

DEVELOPMENT AND QUALITY EVALUATION OF BURFI (INDIAN SWEET DISH) PREPARED WITH INCORPORATION OF COCONUT MILK AND WATERMELON SEEDS

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Abstract– The present experiment entitled “Development and Quality Evaluation of Burfi prepared with incorporation of Coconut milk and Watermelon seeds.” was carried out in food technology lab, Department of Dairy Technology, Sam Higginbottom University of Agricultural Technology and Science, during summer session 2022-2023. The experiment was laid out in Random block design (RBD) with 4 treatment and 5 replications. The different treatment combinations were prepared i.e.; T (100% Buffalo milk + 0% Coconut milk + 0% Watermelon seeds), T(50% Buffalo milk + 45% Coconut milk + 5% Watermelon seeds), T(50% Buffalo milk + 40% Coconut milk + 10% Watermelon seeds), T(50% Buffalo milk + 35% Coconut milk + 15% Watermelon seeds) During the preparation of Burfi, Buffalo milk, Coconut milk and Watermelon seeds were added in ratio 100:0:0, 50:45:5, 50:40:10 and 50:35:15. Control sample was not added with Coconut milk and Watermelon seeds. The treatments were evaluated for various organoleptic characteristic, physico-chemical parameters, and microbial evaluation. After sensory evaluation of Burfi having T2(50:40:10) was found to have highest overall acceptability score of 8.10. On the basis of physico-chemical analysis the development of burfi sample Moisture contain (17.28%). Fat (24.44%). Carbohydrate (42.41%), Protein (15.63%), Ash (3.06%), Titratable- acidity (0.36%) and Antioxidant (8.21%). On the basis Microbial analysis SPC (1.50) x10³(cfu/g). Coliform (nil).

INTRODUCTION

BURFI is one of the most popular milk based indigenous sweets. It is white to light cream in colour with firm body and smooth texture with very fine grains. Sugar is added in different proportions and other ingredients incorporated according to the demand of consumers. Several varieties of burfi are sold in the market viz plain, nut (kaju, pista), chocolate, and coconut and rava burfi. A lot of variation is observed in chemical composition, sensory and rheological characteristics in market samples of burfi Low moisture content and presence of sugar keeps burfi well for fairly long periods.

The shelf life of burfi Packed in parchment paper is 15 days at 30 °C and 50 days at 5 °C. with the view to extend the shelf life and improve the texture of burfi, 50% replacement of cane sugar with corn syrup has shown desired results. It also reduced the

water activity, thereby extending an inhibitory influence on the growth of bacteria (Pal, 2000). An equilibrium relative humidity of 70% for burfi sample having moisture content of about 15% was found to be optimum for storage at 30°C Higher ERH encouraged the Mould growth and the lower impaired the texture of burfi making the product unfit for consumption (Reddy, 1985). Packaging of burfi into pre-sterilized cryvac pouches vacuum packaging increased the shelf life to more than 60 days (Champak, 1998).

COCONUT MILK (*Cocos nucifera*, L.) is commonly called “Tree of Life” because of the myriad uses. All parts of the palm, from the roots to the leaves and particularly its fruit, have special uses as a provider of food, beverage, animal feed and as an important raw material for various industries like the oleochemical industry. Traditionally, it requires little attention throughout its life span of over 50

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years, thus the reference as “lazy man’s crop”. Commercial farms, however, are tended and developed for improved productivity (Agustin, 2000).

Coconut milk is the word used to present the liquid obtained by manual or mechanical force of coconut meat. It is the white, oil-in-water emulsion extracted from fresh coconut flesh with or without added water. It is made with finely grated coconut meat that is steeped in hot water and then filtered. Coconut milk is becoming an increasingly important raw material in home cooking as well as in the food processing industries. It is estimated that 25% of the world coconut output is consumed as coconut milk. It is a major and an essential ingredient in the preparation of a wide variety of food products such as curry, desserts, coconut jam spread, coconut syrup, coconut cheese, bakery products and beverages. It can also be used as a substitute for milk in some desserts such chocolate and other confection arise are exotically Flavoured with coconut milk.

Coconut milk contains fat, water, carbohydrate, protein, and ash with the major components being water and fat. As reported by, coconut milk contains about 54% moisture, 35% fat and 11% solid non-fat and they also showed that fat content played an important role in the flow property of coconut milk. Regular coconut milk is higher in fat and calories than cow’s milk. It is rich in proteins such as albumin, globulin, prolamin and glutelin. Emulsifying agents help in increasing stability of food emulsions; examples of such are phospholipids, cephalin and lecithin which have been found in coconut milk.

WATERMELON (*Citrullus Lanatus*) is herbaceous flowering creeping plant belonging to the family Cucurbitaceous. It is mainly fertilized by seeds and thrives best in warm areas. It is a tropical plant and requires a lot of sunshine and high temperature of over 25°C for optimum growth. Watermelon grows well in a drained fertile soil of acidic nature. It can be grown along the coastal areas of Ghana, the forest zone and especially along riverbeds in the Northern Savannah areas (Ministry of Food and Agriculture 2011). In 2018, global watermelon usage stood at 166 million tons (FAOSTAT) according to statistical database, Food and Agriculture Organization of the United Nations, 2020. According to FAOSTAT (2009) India is the second greatest producer of watermelon amongst the Asian international location’s productions.

