RESEARCH PAPER | Dairy Technology | Volume : 5 | Issue : 2 | Feb 2015 | ISSN - 2249-555X

Study on proximate composition of market samples of palada

KEYWORDS: Palada, market samples, physico-chemical properties

Neetha Narayanan
M. Tech Scholar, Dairy Technology Department, College of Dairy Science and Technology, Mannuthy, Thrissur

S.N.Rajakumar
Professor & Head, Department of Dairy Technology, College of Dairy Science and Technology, Mannuthy, Thrissur

ABSTRACT *An attempt was made to evaluate the physico-chemical properties of palada marketed in Thrissur district, Kerala. Wide variation in composition of market samples was observed. Fat, protein, total solids, lactose, sucrose, ash and acidity of market samples were in range of 3.163 - 4.133 %, 5.23 – 11.0167 %, 37.8 – 45.9 %, 3.61 – 4.7 %, 24.23 - 29.2% , 0.7303- 0.8656 % and 0.2503 – 0.2853 % respectively.*

INTRODUCTION

Payasam is a milk based delicacy popular in southern region of India. It resembles kheer of North India. Payasam forms an integral part of cultural ethos of South India and is closely associated with ritualistic ceremonies such as weddings and religious functions (Aneja *et al.*, 2002). Palada is a variety of payasam popular in Kerala. It is a medium viscous product with rice ada flakes uniformly distributed in it with a pleasant caramelized and cooked flavor and having a characteristic brown color. Milk, sugar and rice ada are the ingredients used for its preparation. Ada

forms the suspended solids of the palada. Its preparation is a long process which involves spreading rice dough in plantain leaves, rolling the plantain leaves and tying it followed by cooking in boiling water to obtain a consistency at which it can be cut into small flakes. The ada thus obtained is cooked in milk with addition of the required quantity of sugar till the desired brown color and characteristic cooked flavor is obtained. The literature pertaining to the physico-chemical composition of palada is limited. Hence the present study was aimed at analyzing the proximate composition of palada samples available in the market.

MATERIALS AND METHODS

Collection of samples

Five different brands of palada manufactured by reputed firms were procured from local market in Thrissur district, Kerala. The samples were randomly selected from the lot. The sample in triplicates was evaluated for its physico-chemical parameters.

Physico-chemical Analysis

Market samples were thoroughly mixed using a pestle and mortar and this homogenous sample was used for further analysis

Fat

Fat content in palada was determined by Mojonnier method (IS: SP: Part XI, 1981)

Total solids

The total solids content of palada as well as its fractions was determined by the method recommended for condensed milk (IS: SP: Part XI, 1981)

Protein

The total nitrogen content of the palada was determined by Micro Kjeldahl method (AOAC, 1984)

Ash

Ash content of palada was determined using the method described for condensed milk (IS: SP: Part XI, 1981).

Sucrose content

Sucrose content of the sample was found out by Lane Eynon method (IS: SP: Part XI, 1981)

Lactose content

Sucrose content of the sample was found out by Lane Eynon method (IS: SP: Part XI, 1981)

Statistical Analysis

All experiments were performed in triplicates and the data were subjected to analysis of variance using one way ANOVA and Duncan's multiple range test(DMRT) for comparison of significant differences ($p<0.05$) using SAS Enterprise guide(5.1, 2012, USA)

RESULTS AND DISCUSSION

Physico-chemical attributes of palada

Significant ($p<0.01$) difference was observed in the physico-chemical properties of market samples of palada. The results are presented in Table 1.

Fat content

The proximate composition of different brands of palada is shown in the Table 1. Significant difference ($P<0.01$) was observed in the compositional characteristics of market samples. The average fat content showed a great variation among the different brands of palada (3.16 per cent to 4.3133 per cent). The highest fat content was observed in Brand V whereas lowest fat content in Brand I. The range of fat content obtained in palada was slightly lower comparable to fat content of palada as reported by Venkateswarlu and Dave (2008). The reason for this wide variation may be due to the difference in composition of milk used for manufacture of palada. Some manufacturer's prefer buffalo milk instead of cow milk for the preparation of palada.

