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Standardization and Sensory evaluation of *Sattu-Mantha:* A traditional energy drink

Research Article

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Abstract

Background: *Sattu* is a traditional and well known functional food in India. It is consumed as a refreshing drink during summers. In Ayurveda, *Sattu* has been described as *Saktu.* According to classical texts of Ayurveda, Powder of roasted and dehusked *Yava* (barley) is known as *Saktu.* Liking and disliking for any food article depends on senses of consumer. For deciding the consumer's choice toward the food products, sensory parameters followed by the nutritional properties are required to be considered. Aim and objectives: To standardize recipe of *Sattu-Mantha* and sensory evaluation of *Sattu-Manha*. Material and methods: In present study, sensory evaluation of *Yava* (Barley) *Sattu* prepared by two different methods has been carried out. *Sattu* was served in the form of *Mantha.* In this study scoring for different sensory parameters was done by using 9-point Hedonic scale (Lawless and Klein, 1991). Results and Conclusion: On the bases of scores given to different sensory parameters, *Sattu-Mantha* prepared by both the methods is accepted by assessors but *Sattu-Mantha* prepared by using sugar powder was much liked by assessors as compared to *Sattu-Mantha* prepared by using Jaggery powder.

Key Words: *Mantha, Sattu, Sensory-evaluation, Yava (Barley).*

Introduction

Sattu is a traditional food in India. It is roasted pulse or cereal flour and used as ready – to – eat (RTE) snack food in northern parts of India, particularly in rural areas (1). It is traditionally prepared from either roasted cereal particularly barley, maize or roasted bengal gram or combination of these. It is consumed as a refreshing drink during summers.

In Ayurveda, *Sattu* has been described as *Saktu* and its medicinal properties have been mentioned in different lexicons of Ayurveda. According to classical texts of Ayurveda, Powder of roasted and dehusked *Yava* (barley) is known as *Saktu* (2). While *Acharya* Bhavaprakash stated that powdered form of any roasted *Dhanya* (cereals/grains/corn) is known as *Saktu* (3). *Saktu* can be made by roasted *Chanaka* (Bengal grams) *Yava* (barley) and *Shali* (a variety of rice) (4). In addition to these, Kaidev Nighantu have also explained the properties of *Saktu* made by *Badar* and *Karkandhu* (Varieties of Jujube) (5).

Sattu/*Saktu* is dry in nature, aggravates *Vata,* increases fecal matter and regulate peristalsis. When consumed, it immediately nourishes and strengthens the consumer (6). When *Sattu* is taken in the form of *Mantha,* it provides instant strength, overcome thirst and fatigue (7).

As *Sattu* is a well known functional food, satisfying the demands of the consumers is a major issue in order to succeed in promoting the consumption of functional food products. For deciding the consumer choice towards the food products, sensory parameters followed by the nutritional properties are required to be considered. Due to this reason, sensory analysis of any developed food product is an important concern prior to supply the product in the market or to the consumers (8). Knowledge gained through individual sensation is the key parameter for the evaluations in any field. But in case of sensory evaluation, it is very problematic to model and manage the knowledge gained by sensation. It is due to the fact that involvement of uncertainty and imprecision in case of acquiring information by human senses makes it difficult for the evaluation of the sensory data (9).

Scientists have developed different scoring scales for getting certainty in the results of sensory evaluation, 9-point hedonic scale is one of these scales. In the present study we have used 9-point hedonic scale for scoring of different sensory parameters like appearance, color, odour etc.

Aim and Objectives

- To develop GMP (good manufacturing practice) and standardize the recipe of *Sattu-Mantha.*
- To compare acceptability and palatability of *Sattu-Mantha* prepared by using two different methods with 9-point Hedonic scale.

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Materials and Methods

Procurement of materials

Seeds of barley (*Yava)*, ghee and sugar powder were procured from local market of Jamnagar and jaggery was procured from an organic farm.

Preparation of barley (*Yava) Sattu*

Barley seeds were cleaned and then roasted in hot sand with continuous stirring. Then Roasted barley seeds were milled and sieved through sieve no.72 (10).

