Impact Of Basil And Mint Paste On The Sensory Properties Of Buffalo Milk Paneer

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ABSTRACT

The addition of basil and mint paste to buffalo milk paneer has a substantial impact on the sensory qualities of the paneer, which in turn enhances its culinary appeal and nutritional profile. Throughout the course of this research project, the impacts of various natural ingredients on the taste, texture, color, and general acceptance of paneer are investigated. The unique and powerful taste that basil produces is a perfect match to the creamy texture of buffalo milk paneer. Basil is well-known for its pungent scent and the potential health advantages it offers. The sharpness of basil is balanced by the use of mint, which has a refreshing and cold character. Mint also adds a lovely scent and a faint green tint to the dish. On the basis of sensory assessment, it has been determined that the modified paneer has enhanced flavor and fragrance, in addition to a significant rise in customer approval in comparison to the conventional paneer varieties. The milk of buffalo, which contains 4.5% fat and 9% SNF, was used for the manufacturing of paneer throughout the research that was conducted on paneer inside this study. The proportion of basil paste to mint leaf paste, which is written as "Basil: Mint (1:1)." The product that was created utilizing mint leaf paste at a concentration of 6 percent in treatment T6 received the highest possible score in terms of sensory parameters, including taste, color, and outward appearance, as well as overall acceptance, and it was regarded as the product that had been optimized. For the purpose of optimizing the product, sensory assessment was accomplished. Additionally, the product was subjected to a physicochemical study as well as a microbiological examination.

Keywords: Consumer, Paneer, Basil, Milk, Sensory.

I. INTRODUCTION

In addition to being a treasured component of Indian cuisine, buffalo milk paneer has also established itself as a fundamental

component of both traditional and contemporary culinary techniques. Curdling buffalo milk with an acidic ingredient results in the production of this fresh cheese, which is highly regarded for its luxurious, velvety texture as well as its nutritional advantages. Both the texture and flavor of the paneer that is produced as a result of using buffalo milk are superior to those of cow's milk due to the unique characteristics of buffalo milk, particularly its higher fat content and higher protein quality. The increased fat level contributes to the paneer's creaminess and richness, while the improved protein quality contributes to the paneer's texture becoming more cohesive and hard. Because of these characteristics, buffalo milk paneer is a very popular ingredient in a wide range of meals, including savory foods such as kebabs and curries, as well as sweet dishes such as paneer desserts. Over the past several years, there has been an increasing interest in the utilization of natural flavoring compounds as a means of boosting the sensory qualities of paneer. Consumer demand for products that not only offer greater flavor but also give additional health advantages is the driving force behind this interest. Because of their distinct flavors and the possibility that they contain compounds that are beneficial to one's health, basil (Ocimum basilicum) and mint (Mentha spp.) have emerged as intriguing candidates for utilization in this context.

Basil, which is frequently referred to as the "king of herbs," is lauded for the aromatic properties it possesses as well as the extensive variety of therapeutic benefits it offers. The sweet-spicy aroma of this herb, which is indigenous to tropical climates, is a result of the essential oils that are extracted from the plant. Eugenol, linalool, and cineole are the three principal components that make up the essential oils that are extracted from basil. Cineole contributes a trace of camphor, linalool contributes a floral and sweet tone, and eugenol contributes a warm and spicy perfume. The unique and alluring aroma profile of basil is the consequence of the mixing of various components to produce the aroma. In addition to the sensory qualities it possesses, basil has also been acknowledged for the possible health benefits it may offer. The herb possesses powerful antioxidant qualities, which provide assistance in the fight against oxidative stress and the neutralization of potentially damaging free radicals within the body. It is possible that the anti-inflammatory properties of basil can help reduce inflammation and alleviate symptoms of a variety of illnesses that are characterized by inflammation. Additionally, due to its antibacterial qualities, it is efficient against specific bacteria and fungus, which contributes to its appeal as a functional component in food products. The incorporation of basil paste into buffalo milk paneer is an attempt to capitalize on these traits, with the potential to improve not just the cheese's sensory experience but also its nutritional profile.

