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## Consumer acceptability of the products formulated from tender tamarind leaves powder

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### Abstract

Micronutrient deficiency has profound effects on physical and mental development eroding the quality of human resources. Micronutrients are also involved in the function of the human system that when deficient lead to potentially harmful infections. An attempt was made to combine the food groups to develop chutney powders and hurigalu (Mixed spicy pulses) in order to combat micronutrient deficiency. An objective was to conduct consumer acceptability test for chutney powders and hurigalu (Mixed spicy pulses). The chutney powders and hurigalu were prepared using standard methods. Consumer Acceptance test was conducted for roasted bengal gram chutney powder, niger seed chutney powder and hurigalu. Among three variations of both the chutney powders and hurigalu, three were selected (RBCP-1, NSCP-1 and HU-2) for consumer acceptability test. A score sheet was prepared and developed chutney powders and hurigalu were distributed to fifty under graduate student's of UAS, Bangalore. They were asked to write their opinion about the products. It was observed that (46 %) of the respondents found RBCP-1 acceptable, (34 %) Neither liked nor disliked and (20 %) of the respondents found the product unacceptable. In NSCP-1, it was observed that (50 %) of the respondents found the chutney powder acceptable, (26 %) Neither liked nor disliked and (24 %) of the respondents found the product unacceptable, in HU-2 It was observed that majority (60 %) of the respondents felt that the hurigalu was acceptable, few respondents (22 %) neither liked nor disliked the product and (18 %) of the respondents found the product unacceptable.

**Keywords:** Chutney powder, Consumer acceptability, Food groups, Organoleptic evaluation

### 1. Introduction

Tamarind (*Tamarindus indica* L.) is a dicotyledonous tree belongs to family Caesalpiniaceae. It is an economically important and most useful tree grows wild in central and southern parts of India. Tamarind is the third largest family of flowering plants with a total of 727 genera and 19,327 species<sup>[1]</sup>. Tamarind is one of the indigenous trees to tropical Africa and India but it has been introduced and naturalized over 50 countries. The major production areas are in the Asian countries India and Thailand, also in Sri Lanka, Bangladesh and Indonesia. Mexico, America and Costa Rica are the biggest producers<sup>[2]</sup>.

It is a multipurpose tree and considered as medicinal tree of which almost every part of tree finds at least some use, either nutritional or medicinal<sup>[3]</sup>. Tamarind plant is used as traditional medicine in Africa for the treatment of many diseases such as jaundice, gonococci, dysentery fever and gastrointestinal disorders<sup>[4]</sup>. Tamarind leaves have several health benefits like antioxidant, anti-bacterial and diuretic effect. Tamarind is valued mostly for its fruit especially for the pulp, which is used for the wide variety of domestic and industrial uses<sup>[5]</sup>.

Tamarind yields pulpy fruits known for its acidic taste used all over India in different traditional food recipes, paste and pickles preparations. Chutney powders and Pickles play a crucial role in the eating habits. Sourness and Pungency are the two major important aspects of tamarinds that have a major impact on sensory profiles. Tamarind is used to prepare different products such as tamarind powder, tamarind juice concentrate, tartaric acid, pectin tartrates, tamarind paste and alcohol<sup>[6]</sup>. It is also considered as green leafy vegetable which contains a high level of protein with many essential amino acids which help to build strong and efficient muscles. It is also high in carbohydrate, which provides energy, rich in the minerals, potassium, phosphorus, calcium and magnesium. *Tamarindus indica* can also provide smaller amounts of iron and vitamin A. *Tamarindus indica* is an important leafy vegetable and food resource for the Thai population the flower and leaf are eaten as vegetables<sup>[7]</sup>.

### Methodology

#### A. Procurement of the materials

Medium mature leaves of tamarind were collected from a fully grown tree in University of

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Agricultural Sciences, GKVK campus, Bangalore. And other materials were procured from the local market viz., Roasted bengal gram, niger seeds, ground nut, green gram, house gram, soybean, cumin seeds, curry leaves, mint leaves, amla powder, chilli powder and common salt.

