



## Physicochemical Analysis and Sensory Evaluation of Burfi Enriched with Dried Date

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### ABSTRACT

The study was aimed at evaluating the quality of burfi enriched with dried date. Three samples of khoa-dried date blends viz. T<sub>1</sub> (90:10), T<sub>2</sub> (85:15), T<sub>3</sub> (80:20) and control (T<sub>0</sub>) burfi was analyzed for physicochemical parameters and sensory attributes. The physicochemical composition of burfi was affected due to addition of dried date. The moisture, fat and protein contents decreased with increase in the amount of dried date while that of total solids and total sugar content recorded an increasing trend. Based on sensory analysis, the dried date burfi prepared with 15% dried date in treatment T<sub>2</sub> scored highest sensory score. The cost of production of highly acceptable burfi enriched with dried date (T<sub>2</sub>) was ₹. 156.50 per kg.

**Keywords:** Dried date, burfi, physicochemical analysis, sensory evaluation, economics

India is world's largest producer of milk, producing 127.85 million tonnes per annum, that is 15% of world's milk production (Sharma *et al.*, 2014). About 50-55% of the total milk produced in India is converted into traditional milk products such as paneer, dahi, khoa, etc, while share of the khoa is about 7% out of total milk production (Kumar, 2013). Burfi is one of the most popular khoa based sweet, prepared from cow or buffalo milk. Burfi is prepared by heating the mixture of khoa and sugar to a near homogenous consistency followed by cooling and cutting it into small cuboids (Chetana *et al.*, 2010). It basically has mild caramelized flavor. Its colour may vary from light off white, creamy to light brown. Good quality burfi is characterized by moderately sweet taste, soft and slightly greasy body and smooth texture with very fine grains. Due to unique adaptability of khoa in terms of its flavor, body and texture to blend with wide variety of food, various forms of burfi are available with different additives depending on regional preference viz. plain, mawa, chocolate, fig, rawa, cashewnut, coconut,

chocolate, etc (Golande *et al.*, 2012; Kamble *et al.*, 2010). The date fruit (*Phoenix dactylifera*) have been recognized for their highly nutritive value. It provides sugar in form of glucose and fructose. According to National Institute of Nutrition (NIN), 100 gm of dry date consist of 15.3 gm moisture, 2.5 gm protein, 0.4 gm fat, 2.1 gm minerals, 3.9 gm fibres, 78.5 gm carbohydrates, 120 mg calcium, 50 mg phosphorus, 7.3 mg iron, 26 mg carotene, 0.01 mg thiamine, 3 mg vitamin C and energy value of 317 calories (Anonymous, 2011). Thus the present study was designed to manufacture burfi enriched with different levels of dried date.

### MATERIALS AND METHODS

The experiment was conducted in laboratory of Dept of Animal Husbandry and Dairying, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India. Fresh buffalo milk of 6.5% fat and 9% SNF was collected from the dairy farm of Dr. Panjabrao Deshmukh

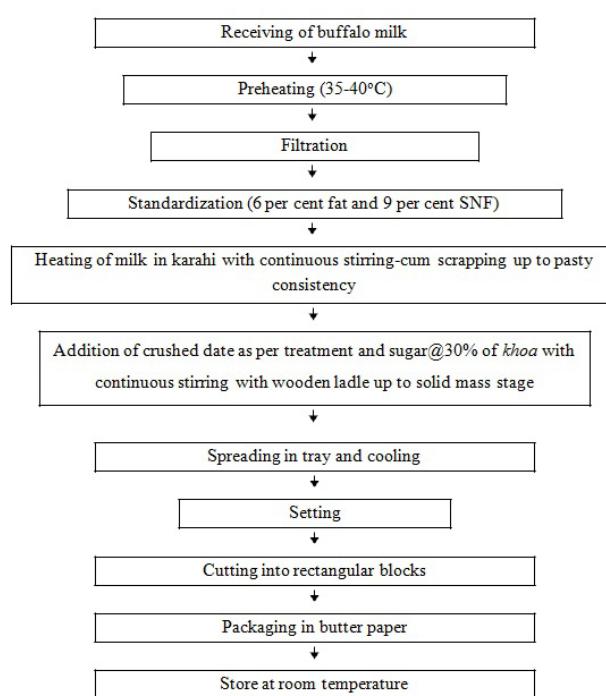
Krishi Vidyapeeth, Akola. Dried date and sugar for the preparation of burfi was purchased from local market.

