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Development of value added paneer with different ratio of herbs like garlic and mint leaf and its physico-chemica analysis

Puneet Arora, SGM Prasad and John David

Abstract
Paneer is high in vitamin D and calcium, both of which are helpful in the prevention of breast cancer. It is a great source of bone-building minerals due to its high calcium and vitamin D concentration. Anyone, whether young or old, may benefit from paneer for strong bones and teeth. Not only that, but calcium is also vital in the nervous and muscular systems. Cancer has become more frequent in recent years. The most prevalent temperament of cancer is breast cancer, affecting one million wimin on average. Premenopausal women are more likely to develop cancer than postmenopausal women.
Herbs serve a variety of purposes, such as culinary flavourings, preservatives, and medicinal ingredients. Antioxidant, antihypertensive, anti-inflammatory, antidiabetic, antibacterial, and other medicinal effects of herbs have been identified. Garlic and peppermint are two of the most significant herbs discussed. Garlic has hypotensive effects, whereas mint has antioxidants. These herbs be able to facilitate prolong the projection time of deri food by inhibiting fungus and bacteria. As a result, careful herb usage in deri food may increase their nutritional and therapeutic worth, allowing for the progress of worth-additional deri food. Herb reinforcement in deri foodstuffs might assist provide value-added, functional dairy products.

Keywords: Milk, paneer, mint, garlic, shelf-life

Introduction
"India is currently the world's largest milk producer, with production surpassing 186.5 million tonnes and annual growth rate around 4.5 percent". A total of 46% of the milk fashioned is addicted in fluid form, 54 percent has been used to produce different dairy products, and 3 percent has been used to Channa and Paneer manufacturing.
Paneer has evolved from a Portuguese gift to India into a gourmet delicacy. Paneer is a required, nutritious, and filling Indian product. It has a good nutritious value due to the high concentration of high-quality fats, minerals, and vitamins. Vegetarians consume it as part of their main course. Paneer is produced from approximately 4-5 percent of India's overall milk supply.
Paneer is a common Indian milk commodity made by heating milk and acid coagulating it with coagulants like "tartaric acid, citric acid, lactic acid and sour whey". Any of the whey is extracted by filtering and pressing. Paneer is a mild cheese that is used in a wide range of culinary dishes and snacks. Paneer is made from approximately 5% of the milk provided in India.
Garlic's name is thought to be derived from a Celtic term that signifies pungent. Garlic is available in the form of "capsules, pills, tinctures, syrup, and oil". For the treatment of asthma, epilepsy, rheumatism and vermifuge garlic has been from ancient time. It has been used externally by for treating such type of diseases with vinegar and sugar; pounded with honey and combination with the milk. In Europe and Asia garlic is widely for medicinal purposes.
Mint is a valuable and wonderful flower. *Mentha spicata* is the botanical name for mint.
It is also known as 'pudina' field mint, corn mint, Japanese mint, among other names. Lamiaceae is the name of the relatives. It belongs to the genus *Mentha*, which contains about 25 species and hundreds of varieties. Mint is well known in folk medicine for its gastrointestinal calming properties. That it has the potential to relax the muscles of the intestinal wall, relieve cramps, and alleviate discomfort associated with gastrointestinal conditions. Mint stimulates the release of saliva, which leads to an increase in chewing, which can boost appetite, decrease nausea, or alleviate motion sickness. It is used to treat rheumatism due to its anti-inflammatory properties. Mint has been shown to have antiviral, antifungal, and antibacterial efficacy in laboratory studies. It improves insomnia, headaches, anxiety, nerves, morning sickness, and congested lungs by stimulating menstruation, bronchioles, and sinuses.

Its active constituents are menthol and carvone, all of which are widely used in both medical and industrial applications.

Objective

Development of value-added experimental paneer with addition of different ratios of herbs *viz*. garlic and mint leaf and analysis of its physico-chemical properties.

Materials and Methods

The experiment "Studies on development of value-added paneer with addition of garlic and mint leaf" was conducted at WCDT, SHUATS, Naini, UP.

Procurement and collection of ingredients

1. The raw milk procured from WCDT student training plant, Naini.
2. Garlic paste was procured from authorized vendor of Naini.
3. Mint leaf was purchase from vegetable market of Naini.

Standardization of milk.

The raw milk fat and SNF Milk was standardize to 6% and 9%.

