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MA Gamit

Department of Livestock
Products Technology, College of
Veterinary Science and Animal
Husbandry, Kamdhenu
University, Anand, Gujarat,
India

BC Parmar

Department of Livestock
Products Technology, College of
Veterinary Science and Animal
Husbandry, Kamdhenu
University, Anand, Gujarat,
India

CN Dharaiya

Department of Dairy
Technology, S.M.C College of
Dairy Science, Kamdhenu
University, Anand, Gujarat,
India

MN Brahmhatt

Department of Veterinary Public
Health & Epidemiology, College
of Veterinary Science and
Animal Husbandry, Kamdhenu
University, Anand, Gujarat,
India

JB Nayak

Department of Veterinary Public
Health & Epidemiology, College
of Veterinary Science and
Animal Husbandry, Kamdhenu
University, Anand, Gujarat,
India

Corresponding Author:**MA Gamit**

Department of Livestock
Products Technology, College of
Veterinary Science and Animal
Husbandry, Kamdhenu
University, Anand, Gujarat,
India

Development of flavoured milk prepared with Tulsi and turmeric

MA Gamit, BC Parmar, CN Dharaiya, MN Brahmhatt and JB Nayak

Abstract

The study was planned to conduct the experiment for optimization of selected levels of basil (*Ocimum sanctum*, tulsi) and turmeric (*Curcuma longa*, haldi) used as a flavouring ingredient in milk. The optimum levels of each form of basil employed was selected on the basis of their sensory quality. Assessment for its compositional, physicochemical properties and sensory attributes.

It is concluded that good quality flavoured milk prepared with tulsi and turmeric can be obtained in which tulsi juice (T₁) at the rate of 2.74% (w/w of milk) and Sugar @ 8.63% (w/w of milk). For turmeric juice (T₂) at the rate of 7% (w/w of milk) and Sugar @ 10% (w/w of milk).

Keywords: Flavoured milk, prepared, tulsi and turmeric

1. Introduction

Milk is regarded as the complete food in the human diet. Milk provides all the nutrient elements, essential for the nourishment of the human body. Modern trend of consumers expectation are that using natural ingredients. Natural ingredients are health benefits, natural antioxidant, natural colorant and free from synthetic additives.

Now a day increased in demand for natural flavours milk. Various milk products are prepared with herbal ingredients such as natural and healthy drinks like ginger milk, tulsi milk and turmeri milk etc. Tulsi (*Ocimum sanctum*) has anti-inflammatory, antipyretic, analgesic, antiulcer, antimicrobial, antistress, anticarcinogenic, hypoglycaemic and hypolipidaemic. The active constituents of the herb include volatile oil chiefly eugenol and beta-caryophyllene, flavonoids and a number of other components present in fixed oil (Das and Vasudevan, 2006)^[4]. Turmeric (*Curcuma longa*) is one of most natural powerful healers. It makes low level of cholesterol, anticancerus, anti-inflammatory, antiseptic, regular use of turmeric can benefit in colitis. Turmeric milk was use for treating hepatitis and improving liver function. It is a valuable remedy for bronchial asthma. Turmeric being rich in iron is useful in anemia and also known for immunity boosting capability.

2. Material and Methods**2.1. Preparation of Tulsi Juice**

Tulsi plants (*Ocimum sanctum*) were obtained from 'Department of Medicinal and Aromatic Herbs', AAU, Anand. Tulsi juice was prepared by sorting out the tulsi leaves by removal of steam, buds, flowers etc. The tulsi leaves were washed, blanched and crushed in the mixture and filtered through a muslin cloth. The proportion of tulsi leaves: water was 50:50.

2.2. Preparation of turmeric juice

Turmeric (*Curcuma longa*) rhizomes green roots were purchased directly from local market of Anand. Turmeric juice was prepared by pilling off turmeric rhizomes green roots. The turmeric rhizomes green roots were washed, crushed in the mixture and filtered through a muslin cloth. The proportion of turmeric rhizomes green roots: water was 50:50.

2.3. Preparation of flavour milk

The study was undertaken to evaluate tulsi (*Ocimum sanctum*) and turmeric (*Curcuma longa*) as a flavouring ingredients in milk.