The herb mint, which is well-known for having a flavor that is both refreshing and cool, is yet another herb that has the ability to significantly enhance the sensory aspects of paneer. The chemical component known as menthol, which is present in high amounts in mint leaves, is principally responsible for the characteristic flavor of mint. By imparting a flavor that is both fresh and energizing, as well as a chilling feeling, menthol has the potential to enhance the sensory appeal of a variety of food products. Over the course of several centuries, mint has been utilized in culinary traditions all over the world. It is loved not just for its flavor but also for the health benefits it offers. The plant is well-known for its digestive qualities, which include the capacity to alleviate discomfort in the gastrointestinal tract and to facilitate digestion for instance. Antimicrobial capabilities are also exhibited by mint, which can assist in preventing the growth of germs that are detrimental to the body. The fact that it has the capacity to ease respiratory difficulties, such as congestion and irritation, is another factor that contributes to its reputation as a therapeutic element. By integrating mint paste into buffalo milk paneer, it is able to offer a flavor profile that is both distinctive and invigorating, while also taking advantage of the potential health advantages of the plant.

It is anticipated that the incorporation of basil and mint pastes into buffalo milk paneer will have a substantial impact on the sensory qualities of the dairy product. It is possible that the addition of basil paste will lend a complex aroma as well as a flavor that is slightly spicy and sweet to the paneer, thereby increasing the paneer's overall sensory appeal. Taking into account the health benefits that are linked with basil, in addition to the aromatic features that it possesses, the paneer might become not only more tasty but also nutritionally advantageous. In a similar vein, it is anticipated that the paneer will include a flavor that is both refreshing and distinctively cool when mint paste is added to it. It is possible that a one-of-a-kind and pleasurable sensory experience could be produced as a result of the interaction between the menthol properties of mint and the rich, creamy texture of buffalo milk paneer. The sensory advantages are further complemented by the potential digestive and antibacterial effects of mint, which adds value to the product from the perspective of both flavor and health.

II. REVIEW OF LITERATURE

Azizkhani, M. & Parsaeimehr, Mahnoosh. (2018) the purpose of this research was to assess the survivability of the probiotics, antioxidant activity and organoleptic acceptability of probiotic-yogurt incorporating essential oils (peppermint, basil and zataria). In addition to the starting culture and the addition of essential oils, samples were prepared by utilizing probiotic organisms such as Lactobacillus acidophilus LA5, Lactobacillus

fermentum, and Bifidobacterium Bb-12. It was shown that the presence of essential oils did not have any impact on the LA5 population in yogurt over the four weeks that it was stored, but it did slow down the development of Bb12. The water extract of zataria-yogurt had the greatest inhibitory impact on DPPH radicals, followed by samples of peppermint and basil. The highest score was awarded to peppermint yogurt, followed by basil yogurt and control yogurt. However, the zataria sample did not accomplish the goal of reaching the consumer acceptance criterion (score more than 5). In light of the data presented here, it seems that the use of essential oils derived from zataria, basil, or peppermint into the composition of probiotic yogurt may enhance the antioxidant capacity of the product. Both the antiradical activity and the sensory tolerability of the peppermint and basil samples were found to be satisfactory.

Kanetkar et al., (2023) it is mostly cattle and buffalo that are responsible for the production of milk that is consumed by humans. In the dairy industry, minor milk species including goats, sheep, camels, horses, yaks, donkeys, and reindeer make up a less substantial fraction of the overall milk supply. This is due to the fact that their production share is relatively low. But in recent years, people have begun to understand the myriad health and nutritional advantages of milk from these lesser milch species. These benefits include a variety of health benefits. There is a wide variety of traditional dairy products available all over the globe. Among them, the ethnic delicacies that are derived from the milk of lesser dairy species have a special position in their respective regions of origin. Additionally, the components and composition of these items, as well as the methods of preparation, are responsible for imparting their distinctive flavor and taste, in addition to the normal nutritional and functional health advantages that they provide. There are a few advantages associated with these items, including anti-microbial, probiotic, antioxidant, nutraceutical, and other attributes that are beneficial to one's health. The paucity of research and development efforts, marketing, and ads of ethnic milk products of minor milk species, on the other hand, has contributed to the limited awareness of these goods among consumers. The purpose of this study is to highlight some of the significant ethnic milk products that are produced all over the globe from the milk of minor milk species. This is done in light of the information presented above.