Total solids

Wide significant ($p<0.01$) difference was noted in the total solid content of palada samples. It ranged between an

Volume : 5 | Issue : 2 | Feb 2015 | ISSN - 2249-555X

average value of 45.9 per cent to 32.1 per cent. The highest total solid content was noted in Brand III and lowest in Brand I. The results are in close agreement with findings of Jha *et al.*, 2013. The difference in total solids may be due to the difference in time employed for desiccation of the product as well as difference in the amount sugar used in its manufacture.

Table 1.Proximate composition of different brands of palada available in the market

Constituents	Brand 1	Brand II	Brand III	Brand IV	Brand V	F value
Fat (%)	3.163 ± 0.0233^{e}	4.0363 ± 0.0319^{b}	3.94 ± 0.0115^{d}	4.033 ± 0.0284^{c}	4.3133 ± 0.1133^{a}	61.179**
Acidity(% of lactic acid)	0.2503 ± 0.0008^{c}	0.275 ± 0.0035^{ab}	0.2513 ± 0.0008^{c}	0.2853 ± 0.0027^{a}	0.2703 ± 0.0063^{b}	18.879**
Total solids (%)	37.8 ± 0.3786^{e}	43.3 ± 0.2082^{c}	45.900 ± 0.0577^{a}	44.333 ± 0.3333^{b}	39.633 ± 0.3180^{d}	377.511**
Lactose (%)	4.45 ± 0.0251^{b}	3.61 ± 0.010^{c}	4.52 ± 0.0152^{b}	4.4667 ± 0.0881^{b}	4.7 ± 0.05774^{a}	74.787**
Protein (%)	5.2333 ± 0.00882^{e}	7.5333 ± 0.0333^{b}	11.0167 ± 0.0088^{a}	6.6333 ± 0.0333^{c}	6.4167 ± 0.0833^{d}	3272.869**
Ash (%)	0.73033 ± 0.0012^{c}	0.7356 ± 0.00008^{c}	0.8656 ± 0.0037^{a}	0.74033 ± 0.0073^{c}	0.8330 ± 0.006^{b}	188.454**
Sucrose (%)	24.2533 ± 0.3747^{e}	28.1236 ± 0.24433^{b}	26.43 ± 0.0608^{c}	29.2 ± 0.3764^{a}	24.203 ± 0.3066^{d}	143.754**

Figures are the mean ± Standard Error of three replications, Mean with different superscripts within a row differ significantly ($p<0.01$), **- significantly different at one per cent level ($p<0.01$).Protein

The protein content in samples varied significantly ($p<0.01$) of 11.01 per cent to 5.233 per cent. Brand III displayed highest protein content among the samples. The protein content are slightly higher than the values reported for protein content of palada by Unnikrishnan *et al.*, 2000. This difference in protein may be attributed to type of milk and also may be due to thickening agents used in its manufacture.

Sucrose

The mean sucrose content varied significantly ($p<0.01$) between 24.203 % and 28.12 % in the samples. Highest value was noted for Brand II and lowest for Brand V. The values for sucrose content are in according with the observations made by Unnikrishnan *et al.*, 2000. The difference in sucrose content may be a result of varying quantity of sugar added in the manufacture of the product.

Lactose

The lactose content of the samples varied significantly ($p<0.01$) between the different brands of palada. It ranged within the range of 3.61 per cent and 4.7 per cent. The lactose content of samples are in agreement with the findings of Unnikrishnan *et al.* (2003) and Venkateswarlu and Dave (2008). The variation in lactose content may be due to composition of milk used for the manufacture of palada.

Ash

The ash content of palada ranged between 0.7303% to 0.8656 % .With respect to ash content it was observed that Brand III showed the highest ash content. The difference in ash content may be due to difference in composition of milk and other additives used for the manufacturing.

Acidity

The acidity of palada ranged between 0.2503 % lactic acid to 0.2853 % lactic acid. The difference in acidity is attributed to variation in intial acidity of milk and storage period.

CONCLUSION

The palada samples procured from market of Thrissur, Kerala showed wide variation in their physico-chemical attributes. The wide variation in fat, protein, total solids, ash, lactose, sucrose and acidity may be attributed to the wide difference in the composition of milk as well as the nature and amount of additives used in its manufacture.

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