



Comparative Study on Nutritional Analysis of Locally Available Cottage Cheese (Paneer) in North-Western and South-Western Zone of Faridabad

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ABSTRACT

The objectives of the present study were to assess the nutritive value along with the adulteration test of the procured samples and to compare the result with standard values given by NIN (ICMR.). Three samples of locally available paneer were procured from each zone. Samples were further analyzed for nutritional analysis and sensory evaluation was conducted through 9 point hedonic score scale by untrained panellist which revealed that samples from North-Western zone were best acceptable with highest mean score in each attributes like taste (6.03 ± 1.58), flavour (5.87 ± 1.52) and appearance (5.82 ± 1.40). The data revealed that that all the samples of paneer available at local vender were of good quality with high energy, protein and Fat content as per the value given by NIN. Negative results were observed for the presence of starch in all samples. Vitamins like Riboflavin, thiamine and Vitamin B6 were found significantly high in all the samples as compared to the value given by NIN (ICMR).

KEYWORDS

Paneer, nutritional analysis, sensory evaluation

Introduction

About half the milk produced is consumed in the liquid form and the remaining is used to prepare products such as ghee, curd, butter, khoa, paneer, cheese, channa, ice cream and milk powders. Paneer is an important indigenous product which is obtained by heat treating the milk followed by acid coagulation using suitable acid viz. citric acid, lactic acid tartaric acid, alum, sour whey. The whey formed is removed to some extent through filtration and pressing. Paneer represents one of the soft varieties of cheese family and is used in culinary dishes/snacks. [1]

According to FSSAI (2011) "Chhana or paneer means the product obtained from the cow or buffalo milk or a combination thereof by milk fat precipitation with sour milk, lactic acid or citric acid". It shall not contain more than 70.0 per cent moisture and the content shall not be less than 50.0 per cent of the dry matter. [2]

It was stated by Smitha et al. (2014) that the highest yield of paneer was obtained at coagulation temperature of 75°C with optimum moisture percentage. Inference was found that when milk was coagulated at 85°C and 70°C the yield was more influenced by fat but when milk was coagulated at 80°C and 70°C, SNF had got significant effect on the yield of paneer. At 90°C and boiling temperature both fat and SNF had got a significant effect on the yield of paneer. [3]

A study was conducted by Dikshit et al. (2015) to optimize the fat percentage of low fat paneer prepared from skim milk powder and to find out the nutritive value as well as to assess the sensory acceptability of low fat paneer prepared. The result revealed that the highest average score for overall acceptability of paneer (7.70) was recorded in T1 followed by T0 (7.37), T1 (7.20) T3 (6.66) and T4 (6.25). Amongst the different combinations used of milk in a ratio of 2.5(fat):8.5(SNF) (T2) is best in term of flavor, taste, body, texture and overall acceptability. The quality of this paneer was very well compa-

table to that of the control paneer which was prepared from buffalo milk standardized to 5 percent fat and 8.5 percent SNF. The paneer was found to have higher protein and lower fat as compared to standard milk paneer (control) and can therefore be helpful from the therapeutic point of view for the people suffering from chronic diseases. [4]

Methodology

The study was conducted under five phases and in the 1st phase 3 samples of paneer were procured from each zone (north-western and south-western). In 2nd phase, sensory evolution of samples was conducted by using 9 point hedonic score card by untrained panellist for attributes like taste, colour, texture, flavour and appearance. Nutritional analysis and comparison of procured samples with the value given by NIN was done in the 3rd phase. The nutritional analysis for moisture, carbohydrate, ash, protein, fat, calcium, phosphorus, riboflavin, thiamine, vitamin B6, Lactose content was determined by the AOAC method.

Collected data was statistically analysed by using SPSS 20 Version software. The analysis included mean, standard deviation and Independent T-test.

Result and Discussions

TABLE 1. COMPARATIVE ANALYSIS OF TWO ZONES ON THE BASIS OF ORGANOLEPTIC EVALUATION

ATTRIBUTES	NORTH-WESTERN	SOUTH-WESTERN	t-VALUE	p-VALUE
TASTE	6.03 ± 1.58	4.95 ± 1.87	4.156	.331
COLOUR	6.15 ± 1.38	5.37 ± 1.69	3.369	.053

TEXTURE	5.95±1.38	5.37±1.73	2.474	.042
FLAVOUR	5.87±1.52	4.87±1.68	4.167	.486
APPEAR- ANCE	5.82±1.40	5.32±1.77	2.098	.107

All values are Mean+ SD
Significant at p<0.05

Table 1 shows the mean acceptability score of two zones. The result revealed that North-Western zone was best acceptable with highest mean score in each attributes like taste (6.03±1.58), colour (6.15±1.38), texture (5.95±1.38), flavour (5.87±1.52) and appearance (5.82±1.40) in comparison to south-western zone. Statistically significant difference was observed between two zones for colour and texture where as statistically no significance difference was observed between samples of North-western and south western zone for taste, flavour and appearance by using t-test.

