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Acceptability of the Belly Fat Reducing (BFR) Puree Sensory Attributes

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Abstract:
This survey research determines the extent of acceptability on the four attributes (Looks, smells, tastes and feels) of the Belly Fat Reducing (BFR) Puree among its end users. An affective analysis or consumer's acceptance survey that utilizes the 9- point hedonic rating scale on the sensory attributes of the BFR Puree is used among the 142 trained and untrained panelists. The data were collated and scrutinized using appropriate statistical tools. Results showed that both panelists' ratings range closely on "like moderately" and "like slightly" on the four sensory attributes of the BFR Puree. In a .05 margin of error, the ANOVA computation disclosed that there is no significant difference in the panelists' acceptance of the BFR Puree. The study concluded with suggesting recommendations the most important of which is on the Efficacy of the Therapeutic Claim of the BFR Puree.

Keywords: *Acceptability, Belly Fat Reducing (BFR) Puree, Sensory Attributes*

1. Introduction

The Belly-Fat Reducing Puree acronym as *BFR Puree* is developed by the *I*nteractive *M*anagement *S*olution (*iMs*) *T*eam of Northwestern Mindanao State College of Science and Technology (NMSCST), Labuyo, Tangub City. *BFR Puree* is a proprietary blend of wholesome "*RaGiLeHoCi*" - radish, ginger, lemon, honey and cinnamon-; 5 locally - grown plants formulated into a puree on intent as *fat buster for a non-invasive weight loss.*

The main consideration of today's consumers, in selecting and eating a food commodity is the product's tastiness or eating quality. Other quality measures, such as nutrition and wholesomeness are secondary (Meiselman & MacFie, 1996; Lawless & Heymann, 1998).

The developed BFR Puree is a newly trialed product which is not known to consumers; therefore, optimization of its desirable sensory attributes would escalate acceptance and consumption. The sensory attributes of food are extensively reflected to be the most important determinant of acceptability. The term "food acceptability" and "acceptance" comprise actual sensory appraisal where the food presented is chosen or manipulated by the developer to obtain the reaction of end users to variation of particular interest (Noemi Raquel Pavon Lic. en Bromatologia, 2001 August 2003)A sensory assessment is made by the senses of taste, smell, and touch when food is eaten. The complex sensation that effects from the interaction of the senses is used to evaluate food quality. (Elizabeth Larmond digitized 2012).Moreover, sensory quality should be considered as a key factor in food acceptance because consumers seek food with certain sensory characteristics. The acceptance of a food will depend on whether it satisfies on consumer preferences and on the degree of contentment that it is able to provide (Heldman, 2004).It is also reported that texture to be a primary aspect which consumers use to judge quality of the product (Prinyawiwatkul et al.1993).

The interplay between BFR Puree's sensory attributes and sensory acceptability among consumers that affect buyers' purchase and choice is an area that merits closer attention. With this, *iMs Team* desires to promote awareness on the importance of *BFR Puree* in diet as it has most medicinal value to the buying public, that is why this survey is made to assess the extent of consumer's awareness, acceptability and overall preference on the four sensory attributes on how the Belly Fat Reducing(BFR) Puree looks, smells, tastes and feels.

2. Methods and Procedures

2.1. Background Profile

The developmental phase and testing of the finished product under - study is conducted twice between the months of January to March 2016 to 6 and 15 volunteered participants respectively. All the 21 participants both male and female range from 25 to 56 years old; 52 to 88 kilos in weight; 76/58 to 208/127 in blood pressure and 97mg/dl to 433mg/dl of blood sugar count. With an intake of 1 table spoon; twice a day preferably before breakfast and dinner; straight in a row for 15 days is found out that the BFR Puree works 100% to cut the unwanted bulges in the belly with no adverse clinical sign consequences even in an eat all you can and no strenuous exercise situation. For proof, the BFR Puree is adjudged - *Best project Runner Up - Food and Nutrition Category - IIT Techhnovation 2016, Iligan City, Mindanao, Philippines.*

2.2. Method

This study employs both awareness questionnaire with a yes and no options and an affective analysis also known as consumer's acceptance test through a 9 Point Hedonic Scale developed by Jones, Peryam, & Thurstone(1955) as adapted from UII, BAFT, B.Sc. Food Science and Technology, Course Material for BASF306B Sensory Science of Food (2012) to evaluate the personal response of preference or acceptance from current or potential customers concerning the four sensory attributes of the BFR Puree. The Survey and Testing were done simultaneously (date and time) to both the volunteered trained and untrained panelists.