Development of ready mix

Many initial trials were conducted to test combination of different proportions of roasted barley powder, ghee, sugar powder/jaggery powder and water. Then following proportions of roasted barley powder, ghee, sugar powder/jaggery powder and water were finalized for sensory evaluation

Sample-A:

- Roasted *Yava* powder – 20 gms
- Ghee – 10 ml
- Jaggery powder- 10gms
- Water – 150 ml

Sample-B:

- Roasted *Yava* powder – 20 gms
- Ghee – 10 ml
- Sugar powder- 10gms
- Water – 150 ml

Method of *Sattu-Mantha* preparation for consumption

According to classical texts of ayurveda, appropriate amount of ghee to be mixed with *Sattu* powder then cold water should be added up to the consistency neither too thick nor too thin liquid to consume it (11).

In present study for every sample 20 grams roasted *yava* powder was properly mixed manually with 10 ml of ghee. After that for sample-A, 10 grams jaggery powder and 150 ml water were added to powdered *Sattu* and it was shaken well in hand shaker. For sample-B, in the place of jaggery powder, 10 grams sugar powder and 150 ml water were added to powdered *Sattu* and shaken well in shaker to mix it properly.

Sensory evaluation of *Sattu-Mantha* prepared from two different methods:

When the quality of food products is assessed by means of human sensory organs, the evaluation is said to be sensory or subjective or organoleptic. Every time when food is eaten, a judgment is made. Sensory evaluation consists of judging the quality of food by a panel of assessors. For this study assessment was done by using 9-point Hedonic scale (Lawless and Klein, 1991) for different parameters.

A panel of assessors consisting of 09 teaching staff, including head of Basic Principles Department, ITRA Jamnagar and 42 Post-graduation and Ph.D scholars of ITRA Jamnagar were selected randomly. Acceptability and organoleptic scoring of the preparations was done on the basis of the scores given by the assessors. The recipes were prepared in the college premises. The recipes were evaluated for

- Appearance
- Color
- Odour
- Flavor
- Consistency
- Mouth-feel (palatability)
- Adhesiveness

The following points were taken in to consideration

- The assessors were not allowed to enter the preparation area, as they could gain information which could influence their judgment.
- They were not allowed to consult each other, but were asked to give unbiased opinion.
- The assessors were provided with a glass of water each for oral revising between the samples.
- Time intervals between the samples were kept constant.

