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Evaluation of shelf stability (sensory characteristics) of functional Chhana Podo

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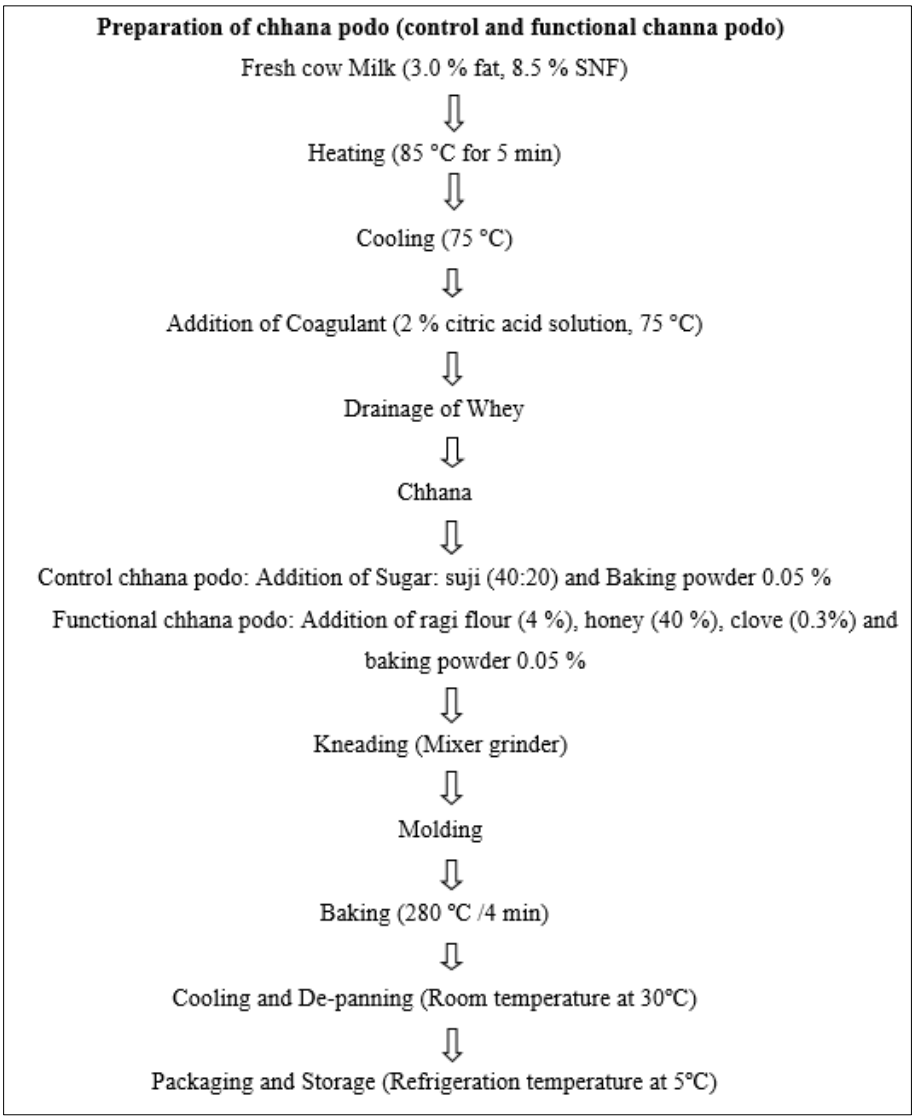
Abstract
Functional chhana podo was prepared using cow milk by incorporation of ragi flour, honey and clove. The attempts have been made to study the effect of packaging material aluminium foil (C), polyethylene terephthalate (P1) and polystyrene (P2), metallic cardboard (P3) for sensory analysis. Based on the sensory analysis functional Chhana Podo packed polyethylene terephthalate was found superior over the rest of the packaging material. Functional chhana podo packed in polyethylene terephthalate received the highest sensory scores over other packaging material and had a shelf life of two days at room temperature (30 °C). Functional chhana podo packed in polyethylene terephthalate received the highest sensory scores over other packaging material and twenty-one days at refrigeration temperature (5 °C) without affecting sensory attributes.

