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Studies on sensory qualities of value added spicy paneer blended with curry leaves (*Murraya koenigii*) and cumin (*Cuminum cyminum*) powder

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Abstract

The present was carried out in the laboratories of Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola during the year 2019-2020 with a view to utilize valuable, medicinal, nutritious curry leaves and cumin powder. The main objective of present investigation was to standardize the acceptable levels of spices and to work out the production cost of paneer. Paneer was prepared by addition of curry leaves and cumin powder and their combinations in buffalo milk as Control(T₁), 0.2% Curry leaves powder (T₂), 0.4% Curry leaves powder (T₃), 0.2% Cumin powder (T₄), 0.4% Cumin powder (T₅), 0.2% Curry leaves powder + 0.2% Cumin powder (T₆) and 0.4% Curry leaves powder + 0.4% Cumin powder (T₇) with 04 replications. The overall acceptability of paneer prepared from buffalo milk was acceptable in all respect but with addition of curry leaves and cumin powder in proportion of 0.2 percent (T₆) each has good quality and acceptability. Regarding the cost of production of paneer was slightly increased i.e. Rs. 231.177 per kg (T₁) to Rs. 237.977 (T₇) per kg by addition of different levels of curry leaves powder, cumin powder and their combinations for preparation of paneer which can compensated with the flavour, medicinal and nutritional values of product.

Keywords: Buffalo milk, Curry leaves, Cumin powder, Paneer, Sensory evaluation, Cost of production.

Introduction

Paneer is a popular indigenous dairy product of India, is similar to an unripened variety of soft cheese which is used in the preparation of a variety of culinary dishes and snacks. It is obtained by heat and acid coagulation of milk, entrapping almost all the fat, casein complexes with denatured whey proteins and a portion of salts and lactose. Paneer is marble white in appearance, having firm, cohesive and spongy body with a close-knit texture and a sweetish-acidic-nutty flavour. Herbal products either in the form of cosmetics or food has become more popular in the world market. Epidemiological data as well as *in vitro* studies strongly suggest that food containing phyto-chemical with anti-oxidation potential have strong protective effect against major disease risks including cancer and cardiovascular disease (Kaur and Kapoor, 2002) [6]. Recently there has been an increasing trend to fortify the product with fruit or spice pulp/juice. Spices are considered as a good source of minerals with medicinal property.

Murraya koenigii, commonly known as curry leaf or *kari patta* in Indian dialects, belonging to Family Rutaceae. Its leaves are widely used in Indian cookery for flavouring foodstuffs. The leaves have a slightly pungent, bitter and feebly acidic taste, and they retain their flavour and other qualities even after drying. The leaves of *Murraya koenigii* contain proteins, carbohydrate, fiber, minerals, carotene, nicotinic acid, Vitamin C, Vitamin A, calcium and oxalic acid. Cumin seeds are obtained from the herb *Cuminum cyminum*, native from East Mediterranean to South Asia belonging to the family Apiaceae-a member of the parsley family. Cumin seeds are oblong and yellow-grey. Cumin seeds are nutritionally rich; they provide high amounts of fat (especially monounsaturated fat), protein, and dietary fibre. Vitamins B and E and several dietary minerals, especially iron, are also considerable in cumin seeds. Cuminaldehyde, cymene, and terpenoids are the major volatile components of cumin (Bettaieb *et al.*, 2011) [3]. Considering the nutritional and medicinal value of cumin and curry leaves, the present research work was planned and conducted with main objectives to standardize the level of curry leaves (*Murraya koenigii*) and cumin(*Cuminum cyminum*) powder in paneer and work out the production cost of paneer.

Material and Methods

Fresh, clean whole buffalo milk was procured from Livestock Instructional Farm of Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola and utilized for preparation of flavoured paneer. Good quality of curry leaves was purchased from local market of Akola city. Good quality Curry leaves were first cleaned properly then fried and grinded in mixer grinder for preparation of powder. Powder was use for experiment purpose as per treatments. Good quality Cumin was roasted on low flame until gives specific aroma then grinded it in mixer and used powder for experiment purpose as per treatments. Paneer was prepared as per the procedure standardized by Aneja *et al.* (2002) with slight modifications. Total 07 treatments were planned and conducted by addition of curry leaves and cumin powder and their combinations in buffalo milk as Control (T₁), 0.2% Curry leaves powder (T₂), 0.4% Curry leaves powder (T₃), 0.2% Cumin powder (T₄), 0.4% Cumin powder (T₅), 0.2% Curry leaves powder + 0.2% Cumin powder (T₆) and 0.4% Curry leaves powder + 0.4% Cumin powder (T₇) with 04 replications.