Scoring scales for different sensory parameters

Image 1: Appearance

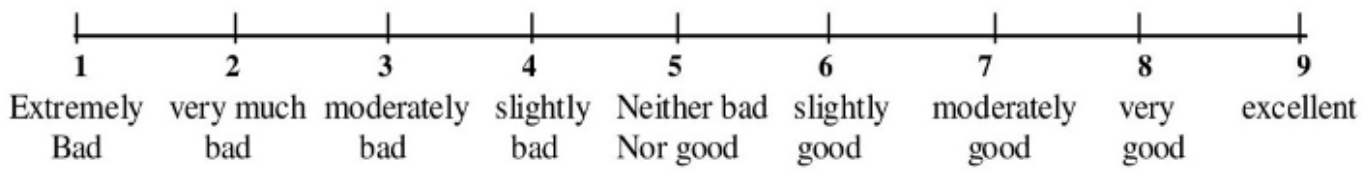


Image 2: Color

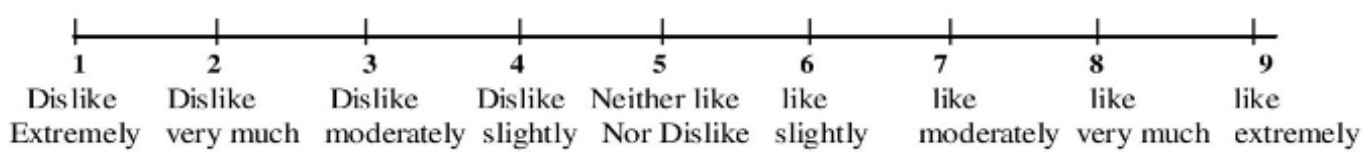


Image 3: Odour

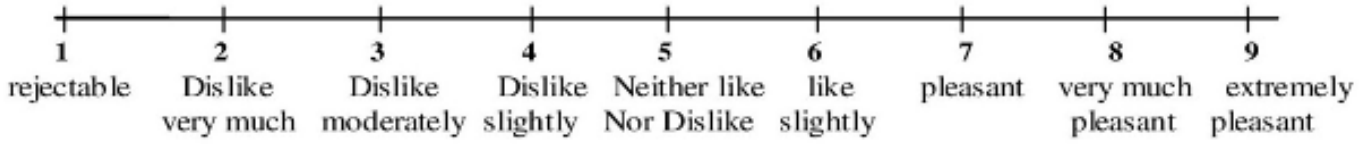


Image 4: Flavour

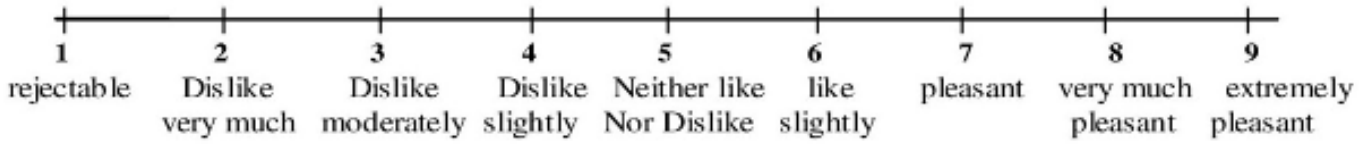


Image 5: Consistency

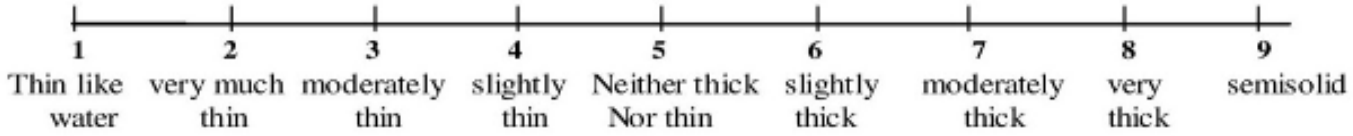


Image 6: Mouth-feel (Palatability)

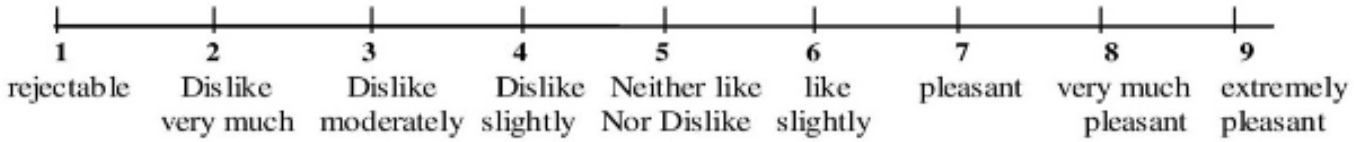
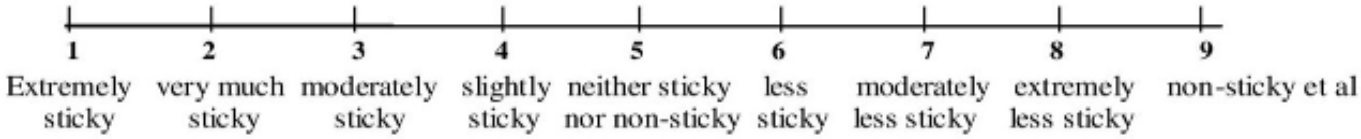


Image 7: Adhesiveness



Observations and Results

Table 1: Score of two samples for Appearance

	Extremely bad	Very much bad	Moderately bad	Slightly bad	Neither bad nor good	Slightly good	Moderately good	Very good	Excellent
Sample-A	0	0	0	1	0	11	10	27	2
Sample-B	0	0	0	1	1	6	12	23	8

Maximum scores for appearance were in 8th column i.e. very good for both the samples followed by 6th i.e slightly good for group A and 7th i.e. moderately good for sample B.

Table 2: Score of two samples for Color

	Dislike extremely	Dislike very much	Dislike moderately	Dislike slightly	Neither like nor dislike	Like slightly	Like moderately	Like very much	Like extremely
Sample-A	0	0	0	1	0	5	19	22	4
Sample-B	0	0	0	1	1	2	18	23	6

Maximum scores for color were in 8th column i.e. like very much for both the samples followed by 7th i.e like moderately for both the samples.

Table 3: Score of two samples for Odour

	Rejectable	Dislike very much	Dislike moderately	Dislike slightly	Neither like nor dislike	Like slightly	Pleasant	Very much pleasant	Extemely pleasant
Sample-A	0	0	0	0	0	5	33	10	3
Sample-B	0	0	0	0	2	6	18	21	4

Maximum scores for odour, for sample A were in 7th column i.e. pleasant and for sample B were in 8th column i.e. very much pleasant followed by score in 8th column i.e. very much pleasant for group A and score in 7th column i.e. pleasant for group B.