Keywords: Chhana podo, Functional chhana podo, Shelf stability, Sensory score

Introduction
Chhana podo, a popular dairy product of India, is prepared by baking the dough of chhana (heat-acid coagulated milk solids), semolina and sugar. Heat induced moisture loss during baking influences the chain of physico-chemical changes, which in turn determine the quality of the final product (Emerald *et al.*, 2020) [4]. Chhana podo is characterized by a brown crust with white or light brown inner body, has a typical cooked flavour and rich taste. The moist crumb has a moderately spongy cakelike texture and soft body, and is sweet due to the addition of sugar. It is probably the only dairy product prepared by baking. The important step in preparation of Chhana podo is baking. During this step, conductive, convective and radiative heat transfer occurs from the oven chamber to the product surface (Emerald *et al.*, 2020) [4].
Banker (2004) [3] reported that shelf life of chhana podo 2 to 4 days at room temperature 30 ºC. Storage studies of microwave treated enriched chhana podo revealed that shelf life was 5 day and 6 days for sample treated for 40 s and 50 s with corresponding temperature of 75 and 82 ºC, respectively as against control samples which showed a shelf-life of 3 days at refrigeration temperature of 7 ºC (Ashraf, 2006) [2].
Kumar and Chandra (2016) reported that chhana podo product is best at the cow and buffalo milk ratio was (2:1), at 170 ºC temperature for the 12 min. baking period. The recorded a shelf life up to 45 days at refrigerated temperatures. The chhana podo has a shelf-life of 21 days when packed in laminated plastic sheets and stored under refrigeration of 8 °C or below (https://www.nddb.coop/services/ppd/dairyproducts/chhana).

Materials and Methods
Fresh raw milk was procured from the Students Experimental Dairy Plant (SEDP) of Dairy Science College, Hebbal, Bengaluru used for the preparation of Chhana podo. Ragi flour, honey, cloves, suji and baking powder were purchased from local market in Bengaluru



Method adopted

The product was prepared as per the procedure followed by Mukhopadhyay *et al.*, 2015 [6] with slight modification. Fresh cow milk was heated to 85 ºC for 5 min. and then cooled to 75 ºC. Slowly add a 2 percent citric acid solution at 75 ºC as a coagulant till complete coagulation and drainage of whey. Sugar of 40%, suji (20%) and 0.05% baking powder on a chhana basis was the mixture was kneaded, baked it and cooled chhana podo and removed it from the cooking utensil (de-panning). This chhana podo was subjected to judging and packaging.

Sensory evaluation

In this study the organoleptic quality of control and treated samples of chhana podo was evaluated at by a panel of five semi trained judges on a 9-point hedonic scale where a score of 5 point represented 'dislike extremely' and score of 9 point represented 'like extremely' (Amerine *et al.*, 1965) [1]. The samples for evaluation were marked suitably before serving the samples to the judges for sensory evaluation. The samples were evaluated in a sensory evaluation room with appropriate facilities.

Statistical analysis

Significant difference between the values was verified by one way analysis of variance (ANOVA) and comparison between means was made by critical difference value by using R software [R. version 4.1.2 (2021-11-01), copyright © 2021, R foundation].

