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Development and quality evaluation of peda manufactured from admixture of flaxseed and sesame seed

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Abstract

Present investigation was carried out to assess the development, chemical composition, and sensory evaluation, of peda. The control sample (T0) of peda and was formulated with @ 70 per cent khoa and @ 30 per cent honey and experimental peda (T1, T2, T3) also formulated by using khoa and flaxseed in different combination with incorporation of 2, 2.5 and 3 per cent flaxseed and to study the chemical and sensory evaluation of peda at different treatment combinations. From the chemical evaluation results it was observed that after the incorporation of flaxseed in peda decreased in moisture (18.44 to 17.49 per cent), and increased in fat (14.57 to 15.67 per cent), protein (13.33 to 15.43 per cent) ash (2.76 to 3.42 per cent), fiber (0.00 to 3.42 per cent) and antioxidant activity (0.00 to 40.6 mg/g) content significantly in treated product as compared to control. Sensory evaluation like (color and appearance, body and texture, flavor and taste and overall acceptability) was evaluated by trained panelist using 9 point hedonic scale. On the basis of findings, it was concluded that T0 was found to be highly acceptable among the other combinations by sensory evaluation. It was observed that the overall acceptability score of treatment T0, T1, T2 and T3 was 7.77, 7.00, 6.72 and 6.22 respectively.

Keywords: Flaxseed, sesame seed, honey, khoa, peda

1. Introduction

India is the largest producer of milk in the world with the annual milk production is 176.35 million tonnes during the year 2017-18. (NDDB, source: Department of Animal Husbandry Statistics Ministry of Agriculture, GOI). India is also the largest Dairy products consumer in the world. India's traditional dairy product (TDP) sector poised for rapid expansion with modern process technologies. The consumption of TDP is likely to grow at an annual growth rate of more than 20 per cent (Gavhane *et al.*, 2014) [5]. Availability of liquid milk and preparation of milk based delicacies has been a practice from time immemorial (Bankar *et al.*, 2013) [3]. As far as traditional milk products are concerned, it has been estimated that 6.5 percent of total milk produced in India is converted into khoa and other condensed milk products (Shete *et al.*, 2012) [9]. The value of khoa manufactured annually in India becomes almost double on its conversion into variety of popular indigenous khoa based sweets particularly burfi, peda, gulabjamun, kalakand etc (Kadam *et al.*, 2010) [6].

Peda are characterized by caramelized flavor and popular due to their pleasant taste among the Indian traditional sweets. Khoa and khoa base sweets; peda have a poor shelf life due to loss of moisture, development of rancidity and surface mould growth upon storage (Londhe and Pal 2007) [7].

Flaxseed has many health benefits as well as rich of nutrients. In fact the content Fiber, proteins, Amino acids, vitamin E and lignans present in flaxseed satisfy basic needs in the human diet. Flaxseed also has healthy properties that prevent from cardiovascular disease, problems related to menopausal and many more disease. Ground flaxseed of 50g/day consumed over 4 weeks increased the average daily ALA plasma levels by about 10 times in healthy adults (Cunnane *et al.*, 1995) [4].

Honey is a natural sweetener, having medicinal properties. This makes the use of honey less harmful than sugar. If we replace sugar with honey in the sweets and deserts, it will certainly help to overcome various health problems and would provide the sweetmeat with therapeutic value. It is used as laxative, blood purifier, a preventive against cold, cough and fever, curative for sores, eye ailments and ulcers on tongue, sore throat and burns (Srivastava, 1998) [10].

So far scanty research work had been conducted on utilization of flaxseed and sesame seed in peda.

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With to aim of value addition and looking to the health benefits and pleasant aroma of flaxseed, the research experiment is planned to study on preparation of flaxseed peda, by using buffalo milk khoa.

2. Material and methods

The research “Development and quality evaluation of peda prepared from admixture of flaxseed and sesame seed” was conducted in the laboratory of Dairy Technology, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj (U.P).

