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Kamat Rohan Chandrakant

Assistant Professor,
Department of Food
Technology, S. D. M. V. M. 'S
Food Technology College of
Aurangabad, Maharashtra,
India

SA Shelke

PhD Scholar, Department of
Food Science and Technology,
WCDT, Sam Higginbottom
University of Agriculture
Technology and Sciences,
Prayagraj, Utter Pradesh,
West Bengal, India

Sirsha Chakraborty

M.Sc., Applied Nutrition,
Department of Food and
Nutrition, WBUHS, West
Bengal, India

Anirban Pattanayak

SACT, Department of
Physiology, Mahishadal Raj
College, West Bengal, India

Correspondence**Kamat Rohan Chandrakant**

Assistant Professor,
Department of Food
Technology, S. D. M. V. M. 'S
Food Technology College of
Aurangabad, Maharashtra,
India

Sensory evaluation of newly developed jam prepared from beetroots and kiwi fruits

Kamat Rohan Chandrakant, SA Shelke, Sirsha Chakraborty and Anirban Pattanayak

Abstract

This research paper presents the sensory evaluation of newly developed jam prepared from kiwi fruits. Kiwi fruits are known for their vibrant color, unique flavor, and nutritional benefits, making them an ideal ingredient for jam production. The study aims to assess the sensory attributes of kiwi fruit jam, including taste, aroma, texture, color, and overall acceptability. Sensory analysis was conducted using trained panellists or consumer participants to evaluate various aspects of the jam. The results indicate that kiwi fruit jam exhibits desirable sensory characteristics, with a balance of sweetness, tartness, and fruit flavor. This research contributes to the understanding of consumer preferences and acceptance of kiwi fruit-based products, as well as the development of innovative jams with enhanced sensory appeal.

Keywords: Sensory evaluation, jam, kiwi fruits, taste, aroma, texture, color, acceptability

1. Introduction

Jam is a popular fruit spread enjoyed worldwide, offering a burst of flavor and sweetness to various culinary creations (Hood, 2021) ^[1]. Kiwi fruits, also known as Chinese gooseberries, are rich in vitamin C, fiber, and antioxidants, making them a nutritious addition to jams and preserves (Khalua *et al.*, 2020) ^[2]. However, limited research has been conducted on the sensory attributes of kiwi fruit jam (Stec, 1989) ^[3]. Kiwi fruit has become terribly popular during the past two decades due to its various medicinal properties. It is also known as Macaque peach and Mihoutau and Chinese gooseberry (Tyagi *et al.*, 2015) ^[4]. In addition to the various nutrients in kiwifruit described above, for which there are dietary intake recommendations and well described physiological functions, kiwifruit contain a complex network of minor compounds that may also be associated with beneficial physiological functions (Richardson *et al.*, 2018) ^[5].

Kiwi fruit may improve the innate and adaptive immune responses of human blood cells. Research has demonstrated that the consumption of kiwi fruit boosted immunoglobulin levels (IgA, IgG, and IgM) as well as the rate of phagocytosis. It has been shown that those who consume less vitamin C are more likely to get bronchitis and wheeze, which worsens in those who are susceptible to asthma and bronchitis. Kiwis help people of all ages bolster their immune systems and lessen the intensity of symptoms associated with colds and the flu. The little kiwi fruit offers a treasure trove of immune-boosting elements, such as zinc, vitamin C, vitamin K, vitamins B6 and B12, fibre, and folate (Khutare & Deshmukhs, 2023) ^[6].

Additionally, it has a lot of vitamin E, which softens, moisturises, and delays the ageing process of the skin. Collagen is a connective protein that is created when vitamin C is present and keeps the skin taut and supple during the healing process. These antioxidants are vital for radiant, healthy skin and aid in the prevention of hair loss. Amino acids included in kiwifruit are vital for boosting bone mass because they stimulate osteotrophic activity in the bone, which shields skin from UV radiation. Kiwis are rich in copper, which prevents premature greying of the hair (Satpal *et al.*, 2021) ^[7]. The phytochemical lutein, found in kiwi fruit, offers protection against age-related blindness. Since the body cannot produce lutein, it is essential to consume a variety of foods high in lutein, including kiwis. Kiwifruits are high in serotonin. In addition, inositol, which is present in kiwi fruit, helps cure depression. Kiwis also improve iron absorption, which lowers the risk of anaemia (Dhakal & Bhattarai, 2011) ^[8]. Because kiwis are strong in potassium and magnesium, they help to counteract the negative effects of sodium on the body and reduce the incidence of kidney stones. Kiwis are a healthy option for those with diabetes because they also have a low glycaemic index (Tyagi

et al., 2015) [4]. This study aims to fill this gap by conducting a comprehensive sensory evaluation of newly developed kiwi fruit jam, with a focus on understanding consumer preferences and acceptance.

2. Materials and Methods

2.1 Ingredients

- Fresh kiwi fruits.
- Sugar.
- Lemon juice.
- Pectin (optional).

