

# Sensory Evaluation of Developed Snack Products by Rice & Pulses for School Going Children

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**Abstract:** As cereals & pulses perform a principal role in diets of developing countries, beyond, the nutritional problem is allied with traditional complementary foods, so the aim of this study was the evaluation of low cost snack products based on cereals (rice) & pulses. Composite flour were prepared using rice, rice by product i.e- rice flakes, rice flour & pulses (Bengal gram, & green gram) flour in ratio of 2:1. The rice flour used in two part were as pulse has only one part. Three major products were developed using different composite flour i.e. rice-pulse noodle, rice-pulse flakes, flakes (rice flakes + green gram powder). Developed product was evaluated on sensory evaluation. Sensory evaluation of prepared product was carried out using 9 point hedonic scale, out of the three, best acceptable product was T1 (rice-pulse noodle) with the highest average (43) & with least S.D.(1.63).

**Keywords:** Rice, Pulses, Rice pulse noodles, Rice flakes, Green gram

## 1. Introduction

Utilisation of rice and dhal for food is still mostly confined as staple for as raw form in day to day life. Because of partly non availability of these grains in ready to eat forms. Both (rice +dhal) are not only nutritionally comparable supplement to each other and superior in respect to protein, energy, vitamins and minerals which is an important component as per developed product characteristics was concerned. Keeping these points in mind the present study is done in which three snacks product were developed using different forms of rice & pulses namely Rice pulse noodles, rice pulse flakes, rice & green gram flake which were put forth for the characterisation by - sensory evaluation by using 9 point hedonic scale. Rice is a distinctive crop due to its colourless, soft taste, low sodium levels, easy edible carbohydrates and hypoallergenic properties (Muna Ilowefah (2014).

Rice contains approximately 7.3% protein, 2.2% fat, 64.3% available carbohydrate, 0.8% fiber and 1.4% ash content (Zhou et al., 2002). Rice flour has become an attractive ingredient in the extrusion industry due to its bland taste, attractive white color, hypoallergenicity and ease of digestion. Rice flakes are the most common breakfast cereal used all over the country round the year (Ena Gupta et al (2012). Rice flakes are prepared from paddy by using parboiling method. Pulses are a good source of dietary fibre and other important nutrients. Flours and fibre-rich fractions obtained from pulse crops can be incorporated into processed foods to increase dietary fibre content and/or serve as functional ingredients. Combination of cereal and pulse provide protein at cheaper cost and suitable for highly populated country like India (Daya S.Singh et al (2014). Bengal gram is called Chickpea or Gram (Cicer aritimum L.) in South Asia and Garbanzo bean in most of the developed world. Bengal gram belongs to the family Leguminosae. It is a small, much branched herbaceous plant. It contains reasonably high protein (17-22%), low fat (6.48%), high available carbohydrate (50%) and crude fiber contents of 3.82% on dry basis. Green gram belongs to the family

Leguminosae (V.Puranik et al.(2011). Gram seeds contain a higher percentage of oil (4-5%) than other pulses. It is consumed in the form of split pulse as well as whole pulse, which is a vital supplement of cereal based diet. Green gram (Mung bean) is reported to be a superior source of carbohydrates, proteins, and minerals. The scope of the study is to basically provide an alternative of the rice & pulses. It can be proved to be good snacks for school going children whose daily requirement of protein is higher during their growing years. People working in offices who generally have a habit of skipping their full meal in noon due to hard working hours, snacks made out of rice & pulses can come to the rescue for such people. Thus, the snacks not only provide high amount of energy, protein, carbohydrates etc but they also provide whole range of choices in our plate.

## 2. Objective

To characterise the different snack products developed by rice & pulses using sensory evaluation method.

## 3. Material & Methods

### Organoleptic evaluation of product developed-

Organoleptic evaluation is a scientific discipline that analyses and measures human responses to the composition of food and drink, e.g. appearance, touch, odour, texture, temperature and taste. This discipline requires panel of human assessors by whom the products are tested, and responses are recorded by them. The different products developed by using different forms of rice and pulses were prepared and were put forward for the sensory evaluation for identifying the best acceptable product. Codes T1, T2, T3 were allotted to different snacks product developed respectively. Then a 9 point hedonic scale was prepared. The most widely used hedonic scale is a nine-point scale, in which the person rates their preference for food, ranging from "extremely dislike" to "extremely like". Differently coded samples were presented to panel members one at a time and they were asked to rate their hedonic response on

the scale. At the end of this phase marking of individual products were calculated and the best acceptable product was determined.