Sensory evaluation: Sensory evaluation was performed by 9 point numeric score card as prescribed by Pal and Gupta (1985).

Cost of production: Cost of production of paneer was calculated by considering the prevailing rates of raw material, labour charges, gas, and electricity and other miscellaneous charges, etc.

Statistical analysis: The data was tabulated and analyzed by employing Completely Randomized Design (CRD) using seven treatments with four replications as prescribed by Sheoran *et al.* (1998).

Results and Discussion

Sensory evaluation value added Paneer blended with curry leaves and cumin powder: The samples of fresh spicy paneer were subjected to sensory evaluation by well-trained panel of judges. The evaluation was done for the flavour, body and texture, colour and acceptability, taste and overall acceptability of paneer by using "9 Point Hedonic Scale". The data obtained by the sensory evaluation of paneer are presented in the Table 1.

Colour and appearance of paneer

The colour and appearance of paneer was significantly varies due to addition of different level of spices and their combinations. The highest score (8.938 out of 9) was received by paneer prepared from blending buffalo milk with combination of 0.2% curry leaves and 0.2% cumin powder as compare to other treatments. The obtained results were in close agreement with Gole (2019) [4] shows that significant effect by addition of different levels of spices with buffalo milk on colour and appearance of paneer. It shows variation in colour and appearance score according to concentration of spices and their combinations. Himabindu *et al.* (2017) observed that the score for colour and appearance of cottage cheese blended with spice was increased with incorporation of black pepper. Omer (2014) that colour and appearance score of soft white cheese enhanced with addition of cumin. Shweta Buch *et al.* (2014) reported that the score for colour and appearance of paneer enhanced with incorporation of turmeric.

Table 1: Effect of different levels of curry leaves and cumin powder on sensory quality of value added spicy Paneer

Treatments	Mean values of scores obtained for four replications ($P < 0.05$)			
	Colour and Appearance	Flavour	Body and texture	Overall acceptability
T ₁	7.093	6.838	7.125	7.138
T ₂	7.338	7.155	7.530	7.450
T ₃	8.550	8.553	8.470	8.563
T ₄	6.413	6.225	6.563	6.413
T ₅	8.100	8.130	8.150	8.138
T ₆	8.938	8.905	8.863	8.875
T ₇	7.963	7.608	7.873	7.888
'F' test	Sig	Sig	Sig	Sig
SE (m) +/-	0.040	0.035	0.020	0.038
CD at 5%	0.120	0.105	0.059	0.113

Flavour of paneer

Significantly highest score (8.905 out of 9) was obtained from paneer prepared with combination of spices at 0.2% curry leaves powder and 0.2% cumin powder. The mild pleasant flavour was realized in paneer prepared with addition of 0.2% curry leaves powder and 0.2% cumin powder in combination which is indicated by treatment T₆. It is observed from the above findings that the blending of buffalo milk with different spices and their combinations in various proportions was produce good quality of paneer to increase upto 0.2% of spices mixing with buffalo milk. This might be due to acceptable level of spices in treatment T₆ of paneer which produces pleasant flavour. These results was also in agreement with Gole (2019) [4] who reported that the mixing of buffalo milk with cumin and black pepper powder in various proportions and combinations produces good quality of paneer and shows highest flavour score of (43.25 out of 45) obtained from 0.4% cumin and 0.4% black pepper powder paneer (T₇). Omer (2014) that flavour score of soft cheese increases with addition of cumin oil.

Body and texture of paneer

It was observed that, body and texture of paneer varies significantly due to addition of spices and their combinations. Significantly highest score (8.863 out of 9) was obtained from paneer prepared with combination of spices at 0.2% curry leaves powder and 0.2% cumin powder. Hence, result indicates that the treatment T₆ was superior over rest of the treatments which had soft body and smooth texture paneer. The result observed in above investigation for body and texture is more or less similar to result showed by Gole (2019) [4] that the body and texture score of paneer in treatment T₇ was (33.50 out of 3) superior over other treatments. It shows that the score differs by the mixing of buffalo milk with different levels cumin and black pepper and their combinations. Anju Boora Khatkar *et al.* (2017) who suggested score for body and texture paneer increased with addition of cinnamon spice.