### Preparation of crushed dates

Prior to preparation of crushed dates, the seeds were removed manually. The seedless dates were then crushed in mixer cum grinder to obtain crushed dates.

### Preparation of burfi

The procedure given by De (1991) was followed for preparation of burfi with slight modification to it. Buffalo milk was filtered by passing through muslin cloth and was standardized at 6% fat and 9% SNF. The milk was concentrated by evaporating in open pan on gentle fire with continuous stirring-cum-scrapping until pasty consistency obtained. The calculated amount of crushed dried dates as per treatment and sugar at 30 percent of khoa were added. The mixture was then further heated with continuous stirring with wooden ladle up to desirable solid mass stage attained. The product was then transferred into greasy tray and was allowed to cool. The final product was cut into rectangular pieces of desirable sizes.



**Fig 1. Preparation of burfi enriched with dried date**

### Treatment details

Burfi was prepared by using three levels of dried date and control treatment i.e. without dried date. The level of sugar at 30% was common in all treatment. The treatment combinations used for the study were  $T_0 = 0\%$  dried date + 100% of khoa by weight,  $T_1 = 10\%$  dried date + 90% of khoa by weight,  $T_2 = 15\%$  dried date + 85% of khoa by weight and  $T_3 = 20\%$  dried date + 20% of khoa by weight.

**Table 1:** Chemical composition of burfi enriched with dried date

Treatment	Constituents (percent)				Total sugar
	Moisture	Fat	Protein	Total solids	
$T_0$	17.66	16.96	14.980	82.228	46.900
$T_1$	17.39	16.38	14.330	82.610	49.110
$T_2$	16.59	15.35	13.820	83.140	51.252
$T_3$	15.76	14.76	13.150	84.240	53.174
SE $\pm$	0.0787	0.084	0.094	0.055	0.127
CD at 5%	0.2348	0.253	0.2815	0.1639	0.3815

Values with different superscripts  $T_0, T_1, T_2, T_3$  differ significantly ( $P<0.05$ )

### Chemical analyses

The sample of finished product obtained from various treatment combinations were chemically analyzed for moisture, fat, protein, total solids and total sugar content. The fat content was determined as per method described in IS: 1224 part II (1977), protein content as ISI (1981), total solids content as per IS: 1479 part II (1961) and total sugar content as per ISI (1981).

### Sensory evaluation

The quality of burfi sample was judged by sensory evaluation by offering the sample to the panel of five judges in each trial separated by 100 points numeric score card method suggested Pal and Gupta (1985). The samples of same volume and equivalent shelf life, labeled with random 3-digit codes were served in counterbalanced order to panel of judges. The taste neutral warm water was provided for oral rinsing to remove residual flavours from the mouth in between the samples.

**Table 2.** Sensory evaluation of burfi enriched with dried date

Treatment	Sensory score			
	Flavour (out of 45)	Body and Texture (out of 35)	Colour and Appea- rance (out of 20)	Overall accepta- bility (out of 100)
T <sub>0</sub>	40.0	28.0	13	81.0
T <sub>1</sub>	41.2	30.4	15	86.8
T <sub>2</sub>	42.5	33.4	18	93.8
T <sub>3</sub>	38.4	25.6	12	76.0
SE±	0.594	0.610	0.485	0.869
CD at 5%	1.782	1.828	1.454	2.606

Values with different superscripts T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> differ significantly (P<0.05)

### Statistical analyses

The experiment was laid out in Randomized Block Design with 4 treatments and 5 replications. The data obtained was statistically analyzed according to the method described by Gomez and Gomez (1984). The significance was evaluated on basis of critical difference at 5%.

