

## Assessment of Sensory quality of Mushroom-incorporated Chapati

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**ABSTRACT:** People are increasingly consuming nutrient-dense foods like mushrooms because of the growing health consciousness in the society. Various edible mushroom varieties are excellent sources of protein, vitamins, and minerals, and they are low in calories, which play a significant role in the body when consumed. The current study's primary goal is to determine chapati's sensory quality when blended with mushroom powder in various amounts (5–20%). On a 9-point hedonic scale, the sensory evaluation was performed. According to the sensory information, the chapati with a 15% milky mushroom powder inclusion was rated highly among all the formulations. Consumers can acquire numerous health benefits from the mushroom value-added foods, which additionally boost the dietary value of the products.

**Keywords:** Nutrient-dense, milky mushroom, chapati, sensory evaluation.

### INTRODUCTION

According to Forde and Graaf (2022), the sensory qualities of foods significantly impact how individuals perceive their consumption. Consumer behavior towards an unidentified meal is influenced by numerous factors. It is essential to understand the food-related qualities of products because they serve as one of the key indicators of consumer willingness to try unfamiliar foods (Martins *et al.*, 2022).

Sensory evaluation plays a very important role in accepting or rejecting new food products. The panelist evaluates the product based on its appearance, colour, flavour, appearance, taste, texture, and smell (Capillas and Herrero 2021). Consumers are influenced by a variety of factors, including price, convenience, taste, overall look, and health-promoting qualities. Food acceptability is also greatly influenced by consumer traits like attitude towards innovation, preferences for particular food groups, or nutritional neophobia. Consumer acceptance is also influenced by social factors like the nation's economic, and political climate, or social conventions (Anusha *et al.*, 2022).

A total of 63 billion dollars are spent annually on the global mushroom market, which is made up of 54% cultivated edible mushrooms, 38% medicinal mushrooms, and 8% wild mushrooms (Grimm and Wosten 2018). The most prominent mushrooms in the world are *Agaricus bisporus*, *Lentinula edodes*, *Pleurotus species*, *Calocybe indica*, *Auricularia*

*auricula-judge*, *Volvariella volvacea*, and *Flammulina velutipes* (Royse *et al.*, 2017).

Mushrooms are regarded as a superior food because they contain very few calories, carbohydrates, fat, sodium, and cholesterol. Additionally, it also consists of significant levels of proteins, fiber, selenium, potassium, riboflavin, niacin, and vitamin D (Valverde *et al.*, 2015).

They have more than 100 medicinal properties, including antioxidant, anticancer, antidiabetic, antiallergic, immunomodulating, cardiovascular protector, anticholesterolemic, antiviral, antibacterial, anti-parasitic, anti-fungal, detoxification, and hepato-protective effects. They also protect against tumor development and improve inflammatory processes (Sivanesan *et al.*, 2017).

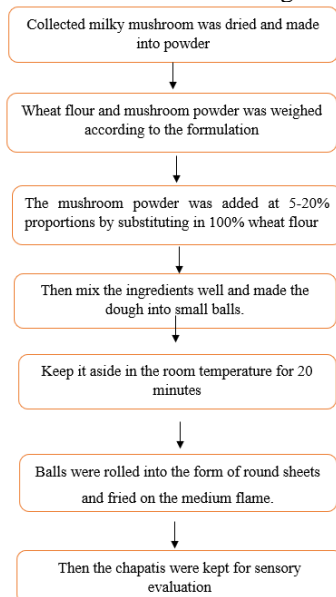
Since the earliest days, people have utilized mushrooms as food and traditional medicine, but they are aware that mushrooms might impact health. The Mushroom is considered a super food that is essential to the human diet for boosting immunity and overall health (Hamza *et al.*, 2023). They are not only used for medical and therapeutic purposes, but they are also used in biomaterials including insulation panels, bio-leather, bio-foams, and bio-composites for packaging (Elsacker *et al.*, 2020). To increase the enrichment of the food item, powdered mushrooms can be added. The primary goal of the current study is to determine the sensory effectiveness of milky mushroom powder incorporated with chapati.

## MATERIAL AND METHODS

This study was conducted in the Department of Food and Nutrition, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad. The sensory evaluation was done for the Milky mushroom (*Calocybe indica*) incorporated chapati.