Procurement and collection of ingredient

1. **Buffalo milk:** Buffalo milk was purchased from Naini, Prayagraj.
2. **Flaxseed:** Flaxseed was obtained from local market of Prayagraj.
3. **Sesame Seed:** Sesame seed was obtained from local market of Prayagraj.
4. **Honey:** Processed honey was purchased from the local market of Prayagraj.

5. **Cardamom Powder:** Processed cardamom powder (Carmines country brand’s) procured from the online website (Flip kart) was used in the product development process.

Four treatment samples were studied and each treatment was replicated five times. In all 20 samples were studied. The final products were analyzed for percent fat, moisture, protein, ash, fiber and antioxidant activity. Sensory analysis was carried out on 9 point Hedonic scale to judge for body & texture, color & appearance, flavor and overall acceptability.

2.1 Treatment combination

Table 1: Treatment combinations for flaxseed and sesame seed formulated peda.

Treatment	Khoa (%)	Flaxseed
T ₀	100	0
T ₁	98	2
T ₂	97.5	2.5
T ₃	97	3

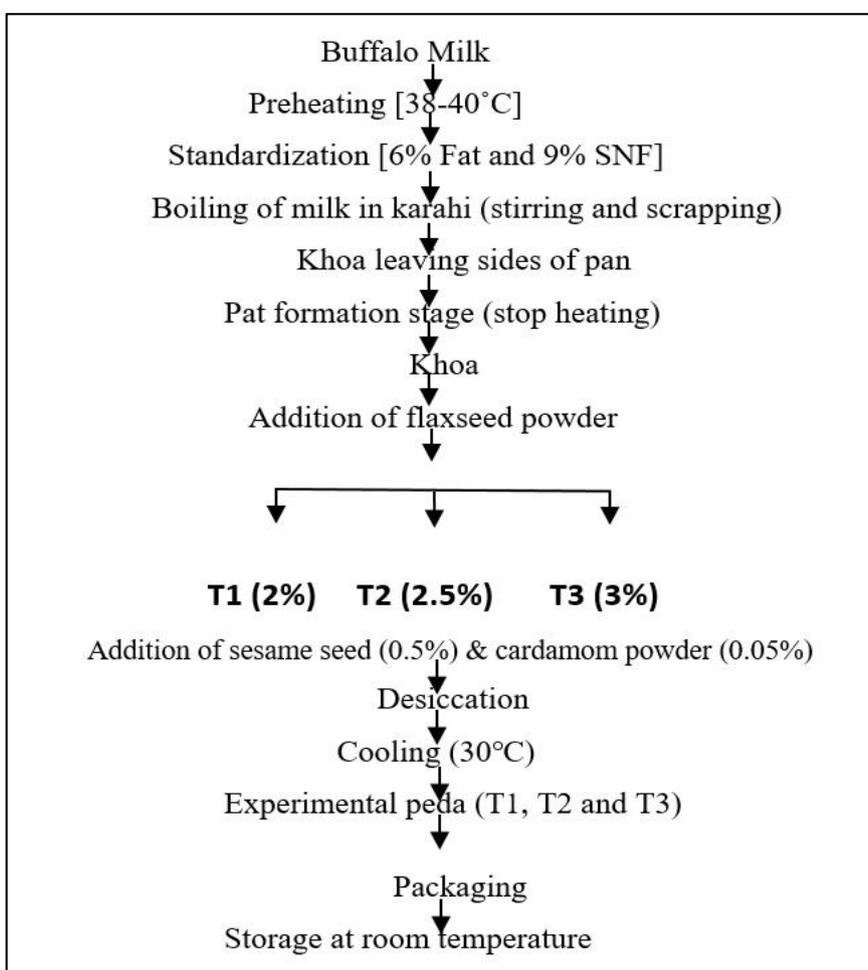


Fig 1: Flow diagram for Flaxseed and Sesame seed powder incorporated peda

2.2 Preparation of flaxseed and sesame seed incorporated peda

The Buffalo milk standardized to 6% FAT and 9 % SNF was taken in a double jacketed steam kettle and concentrated under constant stirring cum scrapping. The concentration of milk was continued till the desired consistency of dough was obtained. The concentration was stopped and the contents of kettle were spread on inner wall of kettle for cooling. After

cooling, the khoa was scrapped and collected khoa then addition of honey (@ 30 per cent) by weight of khoa. Then flaxseed obtained from local market was cleaned and ground to powder by using an electrically operated mixer for manufacturing of Peda addition of flax seeds in khoa. The flax seeds were added at 3 different levels (2, 2.5 and 3%) to manufacture peda. The final product was packed in cardboard boxes and stored at room temperature for further analysis.