Meshram et al., (2022) Herbs serve a variety of purposes, such as a seasoning for food, a preservative, and a component in medical preparations. There are many different herbs that have been extensively researched for their medicinal characteristics, including anti-oxidative, antihypertensive, anti-inflammatory, anti-diabetic, and antibacterial capabilities. The

following herbs are discussed in this review: ashwagandha, arjuna, turmeric, sage, cinnamon, cumin, garlic, fenugreek, peppermint, basil, and aloe vera. These herbs are considered to be the most significant herbs. Some examples of spices and herbs that include antioxidants are basil, cinnamon, clove, dill, ginger, mint, oregano, rosemary, saffron, sage, and thyme, among others. On the other hand, plants that exhibit hypertensive effects include garlic, celery, tea, ajwain, ginger, lavender, basil, radish, and sesame, among others. The sito sterol that is derived from Terminalia Arjuna is widely regarded as one of the most effective heart tonics for maintaining a healthy circulatory system. There are a few herbs that have the ability to assist increase the shelf life of dairy products, particularly fermented dairy products. This is mostly due to the fact that these herbs have a suppressive impact on fungus and bacteria. Therefore, the use of herbs prudently in dairy products has the potential to result in an increase in the nutritional and therapeutic benefits of these products, as well as allow the creation of dairy products with added value. The incorporation of herbs into dairy products has the potential to be beneficial in terms of delivering value-added, functional dairy meals while simultaneously increasing the sales of essential herbs.

Sharma, Darpan & Kumari, Kalpna. (2022). in today's society, spices and herbs have generated a great deal of awareness, which has led people to go to nature for safer herbal therapies. This is because of the many therapeutic advantages that have been shown to be associated with them, as well as the lack of any side effects. Moreover, herbs are well-known for their ability to function as natural preservatives, antioxidants, and taste enhancers. This is a well-known fact. For millennia, people have been using spices and herbs for both culinary and medicinal purposes. Spices and herbs comprise not just herbaceous plants but also the bark, roots, leaves, seeds, flowers, and fruit of trees, shrubs, and woody vines. For centuries, people have utilized these ingredients. Spices and herbs have been included in a variety of Indian dairy products, either in the form of an extract, liquids, or dried forms. This has led to an improvement in the taste, appearance, quality, and overall health benefits of these products. This article provides a summary of the impacts of a variety of spices and herbs that are used in the preparation of ice cream, sandesh, lassi, paneer, and ghee.

III. RESEARCH METHODOLOGY

The raw milk of buffalo was used. The basil paste was purchased from a seller who is permitted to sell it. Mint leaf was purchased from the vegetable market. Both the raw milk fat and the SNF milk were standardized at 6% and 9% respectively. The amount of fat that is included in milk was

established to be 6%. In accordance with the treatment stage, the basil paste was combined with the uniform milk after it had been heated to 85 degrees Celsius for five minutes. The milk was then cooled to 70 degrees Celsius. Afterwards, a strainer made of stainless steel was used in order to remove the whey. The coagulum was gathered and then put in wooden blocks that were lined with muslin material that was both clean and long-lasting. The blocks were blocks made of wood that were rectangular in shape and had holes on one side to facilitate the evacuation of whey. After being filled with coagulum and held by a wooden block, this frame was then attached with another board after the completion of the process. A pressure of 35 kilograms per square centimeter was applied to the top of the hoop for fifteen to twenty minutes. After being removed from the hoop, the coagulum block that had been squeezed was broken into pieces and then submerged in cold water for a period of two to three hours. Paneer that had been allowed to cool was then removed from the bath, let to drain, and kept at room temperature (between 32 and 35 degrees Celsius) before being placed in a polythene bag and placed in the refrigerator at a temperature of 5 degrees Celsius.