Treatments

Treatments	Garlic Paste	Mint Leaf Paste	Garlic: Mint (1:1)
"T0"	"0"	"0"	"0"
"TG1"	"2"	"0"	"0"
"TG2"	"4"	"0"	"0"
"TG3"	"6"	"0"	"0"
"TG4"	"8"	"0"	"0"
"TM5"	"0"	"2"	"0"
"TM6"	"0"	"4"	"0"
"TM7"	"0"	"6"	"0"
"TM8"	"0"	"8"	"0"
"TGM9"	"0"	"0"	"2"
"TGM10"	"0"	"0"	"4"
"TGM11"	"0"	"0"	"6"
"TGM12"	"0"	"0"	"8"

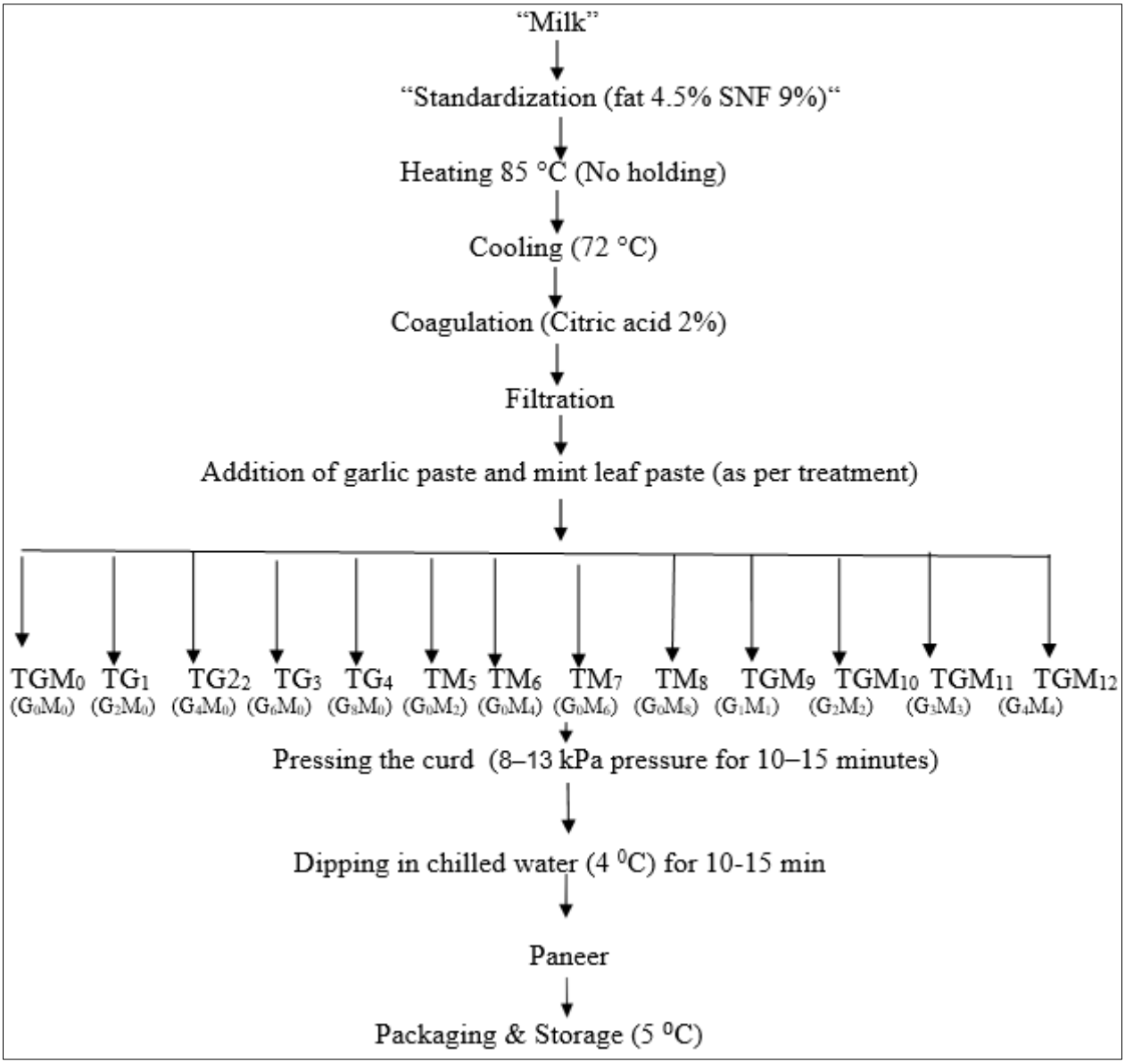

Diagram 1: Flow Diagram for manufacturing of Paneer

Results and Discussion

Standardization and optimization process for the manufacturing of Buffalo Milk Paneer: Milk

Buffalo Milk was used in the study because it is high in calcium and contains minerals including magnesium, potassium, and phosphorus. Buffalo Milk provides thick, fluffy dairy products that are perfect for making conventional milk products such as yogurt and cottage cheese (known in South Asia as "paneer"), as well as indigenous milk products such as khoa and ghee.

