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Comparative study of paneer cutlets prepared with potato and mushroom

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Abstract

The present study was intended to standardize and compare the effect of potato and mushroom in the preparation of paneer cutlet. Paneer with shredded potato (T1) as a base (1:1) and paneer with mushroom (T2) as a base (1:1) was taken for the preparation of paneer cutlet. Paneer cutlets were subjected to physico-chemical properties, proximate estimation and sensory evaluation. Results revealed that, cooking yield of paneer cutlets prepared with potato is significantly ($P \leq 0.05$) higher than the paneer cutlet prepared with mushroom. Rusk powder pickup, pH, moisture, crude protein, crude fibre were significantly ($P \leq 0.05$) higher in paneer cutlet prepared with mushroom than the paneer cutlet prepared with potato. Mean sensory scores *viz.* Flavour, juiciness, tenderness, mouth coating of paneer cutlets prepared with mushroom were significantly ($P \leq 0.05$) higher when compared to that of paneer cutlets prepared with potato.

Keywords: Paneer cutlets, shredded potato, mushroom, quality characteristics

Introduction

Paneer is a delicacy that vegetarians as well as non vegetarians love alike. One very simple yet tasty way to eat it is making paneer cutlets. Paneer cutlets are ready to eat/food provides suitable option for consumers in today's busy lifestyle. It has a mouth melting texture with a perfect crunch. Paneer is one of the popular and good source of high quality protein and iron, omega 3, calcium, magnesium, which makes it an even healthier choice. Potatoes are a good source of fiber, carbohydrates, also contains dietary antioxidants, phytonutrients. It is good source of vitamins B1, B3, B6 and several micronutrients, vitamin-C, calcium, iron and minerals. Mushrooms are basically fungi, which have a fleshy and spore bearing fruiting body. They have been in use not only for consumption purposes but also for medicinal purposes. Mushroom contains proteins, vitamins, minerals, antioxidants and consists of all essential amino acids including lysine required in human diet. Mushrooms also contain vitamin-C, D, K, folic Acid, riboflavin, thiamine, pantothenic acid, niacin minerals like sodium, potassium, calcium, phosphorus, iron. The present study was carried out to standardize and compare the effect of potato and mushroom in the preparation of paneer cutlet.

Materials and Methods

Basic formulation of ingredients for the preparation of products are presented as percentages in table-1.

Table 1: Basic formulation of ingredients for the preparation of products

Paneer potato cutlets (T1)	Paneer mushroom cutlets (T2)
Paneer- 40.52%	Paneer- 40.52%
Potato-40.52%	Mushroom-40.52%
Onions-10.29%	Onions-10.29%
Green chillies-1.01%	Green chillies-1.01%
Ginger-1.01%	Ginger-1.01%
Chicken masala- 0.60%	Chicken masala- 0.60%
Red chilli powder-0.14%	Red chilli powder-0.14%
Pepper-0.10%	Pepper-0.10%
Salt-0.92%	Salt-0.92%
Vegetable oil-4.06%	Vegetable oil-4.06%
Bread crumbs-0.83%	Bread crumbs-0.83%
Total-100%	Total-100%

Source of raw materials

Potato (*Solanum Tuberosum*), Mushroom (*Agaricus Bisporus*), Milk, spices, eggs, table salt (Tata Chemicals Ltd), condiments (onions, ginger, green chillies), vegetable oil (Freedom Refined Sunflower Oil-Reliance Retail), bread crumbs were purchased from the local s-mart. Condiments mix was prepared by peeling of onion, green chilli, ginger, cutting them into fine pieces and mixing with the help of mixer

Methodology for preparation of paneer potato cutlets and paneer mushroom cutlets

Paneer was prepared using fresh buffalo milk on the day of each trail. Fresh potatoes were shredded after boiling. Mushrooms were boiled for 15 minutes. The condiments, spices were fried in the oil till the appearance of golden brown colour. Paneer with shredded potato as a base and paneer with mushroom as a base was taken 1:1 ratio for the preparation of paneer potato cutlets and paneer mushroom cutlets respectively. After uniform mixing of all the ingredients, the batter was moulded into cutlets. The cutlets

$$\text{Rusk powder pick up\%} = \frac{\text{Weight of product after breading} - \text{Weight of cutlets before dusting}}{\text{Weight of the cutlets before dusting}} \times 100$$

Proximate Composition

Moisture, crude protein, crude fat, crude fiber, total ash of products were determined by standard procedure of Association of Official Analytical Chemist 1995 methods

Sensory Evaluation

Sensory evaluation of the products were determined with the help of panellists of 5 members of CVSc. proddatur using 8 point descriptive scale.

