ANALYSIS OF FORMULATION, EVALUATION AND ACCEPTABILITY OF COCKTAILS – A STUDY ON HOTEL MANAGEMENT STUDENTS

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Abstract

This study concentrates on the formulation, evaluation and acceptability of cocktails along with their ingredients used. Developed cocktails are tested for their ingredients and sensory evaluation on hotel management students. Data analyzed using SPSS software (20) for concrete evaluation of association of taste and flavors of alcoholic beverages. Sensory evaluation methods are extensively used in the wine, beer and distilled spirits industries for product development and quality control, while consumer research methods also offer useful insights as the product is being developed. This paper introduces sensory evaluation and consumer research methods and provides a detailed analysis of their applications to a variety of different alcoholic beverages and their association with various flavors. The respondents are from the different region who tasted all the samples of cocktails. Research data was collected through structured questionnaires and 100 respondents given response out of 120 respondents targeted. Five point likert scale used for measuring the performance of all factors. In this research study qualitative methods of research were applied. Present study revealed that using of different types of juices, fresh herbs and other useful ingredients change the taste, color, flavor and give new shape to the drink where customer show the acceptability towards the drinks

Keywords: Formulation, Accessibility, Ingredients, Cocktails. Flavors'

Background of study:

 Alcoholic beverages found been used since very long in the human society. The current trend of consumption of alcoholic beverages and availability of these beverages are easily accessible and approachable. Many researchers have contributed on this aspect of alcohol consumption and revealed in their study that there is relation of drinking behavior and health system of general public also. Cultural differences also influenced that drinking consumption and in addition to that it has also impacted on global burden which is predicted to increase gradually [4].

The world beverage market of soft drinks includes (noncarbonated soft drinks (NCSD) and Carbonated Soft Drinks) and alcoholic drinks. The cocktail is a blend of alcoholic content and juices and other soft drinks that are heavily demanded drink due to their health benefits and features [1]. Bartender in the hotels are preferred the core expert of mixology of drinks as per their nutritive and medicinal content due to the reason that in today scenario guests are more proactive and knowledge with respect to what they drink 3]. The scope for these alcoholic beverages is increasing slightly as the trends and knowledge of health and health based drinks popularizing [4]. Alcohol consumers are consuming these drinks to reduce the stress level and making their following day a fresh day for workplace [2].

Developing cocktails require extensive beverage knowledge and skills to blend the alcoholic beverages as per latest trends. Beverages are classified in two categories alcoholic and non alcoholic drinks. An alcohol base drink contains ethanol content while on the other hand, non-alcoholic beverages contain no alcohol or less than 0.5 percent that also termed as soft drinks [5]. Increasing globalization and international trade, in recent decades, have had effects in the production and consumption patterns of beverages (Increasing supply and competition in the wine industry, as well as developments of concentrations in the beer markets, and probably similar challenges for spirits and soft drinks) [6,8,9]. Convergence in incomes has also been the case among a considerable number of countries and with subsequent influence on tastes and drinking patterns [4, 11]. In light of these issues

Food and Beverage sectors and segments are divided in various sections as given in the figure.
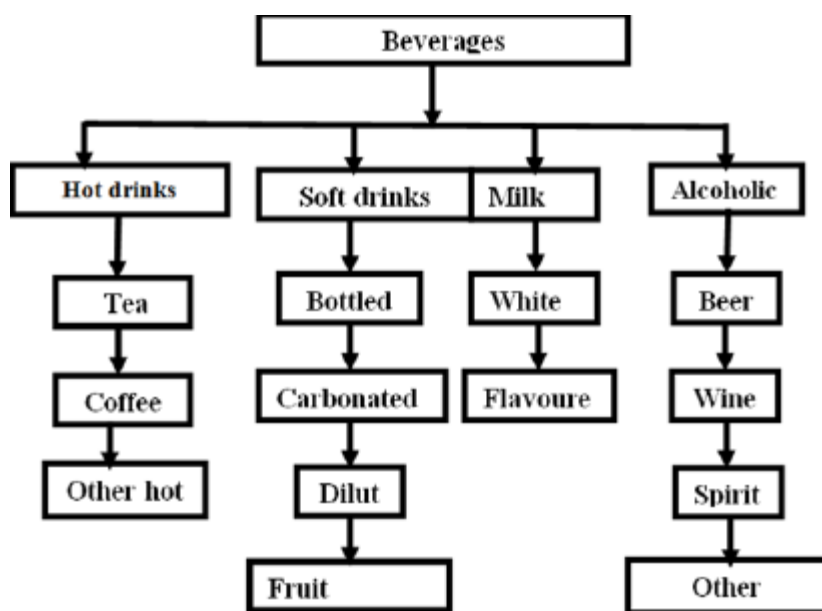