Herbs

In the preparation of buffalo milk paneer, two type of medicinal and aromatic herbs were used i.e. Garlic and mint leaves. All the herbs were dressed and washed for extraction of their juice separately.

Level of herbs

Prepared extract was used at 1%, 2% and 3% level of herbs and incorporated at the time of boiling of milk. Then this milk was cooled up to 85°C and with stand temperature for 2 minutes. Then citric acid was added as coagulant to separate chhana and whey. The free whey was drained from the coagulated mass using a traditional procedure. Then it was pressed for 20 minutes at sufficient pressure and then immersed in to chilled water for 30 minutes.

Using Buffalo Milk Garlic, Mint, and Garlic+ Mint, the various parameters of control and test paneer were determined.

Parameter	T_0	TG_1	TG_2	TG_3	TM_4	TM_5	TM_6	TM_7	TGM_8	TGM_9	TGM_{10}	TGM_{11}	TGM_{12}
	"Physico-chemical analysis"												
	Garlic					Mint				Garlic+ Mint			
Fat %	26.14	25.49	24.98	24.60	24.09	25.48	24.96	24.57	24.05	25.48	24.97	24.58	24.07
Protein %	23.45	23.10	23.16	22.42	22.08	23.01	22.58	22.14	21.87	23.05	22.55	22.28	21.87
Carbohydrate%	6.78	7.80	8.82	9.40	11.74	7.94	7.99	8.04	8.77	8.17	8.45	8.72	9.00
Ash %	2.94	2.83	2.86	2.92	3.01	3.09	3.23	3.57	3.81	2.98	3.01	3.08	3.13
Total solids %	59.31	59.22	59.82	59.34	60.92	59.52	58.76	58.32	58.50	59.68	58.98	58.66	58.07
Acidity %	0.163	0.167	0.212	0.234	0.249	0.231	0.237	0.240	0.242	0.235	0.238	0.243	0.247

Fat

Fat percent of Buffalo milk paneer by using garlic paste highest mean fat percent was recorded in T_4 (26.41) followed by T_3 (26.35), T_2 (26.29), and T_1 (26.23), T_0 (26.17). The data on fat percent of paneer by using Buffalo Milk and mint and control milk beverage, highest mean fat percent was recorded in T_5 (22.24) followed by T_6 (21.78), and T_7 (21.33), T_8 (20.87). The fat percent of Buffalo milk paneer by using garlic paste and mint, the highest mean fat percent was recorded in T_9 (22.36) followed by T_{10} and T_{12} (22.04), T_{11} (21.76).

Protein

The highest Protein percentage of Buffalo milk paneer by using garlic paste and mint, the highest mean protein percent was recorded in T_{12} (16.10) followed by T_{11} (15.90), T_{10} (15.88), and T_9(15.57).

Carbohydrates

The highest mean Carbohydrates percentage Buffalo milk paneer by using garlic paste and mint, the highest mean carbohydrate percent was recorded in T_{12} (16.60) followed by T_{11} (16.51), T_{10} (16.48), and T_9 (16.46).

Ash

The highest Ash percentage was recorded Buffalo milk paneer by using garlic paste and mint, the highest mean ash percent was recorded in T_{12} (2.24) followed by T_{11} (2.19), T_{10} (2.16) and T_9 (2.14).

Total solids

The highest Total solids percentage was recorded in the sample of T_0 (48.67) followed by T_4(48.12), T_3(47.56), T_2(47.04) and T_4 (46.61). It is therefore concluded that there was all treatment was significant which may be ascribed to addition of different level of Garlic paste in treatments.

Total Solids

The highest mean total solid percentage was recorded of Buffalo milk paneer by using garlic paste and mint, the highest mean total solids percent was recorded in T_{12} (57.75) followed by T_{10} (57.21), T_9 (56.47), and T_{11} (56.23).

Acidity

The highest mean acidity percentage was recorded in T_{12} (0.29) followed by T_{11} (0.26), T_{10} (0.24), and T_9 (0.22).

Conclusions

In the present study, milk of buffalo (4.5% fat and 9% SNF) for production of paneer. throughout the research of paneer; four level of garlic paste that is 2, 4, 6 and 8 percent and four levels of mint leaf paste *viz*., 2, 4, 6 and 8 percent was added. The ratio of garlic paste and mint leaf paste [Garlic: Mint (1:1)] *viz*., 2, 4, 6 and 8 percent was added. The product prepared using 6 percent mint leaf paste in treatment T6 score the maximum in sensory parameter that is., flavor, color and outward show and overall acceptability and was considered to be the optimized product. Optimization of product was done by sensory evaluation. Storage study of Paneer was carried out only for the optimized product stored at 5 ºC and concluded that treatment T6 was acceptable.

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