



Effect of different concentration of brine on the sensory quality of spiced paneer

KEYWORDS

Spiced paneer , brine, sensory quality

Grace .A.Thachil

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 The study was conducted to determine the effect of different concentration of brine viz. 3%, 5%, 10% and 15% on the flavor, body and texture, color and appearance and overall acceptability of spiced paneer. Significant ($p < 0.01$) decrease in flavor, body and texture and overall acceptability with increase in concentration of brine was observed in spiced paneer. The color and appearance score also decreases with increase in concentration of brine but the increase is not significant ($p > 0.05$). The sensory attributes i.e. flavor, body and texture and overall acceptability was maximum for spiced paneer immersed in 3 % brine. The increase in concentration of brine above 3 % drastically decreased the sensory scores of spiced paneer.

INTRODUCTION

Paneer is a non-fermentative, non-ripened, unripened variety of cheese obtained by heat acid coagulation of milk. Paneer, by virtue of presence of high quality animal proteins, fat, minerals and vitamins, is a rich source of energy for expectant mothers, children and adults. It forms the base material for several varieties of dishes and snacks. Good quality paneer is characterized by marble white color, sweetish mild acidic taste, nutty flavor, spongy body and closely knit smooth texture. The bland taste of paneer is a major concern affecting its consumer acceptability. This can possibly be resolved by the incorporation of spice extracts of black pepper (*Piper nigrum*), green chilli (*Capsicum annuum*) and ginger (*Zingiber officinalis*) in fat soluble oleoresin form during the preparation of paneer. Oleoresin imparts characteristic spicy flavour without affecting the body and texture as well as colour and appearance of the final product. Being plant natural food stuff, spices appeal to consumers, improves the flavor of foods and have been well known for their medicinal, preservative and antioxidant property (Souza et al., 2005). Immersing paneer blocks in sodium chloride brine is one of the identified method for texturization process. Dipping the paneer in brine solution causes salt uptake in the product, which improves its sensory, textural and microbial quality. Dipping in brine made the paneer more palatable with improved sensory qualities (Sachdeva and Singh, 1990). The present study aims at investigating the effect of different concentration of brine on the sensory quality of spiced paneer.

MATERIALS AND METHODS

Procurement of raw materials

Buffalo milk was collected from University Dairy Plant, KVASU, Kerala. Black pepper, green chilli and ginger oleoresins (fat soluble form) were procured from Plant Lipids Pvt Ltd, Cochin. Commercial grade sodium chloride was purchased from Nice Chemicals, Kerala.

Preparation of Spiced Paneer

Buffalo milk was standardized to 6% fat and fat: SNF ratio of 1:1.65. Each batch of paneer was prepared from 5 litres of milk. Spice oleoresins (@ 1 ml/L black pepper, 2 ml/L ginger and 2 ml/L green chilli) was added to buffalo milk. The buffalo milk was then heated to 90°C followed by sub-

sequent cooling to 80°C. The milk was then coagulated at this temperature with 2% citric acid solution at the same temperature. The citric acid was added slowly to milk with continuous stirring till clear whey separated out. The curd was left for 5-10 minutes in whey without agitation. The whey was then drained through a muslin cloth and coagulated mass was pressed in a hoop by applying pressure of 1.5 kg/cm² for 20 minutes. Spiced paneer blocks were immersed overnight in different concentration of brine at 7°C viz. 3% brine (T₁), 5% brine (T₂), 10% brine (T₃) and 15% brine (T₄). Spiced paneer dipped in normal chilled water forms the control (T₀). The paneer blocks was removed from brine, were sliced and subjected for sensory evaluation.

Sensory evaluation:

The sensory evaluation of spiced paneer was carried out using a 9 –point hedonic scale by a panel of trained judges. The samples were evaluated for its flavour, body and texture, colour and appearance and overall acceptability.

Statistical Analysis

All experiments were carried out in triplicates. The results are expressed as mean ± Standard Error. Significance was tested by employing Friedman test (Mack and Skillings, 1980) and comparisons among treatment was made using Wilcoxon rank signed rank test.

RESULTS AND DISCUSSION

The effect of different concentration of brine on the sensory attributes of spiced paneer is given in Table 1. Significant difference was observed in the sensory scores for different concentration of brine on the sensory attributes of spiced paneer ($p < 0.01$). The χ^2 values were found out to be 38.761, 32.284, 25.386 and 36.144 respectively for flavor, body and texture, color and appearance and overall acceptability of spiced paneer.

