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Study on sensory quality of channa shree

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Abstract

In the current investigation, Channa Shree was prepared by incorporating varying proportions of channa and chakka, coupled with sugar levels set at 60% and 70%. The study underscores the significance of sensory attributes in determining Channa Shree's overall acceptability, with a 50% blend of channa and chakka proving optimal at both 60% and 70% sugar addition levels. This research provides valuable insights into the sensory qualities of Channa Shree, contributing to a comprehensive understanding of factors shaping consumer preferences in milk products.

Keywords: Channa Shree, Chakka, sugar levels, sensory attributes, milk products

Introduction

Milk stands as a fundamental nourishment, especially for newborns, constituting a complete human food with its emulsion of butterfat globules, dissolved proteins, minerals, and carbohydrates. Colostrum, found in early lactation milk, enhances the immune system through antibodies, reducing disease risks. Beyond infancy, milk remains crucial for expectant mothers, children, teenagers, adults, and patients, offering benefits like lowered childhood obesity, improved cardiovascular health, enhanced bone mineral density, and reduced cancer risk.

The dairy industry's growth in India, notably through dairy cooperatives since Operation Flood, has propelled the nation to the forefront of global milk production. India's annual growth rate of 6.26% since 1998 has resulted in it contributing 23% of the world's milk production, reaching 210 million tonnes in 2020–21. Milk consumption in India has seen a remarkable increase, from 107 grams per person in 1970 to 427 grams per person in 2020-21. India's focus on traditional dairy products, like channa, highlights the versatility of milk. Channa, a heat-acid coagulated milk product, is created by coagulating milk with acids, cooling, and filtering. The process leads to a loss of calcium, phosphate, and salts from the casein micelle. India produces 2 million tonnes of channa, valued at Rs. 7000 million, adhering to FSSAI standards. Predominantly found in the eastern region, channa is integral to various products like rasogolla, kalakand, chum chum, channa murkhi, channa podo, and sandesh, contributing to India's diverse culinary landscape.

Fermentation, an affordable and efficient process, not only introduces new food products but also enhances nutritional value and sensory characteristics while aiding in the removal of undesirable substances like tannins, polyphenols, and phytates. Fermented milk products, including curds like dahi, lassi, and shrikhand, play a vital role in the Indian diet. Chakka, comparable in health benefits to dahi, is rich in proteins, calcium, vitamins, and minerals, with a superior protein efficiency ratio compared to pure casein. Shrikhand, made from chakka, a fermented dairy product, offers a sweet, nutritious treat. Studies suggest enhancing chakka's nutritional value by incorporating uncommon fruits, further contributing to the fusion of fruit and dairy products.

Originating in Southern Asia, the mango, a stone fruit from *Mangifera indica*, is led by India, contributing 45% to the global production of 55 million tonnes in 2020. Despite being the top producer, India consumes 1% of the global mango trade. Mango varieties, like Alphanso with a soft, pulpy texture, and Tommy Atkins with toughness, are versatile in Indian cuisine, seen in chutneys, pickles, daals, aam pannha, and mango lassi. Ripe mangoes feature in curries and aamras, while mangoes contribute to jams, jellies, murabba, pickles, ice cream,

and mango salad. Precautions are needed with unripe, pickled, or cooked mango skin, which may cause contact dermatitis.

Materials and Methodology

Channa Shree was prepared using fresh buffalo milk sourced from the Instructional Dairy Farm at the College of Agriculture Dapoli. Sugar and mango pulp were procured from both the nearby market and the university's PHM unit. Following the methodologies outlined by Lande (2021) [4] for channa and Londhe (2019) [5] for chakka, slight modifications were implemented in the preparation process.

Table 1: Treatment details

| Treatment | Channa (%) | Chakka (%) | Sugar % |
|-------------------------------|------------|------------|------------|
| T ₁ S ₁ | 80 | 20 | 60% of mix |
| T ₂ S ₁ | 60 | 40 | |
| T ₃ S ₁ | 50 | 50 | |
| T ₄ S ₁ | 40 | 60 | |
| T ₅ S ₁ | 20 | 80 | |
| T ₁ S ₂ | 80 | 20 | 70% of mix |
| T ₂ S ₂ | 60 | 40 | |
| T ₃ S ₂ | 50 | 50 | |
| T ₄ S ₂ | 40 | 60 | |
| T ₅ S ₂ | 20 | 80 | |