2.2 Preparation of Kiwi Fruit Jam

- Kiwi fruits were washed, peeled, and diced into small pieces.
- The diced kiwi fruits were combined with sugar and lemon juice in a saucepan and cooked over medium heat until the fruits softened and released their juices.
- Pectin was added to the mixture, if desired, to help thicken the jam.
- The jam was simmered until it reached the desired consistency and then allowed to cool.

2.3 Treatment combinations

Sl. No.	Kiwi fruits	Beetroots
T ₁	95	5
T ₂	90	10

All the treatments were admixed with 40% sugar and were replicated three times.

2.4 Sensory Evaluation

- Trained panelists or consumer participants were recruited to evaluate the kiwi fruit jam.
- The sensory attributes assessed included taste, aroma,

texture, color, and overall acceptability.

- Participants used a structured scale or questionnaire to rate each attribute based on predefined criteria.
- Statistical analysis, such as analysis of variance (ANOVA) or t-tests, was conducted to compare sensory scores between different batches of jam.

3. Results and Discussion

The sensory evaluation results revealed that kiwi fruit jam exhibited desirable sensory attributes, with a balance of sweetness and tartness that complemented the natural flavor of the fruit. The jam had a vibrant green color, characteristic aroma, and smooth texture, which contributed to its overall acceptability among participants. Statistical analysis indicated significant differences in sensory scores between batches of jam prepared with varying sugar levels or cooking times, highlighting the importance of these factors in determining sensory quality.

Table 1: Mean value of T₁ and T₂

Treatments	Color	Flavour	Taste	Texture	Overall acceptability
T ₁	7.8	8.2	8.1	7.4	7.8
T ₂	6.7	7.1	6.7	6.1	6.5

After analysis of color, flavor, taste and texture score it was found that T₁ had 7.8, 8.2, 8.1 and 7.4 respectively and T₂ had 6.7, 7.1, 6.7 and 6.1 respectively. After overall acceptability it was found that T₁ had highest score 7.8 than T₂ score 6.5.

Table 2: Descriptive statistics of overall acceptability of T₁ and T₂

Mean	7.800	6.500
Std. Deviation	0.1000	0.1000
Std. Error of Mean	0.05774	0.05774

Table 3: Significance difference between T₁ and T₂

P value	<0.0001
P value summary	****
Significantly different (p< 0.05)?	Yes
One- or two-tailed P value?	Two-tailed
t, df	t=15.92, df=4

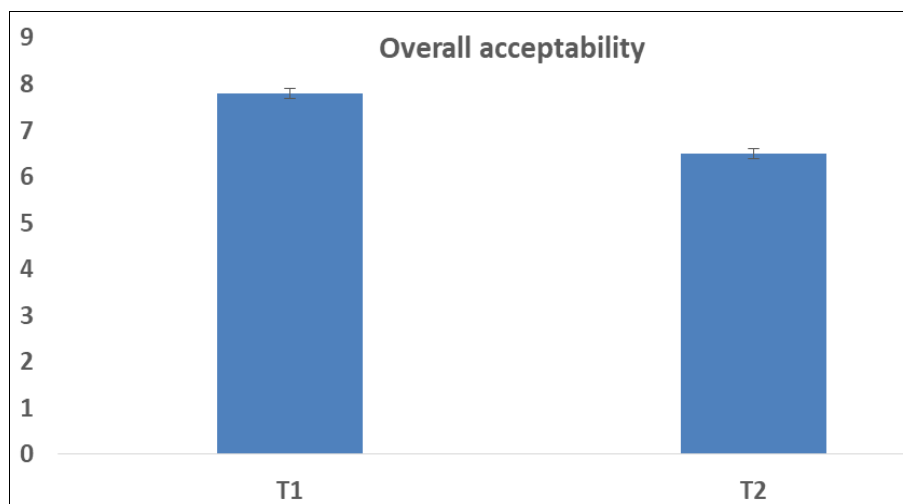


Fig 1: Graphical representation of Overall acceptability

The findings of this study demonstrate the potential of kiwi fruits as a versatile ingredient for jam production, offering unique sensory characteristics and nutritional benefits. The sensory analysis provides valuable insights into consumer preferences and acceptance of kiwi fruit jam, which can inform product development and marketing strategies. Further research could explore optimization of jam formulations, shelf-life studies, and consumer studies to validate the market potential of kiwi fruit-based products.

4. Conclusion

In conclusion, this research paper presents a comprehensive sensory evaluation of newly developed kiwi fruit jam, highlighting its desirable sensory attributes and consumer acceptance. Kiwi fruit jam offers a delicious and nutritious alternative to traditional fruit spreads, with its vibrant color, unique flavor, and health benefits. The findings of this study contribute to the advancement of kiwi fruit-based products in the food industry, offering consumers a flavorful and enjoyable culinary experience.

5. Acknowledgments

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