Figure1: Beverage Sectors and Segments   (Sources: Soft drink worlds/2013).

Cocktail consumption is one new concept in the young generation, drinking of alcohol in large qualities not good for health. Different age group of people have their own way to consume the alcohol, some people consume the in the form of cocktail, where they like mixing of various types of drink together with verities of juices. In the social media sites different verities of cocktails are shown where today's younger get the awareness about the cocktail and give much more preference to consume alcohol in the form of cocktail. Three things keep in mind at the time of preparation of cocktail i.e. **Balance, Style and consistency**. Creating a new cocktail recipes one of the most challenge part i.e. **flavor integration** and another one is taste but which should be according to your brain. The third element is one of the most important ie acidity, sweetness, bitterness and alcohol. The symbolic connection find between the food and cocktail as per psychology, sociology and anthropology [14]. Consumption of alcohol with food reported to show demographic variables such as age, gender, and other factors. The same relationship seen with wine and beer and it will consider as a summer drink. Australians people are passionate about their alcohol, Australian do not have their own particular cuisine but they more emphasis on sea food. Alcohols are generally used for medication and reduce the stress and loneliness.

Food and Wine: Linkage between food and wine coming from ancient times as an interesting food trend. American peoples found of different varieties of wines and they believe "A meal without wine is like a day without sunshine" [15]. People given much more preference to consume white wine with white meat, red meat with red wine and champagne served with sea food. Now a day's there are certain cocktails prepared with using of beer and wine. Wines consume for pleasure and on special occasion. The combination of food and wine give mental relaxation same in the context of sparkling wine. The taste of wine enhances the food flavor.

Collection of ingredients:

There are some of the common ingredients used in the preparation of cocktails Whiskey, Bacardi, Vodka, Scotch Whiskey and Rum. Some other ingredients used for the preparation of cocktail orange juice, lemon juice, tomato juice, pineapple juice, mint leaf, castor sugar, Triple sac, salt, paper, egg white, coconut cream etc.

Preperation and Coding of the Cocktails:
Once all the ingredients collected and then start the process of making the different types of cocktails by using of different methods. Different types of juices are used for the preparation of cocktails and different CODE given according to their color, taste, flavor, presentation and the acceptance level. In the study six samples are collected and check their **PH Value, TSS (Brix) and Titrable Acidity (%).** The cocktail prepared with 1) Scotch Whiskey with Rum along with orange juice and grenadine syrup the coded as CODE A, 2) Bacardi with lemon juice, mint leafs, and caster sugar is coded as CODE B. 3) Vodka based cocktail with addition of cranberry Juice, triple Sec and lemon juice the coded as CODE C. 4) Vodka based cocktail with addition of tomato Juice, Worcestershire sauce, tobacco sauce, lemon juice with salt and paper coded as

CODE D. 5) Scotch whiskey with addition of some other ingredients like egg and lemon juice coded as CODE E. 6) White Rum with the addition of coconut cream and pineapple juice coded as a CODE F.