Result and Discussion

Effect of different packaging material and sensory characteristics of chhana podo at ambient temperature (30 ºC)

The fresh samples of control and developed ragi flour, honey and clove enriched chhana podo was packed in aluminium foil (C), polyethylene terephthalate (P1), polystyrene (P2) and metallic cardboard (P3), were subjected to sensory evaluation and result obtained are presented in Table 1. The physical appearance of products plays an important role in consumer acceptability. Influence of different packaging materials on the developed ragi flour, honey and clove enriched chhana podo. The statistical analysis for data obtained for sensory evaluation indicates a significant difference (P=.05) in the effect of packaging material on sensory characteristic of the samples for all sensory attributes. The developed products stored in PET box were awarded highest in colour and appearance score of 7.60 at the 2nd day of storage with respect to other packaging material. Similarly, for body and texture attribute, 7.80 score at the 2nd day of storage of the product packaged in PET box were awarded highest among the other packaging material. Similarly, for flavour attribute, the

products packaged in PET box were awarded highest average score of 7.70 out of 9 respectively at the 2nd day of storage. The developed products packed in PET box were awarded the highest scores for overall acceptability of 7.70 at the 2nd day of storage among other packaging material. The sensory scores were significantly difference (*P*=.05) at the beginning and at the end of storage. The significant reduction in scores with progress of storage might be due to more browning, much brittle texture and surfaces spoilage by yeast and mould. Stored in PET box was better than other two packaging material due to chemical resistant, has low water absorption, low moisture vapour permeability, low gas permeability.

Effect of different packaging material and sensory characteristics of chhana podo at refrigeration temperature (5 ºC)

The results pertaining to the effect of different packaging materials on the sensory quality of developed ragi flour and honey and clove enriched chhana podo stored at refrigeration temperature are present in Table 2. The P2 and P3 samples significantly secured lower score compared to control and P1 sample with respect to all sensory attribute which mainly due to slight acidic flavoured observed in the samples. The sensory score for control and P1 sample significant changes but with increase in duration of storage, there was decrease in the sensory score for Control and P1 sample with all sensory attributes. On day 7th, sensory score was reduced. This might be due to increased acidity in the product during storage. On day 28th of storage control, P1, P2 and P3 were unacceptable. It was observed that the samples with off-flavour development, hence they were considered as spoiled. The sensory scores were significantly difference (*P*=.05) at the beginning and at the end of storage. Stored in PET box was better than other two packaging material due to chemical resistant, has low water absorption, low moisture vapour permeability, low gas permeability. The chhana podo has a shelf-life of 21 days when packed in laminated plastic sheets and stored under refrigeration (8°C or below). (https://www.nddb.coop/services/ppd/dairyproducts/chhana).

Table 1: Effect of different packaging materials and sensory characteristics of chhana podo at ambient temperature (30 °C)

Sample	Colour and Appearance			Body and Texture			Flavour			Overall Acceptability		
	0	2	3	0	2	3	0	2	3	0	2	3
C	8.50^{b}	7.50^{b}	SPOILED	8.34^{a}	7.60^{d}	SPOILED	8.25^{a}	7.90^{a}	SPOILED	8.36^{a}	7.80^{a}	SPOILED
P1	8.55^{a}	7.60^{a}		8.11^{b}	7.80^{b}		8.12^{b}	7.70^{b}		8.26^{b}	7.70^{b}	
P2	8.45^{c}	7.50^{b}		8.01^{d}	7.70^{c}		8.08^{c}	7.60^{c}		8.16^{c}	7.40^{c}	
P3	8.35^{d}	7.40^{c}		8.06^{c}	7.90^{a}		8.02^{d}	7.20^{d}		8.14^{d}	7.20^{d}	
CD(*P*= .05)	0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01	

Note

- C - Control of chhana podo packed in aluminium foil box
- P1 -Functional chhana podo packed in polyethylene terephthalate box
- P2 - Functional chhana podo packed in polystyrene box
- P3 – Functional chhana podo packed in metallic cardboard box
- CD-Critical difference
- All the value are average of three trails
- Different superscripts with in the column indicate significant difference (*P*=.05)

Table 2: Effect of different packaging material and sensory characteristics of chhana podo at refrigeration temperature (5 ºC)

