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Effect of Skim Milk Powder on Chemical Properties of Low Fat Burfi

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ABSTRACT: The present investigation was conducted to study the effect of skim milk powder (SMP) on chemical properties of low fat burfi at Department of Animal Husbandry and Dairy Science, Dr PDKV Akola, Maharashtra during the year 2020-2021. Majority of consumers are health conscious considering same the present investigation was undertaken to reduce fat content and increase milk protein of burfi by using skim milk powder with main objectives to find out its nutritional properties. Burfi was prepared with five different combinations of cow milk and skim milk powder like 100:00 (T_1), 80:20 (T_2), 70:30 (T_3), 60:40 (T_4) and 50:50 (T_5). The samples of burfi were analyzed for chemical evaluation and it was found that total sugar, protein, total solids, SNF and ash content was increased. Whereas, fat and moisture was decreased with increases in the level of skim milk powder in burfi preparation. Chemical properties of low fat cow milk burfi was prepared from 80% cow milk and 20% skim milk powder (T_2) was recorded 12.83, 15.52, 48.95, 3.26, 80.54, 19.46 and 67.70 per cent of fat, protein, total sugar, ash, TS, moisture and SNF, respectively.

Keywords: Cow milk, Skim Milk Powder, Low Fat, Burfi, TS, SNF.

INTRODUCTION

Milk has been an essential part of our diet from times immemorial. India has emerged as the largest milk producing country of the World. India ranks first in global milk production with milk production of 187.7 MT (NCAER, 2019), at growth rate of 6.62 per cent per year. The per capita availability of milk in India during 2019 was 394 g/day (NDDB, 2019). Traditional dairy products and sweets are an integral part of Indian heritage. These products have great social, religious, cultural, medicinal and economic importance have been developed over a long period with the culinary skills of homemakers and halwais. Khoa based sweets like rabri, basundi, pedha, burfi etc. occupied estimated market size of Rs. 520 billion with annual growth of 50 billion NIR (Rasane *et al.*, 2015). Burfi has been flavoured as one of 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). Value added products is raised, burfi is efficient to fulfill this requirements. High intensity low-fat and protein enriched burfi provide consumers with many benefits, both psychologic and physiologic (Verma and Singh, 2016). The value added dairy products have potential to promote health benefits. Skim milk powder and cow milk contain low level of fat and useful for preparation of low fat burfi. Skim milk powder contains about 1.2-1.5 per cent fat and cow milk contains 3 to 4% fat. The changing lifestyle in affluent and technologically developed societies, diseases like obesity and cardiovascular diseases have become major health problems. It's the need of hour to create the low-fat food and dairy products for the needy CVD patients without much affecting the taste and sweetness. The present investigation was undertaken to explore the use of skim milk powder in burfi to produce low fat burfi. Every day the use of skim milk powder for preparation of staple food is increasing (Baskaran *et al*., 2011).

MATERIAL AND METHODS

The present investigation was conducted at Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola during 2020-21. The treatment details as T_1 – Burfi prepared from 100 % cow milk (control), T_2 – Burfi prepared from 80 % cow milk + 20 % skim milk powder, T_3 – Burfi prepared from 70 % cow milk + 30 % skim milk powder, T_4– Burfi prepared from 60 % cow milk + 40 % skim milk powder and T_5 – Burfi prepared from 50 % cow milk + 50 % skim milk powder. In all treatment cane sugar was added at the rate 30% by wt. of burfi mix. Good quality branded skim milk powder was purchased from local market and used for the experimental purpose as per treatment. Uniform quality and brand was maintained for all replications. The process line was followed prescribed by De, (2008) with certain modifications for burfi preparation. The milk was stirred vigorously and

constantly with a circular motion by a kunti. During this operation all parts of the pan with which the milk comes into contact are lightly scrapped to prevent the milk from scorching. The calculated amount of skim milk powder added according to treatments. Constant evaporation of moisture takes place and the milk thickens progressively. 30% of mixture sugar added into it. The heating continued with greater control here after and the speed of stirring-cum-scrapping increased till the viscous mass reaches a semi-solid/pasty consistency. The final product ready when it showed signs of leaving the bottom and the sides of the karahi.

Determination of chemical composition of burfi. Moisture, fat, protein and ash were determined by the AOAC, (2000) methods, while the refractometric method described by Akinsanya, (1998) was used to determine the total sugar content of burfi. SNF was obtained by subtracting the percentage of fat from the percentage of total solids in burfi. The data obtained was subjected to the statistical analysis by following the Randomized Block Design (RBD) for testing their differences as per the procedure described by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

The data pertaining to the chemical composition of burfi differed by blending with different levels of skim milk powder are presented in Table 1.

Table 1: Average chemical composition of burfi prepared with different combination levels of cow milk and skim milk powder.

Treatments	Parameters						
	Fat	Protein	Total sugar	Ash	Total solids	Moisture	Solid not fat
T_1	15.75	13.16	45.48	2.66	77.05	22.95	61.30
T_2	12.83	15.52	48.93	3.26	80.54	19.46	67.70
T_3	11.38	16.70	50.63	3.56	82.27	17.73	70.89
T_4	9.93	17.89	52.39	3.86	84.07	15.93	74.14
T_5	8.47	19.07	54.12	4.16	85.82	14.18	77.35
S.E. (m) ±	0.232	0.151	0.087	0.051	0.241	0.240	0.168
C.D. at 5%	0.724	0.471	0.271	0.158	0.751	0.748	0.524

Fat content of Burfi. The average fat content in burfi was decreased in case of added the skim milk powder. The fat content of burfi prepared under the treatment T_1, T_2, T_3, T_4 and T_5 by utilization of skim milk powder were 15.75, 12.83,11.38, 9.93, and 8.47 per cent, respectively. The results indicated that fat content was highest in burfi prepared without addition of skim milk powder (T_1). This clearly showed that as the quantity skim milk powder increases the fat content in the burfi was reduced. This might be due to low fat content in skim milk powder. Suryawanshi, (2012) conducted study on quality of peda from skim milk powder blended with cow milk observed as the level of skim milk powder increased the fat content declined from T_1 to T_5 (15.76 to 0.80%). Kumar *et al.*, (2016) reported that, the fat content was reduced by addition on 10 % of pineapple pulp in burfi preparation. Present findings are in agreement with the Chaudhari, (2015); Tanuja *et al*., (2017).