Recipes of Six Cocktail recipes mentioned in Table 1

Table 1. List of Ingredients for Cocktails:

Code	Sample	Ingredients	PH	TSS (Brix)	Titrable Acidity (%)
A	Golden Glow	45 ML Scotch Whisky 15 ML Dark Rum 15 ML Orange Juice 5 MlL Grenadine Syrup	3.79+/_0.21	15+/_0.73	1.52+/_0.11
B	Mojito	4-5 Pcs Lemon Chunks 6-8 Pcs Mint Leafs 60 ML Bacardi White Rum 1 Tbs Castor Sugar	3.78+/_0.23	4.7+/_0.39	1.52+/_0.16
C	Cosmopolitan	45 ML Vodka 90 ML Cranberry Juice 15 ML Triple Sec 05 ML Lemon Juice	3.05+/_0.16 (Lower)	14.2+/_0.72	2.64+/_0.18 (High)
D	Bloody Marry	45 ML Vodka 100 ML Tomto Juice 2-3 drops Worcestershire sacuce 3-4 drops Tobacco sauce 15 ML Lemon Juice Pinch of Salt & Pepper	4.20+/_0.31	8.1+/_0.61	2.08+/_0.18
E	Whisky Sour	45 ML Scotch Whisky 5 Ml Egg White 15 ML Lemon Juice	4.43+/_0.33 (High)	10+/-0.63	1.12+/_0.8 (Lower)
F	Pina Colada	60ML White Rum 60 ML Coconut Cream	4.39+/_0.33	8.2+/_0.44	1.68+/_0.18

		120 ML Pineapple Juice				

Sensory Evaluation Test:

This evaluation plays an important role in developing of the new recipe and to check the acceptance of the targeted population. The sensory evolution was conducted with 100 randomly selected students of Hotel Management and experts in food and beverage service along with the Biotechnology department for the testing the sample and finding the value of **PH Value, TSS (Brix) and Titrable Acidity (%).** The score rating card mentioned on the above table with their value. All the responses data segregated and analysis the result in the SPSS software to fine the Pearson Correlation with each other

Table 2. Evaluation sheet for evaluating Cocktails Recipes:

Sr. No	Hedonic Score	Color/base of the drink	Taste of the drink	Flavor of the drink	Presentation of the drink	Acceptance of the drink
1	Dislike extremely					
2	Dislike very much					
3	Neither like nor dislike					
4	Like					
5	Like Extremely					

Reliability and validity of pilot test

The questionnaire vetted by industry expert and the academician for survey questionnaire. The pilots study conducted between the months of September to October 2019 by taking the sample size of 50 respondents. Based on responses, check their validity and reliability of instrument. Cronbach alpha calculated to measure the reliability of the instrument. In each part of the questionnaire was based on the result of the alpha coefficient. Cronbach's Alpha, KMO used to examine the internal reliability of the pilot test.

Table No.3   Acceptable and Unacceptable Level of Cronbach's Alpha Coefficient

Alpha coefficient	Implied reliability
Below then .60	Unacceptable
In between .60 and .65	Undesirable
Between .65 and .70	Minimally acceptable

Between .70 and .80	Respectable
Between .80 and .90	Very good
Above then .90	Consider shortening the scale

Source: DeVellis (1991)

After the collection of data from the respondents it is further tested through software SPSS (20 version).The results shows that the alpha coefficients for all attributes were high range that is .660 which is acceptable as a good value.

Table No.4 Cronbach Alpha

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.660	.669	8

Results and discussion:

Table 5: Demographic Characteristics of the Sample

Age Group-		Count	%
15-20	1	52	52
21-25	2	25	25
26-30	3	10	10
31-35	4	7	7
36-50	5	6	6
Gender			
Male	1	82	82
Female	2	18	18
Program			
Diploma	1	16	16
Undergraduate	2	50	50
Certificate	3	9	9
Postgraduate	4	10	10
Other	5	15	15
Year			

First Year	1	15	15
Second Year	2	45	45
Third Year	3	17	17
Final Year	4	9	9
Other	5	14	14

Source: Primary Data

The data shown in the Table 5, the male respondents are 82% and female respondents 18% which 52% of customers are in the age group between 15 to 20 years and majority of respondents are professional degree holder and study the different program of hotel management. The data are collected from hotel management students where 50% students in undergraduate program and 10% students are doing post graduation. Respondents are studying in different years 45% students from second years and 17% from third years. These all respondents do the sampling of the cocktails and do the tasting, checking the actual color of the drink along with their flavor, presentation and check the acceptance level of the drink.