Watermelon seeds are used to prepare porridge and considered as a source of protein and fat in the diet (Seyed and Elnaz, 2006). Watermelon seeds have great nutritional value and are utilized for human consumption as snacks after salting and roasting in Arabian and Asian regions (Ziyada and Elhussien, 2008).

Watermelon seeds known to be remarkably nutritional varieties of seeds. They are a storehouse of proteins, vitamins, omega 3 and omega 6 fatty acids, magnesium, zinc, copper, potassium and phytochemicals (Tak and Jain, 2016).

Seeds composed of polyunsaturated fatty acids such as omega 6 (linoleic acid). monounsaturated fatty acids such as omega 9 (oleic acid). They also contain saturated fatty acids, such as palmitic acid and stearic acid (Mehra *et al.*, 2015). The seeds are rich source of dietary fiber (5%), high in protein (35%) and fat (50%), it is a rich source of magnesium, calcium, potassium, iron, phosphorus and zinc (Odibo *et al.*, 2012). Watermelon seeds are a good source of low-molecular-weight polypeptides L.e. globulin, glutenin and albumin. Seeds are also rich in aspartic acid, glutamic acid and serine (Tabiri *et al.*, 2016).

MATERIALS AND METHODS

The present experiment entitled “**Development and Quality Evaluation of Burfi prepared incorporation with Coconut milk and Watermelon seeds**” was conducted in the Department of Food Technology, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Prayagraj (U.P) during the year 2022-23 materials to be used and methodology to be adopted during the course of study are mentioned below.

Materials: Buffalo milk, Coconut milk and Watermelon seeds were obtained from the local market of the Prayagraj.

Procedure: The procedure of manufacturing the Burfi was followed as per the process given in the (Fig.1). Different proportions were made in order to standardize the formulations. The standard formula for marking Burfi has been given in (Table 1).

RESULTS

The result revealed that physico-chemical characteristics of fruit leather prepared from papaya and apple had the following performance.

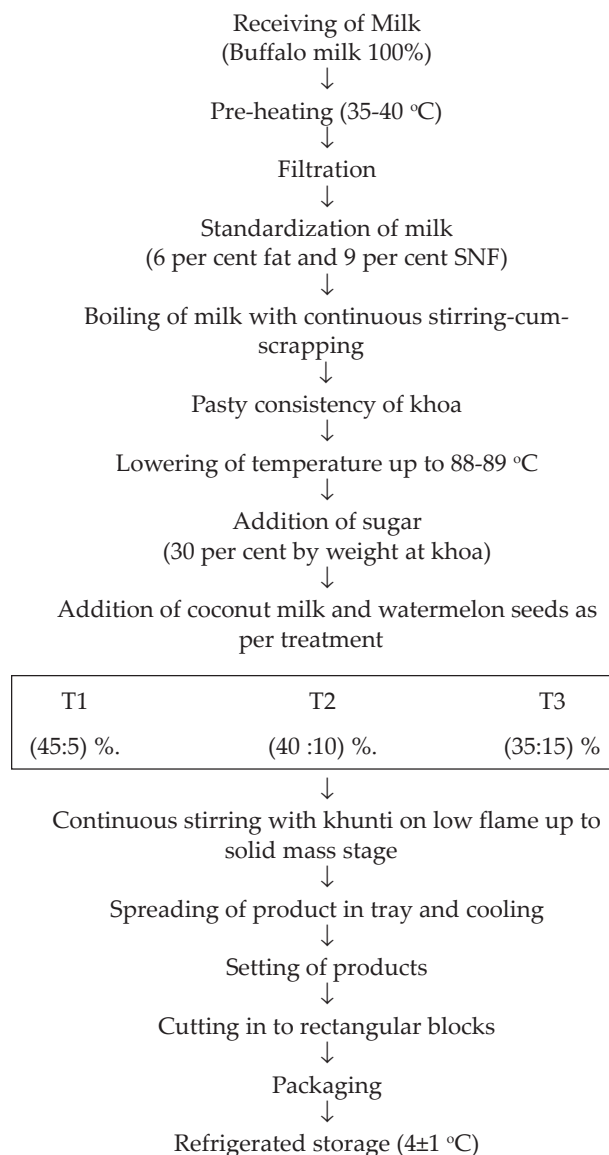


Fig. 1. Flow diagram for preparation of Coconut and buffalo milk-based burfi blended with or without watermelon seeds

Table 1. Standard recipe for formulation of Burfi

Treatment	Buffalo milk	Coconut milk	Watermelon seeds power
T 0	100%	0	0
T 1	50%	45%	5%
T 2	50%	40%	10%
T 3	50%	35%	15%

Moisture

The maximum moisture (18.28) was observed in T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum

moisture (15.13) was observed in T buffalo milk (100%) +coconut milk (0%) + watermelon seeds (0%).

Fat

The maximum fat (25.38) was observed in T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum fat (20.69) was observed in T buffalo milk (100%) +coconut milk (0%) + watermelon seeds (0%).