Effect on flavor

Significant ($p < 0.01$) reduction in flavor score was observed with increase in concentration of brine from 3 % to 15%. The maximum flavor score of 8.4 was observed for T₁ (paneer immersed in 3% brine). Relatively lower flavor scores was obtained for treatments T₂, T₃ and T₄.

Table 1. Effect of concentration of brine used for texturization process on sensory scores of functional spiced paneer

Parameter	T ₀	T ₁	T ₂	T ₃	T ₄	Chi-Square value
Flavor	8.15 ± 0.1067	8.4 ± 0.17	6.7 ± 0.18	5.4 ± 0.14	4.6 ± 0.22	38.761**
Body and Texture	8 ± 0.1054	8.3 ± 0.11	7.2 ± 0.006	7.15 ± 0.16	6.8 ± 0.11	32.284**
Color and appearance	8.2 ± 0.1291	8.1 ± 0.16	7.910 ± 0.06	7.8 ± 0.13	7.75 ± 0.12	25.386 ^{ns}
Overall acceptability	8 ± 0.1102	8.35 ± 0.106	6.8 ± 0.15	5.90 ± 0.22	5.15 ± 0.37	36.144**

Table 2. Wilcoxon signed rank test for sensory attributes

Parameter	Z-value										
	T ₀ -T ₁	T ₀ -T ₂	T ₀ -T ₃	T ₀ -T ₄	T ₀ -T ₅	T ₂ -T ₁	T ₃ -T ₁	T ₄ -T ₁	T ₃ -T ₂	T ₄ -T ₂	T ₄ -T ₃
Flavor	-2.97**	-2.543**	-2.345**	-2.45**	-2.99**	-2.829**	-2.825**	-2.859**	-2.842**	-2.825**	-2.829**
Body and Texture	-1.456**	-0.875**	-1.022**	-2.14**	-2.987**	-2.842**	-2.694**	-2.848**	-.250 ^{ns}	-2.271*	-1.667**
Color and appearance	-0.405 ^{ns}	-.563 ^{ns}	-.766 ^{ns}	-0.976 ^{ns}	-.985 ^{ns}	-.807 ^{ns}	-.625 ^{ns}	-.724 ^{ns}	-.707 ^{ns}	-.789 ^{ns}	-.633 ^{ns}
Overall acceptability	-.745**	-1.02**	-1.222**	-2.33**	-1.234**	-2.842**	-2.825**	-2.818**	-2.719**	-2.579**	-2.176*

*-significant at five per cent level, **-significant at one per cent level, ns-non-significant, T₀-control, T₁ - 3% brine, T₂- 5% brine, T₃- 10% brine, T₄- 15% brine

Sachdeva and Singh (1990) reported that immersing paneer in brine containing more than 5 % sodium chloride imparted sharp salty taste which in turn affected its flavor score.

Effect on body and texture

The mean values for body and texture of spiced paneer are presented in Table 1. Significant ($p < 0.01$) reduction in body and texture scores was observed as concentration of brine increased. However no significant ($p > 0.05$) difference was observed in the body and texture scores between T₂ and T₃ (Table 2) The average mean score was secured by treatment T₁ (8.3). The relatively lower body and texture score in spiced paneer may be due to the softening of body with increase in salt concentration. The results are in accordance with findings of Yadav *et al.*, 2010.

Effect on color and appearance

The mean color and appearance scores of spiced paneer immersed in different concentration of brine is summarized in Table 1. From the Table 1. it can be inferred that color and appearance scores declined as concentration of brine

increased, but the reduction is not significant ($p > 0.05$). Highest mean score for color and appearance was obtained by control paneer (8.2). The reason for decreasing color and appearance with increase in salt concentration may be due to the dull appearance observed on surface of spiced paneer. The findings are in agreement with observations made by Thippeswamy *et al.*, 2010.

Effect on overall acceptability

The results obtained for overall acceptability of spiced paneer is presented in Table 1. The concentration of brine significantly ($p < 0.01$) reduced the overall acceptability of spiced paneer. The overall acceptability score of spiced paneer ranged between 5.15 and 8.35. The maximum score was obtained for treatment T₁ and minimum for T₄. The overall acceptability score of T₁ was significantly higher than control. The decrease in overall acceptability score may be attributed to decrease sharp salty flavor and weak body of spiced paneer at increased concentration of brine.

CONCLUSION

The current investigation revealed that the concentration of brine increased the sensory quality of spiced paneer was adversely affected. The spiced paneer immersed in 3 % brine exhibited enhanced sensory qualities. But further increase in brine concentration decreased sensory scores.

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