Table No. 6 Coefficient between the age and samples

Correlations		Age	Color	Taste	Flavor	Presentation	Acceptance
Age	Pearson Correlation	1	**.130**	**.087**	**.084**	**.140**	**.163**
	Sig. (2-tailed)		.197	.388	.406	.166	.104
	N	100	100	100	100	100	100
Color	Pearson Correlation	**.130**	1	**.653**[**]	**.597**[**]	**.535**[**]	**.355**[**]
	Sig. (2-tailed)	.197		.000	.000	.000	.000
	N	100	100	100	100	100	100
Taste	Pearson Correlation	**.087**	**.653**[**]	1	**.808**[**]	**.553**[**]	**.663**[**]
	Sig. (2-tailed)	.388	.000		.000	.000	.000
	N	100	100	100	100	100	100
Flavor	Pearson Correlation	**.084**	**.597**[**]	**.808**[**]	1	**.574**[**]	**.511**[**]
	Sig. (2-tailed)	.406	.000	.000		.000	.000
	N	100	100	100	100	100	100
Presentation	Pearson Correlation	**.140**	**.535**[**]	**.553**[**]	**.574**[**]	1	**.593**[**]
	Sig. (2-tailed)	.166	.000	.000	.000		.000
	N	100	100	100	100	100	100

Acceptance	Pearson Correlation	.163	.355**	.663**	.511**	.593**	1
	Sig. (2-tailed)	.104	.000	.000	.000	.000	
	N	100	100	100	100	100	100
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: Primary Data

The study proves that the correlations found between the age, color, taste, flavor, presentation and acceptance of the drink. As per the above table number 5 the correlation between age and color of the drink show positive significance ie (r=**.197**) where the result prove that different age group of people given the preference to the color of the drink but their responses may be different. As the above table show the Correlation between customer satisfaction and loyal guest (r= .520). In the same table another color of the drink have strong significance correlation with taste ie (**.653**) The another result seen in the table different age group of people have different opinion towards the taste vs flavor.

Different drinks prepared and tasted where all the value has positive relationship with each other but strong correlation was found ie (**.808**) Different drink are prepared and tasted by the responded with different age group where study proved that where presentation of the drink is art and skill. The value shows the relationship between (r=**.574** and **.593**) which show the strong correlation with each other.

Table No. 7 Coefficient between the gender and samples of cocktail

Correlations		Gender	Color	Taste	Flavor	Presentation	Acceptance
Gender	Pearson Correlation	1	.022	.085	.131	.150	.076
	Sig. (2-tailed)		.827	.402	.195	.137	.454
	N	100	100	100	100	100	100
Color	Pearson Correlation	.022	1	.653**	.597**	.535**	.355**
	Sig. (2-tailed)	.827		.000	.000	.000	.000
	N	100	100	100	100	100	100
Taste	Pearson Correlation	.085	.653**	1	.808**	.553**	.663**
	Sig. (2-tailed)	.402	.000		.000	.000	.000
	N	100	100	100	100	100	100
Flavor	Pearson Correlation	.131	.597**	.808**	1	.574**	.511**
	Sig. (2-tailed)	.195	.000	.000		.000	.000

		100	100	100	100	100	100
Presentation	Pearson Correlation	**.150**	**.535**[**]	**.553**[**]	**.574**[**]	1	**.593**[**]
	Sig. (2-tailed)	.137	.000	.000	.000		.000
	N	100	100	100	100	100	100
Acceptance	Pearson Correlation	**.076**	**.355**[**]	**.663**[**]	**.511**[**]	**.593**[**]	1
	Sig. (2-tailed)	.454	.000	.000	.000	.000	
	N	100	100	100	100	100	100
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: Primary Data

As mentioned in the Table number 07 shows the correlation between gender and color of the drink, the result shows the positive significance correlation with each other. The gender given the preference to color of the drink ie (**.653**[**]) where in another case it seen that different gender tasted the sample of the cocktail and found strong correlation with taste and flavor ie (**.808**[**]). Further the relationship seen between presentation and acceptance of the drink, where it seen in the results that presentation of drink different gender given their importance and result prove that the correlation found satisfactory ie (**.593**[**]).

