

**Research Article**

## STUDIES ON PREPARATION OF *PEDA* WITH GINGER POWDER

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### ABSTRACT

Present investigation was carried out to assess the chemical composition, sensory evaluation, shelf life and microbial quality of ginger *peda*. *Peda* was prepared from buffalo milk with constant level of sugar (30 per cent by weight by *Khoa*) and different levels i.e. 0% (T<sub>0</sub>), (T<sub>1</sub>) 2%, (T<sub>2</sub>) 4% and (T<sub>3</sub>) 6% of ginger powder by weight of *Khoa*. The product prepared using 2% ginger powder was found most acceptable on the basis of overall acceptability. The average standard plate count of fresh sample was found to be 8, 6, 5 and 3 x 10<sup>3</sup> cfu per gm for treatments T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> respectively. Yeast and mould and coliform count were not observed in fresh *peda* samples. It was observed that the overall acceptability score of treatment T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> was 8.49, 8.01, 7.52 and 6.89 respectively. The cost for preparation of bottle gourd *Peda* for treatment T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> was Rs. 153.53, Rs.152.42, Rs. 151.34 and Rs. 150.29 per kg, respectively. It can be concluded that the *peda* with ginger powder can be very well utilized for preparation of nutritious, palatable and low cost *Peda* by blending 2 percent ginger powder with 95 per cent buffalo milk *Khoa* on weight basis.

**Keywords:** Chemical Composition, Shelf Life, Microbial Quality, *Peda*, Sensory Evaluation

### INTRODUCTION

India rank first in the world with record production of 127.9 million tons of milk per annum with per capita availability 291gm/day (Anonymous, 2012). The consumption of traditional dairy products is likely to grow at annual growth rate of more than 20 per cent, but for Western dairy products the growth rate is relatively much lower, varying from 5-10 per cent. Thus, the expanding business prospects provided by the traditional Indian dairy products to the organized dairy sector triggers a thorough face-lifts of these products (Bandyopadhyay *et al.*, 2006).

*Peda* is highly nutritious product as it contains almost all milk solids plus sugar and other additives. *Peda* is indigenous milk sweet prepared by heating a mixture of *khoa* and sugar until the desired granular, hard texture and flavour develops. The varieties of *pedas* have distinct characteristics and methods of manufacture, of these *pedas* vary from region to region. The base for all this type of *peda* is *khoa* and cane sugar in different proportions, other ingredients are also incorporated to cater the need of flavor or body and textural characteristics.

The manufacture of *peda* is mostly restricted to *halwais*. Since *peda* has lower moisture content it has a better shelf life. It is prepared by mixing *khoa* with measured quantities of sugar. *Peda* is whitish yellow in color and has a coarse grainy texture. Its quality is determined by chemical composition, body, texture, appearance and microbial quality

The medicinal properties of ginger in preventing cough and cold are well documented. Now a days tendencies among people to assume a high degree of confidence in wholesomeness and safety of natural foods and natural flavour than those based on chemical. Ginger act as a useful food preservative. Ginger has nutritive as well as medicinal value.

So far scanty research work had been conducted on utilization of ginger powder in *peda*. With to aim of value addition and looking to the health benefits and pleasant aroma of ginger powder, the research experiment is planed to study on preparation of *ginger peda*, by using buffalo milk *khoa*.

### MATERIALS AND METHODS

The whole fresh and clean buffalo milk was obtained from buffalo maintained at Department of Animal Husbandry and Dairy Science, College of Agriculture, Latur. Good quality dried ginger procured from the local market.

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### Treatment Details

Treatment combinations used for preparation of ginger *peda* were as detailed below:

T<sub>0</sub>- Buffalo milk *peda* (control)

T<sub>1</sub>- *khoa* + ginger powder @ 2 % on *khoa* weight basis.