Overall acceptability of paneer

The overall acceptability of paneer was significantly varies due to addition of spices and their combinations. Significantly highest score (8.875 out of 9) was recorded in paneer prepared by blending 0.2% curry leaves and 0.2% cumin powder in combination with buffalo milk as compare to other treatments. These results were in agreement with results showed by Anju Boora Khatkar *et al.* (2017) that the score for overall acceptability of paneer increased with the addition of cinnamon spice. Gole (2019) [4] shows that, paneer prepared

from buffalo milk (T₁) and blending of buffalo milk with different spices like cumin and black pepper individually and in combinations while treatment with 0.4% cumin and 0.4% black pepper (T₇) was found superior than other treatments.

Cost production of paneer

The effect of curry leaves powder, cumin powder and their combinations in preparation of paneer under various treatments was studied on cost structure presented in Table 2. The cost of production of 1 kg paneer under various treatments was calculated by considering cost of finished product. The present investigation clearly indicated that the cost of production of paneer showed slight variation due to addition of curry leaves and cumin. It is observed that overall

change in cost of production was non-significant because very small quantity of curry leaves and cumin were added in paneer. The data showed slight increase in the rate of paneer can be compensated with improved flavour, taste and value addition of paneer due to incorporation of curry leaves and cumin which had different medicinal properties. The present findings are in line with Gole (2019) [4] observed that the cost production increased considerably due to blending of cumin and black pepper powder but which can be compensated with flavour and acceptability of product as ready to eat spicy paneer as snacks also. Mrunali Mhatre (2018) concluded that addition of ginger juice increased the cost of production of paneer as compared to control paneer.

Table 2: Estimation of cost structure of 1 kg paneer production from buffalo milk blended with curry leaves, cumin powder and their combinations

S. No.	Particular	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇
1	Ingredients used							
a.	Buffalo milk(lit)	1	1	1	1	1	1	1
b.	Curry leaves powder (g)	00	0.45	0.9	00	00	0.45	0.9
c.	Cumin powder (g)	00	00	00	0.45	0.9	0.45	0.9
d.	Citric acid (g)	2	2	2	2	2	2	2
e.	Salt (g)	5	5	5	5	5	5	5
2.	Cost							
a.	Buffalo milk @ Rs./lit	40	40	40	40	40	40	40
b.	Curry leaves (Rs.70/50g)	00	0.63	1.26	00	00	0.63	1.26
c.	Cumin (Rs.15/50g)	00	00	00	0.135	0.27	0.135	0.27
d.	Salt (Rs.19/kg)	0.095	0.095	0.095	0.095	0.095	0.095	0.095
3.	Cost of coagulant citric acid @ (Rs.96/100g)	1.92	1.92	1.92	1.92	1.92	1.92	1.92
4.	Cost of processing (i.e. utensil, handling, labour etc.) (Rs.)	10	10	10	10	10	10	10
5.	Total cost of production of paneer (Rs)	52.015	52.645	53.275	52.150	52.285	52.780	53.545
6.	Quantity of paneer obtained (g)	225	225	225	225	225	225	225
7.	Cost of production of 1 kg paneer (Rs.)	231.177	233.977	236.777	231.777	232.377	234.577	237.977
8.	% increase in cost production as compared to control (T ₁)	-	1.20%	2.36%	0.25%	0.51%	1.19%	2.85%

Conclusions

On the basis data obtained during present investigation this is concluded that sensory quality of paneer in respect of flavour, colour and appearance, body and texture and overall acceptability for 0.2% curry leaves powder and 0.2% cumin powder in manufacture of paneer could scored more score than the rest of the inclusion level of spices without any off flavor shored acceptability of product. The cost of paneer was slightly increased i.e. Rs. 231.177 per kg (T₁) to Rs. 237.977(T₇) per kg by addition of different levels of curry leaves powder, cumin powder and their combinations for preparation of paneer which can compensated with the flavour, medicinal and nutritional values of product.

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