#### 4. Result and Discussion

##### Characterisation of developed product on various parameters

The experimental snacks products of rice and pulses were characterised as developed product in the present study. For that sensory evaluation process was done by set of panellist constitute 5 members in the expertise field of nutrition. For evaluating, a 9-point hedonic scale which is one of the sensory evaluation method used to evaluate any product. Four parameters were used to analyse the acceptability of developed product these are as below-

- Body and Texture
- Color and Appearance
- Flavor and Taste
- Overall Acceptability

The total average and standard deviation of individual product was calculated and the best of the three products was found. Individual markings from each of the panel members for different parameters have been mentioned below.

##### Parameter 1. Flavour and Taste

**Table 1:** Individual Markings For Flavour And Taste

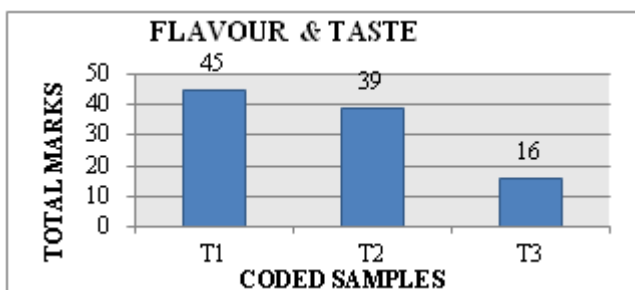
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Member 1	9	8	3
Member 2	9	8	4
Member 3	9	8	2
Member 4	9	8	4
Member 5	9	7	3
Total score	45	39	16

Where T<sub>1</sub>= rice pulse noodle

T<sub>2</sub>=rice pulse flakes.

T<sub>3</sub>= flakes (rice flakes + green gram powder)

The above mentioned table represent score of individual markings by members on the basis of flavour and taste the minimum average scored is 16 by T<sub>3</sub> while maximum is of T<sub>1</sub> with an average of 45, which shows the highest acceptability of sample T<sub>3</sub> in respect of flavour & taste.



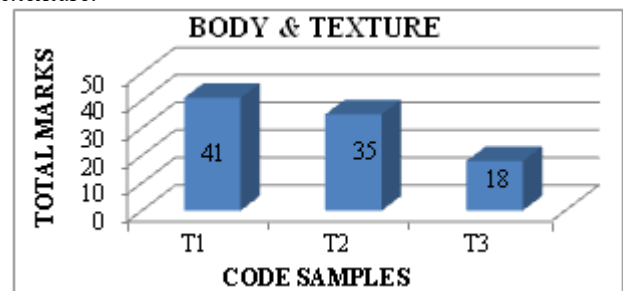
**Figure 1:** Graphical Representation of Scores For Flavour And Taste

##### Parameter 2. Body and Texture

**Table 2:** Individual Markings for Body and Texture

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Member 1	8	7	4
Member 2	9	7	4
Member 3	8	7	3
Member 4	8	7	4
Member 5	8	7	3
Total score	41	35	18

The above mentioned table represent score of individual markings by 5 panellist members on the basis of body & texture the minimum average scored is 18 by T<sub>3</sub> while maximum is of T<sub>1</sub> with an average of 41, which shows the highest acceptability of sample T<sub>3</sub> in respect of body & texture.



**Figure 2:** Graphical Representation of Scores For Body and Texture

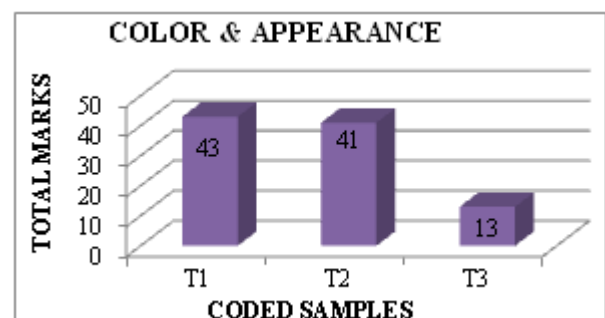
The above graph represents the scores for body and texture of the product where T1 has average of 41 marks while T3 scores the least, each product presented an individual texture according to the coded samples.

