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## Effect of *red* pumpkin pulp on quality of buffalo milk *Basundi*

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### Abstract

In this study, the attempts have been made to prepare Basundi by utilizing Red pumpkin in different proportion and study the quality of Basundi. The level of red pumpkin extract was optimized on the sensory basis the score obtained was subjected for chemical analysis and organoleptic evaluation by the panel of judges.

**Keywords:** Red pumpkin, buffalo milk, physicochemical properties, Basundi

### 1. Introduction and Objectives

India is the largest milk producer country in the world with milk production 155.5 MT and per capita availability is 337 gm/day during 2015-16. Where as in Maharashtra it is 239 gm/day. In India, out of total milk produced buffalo milk contributes 55 per cent and cow milk 40.50 per cent. Buffalo milk is considered more superior than cow milk due to its higher fat, and SNF content and hence it is utilized for preparation of frozen, heat and acid coagulated fermented milk products and concentrated milk products such as *khoa* and *basundi*.

*Basundi* is traditional, concentrated and sweetened whole milk product having sweetish caramel and pleasant aroma, light to medium brown colour, thick body and creamy consistency with or without soft textured flakes that are uniformly suspended throughout the product. (Pagote, 2003) [7].

In recent years, a lot of interest has been generated in the development of milk product with vegetable, fruit and nuts based delicacies. Research workers have tried different vegetables, fruits and nuts in milk products such as a Gajarka halwa, Kaju *burfi*, Sohan halwa, with an aim to improve nutrient, fiber content, texture, mouth feel and flavor. Some of the milk product with vegetable and fruit based delicacies are very popular *viz.* bottle gourd *basundi*, red pumpkin *Pedha* (Bhutkar *et al.*, 2015) [2].

Among the different vegetables red pumpkin (*Cucurbita moschata*) belongs to family *Cucurbitaceae* is one of the best known sources of beta- carotene, a powerful antioxidant that gives orange vegetables and fruits their vibrant colour. Red pumpkin is rich sources of vitamins-A, C, E and K. It is excellent sources of many polyphenolic flavonoid compounds such as alpha, beta-carotenes, cryptoxanthin, lutein and zeaxanthin, carotenes convert into vitamin A inside the human body.

### 2. Objectives

1. To standardize the process preparation of buffalo milk *basundi* with *red pumpkin pulp*
2. To study chemical composition and sensory qualities of buffalo milk *basundi* with *red pumpkin pulp*
3. To study the cost of production of buffalo milk *basundi* with *red pumpkin pulp*

### 3. Materials and Methods

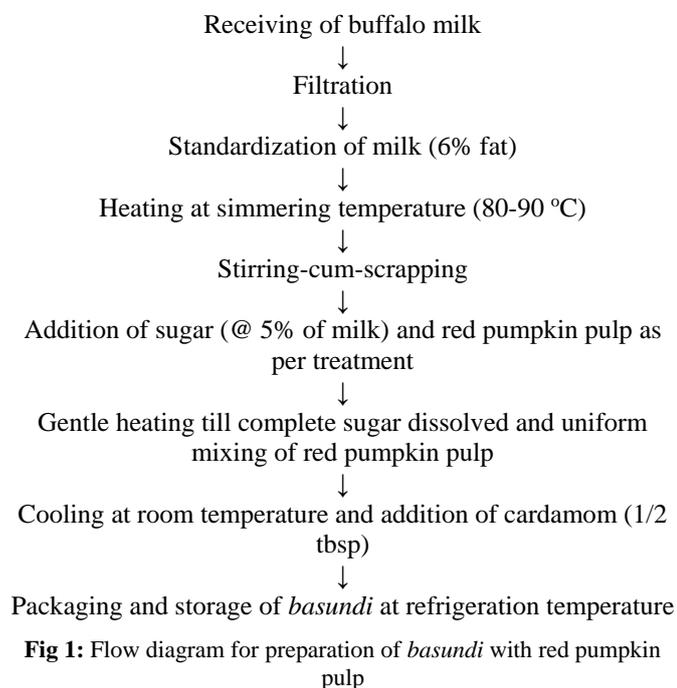
#### 3.1 Red pumpkin pulp

Good quality ripened fresh red pumpkin fruit was procured from local market of Parbhani. The fruit was washed with clean fresh potable water. The skin was removed and fruit was cut into pieces with the knife and seed was removed. The pulp of the fruit was made by using mixer cum grinder and under hygienic condition was used in *basundi*.