Table 4: Score of two samples for Flavour

	Rejectable	Dislike very much	Dislike moderately	Dislike slightly	Neither like nor dislike	Like slightly	Pleasant	Very much pleasant	Extemely pleasant
Sample-A	0	0	0	1	0	12	20	13	5
Sample-B	0	0	0	0	0	7	12	27	5

Maximum scores for flavour, for sample A were in 7th column i.e. pleasant and for sample B were in 8th column i.e. very much pleasant followed by score in 8th column i.e. very much pleasant for group A and score in 7th column i.e. pleasant for group B.

Table 5: Score of two samples for Consistency

	Thin like water	Very much thin	Moderately thin	Slightly thin	Neither thick nor thin	Slightly thick	Moderatley thick	Very thick	Semisolid
Sample-A	0	0	2	1	34	11	3	0	0
Sample-B	0	0	2	7	23	16	3	0	0

Maximum scores for consistency were in 5th column i.e. neither thick nor thin for both the samples followed by score in 6th column i.e slightly thick for both the samples.

Table 6: Score of two samples for Mouth-feel (palatability)

	Rejectable	Dislike very much	Dislike moderately	Dislike slightly	Neither like nor dislike	Like slightly	Pleasant	Very much pleasant	Extemely pleasant
Sample-A	0	0	0	0	1	10	26	11	3
Sample-B	0	0	0	1	0	5	15	24	6

Maximum scores for mouth-feel (palatability), for sample A were in 7th column i.e. pleasant and for sample B were in 8th column i.e. very much pleasant followed by score in 8th column i.e. very much pleasant for group A and score in 7th column i.e. pleasant for group B.

Table 7: Score of two samples for Adhesiveness

	Extremely sticky	Very much sticky	Moderately sticky	Slightly sticky	Neither sticky nor sticky	Less sticky	Moderately sticky	Extremely less sticky	Non-sticky at al
Sample-A	0	0	0	1	0	11	10	27	2
Sample-B	0	0	0	1	1	6	12	23	8

Maximum scores for adhesiveness were in 5th column i.e. neither sticky nor non-sticky for both the samples followed by 6th i.e slightly sticky for both the samples.

Table: 8 Average score of two samples for different parameters

Sample	Appearance	Colour	Odour	Flavour	Consistency	Mouth-feel	Adhesiveness
Sample-A	7.35	7.43	7.21	7.15	5.15	7.09	6.52
Sample-B	7.54	7.54	7.37	7.58	5.35	7.54	6.45

The average scores of different parameters selected for sensory evaluation of *Sattu-Mantha* are given in table-8.

From the observations on different sensory parameters, it was observed that, 52.94% assessors found very good appearance for sample-A and 45.09% for sample-B. On the bases of scores given to the color, 43.13% assessors liked sample-A very much and 45.09% assessors liked sample-B very much. According to 64.70% assessors, odour of sample-A is pleasant and odour of sample-B is very much pleasant according to 41.17% assessors. In case of flavor for sample-A, 39.21% assessors found it pleasant and for sample-B 52.94% assessors found it very much pleasant. Neither thick nor thin consistency was observed by 66.66% assessors for sample-A and by 45.09% assessors for sample-B. In case of mouth-feel parameter 50.98% assessors found sample-A pleasant and 47.05% assessors found sample-B very much pleasant. In the

evaluation of adhesiveness 27.45% and 25.49% assessors found neither sticky nor non-sticky adhesiveness for sample-A and B respectively.

Conclusion

In present study *Sattu-Mantha* prepared by both the methods are accepted by assessors. On the basis of individual scores of different parameters sample-B was much liked by assessors as compared to sample-A i.e *Sattu-Mantha* prepared using sugar powder is more suitable as compared to *Sattu-Mantha* prepared using Jaggery powder.

Author's note

Hitesh Vyas and Preetpal Singh: Preparation of study design, supervising, performing and co-ordinating the study, collecting data, analyzing data, drafting and submitting the manuscript. Ashvinee Vasava, Dharmik Vasani, and Sunny Patil: Supported in preparation of *Sattu-Mantha*.

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