TABLE 2: COMPARATIVE ANALYSIS BETWEEN NORTH-WESTERN AND SOUTH WESTERN ZONES ON THE BASIS OF NUTRITIONAL ANALYSIS.

ATTRIBUTES	NORTH-WESTERN	SOUTH-WESTERN	t-VALUE	p-VALUE
ENERGY (Kcal)	333.55±8.32	314.44±7.61	5.081	.962
PRO-TEIN(gm)	16.50±0.76	14.86±1.04	3.798	0.445
CARBO-HYDRATE (gm)	2.54±0.25	2.53±0.34	0.092	0.187
MOISTURE (%)	41.81±0.85	41.6±0.41	4.64	0.56
FAT (gm)	27.98±0.51	28.28±1.19	0.733	0.023
ASH (%)	1.85±0.03	3.56±5.15	0.998	0.038
LAC-TOSE(gm)	1.53±0.12	1.16±0.10a	6.875	0.422
CALCIUM(mg)	260.22±21.8	292.33±30.54	2.564	0.287
PHOSPHO-RUS (mg)	159.88±28.56	161.44±18.48	0.137	0.051
THIAMINE (mg)	1.18±0.17	1.01±0.02	2.951	0.001
RIBOFLA-VIN (mg)	1.16±0.06	1.49±0.29	3.354	0.001
VITAMIN B6 (mg)	1.18±0.17	1.50±0.29	1.474	0.001

All values are Mean+SD
Significance at p<0.05

Table 2 depicts the comparison of the nutritive values of North-western and South-western zone. The energy content of North-Western zone (333.55±8.32 Kcal), was slightly higher than South-western zone (314.44±7.61) whereas statistically no significant difference was found between two zones by using Independent t-test. Protein content (16.50±0.76) of samples from North-western zone was found to have highest mean score where as samples from South-western zone scored highest mean value for fat content (28.28±1.19). Statistically no significant difference was found between samples of two zones regarding carbohydrate and protein whereas statistically significant difference was observed between samples of different zones regarding fat.

High ash percentage was found to be observed in the sample from south-western zone i.e. (3.56±5.15) as compared to samples from north-western zone (1.85±0.03).

Riboflavin and vitamin B6 content was found to be higher in samples of North-western (1.49±0.29 and 1.18±0.17) as compared to samples of South-western zone (1.16±0.06 and 1.18±0.17) respectively and statistically significant difference was observed between samples of two zones. Samples from North-western zone scored the highest mean value i.e. (1.18±0.17) for Thiamine content, statistically significant difference was observed between samples of two zones.

TABLE 3. COMPARISON OF NUTRITIVE VALUE OF NORTH-WESTERN ZONE WITH NIN (ICMR) VALUES

PARAMETERS	NIN VALUE	NORTH-WEST-ERN	t-VALUE	p-VALUE
Energy (Kcal)	292	333.55±0.005	123.63	0.017
Protein (gm)	13.4	16.50±0.005	94.62	0.023
Carbohydrate (gm)	7.9	2.54±0.005	158.90	0.023
Moisture (%)	54.1	48.1±0.05	127.27	1.00
Fat (gm)	23.0	27.9±0.005	147.76	0.023
Calcium (mg)	480	260.2±0.005	660.3	0.017
Phosphorus (mg)	277	159.76±0.05	350.95	0.023
Thiamine (mg)	0.07	1.18±0.005	235.465	1.00
Riboflavin (mg)	0.02	1.16±0.005	241.8	1.00
Vitamin B6 (mg)	0.0	1.63±0.1	-	-

*Significant at p<0.05

Table 3 revealed the mean score of energy content for North-Western zones (333.55±0.55) which was found to be more than NIN (ICMR) value i.e. (292 kcal). The protein and fat content (16.50±0.005 and 27.9±0.005) were found to be higher in the North-western region as compared to value given by NIN (13.4gm and 23.0), statistically significant difference was observed for energy, protein and fat at p<0.05.