Sample	Colour and Appearance					Body and Texture					Flavour					Overall Acceptability				
	0	7	14	21	28	0	7	14	21	28	0	7	14	21	28	0	7	14	21	28
C	8.50^{b}	8.40^{a}	7.90^{a}	7.50^{a}	SPOILED	8.44^{a}	8.20^{a}	7.90^{a}	7.60^{a}	SPOILED	8.45^{a}	8.25^{a}	7.80^{a}	7.60^{a}	SPOILED	8.45^{a}	8.33^{a}	7.80^{a}	7.40^{a}	SPOILED
P1	8.55^{a}	8.30^{b}	7.80^{a}	7.40^{b}		8.21^{b}	8.10^{a}	7.80^{a}	7.50^{b}		8.40^{b}	8.15^{b}	7.90^{a}	7.50^{b}		8.35^{b}	8.30^{b}	7.70^{a}	7.36^{b}	
P2	8.35^{b}	8.10^{c}	7.70^{a}	7.33^{c}		8.15^{c}	8.00^{a}	7.70^{a}	7.43^{c}		8.33^{c}	8.00^{c}	7.80^{a}	7.45^{c}		8.32^{b}	8.25^{c}	7.50^{a}	7.25^{c}	
P3	8.25^{b}	7.80^{d}	7.60^{a}	7.20^{d}		8.11^{d}	7.90^{a}	7.60^{a}	7.33^{d}		8.30^{c}	7.85^{d}	7.70^{a}	7.35^{d}		8.30^{b}	7.80^{d}	7.40^{a}	7.15^{d}	
CD (P= 0.05)	0.03	0.01	0.35	0.01		0.03	0.48	0.35	0.01		0.03	0.01	0.35	0.01		0.03	0.01	0.35	0.01	

Note

- C - Control of chhana podo packed in aluminium foil box
- P1 - Functional chhana podo packed in polyethylene terephthalate box
- P2 - Functional chhana podo packed in polystyrene box
- P3 – Functional chhana podo packed in metallic cardboard box
- CD-Critical difference
- All the value are average of three trails
- Different superscripts with in the column indicate significant difference (*P*=.05)

Conclusion

Shelf stability of functional chhana podo and control chhana podo. In sensory parameter analysis in packed in aluminium foil (C), polyethylene terephthalate (P1) and polystyrene (P2), metallic cardboard (P3). Functional chhana podo packed in PET had secured highest sensory scores and had shelf life of two days at room temperature (30 ºC) and twenty one days at refrigeration temperature (5 °C) without affecting sensory attributes.

References

1. Amerine MA, Panborn EB, Roessler EB. Principles of

sensory evaluation of food. Academic Press, New York; c1965.
2. Ashraf Unnisa. Development of enriched and long life Chhana podo. M. Tech Thesis submitted to Karnataka Veterinary Animal and Fishery Sciences University, Bidar, India; c2006.
3. Bankar Sheela Sanduji. Studies on the quality of Chhana podo from cow milk. M.Vsc. Thesis submitted to Maharashtra Animal and Fishery Sciences University, Nagpur, India; c2004.
4. Emerald F, Pushpadass HA, Manjunatha M, Manimala, K, Dejey D, Salish K. *et al*, Modelling approaches for predicting moisture transfer during baking of Chhana podo (milk cake) incorporated with tikhur (*Curcuma angustifolia*) starch. J Food Measurement and Characterization. 2020;14(6):2981-2997.
5. https://www.nddb.coop/services/ppd/dairyproducts/chhana
6. Mukhopadhyay S, Mishra HN, Goswami TK, Majumdar GC. Neural network modeling and optimization of process parameters for production of chhana cake using genetic algorithm, International Food Research Journal. 2015;22(2):465-475.
7. Version R 4.1.2 (2021-11-01), copyright © 2021, R foundation.
8. Kumar Sanjai, Chandra R. Standardize the Technology for Preparation of Chhana podo For Shelf Life Extension Int. J Appl. Pure Sci. Agril. 2016;2(7):72-82.