### B. Pre-preparation for the product development

Pre-preparation of ingredients for preparation of chutney powders and hurigalu (Mixed spicy pulses) was done by cleaning, dehydrating and grinding them.

### C. Development of chutney powders and hurigalu.

Chutney powders and hurigalu, Roasted bengal gram chutney powder (RBCP-1, RBCP-2 and RBCP-3), Niger seed chutney powder (NSCP-1, NSCP-2 and NSCP-3) and Hurigalu (HU-1, HU-2 and HU-3) were developed by using standard procedure. Organoleptic evaluation was conducted and three products (RBCP-1, NSCP-1 and HU-2) were selected for consumer acceptability. Table 1, 2 and 3 shows the formulation of chutney powders and hurigalu.

**Table 1:** Formulation of Roasted Bengal Gram Chutney Powder

Ingredients	RBCP1 Quantity (gm)	RBCP2 Quantity (gm)	RBCP3 Quantity (gm)
Roasted Bengal gram	60	50	40
Raw tamarind leaves powder	20	30	40
Curry leaves powder	10	10	10
Cumin seeds	5	5	5
Chilli powder	4	4	4
Salt	1	1	1
Total	100	100	100

**Table 4:** Score Sheet for the Acceptability of the Products by Consumers

1. Name:	Age:		
2. Male/Female	Tick: Students /Adult /Elderly		
<b>Product</b>	<b>Like</b>	<b>Neither like/ Dislike</b>	<b>Dislike</b>
1. RBCP-1 2. NSCP-1 3. HU-2			
3. Does it remind you of any other burfi? Please mention			
4. Your suggestions to improve the biscuits.			

### Results and Discussion

Table 5. shows acceptability of the chutney powders, that majority (46 %) of the respondents found the roasted bengal gram chutney powder-1 acceptable (Liked), few respondents (34 %) Neither liked nor disliked the product and (20 %) of the respondents found the product unacceptable. Majority (74%) of the respondent answered that the roasted bengal gram chutney powder-1 did not remind them of any other chutney powder. However, (26 %) of the respondents answered that the product reminded them of some other chutney powder that is ground nut chutney powder. The results were on par with the report of [8] chutney powders based pea nut and sesame with incorporation of tamarind leaves powder more panelists preferred the sesame based chutney powder over the peanut based chutney powder. It was observed that (18 %) of the respondents suggested that the product need not to be improved, (10 %) suggested to add some other ingredients, (14 %) of the respondents suggested to add salt, (12 %) and (10 %) of the respondents suggested to reduce the spice material and sourness respectively and

**Table 2:** Formulation of Niger Seed Chutney Powder

Ingredients	NSCP1 Quantity (gm)	NSCP2 Quantity (gm)	NSCP3 Quantity (gm)
Niger seed	60	50	40
Raw tamarind leaves powder	20	30	40
Curry leaves powder	10	10	10
Cumin seeds	5	5	5
Chilli powder	4	4	4
Salt	1	1	1
Total	100	100	100

**Table 3:** Formulations Hurigalu

Ingredients	HG1 Quantity (g)	HG2 Quantity (g)	HG3 Quantity (g)
Ground nut	15	20	20
Green gram	20	10	5
Horse gram	20	10	5
Soya bean	5	10	10
Roasted Bengal gram	15	15	15
Raw tamarind leaves powder	10	20	30
Mint + Amla powder	8+2	6+4	4+6
Chilli powder	5	5	5
Salt	1	1	1
Total	100	100	100

Consumer acceptability of the nutri-dense burfis.