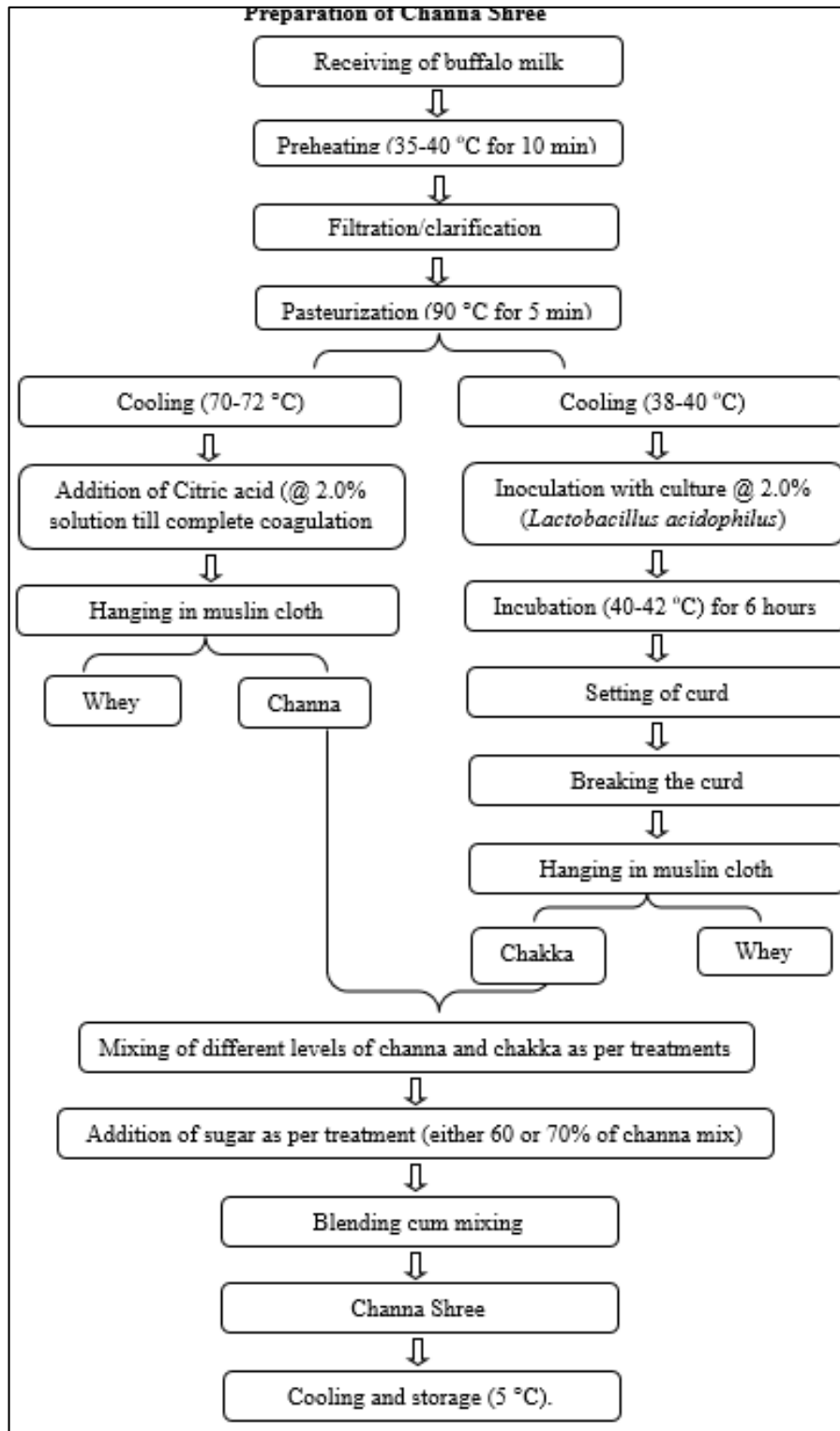


Fig 1: Flow chart for preparation of Channa shree

Results and Discussion

Table 2: Score for sensory analysis of plain channa shree

| Treatments | Colour and appearance | Flavour | Body and texture | Overall acceptability |
|-------------------------------|-----------------------|---------|------------------|-----------------------|
| S ₁ T ₁ | 7.42 | 7.32 | 7.28 | 7.42 |
| S ₁ T ₂ | 7.78 | 7.64 | 7.5 | 7.64 |
| S ₁ T ₃ | 8.18 | 8.12 | 7.92 | 8.02 |
| S ₁ T ₄ | 7.58 | 7.62 | 7.70 | 7.72 |
| S ₁ T ₅ | 7.32 | 7.24 | 7.42 | 7.34 |
| S ₂ T ₁ | 7.76 | 7.50 | 7.38 | 7.32 |
| S ₂ T ₂ | 7.94 | 7.92 | 7.62 | 7.52 |
| S ₂ T ₃ | 8.00 | 8.00 | 7.88 | 7.92 |
| S ₂ T ₄ | 7.72 | 7.54 | 7.60 | 7.42 |
| S ₂ T ₅ | 7.52 | 7.06 | 7.32 | 7.24 |

Colour and appearance

The colour and appearance of milk products significantly influence customer acceptance. For any milk product to be well-received, its colour should be appealing, consistent, gleaming, and devoid of unnatural or off-putting tones. A detailed examination of Table 2 reveals that at a 60% sugar level, treatment T₃S₁ scored the highest for colour and appearance at 8.18, followed by T₂S₁ (7.78), T₄S₁ (7.58), T₁S₁ (7.42), and the lowest being treatment T₅S₁ (7.32). Conversely, at a 70% sugar level, treatment T₃S₂ secured the highest score at 8.0, followed by T₂S₂ (7.94), T₁S₂ (7.76), T₄S₂ (7.72), with T₅S₂ obtaining the least score at 7.52. Notably, at higher chakka levels (80% and 60%), the product exhibited a whiter colour, while lower levels (40% and 20%) resulted in a yellowish tint. It is worth mentioning that the sugar used, despite being pure white, does not contribute to the colour of the product.