2.3. Panel Participants

Open recruitment was done for all interested participants to be the panelists for the sensory evaluation of the BFR Puree. The 142 volunteered panelists were of wide age group, ranging from 18 to 57 years old. The target number of panelists are grouped in 2 sets: The first panel set of 110 belongs to the possible consumers not aware nor tasted the product yet, who were randomly chosen between the 8:00 a.m. to 10:00 a.m. costumers of *Sha pharmacy,* located at the city proper of Tangub during the March 2017 4P's.The second panel set of 32 is a composite of Agriculture, Food Tech and Hotel Restaurant Service Technology Instructors of Northwestern Mindanao State College of Science and Technology (NMSCST) who are trained or tested foods' sensory attributes during their classes on major subjects about food processing. Testing of the BFR Puree was done simultaneously on the same date and time.

2.4. Sample Preparation& Sensory Test

A proprietary blend of five locally found healthful radish, lemon, honey, ginger and cinnamon which are good for a 15 – day regimen intended as *fat buster for a non-invasive weight loss* was prepared by the *iMs Team*. Each of the randomly chosen participants in the two sets of panelists was given one teaspoonful of BFR Puree for affective analysis on its four sensory attributes – *looks, smells, tastes and feels*– using the description of the hedonic point of scaling.

2.5. Statistical Analysis

The result obtained in the responses of all the panelists were collated and scrutinized using the statistical tool of frequency distribution, mean and percentage. To find out the extent of acceptability of the BFR Puree on its four attributes in a .05 margin of error, the ANOVA is used.

3. Results and Discussions

3.1. Untrained Panelists / Prospective Buyers - Consumers

The first set that were considered as the untrained panelists were the possible buyers and consumers or the target end-users of the BFR Puree who were randomly chosen between the 8:00 a.m. to 10:00 a.m. (*as participants/ panelists are not overly hungry nor full*) costumers of *Sha Pharmacy*, located at the city proper of Tangub, during the March 2017 4P's. They were considered untrained of which they did not have any knowledge yet nor tasted about the BFR Puree.

Table 1 below shows the first set of participants' acceptance rating on the sensory attributes – *looks, smells, tastes and feels* - of the BFR Puree.

	9 point Hedonic Scale	Looks	Smells	Tastes	Feels	TOTAL
9	Like Extremely					
8	Like Very Much	12	2	16	12	**42**
7	Like Moderately	44	20	36	30	**130**
6	Like Slightly	45	40	32	46	**156**
5	Neither Like nor Dislike					
4	Dislike Slightly	9	20	20	14	**70**
3	Dislike Moderately		6	6	8	**20**
2	Dislike Very Much		18			**18**
1	Dislike Extremely		4			**4**
		N=110	**N=110**	**N=110**	**N=110**	**N=440**
	Total Rating Score	**710**	**534**	**670**	**654**	**2,562**
	Mean	**6.45**	**4.85**	**6.09**	**5.94**	**5.82**
	Verbal Description	**Like Moderately**	**Neither Like nor Dislike**	**Like Slightly**	**Like Slightly**	**Like Slightly**

Table 1: Untrained Participants Acceptance on the Sensory Attributes of the BFR Puree

Based on the data listed on table 1, it could be deduced that rating scores of the 110 untrained participants/panelists to the Sensory Attributes (looks, smells, tastes and feels) of the BFR Puree were varied, yet it ranges closely on the "*Like Slightly and Like Moderately*". This goes to show that the findings of the hedonic testing reveal that even in the absence of knowledge and information

about the nutritional benefits of the BFR Puree in the diet, panelists who are considered as prospective buyers / consumers in general do not dislike the newly developed product.

3.2. Trained Panelists / NMSCST Instructors

The second set of participants / panelists were 32 ; a composite of Agriculture, Food Technology and Hotel Restaurant Services Technology instructors of NMSCST. They are trained by profession on food processing and assessing food sensory attributes.

	9 point Hedonic Scale	Looks	Smells	Tastes	Feels	TOTAL
9	Like Extremely					
8	Like Very Much	12		16	6	**34**
7	Like Moderately	16		16	10	**42**
6	Like Slightly	4	22		14	**40**
5	Neither Like nor Dislike					
4	Dislike Slightly				2	**2**
3	Dislike Moderately		4			**4**
2	Dislike Very Much		6			**6**
1	Dislike Extremely					
	TOTAL	**N=32**	**N=32**	**N=32**	**N=32**	**N=128**
	Total Rating Score	**232**	**156**	**240**	**210**	**840**
	Mean	**7.25**	**4.87**	**7.5**	**6.56**	**6.56**
	Verbal Description	**Like Very Much**	**Neither Like nor Dislike**	**Like Very Much**	**Like Moderately**	**Like Moderately**

Table 2: Trained Participants' Acceptability on the Sensory Attributes of the BFR Puree

As shown in Table 2, data reveal that the acceptability rating scores of the trained panelists towards the sensory attributes of the BFR Puree range more on the *"like very much"* on the looks and tastes while *"like moderately"* for the feels that is because the developed product is a puree. On the other hand, "*ne*ither like nor *dislike*" is rated on the smells. Common reasons when asked in a follow through interview were; although the combined ingredients of the radish and cinnamon produced a pungent aroma, but the BFR Puree very appetizing appearance and palatable taste outweigh its smells. However for the BFR Puree to survive in the market, it needs to meet consumers' expectations and needs. Therefore, it is necessary that improvements were needed to refine its texture and to diminish the level of the puree's pungent aroma.