Statistical Analysis

The experiment is repeated for three trails. The data obtained from each experiment was analyzed for mean Standard Errors, t value and P value and is summarized in the table

Results and Discussion

Mean values of the physico-chemical characteristics of products are presented in the table-2, 3. Compared to paneer potato cutlets, paneer cutlets incorporated with mushroom showed a decrease ($P \leq 0.05$) in cooking yield. In fact, the high cooking loss was from the mushroom-based cutlets. This could be attributed due to high loss of moisture and fat during cooking (Wan Rosli. *et al.* 2011) [26]. Rusk powder pick up of paneer cutlets prepared with mushroom is significantly ($P \leq 0.05$) higher than the paneer cutlets prepared with potato. This might be due to the highest moisture content in the mushroom which facilitates the large pick up of the rusk materials (Essien, 2000) [9]. Moisture content in the paneer cutlets prepared with mushroom is significantly higher ($P \leq 0.05$) than the paneer cutlets prepared with potato. This might be due to higher moisture content in mushroom as Gosh *et al.* (1991) [12], Mattila *et al.* (2001) [18], Yang *et al.* (2001) [27], Hassan (2002) [14], Medany (2004) [19] and Bernas *et al.* (2006) [5] noted that the moisture content in (*Agaricus bisporus*) ranged from (88.6%) to (92.5%) per 100g fresh weight, while moisture content in potatoes ranges from 75-85% (R. j. Norell *et al.*, 2016) [23]. Crude protein is significantly ($P \leq 0.05$) higher in paneer cutlets prepared with mushroom than the

were dipped in the whole egg liquid and rolled in rusk powder till uniform coating was formed on the surface. The cutlets were deep fried in sunflower oil for 3 minutes till the appearance of golden brown colour and the measure the internal core temperature (80°C) and excess fat was removed from the fresh cutlet with the help of tissue paper.

PH

The Product's pH was determined as per (Keller *et al.*, 1992) [16].

Cooking yield

The cooking yield of products were estimated as per (Murphy *et al.*, 1975) [20].

$$\text{Cooking yield \%} = \frac{\text{Weight of product after frying}}{\text{Weight of product after breading}} \times 100$$

Rusk powder pick up

The rusk pick up percent was determined as per (Hsia *et al.*, 1992) [15].

paneer cutlets prepared with potato. As per Ahmed (1995) [1], Madbouli and El Husseini (1996) [17], Hassan (2002) [14] and Medany (2004) [19] reported that the protein content in (*Agaricus bisporus*) is 24.0%, while potato contains 9.5% (Rust *et al.*, 1997; USDA) [24] of crude protein. The crude fiber of paneer cutlets prepared with mushroom is significantly ($P \leq 0.05$) higher than the paneer cutlets prepared with potato. Generally, in *Agaricus bisporus* crude fibres ranges from (13.07%) to (15.02%) as reported by Chang (1972) [7], Hassan (2002) [14] and Medany (2004) [19], crude fibre of potato ranges 1.49 ± 0.02 as reported by Arshad, A.*et al.* 2021. PH of the paneer cutlets prepared with mushroom is significantly ($P \leq 0.05$) higher than the paneer cutlets prepared with potato. This could be due to higher PH of mushroom and present findings are in agreement with Anon. 1962 [2].

Table 2: Effect of potato and mushroom on the physico-chemical characteristics of paneer cutlets

Parameters	Mean \pm SE	Mean \pm SE	t-value	P-value
	T ₁ (Potato)	T ₂ (Mushroom)		
Cooking yield	97.23 \pm 0.64	94.53 \pm 0.89	4.164*	0.044
Rusk pick up	8.54 \pm 0.11	9.89 \pm 0.33	4.13*	0.032
PH	5.76 \pm 0.147	5.99 \pm 0.172	3.91*	0.046
Moisture	45.11 \pm 1.21	48.94 \pm 0.983	3.82*	0.042
Crude protein	18.23 \pm 0.50	22.51 \pm 0.76	4.826*	0.037
Crude fat	20.12 \pm 0.16	20.16 \pm 0.42	0.712	0.983
Crude fibre	3.97 \pm 0.08	8.246 \pm 0.047	5.225**	0.006
Total ash	2.15 \pm 0.031	2.156 \pm 0.034	1.697	0.164

Mean \pm SE in a row differ significantly

Probability test and Two sample T-test. P-probability and t -T test

Mean sensory scores *viz.* flavour, juiciness, tenderness and mouth coating and overall acceptance of paneer cutlets prepared with mushroom were significantly ($P \leq 0.05$) higher when compared to that of paneer cutlets prepared with potato. This could be due to high rusk pick up and moisture contents in mushroom which makes panelists to score more for mushroom cutlets. (Rao and Delaney, 1995) [22].

Table 3: Effect of potato and mushroom on sensory characteristics of paneer cutlets

Parameters	Mean \pm SE	Mean \pm SE	t-value	P-value
	T ₁ (Potato)	T ₂ (Mushroom)		
Colour	7.83 \pm 0.16	7.83 \pm 0.16	0	1
Flavour	7.13 \pm 0.333	7.68 \pm 0.166	2.894*	0.041
Juiciness	7.5 \pm 0.288	8.45 \pm 0.24	3.032*	0.038
Tenderness	7.5	8.16 \pm 0.167	4.0*	0.016
Mouth coating	7.16 \pm 0.167	8.16 \pm 0.167	4.24*	0.013
Overall acceptance	7.16 \pm 0.167	8.16 \pm 0.167	3.53*	0.024

Mean \pm SE in a row differ significantly

Probability test and Two sample T-test. P-probability and t -T test

Conclusion

Mushroom addition into the products can be a strategy to develop products that can decrease fat and sodium consumption while increasing vegetable intake without compromising the quality and taste of consumers demand. The present study showed that paneer cutlets prepared with mushrooms could be used as a potential source of supplements by replacing regular potato addition.

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