## RESULTS AND DISCUSSION

### Chemical analysis

The result of chemical analysis of sample is presented in Table 1. The values for the moisture content varied

significantly. The average moisture content of finished product ranges from 15.76 (T<sub>3</sub>) to 17.66 (T<sub>0</sub>). The decrease in moisture content was due to less moisture content of dried date as compared to khoa. The results for moisture content were similar to those reported by Bankar *et al.* (2012). The fat content decreased from 16.96 (T<sub>0</sub>) to 14.76 (T<sub>3</sub>) with increase in level of dried date in burfi. The decrease in fat content was there as dried date contains less fat than khoa. The results for fat content were similar to those obtained by Wakchaure (1998). The result of protein content noted for all samples were found significantly different. The minimum protein content was found in T<sub>3</sub> i.e. 13.15 percent while maximum in T<sub>0</sub> i.e. 14.98 percent. The decrease in protein content was there as dried date contains less protein than khoa. The results for protein were similar to those reported by Ghodekar (1974) and Sachdeva and Rajorhia (1982). The values for total solids content varied significantly. The total solid content increased from 82.23 percent (T<sub>0</sub>) to 84.24 percent (T<sub>3</sub>) with increase in level of dried date in burfi. The increase in total solids was there as dried date contains more total solids than khoa. The results are similar to those reported by Kolhe (2003) and Gorgade (2004). The total sugar content for control sample was 46.90 percent (T<sub>0</sub>) and was highest in treatment T<sub>3</sub> i.e. 53.17 percent. The increase might be due to high sugar content in dried date. The results for total sugar content were similar to those obtained by Patil *et al.* (1991).

### Sensory evaluation

The sensory scores given for various samples are present in Table 2. Burfi sample blended with 15% dried date

**Table 3.** Cost structure of burfi enriched dried date

Sr. No.	Particular	Cost	T1		T2		T3		T4	
			Qty (g)	Amt (₹)	Qty(g)	Amt (₹)	Qty (g)	Amt (₹)	Qty (g)	Amt (₹)
1	One kg Buffalo milk (`35/kg) expected to receive 250 gm khoa	₹140 per kg Khoa	700	98	600	84	550	77	500	70
2	Sugar (g)	₹40 per kg	300	12	300	12	300	12	300	12
3	Date (g)	₹350 per kg	-	-	100	35	150	52.50	200	70
6	Fuel charges	₹670/ cylinder		10		10		10		10
7	Miscellanies charges	₹5.0		5.0		5.0		5.0		5.0
	Cost per Kg			125		146		156.50		167

scored the highest score 42.50 ( $T_2$ ) for flavor whereas lowest score was 38.4( $T_3$ ). The score recorded for body and texture ranged from 28.0 to 33.4 between  $T_0$  and  $T_2$  treatment combination samples. The  $T_3$  treatment combination sample had lowest score of 25.6. In case of colour and appearance, the highest score was recorded for treatment combination  $T_2$  i.e. 18, while the score decreased on further addition of dried date and the lowest score was recorded in  $T_3$  i.e. 12. The highest score of overall acceptability was recorded for treatment combination  $T_2$  i.e. 93.8 over all the other treatment combinations. It is observed that the score for all the parameter increased with increase in level of dried date in burfi to certain limit, thereafter it decreased proportionately. The values for all parameters varied significantly.

### Cost structure

The cost of finished product for different treatment combinations is represented in Table 3. The cost per kg of finished product ranged between ₹ 125 to ₹ 167. The cost increased with increase in level of dried date. The cost of burfi with 20% dried date was highest i.e. ₹ 167 per kg.

### CONCLUSION

It may concluded that the superior quality of burfi enriched with dried date can be prepared by addition of 15 part of dried date and 85 part of khoa as the overall acceptance for treatment combination  $T_2$  was highest in all parameters.

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