International Journal of Agriculture and Nutrition
www.agriculturejournal.net
Online ISSN: 2664-6072; Print ISSN: 2664-6064
Received: 05-11-2018; Accepted: 06-12-2018; Published: 13-12-2019
Volume 1; Issue 1; 2019; Page No. 22-24

Effect of singhara (*Eleocharis dulcis*) flour on cost structure of peda

TA Meshram[1], DT Undratwad[2], AS Ingole[3]
[1-3] Animal Husbandry and Dairy Science section, College of Agriculture, Nagpur, Maharashtra, India

Abstract
The research work on effect of different combinations of singhara flour on cost structure of buffalo milk peda was conducted during 2018-2019 in the section of Animal Husbandry and Dairy Science at College of Agriculture, Nagpur. The different concentrations of singhara flour were T1 (0%), T2 (05%), T3 (10%) and T4 (15%) with 30 per cent constant rate sugar was mixed in a khoa for preparation of peda. The different levels of singhara flour had a definite effect on cost structure of peda. The cost of production of one kg peda under various treatments was calculated by taking into consideration the prevailing retail market price for various items i.e. khoa, sugar, singhara flour, cardamom, fuel, electricity and labour charges. The cost of peda prepared without addition of singhara flour T_1 (control) was Rs. 325.86 kg^{-1} and total cost of peda prepared from different levels of singhara flour in treatments T_2 (95:05), T_3 (90:10) and T_4 (85:15) was Rs. 323.86, 321.86 and 319.86 kg^{-1} respectively.

Keywords: khoa, singhara flour, peda, cost configuration

Introduction

Khoa is used as base material for production of traditional dairy product peda. It is indigenous khoa based heat desiccated milk sweet prepared by heating mixer of khoa and sugar with addition of natural and/or artificial color and flavor until the desired characteristics texture and flavor develops. Peda is made into round balls of about 20-25g size, normally by rolling between the palms and flattened (Pal, 2000) [5].

Peda is highly nutritious product as it contains almost all milk solids plus sugar and other additives. It is heat desiccated indigenous milk sweet prepared by heating a mixture of *Khoa* and sugar until the desired granular and firm texture and flavor develops. The quantity of *peda* produced in India exceeds any other indigenous milk based sweet and it has also special importance in various celebrations (wedding, inaugural functions, etc.) throughout the year (Ghule *et al*., 2013) [3].

The singhara (*Eleocharis dulcis*) is one of the most popular foods for Asian people owning to its unique taste. This herbal plant belongs to the sedge family, which is often found in wet farm lands or pool districts. It has been suggested that this fruit possesses some health benefits such as antimicrobial effects on bacteria. It also has antioxidant, antiviral and anticancer properties, inhibition of inflammation and treatment for pharyngitis and laryngitis. Singhara is effective on Jaundice and loose motion due to their detoxifying properties. It is rich in polyphenolic and flavonoid compound (Ge Zhan et al., 2014) [2].

1. P.G. Student, Animal Husbandry and Dairy Science, College of Agriculture, Nagpur.
2. Asstt. Professor, Animal Husbandry and Dairy Science, College of Agriculture, Gadchiroli.
3. Professor, Animal Husbandry and Dairy Science, College of Agriculture, Nagpur.

Now a days, consuming low fat food gaining more importance in human diet to avoid bad cholesterol for preventing heart attack, blood pressure and obesity etc. Singhara contain Calories – 97 (2.40 per cent), Fat - 0.1 gm (0.010 per cent), Potassium – 584 mg (58.4 per cent), Sodium – 14gm (1.4 per cent), Carbohydrate – 24 gm (2.40 per cent), Protein – 1.4 gm (0.13 per cent), Fiber – 2 gm (0.2 per cent), Vit. C – 6 per cent, Vit. B6 – 15 per cent as per 100 gm. Singhara is highly nutritious as well as low in calories and almost fat free (Gopalan, *et al.* 1989) [4].

In Maharashtra, especially Eastern Vidarbha region of Chandrapur, Gadchiroli, Nagpur, Gondia and Bhandara district people are loving to eat singhara. It is seasonal nut available in winter therefor market demand of *singhara* is high. Also, *peda* is popular in this area and consume throughout the year. Hence considering the benefits of supplementation of low fat in the diet with respect to its nutritional and medicinal value, decided to blend singhara flour for preparation of peda.

Treatment details

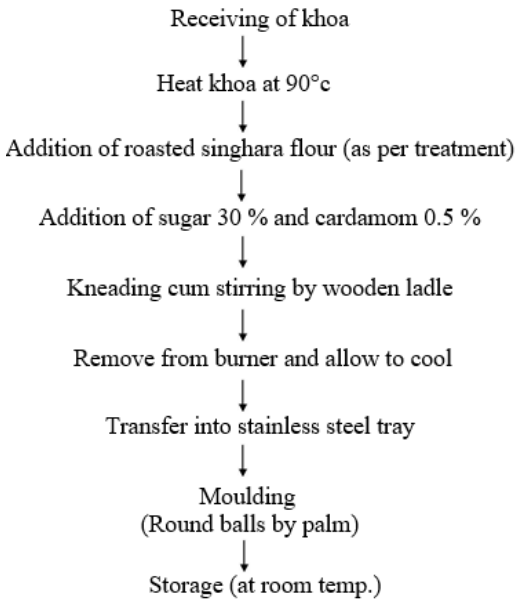
The present study was conducted on the studies on preparation of peda blended with singhara flour at Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur during the year 2018-2019. Peda prepared from buffalo milk was standardized at 6% fat. Singhara flour was added in peda at different levels, *i. e.* 0 (T_1), 5 (T_2), 10 (T_3) and 15 (T_4) part of khoa with five replications and sugar was added @ 30% of khoa.