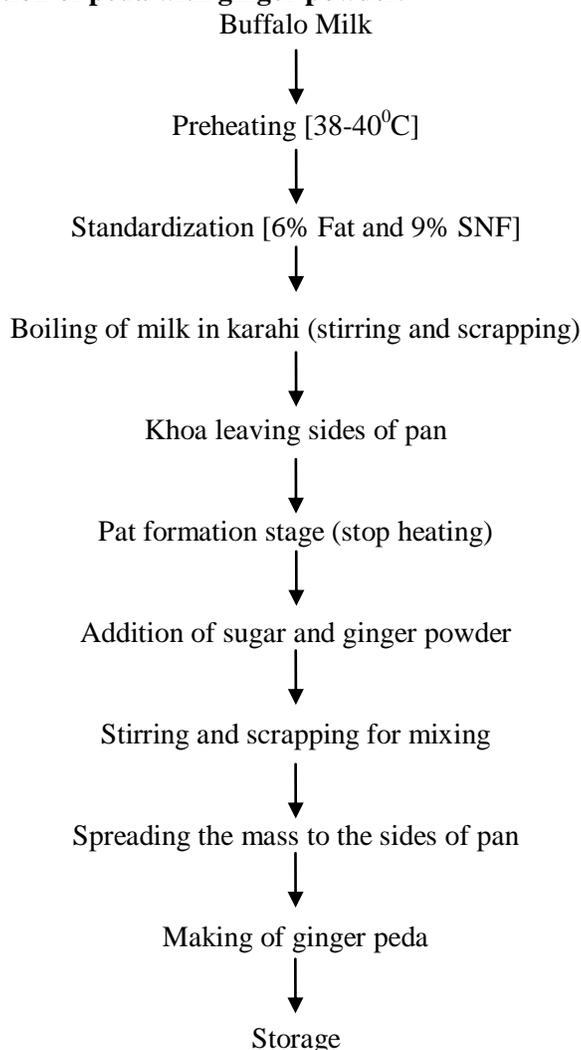
T<sub>2</sub>- *khoa* + ginger powder @ 4 % on *khoa* weight basis.

T<sub>3</sub>- *khoa* + ginger powder @ 6 % on *khoa* weight basis.

The different levels were tried and compared with control (T<sub>0</sub>).

In above preparation sugar was added @ 30% of *khoa* weight basis.

### Flow daigram for preparation of *peda* with ginger powder.



**Sensory Evaluation:** Sensory evaluation of ginger *pedha* was carried out by a panel of judges comprising “9 point Hedonic scale” developed by Gupta (1976).

**Analysis:** The samples of finished product from various treatment combinations were chemically analyzed for moisture (ISI: 2785, 1964), fat (ISI: 1224, Part II, 1977), Protein by Micro Kjeldahl’s method as per Menefee and Overman (1940), the protein content was obtained by multiplying per cent nitrogen of sample by factor of 6.38 and ash (A.O.A.C 1975), total solid (IS: 1479 part II 1961), Total sugars by the volumetric (Lane-Eynon) method as described in ISI (1981) and Shelf life of fresh *peda* with ginger powder were analyzed at room temperature.

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Microbiological parameters were determined by using standard procedure for Total plate count by method cited in ISI: 5402(1969) by using Tryptone Dextrose Agar medium, Yeast and Mould count by method cited in ISI: 5403(1969) by using Potato glucose agar medium and Coliform count by (Chalmers, 1955) by using Meconkey's broth medium. In all four replication was carried out. The results obtained were analyzed statistically by using completely randomized design (CRD) as per Panse & Sukhatme (1985).

**Cost of Peda Production**

The rates of ingredient and raw material used for preparation of control *peda* and *peda* with ginger powder were prevailing to market rates. The product was prepared on laboratory scale and expenditure made on the recurring items was only considered for cost estimation.

**RESULT AND DISCUSSION**

**Chemical Composition:-** An addition of ginger powder (2, 4 and 6 per cent) significantly decreases in moisture (17.55, 17.29 and 17.00), fat (18.10, 17.76 and 17.39), and protein (14.14, 14.03 and 13.60), while significant increase in total sugar (46.90, 47.40, and 48.28), total solid (81.94, 82.18 and 82.57) and ash (2.80, 3.00 and 3.30) in finished product as compare to control (17.97, 18.40, 14.57, 46.05, 81.62 and 2.60), respectively. The results obtained in the finished products were similarly to those reported by Rayet al. (2002), Nawadkar (2007), Gotarne (2011).

**Table 1: Mean chemical composition of *peda* with ginger powder**

Chemical constituent (%)	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Moisture	17.97	17.55	17.29	17.00
Fat	18.40	18.10	17.76	17.39
Protein	14.57	14.14	14.03	13.60
Total Sugar	46.05	46.90	47.40	48.28
Total solid	81.62	81.94	82.18	82.57
Ash	2.60	2.80	3.00	3.30

**Table 2: Overall acceptability of *peda* with ginger powder**

Treatment	Sensory property				Overall acceptability
	Colour and Appearance	Body and Texture	Sweet-ness	Flavour	
T <sub>0</sub>	8.42	8.50	8.54	8.50	8.49 <sup>a</sup>
T <sub>1</sub>	8.00	7.78	8.26	8.00	8.01 <sup>b</sup>
T <sub>2</sub>	7.62	7.60	7.25	7.62	7.52 <sup>c</sup>
T <sub>3</sub>	6.87	6.66	6.86	7.20	6.89 <sup>d</sup>

**SE ± 0.091 CD at 5% = 0.274**

Values with different superscripts are significantly different at P<0.05

**Table 3: Overall acceptability score for *peda* with ginger powder during storage (out of 9.0)**

Days	Treatment			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
1	9.00	8.72	8.68	8.61
5	8.40	8.21	8.15	8.15
10	-	7.20	7.15	7.10
15	-	6.90	6.90	6.80

Note= - indicated that the product has been spoiled.