#### 3.2 Preparation of *basundi*

The standardized buffalo milk *basundi* with red pumpkin pulp was prepared by the flow diagram given. For the Preparation of Buffalo Milk *Basundi* with *Red Pumpkin Pulp*, buffalo

milk was procured from the dairy unit in the Department of Animal Husbandry and Dairy Science, at college of Agriculture Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani and was standardized to 6 per cent fat by Pearson's square method De (1980). The standardized milk was taken in stainless steel "karahi" and heated over a direct fire. For heating, medium LPG was used. The milk was stirred vigorously and constantly with a circular motion (clockwise) by a "kunti" so as to avoid scorching the milk. As soon as the milk started boiling, constant evaporation of moisture took place. The speed of churning cum scrapping was maintained constantly to evaporate the maximum moisture as soon as possible. When the concentration of milk reached 3:1, add the three levels red pumpkin pulp (2.5, 5, and 7.5 by weight of cow milk) and sugar were added. After the addition of sugar the milk was continuously heated, stirred vigorously till the three levels of concentration were obtained. After the final concentration the product was cool at room temperature to attain desired body and texture.



**Fig 1:** Flow diagram for preparation of *basundi* with red pumpkin pulp

### 3.3 Treatment details

T<sub>0</sub>= *Basundi* from buffalo milk (control)

T<sub>1</sub>= *Basundi* with 2.5 per cent of *red pumpkin* pulp by weight of buffalo milk

T<sub>2</sub>= *Basundi* with 5.0 per cent of *red pumpkin* pulp by weight of buffalo milk

T<sub>3</sub>= *Basundi* with 7.5 per cent of *red pumpkin* pulp by weight of buffalo milk

### 3.4 Chemical analysis

Moisture content of *basundi* was determined by BIS (1981) [1], Fat by Gerber's described in BIS (1981) [1], Protein by Microkjeldhal method as described in BIS (1981) [1], Ash by BIS (1981) [1], Carbohydrate by subtraction method, Total solid by BIS (1981) [1], and Sucrose by BIS (1981) [1].

### 3.5 Sensory evaluation

Sensory evaluation of *Basundi* samples was carried out by using 9-point hedonic scale described by Gupta (1976) [4]. The product was evaluated for sensory attributes by the panel of 5 Semi Trained judges.

### 3.6 Statistical analysis

Experiment was laid out in CRD with four replication and experimental data was analyzed as per the procedures given by Panse and Sukhatme (1967) [8].

## 4. Main findings

### 4.1 Chemical composition

The chemical composition of finished product are presented in table 1. From the result it was observed that addition of red pumpkin pulp in buffalo milk *basundi* decreased moisture ( $49.41 \pm 0.08$  to  $46.69 \pm 0.27$  per cent, fat  $11.07 \pm 0.05$  to  $10.10 \pm 0.04$  per cent and sucrose  $16.77 \pm 0.10$  to  $16.09 \pm 0.03$  per cent) and increased protein ( $8.0 \pm 0.11$  to  $9.0 \pm 0.08$  per cent, ash  $1.95 \pm 0.06$  to  $2.85 \pm 0.01$  per cent, carbohydrate  $29.55 \pm 0.04$  to  $31.35 \pm 0.01$  per cent and total solid  $50.58 \pm 0.08$  to  $53.30 \pm 0.27$  per cent) content significantly in treated product as compared to control.

### 4.2 Sensory evaluation

The sensory scores given for various samples are presented in table 2. It was observed that *basundi* with 2.5 per cent red pumpkin pulp rated higher score for flavour ( $8.42 \pm 0.04$ ), taste ( $8.40 \pm 0.04$ ), colour and appearance ( $8.55 \pm 0.06$ ), consistency ( $8.25 \pm 0.06$ ) and overall acceptability ( $8.40 \pm 0.06$ ) than control *basundi* (T<sub>0</sub>) as well as *basundi* with 5 and 7.5 per cent red pumpkin pulp (T<sub>2</sub> and T<sub>3</sub>).

## 5. Conclusion

From the results of chemical and sensory analysis of cow milk *basundi* with addition of red pumpkin pulp (2.5, 5 and 7.5 per cent) it could be concluded that red pumpkin pulp could be incorporated up to 7.5 per cent in *basundi* without affecting sensory properties adversely.

Addition of *red pumpkin pulp* in *basundi* decreased moisture, fat, and sucrose content significantly in the finished product as compare to control.

Per cent protein, ash, carbohydrate and total solid content were increased significantly in treated product as compared to control.

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