Carbohydrate and moisture content were lower in Samples of North-Western zone (2.54 ± 0.005 and 48.1 ± 0.005) than NIN (ICMR) value (7.9gm) and no significant difference was observed for moisture. The calcium and phosphorus content (260.2 ± 0.005 and 159.76 ± 0.005) was found to be lower in the North-western zone whereas statistically significant difference was observed at $p < 0.05$.

The Thiamine and Riboflavin content (1.18 ± 0.005 and 1.16 ± 0.005) was higher in the North-western zone as compared to value given by NIN (0.07mg and 0.02mg) statistically no significant difference was observed.

All samples of North-Western contained Vitamin, whereas vitamin B6 presence in paneer is not quoted in NIN (ICMR)

TABLE .4 COMPARISON OF NUTRITIVE VALUES OF SOUTH -WESTERN WITH NIN (ICMR) VALUES

PARAMETERS	NIN VALUE	SOUTH-WEST-ERN	t-VALUE	p-VALUE
Energy (Kcal)	292	314.44 ± 0.005	66.32	0.17
Protein (gm)	13.4	14.86 ± 0.11	45.10	0.036
Carbohydrate (gm)	7.9	2.53 ± 0.005	159.20	0.23
Moisture (%)	54.1	41.56 ± 0.05	266.5	1.00
Fat (gm)	23.0	28.28 ± 0.005	156.7	0.023
Calcium (mg)	480	292.33 ± 0.05	561.20	0.023
Phosphorus (mg)	277	161.43 ± 0.05	345.97	0.023
Thiamine (mg)	0.07	1.01 ± 0.005	199.40	1.00
Riboflavin (mg)	0.02	1.50 ± 0.005	313.95	1.00
Vitamin B6 (mg)	0.0	1.50 ± 0.2	-	-

Significant at $p < 0.05$

Table 4 revealed the mean score of energy content for South-Western zones (314.44 ± 0.005) which was found to be more than NIN (ICMR) value (292 kcal). The protein and fat content (14.86 ± 0.11 and 28.28 ± 0.005) was higher in the South-western zone as compared to the value given by NIN (13.4gm and 23.0), statistically significant difference was observed for energy fat and protein at $p < 0.05$. Carbohydrate and moisture content was lower in Samples of South-Western zone (2.53 ± 0.005 and 41.56 ± 0.05) than NIN values (7.9gm), no significant difference was observed for moisture. The calcium and phosphorus content (292.33 ± 0.05 and 161.43 ± 0.05) was found to be lower in the South-western zone, statistically significant difference was observed at $p < 0.05$.

Summary and Conclusions

Present study result revealed that all samples from two zones contained vitamin B6 whereas

Vitamin B6 presence in paneer is not quoted in NIN (ICMR). Vitamin B6 functions as a co enzyme in the synthesis and breakdown of amino acids and in decarboxylation and transamination. Deficiency of vitamin B6 in human diet results in symptoms like conjunctivitis, anorexia, lethargy [5]

Negative results were observed for the presence of starch in all samples.

The minerals like calcium and phosphate were found to be higher in samples of south western zones which results in high Ash content of the sample similar result were also shown by (De, S. 1996) which revealed that the ash content of product depends upon the mineral content in the raw material. The mineral content may vary from species to species, breeds, and feed. [6]

It may be inferred from the present study that all the samples of paneer available at local vender are of good quality with high energy, protein and Fat content. Calcium and phosphorus content was found to be lower in all the paneer samples as compared to values given by NIN (ICMR), whereas vitamins like Riboflavin, thiamine and Vitamin B6 were found significantly high in all the samples as Compared to the value given by NIN (ICMR).

References

- Chandan R.C. (2007); Manufacturing of paneer, Dairy India Year Book .Pg 411.
- FSSAI Act (2006) and rule (2011); Akalank's food safety and standards Act, Rule and regulation, Akalank Publication P.G 293
- Smitha, Sathia, Rajkumar (2014): A study on Relationship between composition of milk and yield of paneer prepared under different coagulation temperature. Indian Journal of natural science, volume.5, October 2014.
- Shrish Chand Singh Dikshit, ShikhaKumari, Praveen Kumar Singh (2015): Sensory and nutritional acceptability of low fat paneer prepared by optimization of milk by skim milk. International Journal of Multidisciplinary Research and Development. Volume 2; Issue 12; December 2015; Page No. 09-11
- Nutritional data. J.H Heinz publication. Co., Pittsburgh. Fifth edition 1962
- De, S. 1996. Outlines of Dairy Technology. Oxford University Press, New Delhi, pp. 416,473,475.