Protein

The maximum protein (16.52) was observed in T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum protein (13.42) was observed in T buffalo milk (100%) + coconut milk (0%) + watermelon seeds (0%).

Carbohydrate

The maximum Carbohydrate (46.73) was observed in T buffalo milk (100%) +coconut milk (0%) + watermelon seeds (0%). Whereas minimum Carbohydrate (40.83) was observed in T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%).

Ash

The maximum ash (3.42) was observed in T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum ash (2.42) was observed in T buffalo milk (100%) +coconut milk (0%) + watermelon seeds (0%).

Titrateable Acidity

The maximum titrateable acidity (0.37) was observed in T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum titrateable acidity (0.33) was observed in T buffalo milk (100%) +coconut milk (0%) + watermelon seeds (0%).

Antioxidant

The maximum antioxidant (10.06) was observed in T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum antioxidant (4.33) was observed in T buffalo milk (100%) +coconut milk (0%) + watermelon seeds (0%).

Microbial Parameters

Standard plate count score (cfu/gm × 10³)

The maximum standard plate count score (cfu/gm

$\times 10^3$) (1.52) was observed T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum standard plate count score (cfu/gm $\times 10^3$) (0.64) was observed in T buffalo milk (100%) +coconut milk (0%) + watermelon seeds (0%).

Coli form count (cfu/gm)

The coli form count (cfu/gm) in the sample of different experimental treatments and control was found to be absent.

Organoleptic Parameters

Colour and appearance

The maximum colour and appearance (8.70) was observed T₀ buffalo milk (100%) + coconut milk (0%) + watermelon seeds (0%). Whereas minimum colour and appearance (7.21) was observed in T₃ buffalo milk (50%) +coconut milk (35%) + watermelon seeds (15%).

Flavour and Taste

The maximum Flavour and Taste (8.75) was observed T₀ buffalo milk (100%) + coconut milk (0%) + watermelon seeds (0%). Whereas minimum flavour and taste (7.34) was observed in T₃ buffalo milk (50%) +coconut milk (35%) + watermelon seeds (15%).

Body and Textural

The maximum Body and Textural (8.81) was observed T₀ buffalo milk (100%) + coconut milk (0%)

+ watermelon seeds (0%). Whereas minimum body and texture (7.15) was observed in T₃ buffalo milk (50%) +coconut milk (35%) + watermelon seeds (15%).

Overall Acceptability

The maximum Overall Acceptability was (8.39) observed T₀ buffalo milk (100%) + coconut milk (0%) + watermelon seeds (0%). Whereas minimum overall acceptability (7.17) was observed in T₃ buffalo milk (50%) +coconut milk (35%) + watermelon seeds (15%).

Cost analysis

The maximum cost analysis was (35.16) observed T buffalo milk (50%) + coconut milk (35%) + watermelon seeds (15%). Whereas minimum cost analysis (31.41) was observed in T₁ buffalo milk (50%) +coconut milk (45%) + watermelon seeds (5%).

CONCLUSION

According to the experimental results obtained during the study on the topic Development and Quality Evaluation of Burfi prepared with incorporation of Coconut milk and Watermelon seeds, it can be concluded from the result obtained that the burfi can be successfully prepared by using buffalo milk, coconut milk and watermelon seeds. During the preparation of burfi, buffalo milk, coconut milk and watermelon seeds. were added in

Table showing observation of Physico-Chemical, Microbiological Analysis and Sensory attributes of final Burfi prepared with Coconut milk and Watermelon seeds powder.

Physico-Chemical Parameters	TREATMENTS			
	T0	T1	T2	T3
Moisture%	15.13	16.18	17.28	18.28
Fat%	20.69	22.60	24.44	25.38
Protein%	13.42	14.30	15.63	16.52
Carbohydrate%	46.73	45.81	42.41	40.83
Ash%	2.42	2.62	3.06	3.24
Titratable Acidity	0.33	0.33	0.36	0.37
Antioxidant %	4.33	6.11	8.21	10.06
Microbiological Analysis				
SPC($\times 10^3$) (cfu/g)	0.64	1.30	1.50	1.52
Coliform	Nil	Nil	Nil	Nil
Sensory Attributes				
Colour and Appearance	8.70	8.13	8.17	7.12
Taste and Flavour	8.75	7.48	7.86	7.34
Body and Texture	8.81	7.49	7.92	7.15
Overall acceptability	8.39	7.55	8.10	7.17

ratio 100:0:0, 50:45:5, 50:40:10 and 50:35:15. Control sample was not added with Coconut milk and Watermelon seeds. Based on finding of the present experiment it is concluded that T2 buffalo milk (50%), coconut milk (40%) and watermelon seeds (10%) was found superior in respect of the physico-chemical parameters like Moisture (%), Carbohydrate (%), Protein (%), Fat (%), Ash (%), Titratable Acidity (%) and Antioxidant (%). With respective sensory attributes like colour and appearance, Body and Texture, Flavour and Taste and Overall acceptability T2 buffalo milk (50%) + coconut milk (40%)+ watermelon seeds (10%) was found as best.

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