A score sheet (table 4) was prepared and developed products were given for consumer acceptance to the student community (n=50) under graduate students from University of Agricultural Sciences, Bengaluru. They were asked to write their opinions about the products.

remaining (24 %) of them did not responded the questions. The results of niger seed chutney powder showed in Table 5. It was revealed that majority (50 %) of the respondents found it acceptable, few respondents (26 %) neither liked nor disliked the product and (24 %) of the respondents found the product unacceptable, these results were in class with study conducted by [9] formulated carrot powder and incorporated into different products out of all products, enriched halwa showed 10% liked extremely, 50% liked very much, 20% liked slightly. Majority (66%) of the respondent answered that the niger seed chutney powder-1 did not remind them of any other chutney powder. However, (34 %) of the respondents answered that the product reminded them of some other chutney powder that is flax seed chutney powder. Majority (28 %) of the respondents suggested that the product need not to be improved, six per cent suggested to add some other ingredients, (18 %) of the respondents suggested to add salt, (14 %) of the respondents suggested to reduce both spice material as well as sourness and remaining (20 %) of then did not responded the questions.

Table 6 show the acceptability result of hurigalu-2, it was observed in that majority (60 %) of the respondents found the HU-2 acceptable, few respondents (22 %) neither liked nor disliked the product and (18 %) of the respondents found the product unacceptable. Majority (84 %) of the respondent answered that the HU-2 (Mixed spicy pulses) did not remind them of any other product. However, 16 per cent of the respondents answered that the hurigalu (reminded them of some other product that is Haldiram's snacks. It was observed that (22 %) of the respondents suggested that the product need not to be improved, eight per cent suggested to add some

other ingredients, (30 %) of the respondents suggested to make it salty, 24 per cent of the respondents suggested to reduce the sourness and remaining (16 %) of them did not respond. It means it could be a positive reason for the discrepancy between the present study and the study conducted by Negi *et al.* that, biscuits containing wheat bran (20%) were selected for mass consumer acceptability. Fifty per cent consumers rated the product as excellent whereas 39 per cent and 10 per cent rated it as very good and good, respectively.

**Table 5:** Consumer Acceptability of the Chutney Powders

Characteristics	Category	Respondents			
		RBCP-1 (Roasted bengal gram chutney powder -1)		NSCP-1 (Niger seed chutney powder -1)	
		Number	Per cent	Number	Per cent
Taste	Like	23	46.00	25	50.00
	Neither like nor dislike	17	34.00	13	26.00
	Dislike	10	20.00	12	24.00
Does it remind you of any other chutney powders?	Yes	13	26.00	17	34.00
	No	37	74.00	33	66.00
If yes please mention	Flax seed/ Ground nut chutney powder	13	26.00	17	34.00
	No response	37	74.00	33	66.00
Your suggestions to improve the chutney powders	No need	09	18.00	14	28.00
	Add other ingredients	05	10.00	03	06.00
	Add salt	07	14.00	09	18.00
	Reduce spices	12	24.00	07	14.00
	Reduce sourness	05	10.00	07	14.00
	No response	12	24.00	10	20.00

**Table 6:** Consumer Acceptability of the Hurigalu-2

Characteristics	Category	Respondents	
		HU-2 (Hurigalu-2)	
		Number	Per cent
Taste	Like	30	60.00
	Neither like nor dislike	11	22.00
	Dislike	09	18.00
Does it remind you of any other chutney powders?	Yes	08	16.00
	No	42	84.00
If yes please mention	Flax seed/ Ground nut chutney powder	08	16.00
	No response	42	42.00
Your suggestions to improve the chutney powders	No need	11	22.00
	Add other ingredients	04	08.00
	Make it salty	15	30.00
	Reduce sourness	12	24.00
	No response	08	16.00



**Fig 1:** Best accepted products

## Conclusion

Hence, it was concluded that the formulated products such as roasted bengal gram chutney powder, niger seed chutney powder and hurigalu (Mixed spicy pulses) were nutri dense with good acceptability and having fairly good storage stability which can be promoted for regular consumption.

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