	Trained Panelists	Untrained Panelists
Appearance	7.25	6.45
aroma	4.87	4.85
flavor	7.5	6.09
Texture	6.56	5.94
MEAN	**6.545**	**5.8325**

Table 3: Analysis of Variance (ANOVA) on the Acceptability of BFR Puree Sensory Attributes between Trained and Untrained Panelists

The computation below compares the difference between the acceptability of the Trained and Untrained Panelists towards the sensory attributes of the BFR Puree in 5% level of Significance.

- Step 1: Null and alternative hypotheses

$H_0: \mu_1 = \mu_2$; The mean are statistically equal to each other

H_1= Mean are not equal

- Step 2: Calculating the appropriate test statistics

The Grand Mean

$$\bar{\bar{X}} = \frac{\sum X_{all}}{N} = 6.18875$$

Total Sum of Squares

$$SST = \sum (X_{all} - \bar{\bar{X}})^2 = 6.654688$$

Sum of Squares treatment

$$SSTR = \sum r\left(\bar{X} - \bar{\bar{X}}\right)^2 = [4(6.545 - 6.18875)^2] + [4(5.8325 - 6.18875)^2]$$
$$= 1.015313$$

Sum of Squares Error

$$SSE = (7.25 - 6.545)^2 + (4.87 - 6.545)^2 + (7.5 - 6.545)^2 + (6.56 - 6.545)^2 + (6.45 - 5.8325)^2 + (4.85 - 5.8325)^2 + (6.09 - 5.8325)^2 + (5.94 - 5.8325)^2 = 5.639375$$

Total Mean Square

$$MST = \frac{SST}{N-1} = \frac{6.654688}{8-1} = 0.95067$$

Mean Square Treatment

$$MSTR = \frac{SSTR}{\#columns - 1} = \frac{1.015313}{2-1} = 1.015313$$

Mean Square Error

$$MSE = \frac{SSE}{N - \#columns} = \frac{5.639375}{8-2} = 0.939896$$

$$F = \frac{MSTR}{MSE} = \frac{1.015313}{0.939896} = 1.08024$$

- Step 3: Obtain critical value from table of f-distribution

$$df_1 = \#columns - 1 = 2 - 1 = 1$$
$$df_2 = N - \#columns = 8 - 2 = 6$$
$$\alpha = 5\%$$
$$F_{1,6}^{cv} = 5.99$$

- Step 4: Decision rule

Reject the null hypothesis if: F (observed value)>F^{cv}(tabular).
In this situation 1.08024 (observed value) is lesser than 5.99 (Tabular value).

- Step 5: Interpretation

Since null hypothesis is not rejected, it is 95% confident that the means are statistically equal to each other. Therefore, there is no difference in the perception between Trained and Untrained panelists towards BFR Puree's sensory attributes. The computation suggests that the acceptability perception towards BFR Puree does not matter whether the panelists are trained or untrained because the data clearly show that both panelists are looking at the BFR Puree in the same manner or perspective.

4. Conclusion

The produced sensory attributes evaluation result can be used as laying ground to develop and modify recipes especially on the 'smells' and predict market success of the BFR Puree. This is in consonance with the opinions of (Cardello, Schutz &Lesher,2007 ; Henson et al., 2008) "that an ensured successful commercialization of emerging technologies and effective national, regional and international food governance – consumers' acceptance plays a pivotal role". Findings gathered after the hedonic testing of the BFR Puree reveal that even in the absence of previous knowledge and information about the nutritional benefits of the BFR Puree in the diet, panelists who are considered as prospective buyers and target consumers in general do not dislike the newly developed product. However, there are other measures to account with in consuming a particular food in addition to the fact that its sensory attributes give pleasurable experience once eaten. End users' preferences, acceptance and appetite are developed through constant exposure to the physical characteristics of foods in combination with environmental and psychological influences and this can be measured by the consumers' frequency of use. The 142 panelists are limited only to the confine of two hours in one particular day; therefore the result may not be viewed as the representation of the entire city's perceptions, but rather as a direct understanding of consumers with sufficient interest in the research project to participate in the survey. However, their higher rating on the four sensory attributes could be a good indicator for market sustainability of the BFR Puree in the food industry. Advertisements or additional information (word of the mouth / research result publications and reviews) especially from medical professionals and food specialists would enable consumers well informed in their dietary choices.

Since this inquiry is limited only on the acceptability of the BFR Puree sensory attributes, a follow through in the next research survey will be on the efficacy of the BFR Puree in its therapeutic claim as belly fat reducer.

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