Protein content of Burfi. The protein content in low fat burfi was found higher in treatment (T_5) 19.07 per cent and lowest in treatment (T_1) 13.16 per cent. The protein content in all treatments significantly differed from each other and it was increased with the increases the level of skim milk powder in burfi preparation. This is might be due to the high amount of protein in skim milk powder. Nearly closed findings noted by Satav, (2014) reported that as the levels of walnut powder increases, there was increased (14.90 to 16.30%) in the level of protein content in burfi. Also, Jadhav, (2015) reported that, increases the level of gram flour, there was increased in the level of protein content in burfi (12.59 to 16.48per cent). On the other hand, Kumar *et al.*, (2016) reported that decreased protein content with increased the level of pineapple pulp in burfi preparation.

Total sugar content of Burfi. The addition of skim milk powder in the preparation of burfi, significantly changes the total sugar content. The average values of total sugar content in burfi prepared under the different treatment T_1, T_2, T_3, T_4 and T_5 were 45.48, 48.93, 50.63, 52.39 and 54.12 per cent, respectively. This indicated that as the skim milk powder level increased, the total sugar content in burfi also increased. This might be due to high content of total sugar in skim milk powder. The present findings are in agreement with Patil, (2012) reported that as the level of dried date increased with increases total sugar content in burfi from 46.90 to 53.17 percent. Kumar *et al.*, (2016) reported that increased total sugar content with increases the level of pineapple pulp in burfi preparation.

Ash content of Burfi. The ash content in the burfi prepared by addition of skim milk powder at the rate 0 per cent (T_1), 20 per cent (T_2), 30 per cent (T_3), 40 per cent (T_4), and 50 per cent (T_5) were 2.66, 3.26, 3.56, 3.44, 3.86 and 4.16 per cent, respectively. The ash per cent was highest (4.16 per cent) in burfi prepared with addition of 50 per cent of skim milk powder (T_5). Suryawanshi, (2012) conducted study on quality of peda from skim milk powder blended with cow milk observed as the level of skim milk powder increased the ash content increased from 2.00 to 2.20 per cent. Ash content increased due to high ash content in skim milk powder.

Also, the results of present study are in agreement with Kapare, (2017) studied on preparation of burfi blended with finger millet, ash content was increases in burfi. Kumar *et al.*, (2016) revealed that, the observation was contradictory regarding the ash content in pineapple burfi.

Total solids content of Burfi. The total solids content was higher in treatment T_5 as 85.82 per cent and

treatment wise increasing trend of total solids was observed as (T_1) 77.05, (T_2) 80.54, (T_3) 82.27, (T_4) 84.07, (T_5) 85.82 per cent. The total solids content in the final product was increased with increasing level of skim milk powder. Patil, (2012) conducted study on utilization of dried date in preparation of burfi as the level of dried date increased the total solids content increases from T_1 to T_5 (82.22 to 84.24%), Total solids content increased might be due to high total solids content in dried date. Moreover, Satav, (2014) reported that, the increased total solids content with increases the level of walnut powder in burfi from 83.16 to 83.85 per cent. On the other hand, Kumar *et al*., (2016) observed that, decreased total solids content with increased the level of pineapple pulp in burfi preparation.

Moisture content of Burfi. Moisture content in the burfi prepared by addition of skim milk powder at 0 per cent (T_1), 20 per cent (T_2), 30 per cent (T_3), 40 per cent (T_4) and 50 per cent (T_5) were 22.95, 19.46, 17.73, 15.93, and 14.18 per cent, respectively. The moisture per cent was significantly highest (14.18 per cent) in burfi prepared without addition of skim milk powder (T_1) while, moisture content was less (14.18 per cent) in T_5 treatment. Satav, (2014) reported that, increased in the level of walnut powder with decreases the moisture content in burfi.

Solid Not Fat content. The addition of skim milk powder in burfi preparation significantly changed the solid not fat content in burfi. The average value of solid not fat content in burfi prepared under different treatments T_1, T_2, T_3, T_4 and T_5 were 61.30, 67.70, 70.89, 74.14 and 77.35 per cent, respectively. SNF was found significantly highest in T_5 treatment (77.35%). It clearly indicated that as skim milk powder level was increased in burfi preparation, the solid not fat content in burfi also increased. This might be due to more SNF content was found in skim milk powder. The results are correlated with Hukare, (2015) reported that, increased in the level of custard apple pulp, there was increases SNF content in low fat milk shake from 19.46 to 22.12 per cent.

CONCLUSION

On the basis of investigation results obtained it may concluded that the nutritional properties of burfi like protein, total sugar, ash, total solids and solid not fat per cent was increased. Whereas, fat and moisture was decreased with increases in the level of skim milk powder in burfi preparation.

FUTURE SCOPE

Such type of research studies will help to prepare low fat milk products because aware about health conscious consumers. Also, to utilize the milk protein through skim milk powder.

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Conflict of Interest. None.

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