Procedure for preparation of peda

The buffalo milk was concentrated in khoa making machine on gentle fire for obtaining khoa. Milk heated gently till pat formation, when the product started to leave the sides of machine

(within 5 to 8 min), close machine and collect khoa. Khoa received in iron karahi and heat at 90°C. Sugar (30%), cardamom (0.5%) on weight basis of khoa and roasted singhara flour was added @ rate of 0 (T_1), 5 (T_2), 10 (T_3), 15 (T_4) as per treatment.

Flow chart for preparation of peda blended with singhara flour



Overall acceptability

The overall acceptability of peda was significantly affected by addition of singhara flour. Peda prepared with treatment T2 (86.47) was significantly superior over the rest of the treatments i.e. T_1 (85.21), T3 (78.79) and T4 (75.95). The lowest score obtained by peda prepared with 15 parts addition of singhara flour (T4).

Table 1: Cost structure of peda

Particulars	Treatments							
	T_1		T_2		T_3		T_4	
	Qty.	Value (Rs)	Qty.	Value (Rs)	Qty.	Value (Rs)	Qty.	Value (Rs)
Buffalo milk khoa (g) @ Rs. 360/kg	695	250.20	645	232.20	595	214.20	545	196.20
Singhara flour (g) @ Rs. 320/kg	--	--	50	16.00	100	32.00	150	48.00
Cardamom (g) @ 0.5 % (by wt. of Khoa) Rs. 1000/kg	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Sugar (g) @ 30% (by wt. of Khoa) Rs. 40/kg	300	12.00	300	12.00	300	12.00	300	12.00
Electricity charges @ Rs. 3/unit	0.40	1.20	0.40	1.20	0.40	1.20	0.40	1.20
Fuel charges LPG (g) Rs. 780/14.2 kg	500	27.46	500	27.46	500	27.46	500	27.46
Labour charges @ Rs. 240/8 hrs	1	30.00	1	30.00	1	30.00	1	30.00
Total cost of production		325.86		323.86		321.86		319.86

Cost configuration of singhara flour peda

The cost of production of one kg peda under various treatments was calculated by taking into consideration the prevailing retail market price for various items i.e. khoa, sugar, singhara flour, cardamom, fuel, electricity and labour charges. The cost of peda prepared without addition of singhara flour T_1 (control) was Rs. 325.86 kg^{-1} which decreased to 323.86 kg^{-1}, 321.86 kg^{-1} and 319.86 kg^{-1} for treatments T_2, T_3 and T_4 respectively (Table 1). As the singhara flour level were increase their decreased in the cost of peda.

The cost of production of plain peda was considerably higher than peda blended with singhara flour had decreasing trend of Rs. 2 kg^{-1}, these differences were mainly observed because of variable levels of singhara flour.

More or less similar results were reported by Datarkar (2012) [1] that the cost of production was higher in treatment T_1 with 0 parts of singhara flour level (Rs. 206.02 kg^{-1}) while the burfi prepared by blending with 20 parts of singhara flour level (T_5 treatment) costing (Rs. 163.02 kg^{-1}).

Also, Ramteke, *et al.* (2018) [8] reported cost structure of burfi prepared with 0 parts of potato flour had highest cost of production i.e. Rs. 432.24 kg^{-1}. While, the lowest cost of production (Rs.389.51 kg^{-1}) was observed under treatment T_5 i.e. burfi with 20 parts of potato flour. It is observed that with increase in level of potato flour resulted decrease in the cost of production of burfi.

It may be inferred that the superior, nutritional and medicinal quality singhara peda can be prepared by addition of 5 parts of

singhara flour and 95 parts buffalo milk khoa with 30 per cent sugar. (Costing Rs.323.86 kg^{-1}).

Conclusions

It can be concluded from the present study that,

1. The cost of peda decreased with increased level of singhara flour. The cost of most acceptable treatment with 5 per cent level of singhara flour (T2) was Rs. 323.86 kg^{-1}.
2. Singhara flour (5%) could be successfully and economically used for preparation of peda.

References

1. Datarkar KN. Utilization of singhara flour in preparation of cow milk burfi. M. Sc. Thesis (Unpub.) Dr. P.D.K.V., Akola, 2012, 1-72.
2. Ge Zhan, Lei‐Qing Pan, Shu‐Bo Mao, Wei Zhang, Ying‐Ying Wei Kang. To Study on antibacterial properties and major bioactive constituents of Chinese water chestnut (*Eleocharis dulcis*) peels extracts/fractions. Eur Food Res Technol. 2014; 238:789-796.
3. Ghule BK, Desale RJ, Hassan Bin Awaz.. Studies on preparation of bottle gourd *pedha* - a review. Asian J. Dairy and Food Res. 2013; 32 (4):328-331.
4. Gopalan C, Ramasastri BV, Balasubramanian SC. The Handbook of Nutritive value of Indian Food, 1989, 51.
5. Pal D. Technological advances in the manufacture of heat desiccated traditional Indian milk products. Indian Dairyman. 2000; 52(10):27-35.
6. Ramteke VM, Atkare VG, Khupse SM. Studies on Preparation, Sensory Evaluation and Cost Configuration of Potato (*Solanum tuberosum*) Flour Burfi. Int. J Curr. Microbiol. App. Sci. 2018; 7(08):1610-1615.