Flavour

Flavour stands out as one of the most crucial characteristics of every dairy product, representing a combination of taste and smell that significantly influences customer acceptance or rejection. A detailed analysis of Table 2 indicates that at a 60% sugar level, the highest score for the flavour attribute was attained by T₃S₁ (8.12), followed by T₂S₁ (7.64), T₄S₁ (7.62), T₁S₁ (7.32), with the least score recorded for treatment T₅S₁ (7.24). In the case of a 70% sugar level, treatment T₃S₂ (8.02) secured the highest points, followed by T₂S₂ (7.92), T₄S₂ (7.54), T₁S₂ (7.50), while the least score

was observed for treatment T₅S₁ (7.06). The close relationship between flavour and customer preference highlights its paramount importance in determining the overall acceptance of milk products.

Body and texture

Each dairy product possesses distinctive mouthfeel characteristics, often defined in terms of body and texture. In the examination of Table 2, at a 60% sugar level, the highest score for the body and texture attribute was achieved by T₃S₁ (7.92), followed by T₄S₁ (7.70), T₂S₁ (7.54), T₅S₁ (7.42), with the least score recorded for treatment T₁S₁ (7.28). For the 70% sugar treatment, T₃S₂ (7.88) secured the highest points, followed by T₂S₂ (7.62), T₄S₂ (7.60), T₁S₂ (7.38), while the least score was observed for treatment T₅S₂ (7.32). In the case of the channa-chakka mix, it is noted that decreasing channa levels and increasing chakka levels result in an increased score for treatments T₁, T₂, and T₄, while it decreases for T₄ and T₅. The high total solids content in chhana, ranging from 40 to 48 percent, likely contributes to the high score for body and texture. The body and texture of channa shree result from the combined effect of the smooth body of chakka and the slightly crumbly nature of channa. As the proportion of channa increases, the product tends to acquire a crumbly texture, leading to a lower score.

Overall acceptability

The overall acceptability of a product is an amalgamation of its various sensory qualities, including colour and appearance, body and texture, and flavor, all of which directly influence its overall acceptability. In the examination of Table 2 at a 60% sugar level, the highest score for overall acceptability was achieved by T₃S₁ (8.02), followed by T₄S₁ (7.72), T₂S₁ (7.64), T₅S₁ (7.72), with the least score recorded for treatment T₁S₁ (7.42). For the 70% sugar treatment, T₃S₂ (7.92) secured the highest points, followed by T₂S₂ (7.52), T₄S₂ (7.42), T₁S₂ (7.32), while the least score was observed for treatment T₅S₂ (7.24). Overall acceptance relies on a thorough evaluation of a product's attributes, as consumers weigh the combined impact of sensory features, transcending a simple average of individual characteristics. In this study, channa shree, crafted with an equal 50% blend of channa and chakka, excelled at both 60% and 70% sugar addition levels.

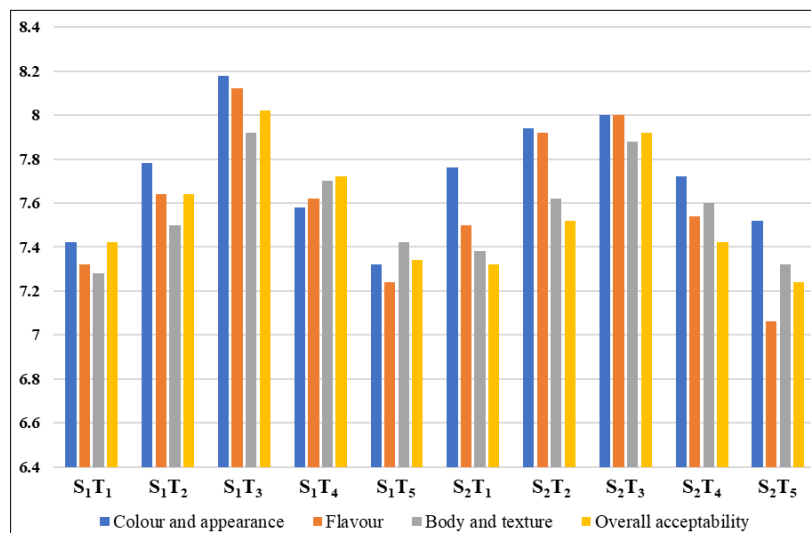


Fig 2: Sensory analysis of channa shree

Conclusion

In conclusion, the study underscores the pivotal role of colour, flavour, body and texture and overall acceptability in shaping the consumer perception of milk products. Optimal sugar levels, channa-chakka proportions, and their intricate interplay significantly impact these sensory attributes. Noteworthy is the consistent excellence of channa shree, formulated with a balanced 50% blend of channa and chakka, at both 60% and 70% sugar addition levels. This research provides valuable insights for dairy product formulation, emphasizing the need for a holistic approach to sensory characteristics for enhanced consumer acceptance and market success.

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