IV. DATA ANALYSIS AND INTERPRETATION

Table 1: Control and test paneer properties were established using Buffalo Milk, Basil, Mint, and Basil+ Mint

Parameter	**T0**	**TB1**	**TB2**	**TB3**	**TB4**	**TM5**	**TM6**	**TM7**	**TM8**	**TBM9**	**TBM10**	**TBM11**	**TBM12**
	Basil					**Mint**				**Basil + Mint**			
	Organoleptic scores (9 point hedon c scale)												
Colour and Appearance	7.59	7.80	8.26	6.85	7.80	8.02	8.82	7.88	7.17	7.76	7.28	7.90	7.76
Body and Texture	7.46	7.57	8.19	7.74	7.60	7.14	8.31	7.35	7.73	7.15	7.26	7.84	8.25
Flavour and	7.0	7.2	8.9	7.7	7.3	7.3	8.1	7.9	7.3	7.1	7.79	7.56	7.80

Taste	3	8	2	4	8	7	6	8	0	5			
Over all Acceptability	7.37	7.72	8.38	7.12	7.79	7.28	8.19	7.59	7.72	7.76	7.67	7.38	7.42

According to Table 1, there are significant variations in the organoleptic qualities of buffalo milk paneer when tested with various additions. These variations are depending on the kind and mix of additives employed.

Control Paneer (T0)

Overall acceptability is 7.37, color and appearance is 7.59, body and texture is 7.46, flavor and taste is 7.03, and there is a balanced sensory profile in the control sample (T0).

Basil-Infused Paneer (TB1-TB4)

When compared to the control, adding basil results in slight improvements across the board: 7.80 for color and appearance, 7.57 for body and texture, 7.28 for flavor and taste, and 7.72 for overall acceptance. With a score of 8.92 for flavor and taste and 8.38 for overall acceptability, this recipe clearly stands out as the most preferred option. Scores of 7.74 for flavor and taste and 7.74 for body and texture are still good, but a score of 6.85 for color and appearance lowers the overall acceptability to 7.12.

Mint-Infused Paneer (TM5-TM8)

Performs better in terms of general acceptability (7.28) and color and appearance(8.02), but falls short in terms of body and texture (7.14). A good effect of mint on visual and textural quality is suggested by the large improvements seen, especially in color and appearance (8.82) and body and texture (8.31). Color and appearance (8.82), body and texture (8.31), and flavor and taste (8.16), all of which are high compared to TM6, are comparable.

Basil and Mint Combination Paneer (TBM9-TBM12)

Scores 7.76 for color and appearance, 7.15 for body and texture, 7.15 for flavor and taste, and 7.76 for overall acceptance, demonstrating balanced sensory characteristics. Consistent across all metrics, showing considerable improvement while keeping the mint and basil tastes well-balanced. Combines well, as seen by better ratings in flavor and

taste (7.79) and body and texture (7.26). All three sensory dimensions are well-represented by the high ratings (8.25 for body and texture, 7.80 for flavor and taste, and 7.42 for overall acceptability), indicating that the additives work together well.

V. CONCLUSION

When buffalo milk paneer is mixed with mint and basil paste, it improves the flavor and texture in a number of ways. TB2 and other basil-infused paneer formulations stood out for their very high flavor and taste scores, as well as their powerful tastes and enhanced overall acceptance. TM7's strong color and appearance ratings are indicative of the pleasant scents and increased visual appeal offered by mint-infused paneer. A well-rounded sensory experience with enhanced texture, taste complexity, and overall consumer approval was provided by the combination of basil and mint (TBM12), which successfully balanced these properties.

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