Conclusion:

Since long back the history of alcoholic beverages traced and observed that the consumption of these beverages are good for health or bad which has become the topic of debate at present. The consumption or intake of theses beverages evolve constantly around the world. Although India is dry country where drinking practices are found different at the various stages and aspects. From this study the results revealed that there is positive association of alcoholic beverages in terms of taste, color, flavors and nutritive value. Cocktails are found as International drink where all the different categories customer are given their preference. The study suggest that using of different types of juices, fresh herbs and other useful ingredients change the taste, color, flavor and give new shape to the drink where customer show the acceptability towards the drinks. Some spirits are bitter in their taste where customer not given much more preference, but when they are prepared in different style and technique with addition of some mixture customer love to consume drinks and become preferable drink for the customer

References:

1. Troiano RP, Briefel RR, Carroll MD, Bialostosky K (2000) Energy and fat intakes of children and adolescents in the United States: data from the National Health and Nutrition Examination Surveys. Am J Clin Nutr 72(5 Suppl): 1343S-1353S.

2. Fiordalisi I, Finberg L (2003) Diarrhea and Dehydration. In: Perkin RM, Swift JD, Newton DA (Eds.), Pediatric Hospital Medicine. Lippincott Williams & Wilkins, Philadelphia, USA, pp.191-198.

3. Lorenz JM, Kleinman LI (2003) Physiology and Pathophysiology of Body Water and Electrolytes. In: Kaplan LA, Pesce AJ, Kazmierczak SC (Eds.), Clinical chemistry: theory, analysis, correlation. Mosby, Inc, Missouri, USA, pp. 452-453.

4. Abdeiazmi Sayed, Abdelazimf Abdellati. The Beverages. Agri Res & Tech: Open Access J. 2018; 14(5): 555933. DOI: 10.19080/ARTOAJ.2018.14.555933.

5. Das, Subir & Balakrishnan, Vallath & Vasudevan, Damodaran. (2006). Alcohol: Its health and social impact in India. The National medical journal of India. 19. 94-9.

6. Roethenbaugh G (2005) Ingredients. In Chemistry and Technology of Soft Drinks and Fruit Juices. Ashurst PR (Eds.), Sheffield Academic Press, England, pp. 15-34.

7. *Alcohol: Its health and social impact in India*. Available from: https://www.researchgate.net/publication/7027233_Alcohol_Its_health_and_social_impa ct_in_India [accessed Apr 09 2020].

8. Launch of Indian Alcohol Policy Alliance. The Globe. 2005; 2:1- 24. 5. WHO Global Status Report on Alcohol 2004:28-52

9. Gupta PC, Saxena S, Pednekar MS, Maulik PK. Alcohol consumption among middle-aged and elderly men: a community study from western India. Alcohol and Alcoholism. 2003 Jul-Aug; 38(4):327-31

10. Haider W, Chaudhary MA. Prevalence of alcoholism in the Punjab, Pakistan. Biomedica.2008 July-Dec;24:80-84

11. Dorothy Hector, Elizabeth McGill, Daniel Grace and Matt Egan, Challenging, co-operating and splitting: a qualitative analysis of how the trade press responded to cumulative impact policies in England and Wales, *Drugs: Education, Prevention and Policy*, 10.1080/09687637.2017.1353063, **26**, 1, (104-112), (2017).

12. S. Costanzo, G. de Gaetano, A. Di Castelnuovo, L. Djoussé, A. Poli and D.P. Van Velden, Moderate alcohol consumption and lower total mortality risk: justified doubts or established facts?, *Nutrition, Metabolism and Cardiovascular Diseases*, 10.1016/j.numecd.2019.05.062, (2019).

13. Ingeborg Rossow and Jim McCambridge, The handling of evidence in national and local policy making: a case study of alcohol industry actor strategies regarding data on on-premise trading hours and violence in Norway, *BMC Public Health*, 10.1186/s12889-018-6348-y, **19**, 1, (2019).

14. Wondrich, D. (2007) Imbibe: From Absinthe Cocktail to Whiskey Smash, a Salute in Stories and Drinks to 'Professor' Jerry Thomas Pioneer of the American Bar, Perigee Trade, USA.

15. Exley, H. (Ed.) (1994), Wine Quotations, Exley Publications, Watford.