The study was divided into two phases.

Phase A: Selection of level of tulsi juice in milk.

Phase B: Selection of level of turmeric juice in milk.

Double tone milk having an average fat $1.5 \pm 0.1\%$ and average milk solid not fat content of $9 \pm 0.1\%$ was used for preparation of flavoured milk. Addition of ingredients tulsi juice and sugar (w/w of flavoured milk). The experimental plan consisted of a set of 13 experiments (Table 1). Addition of ingredients turmeric juice and sugar (w/w of flavoured milk). The experimental plan consisted of a set of 13 experiments (Table 2). The product was heated at subjected to pasteurization at 72°C for 15 sec.

Table 1: Experimental Design development by Response surface methodology (RSM) for flavoured milk prepared with tulsi juice

Treatments	Factor-1	Factor-2
	Level of Tulsi Juice (%)	Level of sugar (%)
1.	4.0	8.0
2.	1.17	8.0
3.	4.0	8.0
4.	2.0	6.0
5.	4.0	10.83
6.	6.0	10.0
7.	4.0	8.0
8.	6.83	8.0
9.	4.0	8.0
10.	4.0	8.0
11.	4.0	5.17
12.	6.0	6.0
13.	2.0	10.0

Table 2: Experimental design development by response surface methodology (RSM) for flavoured milk prepared with turmeric juice

Treatments	Factor-1	Factor-1
	Level of Turmeric Juice (%)	Level of sugar (%)
1.	11.0	6.0
2.	9.0	8.0
3.	11.0	10.0
4.	6.2	8.0
5.	9.0	8.0
6.	9.0	8.0
7.	7.0	10.0
8.	11.8	8.0
9.	7.0	6.0
10.	9.0	10.8
11.	9.0	5.2
12.	9.0	8.0
13.	9.0	8.0

2.4. Sensory evaluation

Flavoured milk prepared with Tulsi juice and Turmeric juice were evaluated for sensory attributes by a panel of seven judges selected from the department. The samples were evaluated for flavour, odour, colour / appearance and overall acceptability on 9-point hedonic scale (Stone and Sidel, 2004) [6].

2.5. Physico-chemical characteristics

The samples were analysed for pH, Moisture, Fat, Protein, Carbohydrate, Ash and total solid was determined by the method described in FSSAI manual (2015) [5].

3. Results

3.1. Optimization of product formulation for flavoured milk prepared with tulsi juice

Considering the parameters and their limits, the Response Surface Methodology (RSM) suggested the one most suited solution for flavoured milk prepared with tulsi Juice.

Suggested solution from RSM analysis for Tulsi juice (T1) @ 2.74% (w/w of milk) and Sugar @ 8.63% (w/w of milk).

The sensory scores, viz. flavour score, odour score, color & appearance score and overall acceptability score for the product was observed in the range from 7.87, 7.37, 7.37 & 7.75 (out of 9) respectively.

3.2. Optimization of product formulation for flavoured milk prepared with turmeric juice

Considering the parameters and their limits, the RSM suggested the one most suited solution for flavoured milk prepared with turmeric juice. Suggested solution from RSM analysis for turmeric juice (T2) @ 7% (w/w of milk) and Sugar @ 10% (w/w of milk).

The sensory scores, viz. flavour score, odour score, color & appearance score and overall acceptability score for the product was observed in the range from 7.75, 7.25, 7.75 & 7.87 (out of 9) respectively.

Physico-chemical characteristics of tulsi flavour milk and turmeric flavour milk given in Table 3

Table 3: Physico-chemical characteristics of optimization of product

Parameters	Tulsi flavour milk (T1)	Turmeric flavour milk (T2)
pH	6.54	6.47
Moisture,% by wt.	81.38	81.13
Total Solid,% by wt.	18.62	18.87
Fat,% by wt.	1.55	1.45
Protein,% by wt.	2.91	2.82
Carbohydrates,% by wt.	13.32	15.64
Ash,% by wt.	0.84	0.96

4. Conclusion

On the basis of these present studies flavoured milk prepared with tulsi juice at the rate of 2.74% and flavoured milk prepared with turmeric juice at the rate of 7% were found that suitable for good for health benefits.

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