2.3 Physico- chemical analysis

Chemical constituents like moisture, protein, fat, and ash content of flaxseed peda were determined by AOAC, (2003) [2]. The dietary fiber content of peda sample was determined by the method as described in AOAC method (1975) [1]. Antioxidant was determined by DPPH method described in Ranganna (1986) [8].

2.4 Sensory analysis

The samples were subjected to sensory evaluation as described in using a 9 point hedonic scale score card as suggested by Stone and Sidel (2004) [11].

2.5 Statistical analysis

Statistical designs Data was analyzed using Analysis of Variance (ANOVA) and Critical difference (C.D) in WASP software and excel software.

3. Results and discussion

The results of the present study as well as relevant discussions have been presented under following sub heads and Table 2 to 3.

3.1 Chemical evaluation of flaxseed and sesame seed incorporated peda

Chemical composition of flaxseed incorporated peda prepared with honey by the replacement of sugar. The flaxseed level in peda is 2, 2.5 and 3 per cent respectively in all experimental peda. The honey was added @ 30 per cent level of khoa with complete replacement of sugar in flaxseed incorporated peda. After final product preparation with different levels of flaxseed were selected for further studies and different chemical properties viz., moisture, fat, protein, ash, fiber and antioxidant content were determined and the results are summarized in the Table 2.

Table 2: Chemical evaluation of flaxseed and sesame seed incorporated peda (Mean)*

Chemical parameters	Samples						
	T0	T1	T2	T3	S. Ed (±)	CD at 5%	Result
Fat (%)	14.57	15.61	15.63	15.67	0.12	0.27	Significant
Moisture (%)	18.44	17.89	17.76	17.49	0.18	0.39	Significant
Protein (%)	13.33	14.50	15.25	15.43	0.27	0.59	Significant
Ash (%)	2.76	2.84	2.97	3.35	0.40	0.37	Significant
Fiber (%)	0.00	0.92	2.55	3.42	0.15	0.33	Significant
Antioxidant (%)	0.00	34.6	37.4	40.6	0.68	1.48	Significant

*Average of five trials.

3.2 Sensory evaluation of flaxseed and sesame seed incorporated peda

The score of color & appearance, body & texture, flavor & taste as well as the overall acceptability of different treatment combinations of peda with 2, 2.5 and 3 per cent of flaxseed

were compiled in Table 3. The highest sensory evaluation shown for color and appearance, body and texture, flavor and taste and overall acceptability is for control peda with the score 7.77, 7.00, 6.72 and 6.22 respectively.

Table 3: Sensory evaluation of flaxseed and sesame seed incorporated peda (Mean)*

Sensory Parameter	Samples						
	T0	T1	T2	T3	S. Ed (±)	CD at 5%	Result
Color & Appearance	8.60	6.00	5.70	4.00	0.65	0.30	Significant
Body & Texture	7.40	7.00	6.32	6.50	0.79	1.11	Significant
Flavour & Taste	8.72	7.12	6.80	5.34	0.33	0.72	Significant
Overall Acceptability	7.77	7.00	6.72	6.22	0.52	1.13	Significant

*Average of five trials.

4. Conclusion

Present study concludes that the incorporation flaxseed and sesame seed in khoa to prepare nutritionally enriched peda by complete replacement of sugar with honey. Peda made with flaxseed of treatment T1 were best in sensory evaluation and received highest score in sensory evaluation (color & appearance, body & texture, flavor & taste, overall acceptability).

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