**Research Article**

**Table 4: Total plate count of *peda* with ginger powder**

Treatment	Replication				Mean Score
	Microbial count cfuX 10 <sup>3</sup> / gm				
	I	II	III	IV	
T <sub>0</sub>	8	7	8	9	8 <sup>a</sup>
T <sub>1</sub>	6	7	5	6	6 <sup>b</sup>
T <sub>2</sub>	5	6	4	5	5 <sup>b</sup>
T <sub>3</sub>	3	4	2	3	3 <sup>c</sup>

**SE ± 0.416 CD at 5% =1.250**

Values with different superscripts are significantly different at P<0.05

**Table No.5 Cost structure of ginger *peda***

Sr. No.	Particulars	Rate (Rs)	T <sub>0</sub>		T <sub>1</sub>		T <sub>2</sub>		T <sub>3</sub>	
			Qty. (kg)	Amt. (Rs.)						
1	Milk (lit)	40	4	160	4	160	4	160	4	160
2	<i>Khoa</i> obtained (Kg)		1		1		1		1	
3	Sugar (kg)	32/kg	0.300	9.60	.300	9.60	.300	9.60	.300	9.60
4	Ginger powder (kg)	80/kg	--	--	0.02	1.60	0.04	3.20	0.06	4.80
5	Miscellaneous -charges	--	--	10.00	--	10.00	--	10.00	--	10.00
6	Fuel charges	--	--	5.00	--	5.00	--	5.00	--	5.00
7	Labour charges	--	--	15.00	--	15.00	--	15.00	--	15.00
8	Product Obtained (kg)		1.30		1.32		1.34		1.36	
9	Total cost for obtained product			199.60		201.2		202.8		204.4
10	Total cost per kg	--	--	153.53		152.42		151.34		150.29

**Sensory Properties:-**

The overall acceptability score for treatment T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 8.49, 8.01, 7.52 and 6.89 respectively. Treatment T<sub>1</sub> was significantly superior over rest of the treatment. However *pedha* of treatment T<sub>2</sub> was significantly superior over T<sub>3</sub> and T<sub>4</sub>. The lowest overall acceptability score of treatment T<sub>4</sub> (6.89) was due to 6% ginger powder which decrease coloured appearance body and texture, flavour and sweetness. The score was significantly higher in control *peda* than the *peda* blended with 2, 4 and 6 per cent ginger powder. However, control *peda* and *peda* with ginger powder at 2 per cent level was rated good and acceptable.

**Shelf Life:-**The shelf life of control *peda* is up to 7<sup>th</sup> days whereas shelf life of developed *peda* increased by double.

**Microbiological Analysis:-**Total plate count of *peda* with 2, 4 and 6 per cent ginger powder decreased from 6x10<sup>3</sup> to 3x10<sup>3</sup>cfu/g significantly as compared to control (8x10<sup>3</sup>cfu/g), Yeast mould count and coliform count was absent.

### **Research Article**

**Cost of Production:**—Cost structure of product showed that, cost was decreased from Rs. 152.42 to 150.29 as compared to control Rs. 153.53. This might be due to the levels of addition of ginger powder increased from 2 to 6 per cent.

### **Conclusions**

Control *peda* scored highest score for all sensory attributes as compared to *peda* with 2, 4 and 6 per cent ginger powder. Among the *peda* with different levels of ginger powder, 2 per cent level of addition of ginger powder had highest score than 4 and 6 per cent. Addition of ginger powder in *peda* decreased moisture, fat and protein content significantly in finished product as compare to control. Per cent total sugar, total solid and ash content increased significantly in treated product as compared to control. The shelf life of *peda* prepared by using ginger powder was double as compared to control *peda*. Total plate count, of *peda* with 2, 4 and 6 per cent ginger powder decreased significantly as compared to control. Yeast and mould and coliform count was absent. Cost of *peda* with ginger powder was lower than control.

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