##### Parameter 3: Colour and Appearance

**Table 3:** Individual Markings For Colour And Appearance

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Member 1	9	7	2
Member 2	9	8	3
Member 3	8	9	2
Member 4	9	8	3
Member 5	8	9	3
Total score	43	41	13

The above drawn table represent score of individual markings by 5 panellist members & their average marks on the basis of colour & appearance the minimum average scored is 13 by T<sub>3</sub> while maximum is of T<sub>1</sub> with an average of 43, which shows the highest acceptability of sample T<sub>3</sub> in respect of colour & appearance.



**Figure 3:** Graphical Representation of Scores For Colour And Appearance

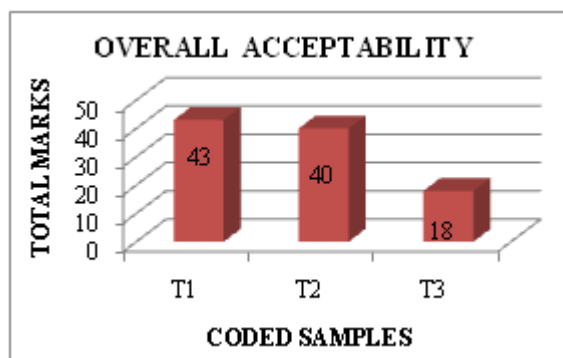
- The average score for colour and appearance for T<sub>1</sub> is 43 which is maximum and the least score is for T<sub>3</sub> which is 13, this shows acceptability of T<sub>1</sub> highest while that of T<sub>3</sub> has least acceptability.

**Parameter 4: Overall Acceptability**

**Table 4: Individual Markings For Overall Acceptability**

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Member 1	9	8	4
Member 2	9	8	4
Member 3	8	8	3
Member 4	9	8	4
Member 5	8	8	3
Total score	43	40	18

- The drawn table represent score of individual markings by panellist members & their average marks of overall acceptability, the minimum average scored is 18 by T<sub>3</sub> while maximum is of T<sub>1</sub> with an average of 43, which shows the highest acceptability of sample T<sub>3</sub> in respects of products overall acceptability.



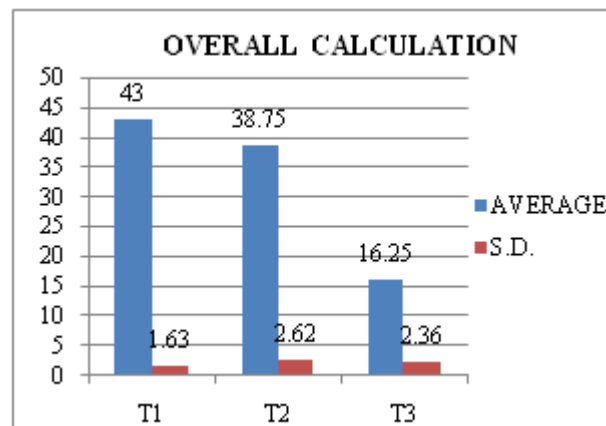
**Figure 4: Graphical Representation Of Scores For Overall Acceptability**

- The overall acceptability graph represents the acceptance on the basis of all the mentioned parameters, the maximum average scored is 43 by the product T<sub>1</sub> i.e.- rice pulse noodle.

**Table 5: Overall Calculation**

	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
P <sub>1</sub>	45	39	16
P <sub>2</sub>	41	35	18
P <sub>3</sub>	43	41	13
P <sub>4</sub>	43	40	18
<b>Overall sum</b>	<b>172</b>	<b>155</b>	<b>65</b>
<b>Average</b>	<b>43</b>	<b>38.75</b>	<b>16.25</b>
<b>S.D.</b>	<b>1.63</b>	<b>2.62</b>	<b>2.36</b>

- The respective table which is drawn above shows the overall calculations of average marks given by each panellist in each parameters ,with calculated average values & S.D. of each sample on the basis of each parameters.



**Figure 5: Graphical Representation Of Average Score And Standard Deviation For Overall Calculation**

**Where -** T<sub>1</sub>,T<sub>2</sub>,T<sub>3</sub> was coded samples prepared  
**P= Parameter** (P<sub>1</sub>= Flavor and Taste, P<sub>2</sub>= Body and Texture, P<sub>3</sub>= Color and Appearance and P<sub>4</sub>= Overall Acceptability)  
**S.D.= Standard Deviation** (SD reflex the fluctuation in the marks given by different Members and for different parameter)

**T<sub>1</sub> scored maximum with highest average and least SD which indicate its highest acceptability among the three prepared experimental samples.**

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