscript.
REFERENCES