### Preparation of chapati

**Sensory Evaluation.** Sensory evaluation was conducted with the help of 20 semi-trained panelists based on the 9-point hedonic scale (Meilgaard *et al.*, 1999). The samples were coded and given to the panelists to evaluate the product based on the scores. The panelists were suggested to drink water in between the different formulations while tasting chapati.



**Table 1: Mean sensory evaluation scores of milky mushroom powder incorporated chapati.**

Sample code	Appearance	Color	Flavor	Taste	Texture	Overall acceptability
Control	8.05±0.75 <sup>a</sup>	7.90±0.85 <sup>a</sup>	7.80±0.83 <sup>a</sup>	7.85±0.87 <sup>a</sup>	8.25±0.96 <sup>a</sup>	7.85±0.87 <sup>a</sup>
MMC1	7.80±0.70 <sup>a</sup>	8.05±0.51 <sup>a</sup>	7.75±0.63 <sup>a</sup>	7.70±0.73 <sup>a</sup>	7.65±0.67 <sup>a</sup>	7.85±0.48 <sup>a</sup>
MMC2	7.90±0.55 <sup>a</sup>	7.95±0.68 <sup>a</sup>	7.65±0.58 <sup>a</sup>	7.40±0.82 <sup>a</sup>	7.70±0.65 <sup>a</sup>	7.80±0.76 <sup>a</sup>
MMC3	8.10±0.64 <sup>a</sup>	7.90±0.44 <sup>a</sup>	7.80±0.61 <sup>a</sup>	7.70±0.86 <sup>a</sup>	7.70±0.73 <sup>a</sup>	7.90±0.64 <sup>a</sup>
MMC4	7.15±0.93 <sup>b</sup>	7.15±1.08 <sup>b</sup>	6.25±1.44 <sup>b</sup>	5.80±1.43 <sup>b</sup>	6.50±1.50 <sup>b</sup>	6.45±0.94 <sup>b</sup>
Mean	7.80±0.80	7.79±0.80	7.45±1.05	7.29±1.22	7.56±1.10	7.57±0.93
E <sub>m</sub>	0.07	0.08	0.10	0.12	0.11	0.09
CV%	10.25	10.26	14.09	16.73	14.55	12.28
CD	0.60	0.62	0.73	0.81	0.79	0.63
F-value	5.52	4.63	11.58	15.05	8.92	13.57
P-value	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**

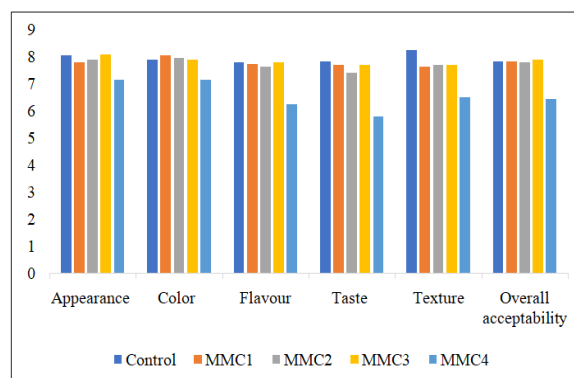
**Note:** Sensory Values are expressed as mean ± standard deviation of three replications. Values in the column with different superscripts are significantly different \*\*( $p < 0.01$ ), E<sub>m</sub>-Standard Error of mean, CV-Coefficient of Variance, CD- CD-Critical Difference.

Considering, the sensory results of all the formulations of milky mushroom incorporated chapati, the highest sensory attributes were recorded in the chapati which is incorporated with 15% milky mushroom powder (MMC3) where the scores ranged i.e., appearance (8.10±0.64), color (7.90±0.44), flavour (7.80±0.61), taste (7.70±0.86), texture (7.70±0.73) and overall acceptability (7.91±0.64) than the control chapati which are ranged from appearance (8.05±0.75), color (7.90±0.85), flavour (7.80±0.83), taste (7.85±0.87),

All the sensory results were analyzed statistically to test the significance of the results using percentages, mean, standard deviation, and analysis of variance (ANOVA) technique.

## RESULTS AND DISCUSSION

The chapati was prepared by substituting 100% wheat flour with Milky mushroom (*Calocybe indica*) powder at 5%, 10%, 15%, and 20% proportions. The milky mushroom powder incorporated chapati was organoleptically evaluated by the panelists. The sensory scores of the chapati may vary due to the appearance, color, flavor, taste, texture, and overall acceptability of each formulation. The best accepted chapati were selected considering the highest sensory scores which are represented in Table 1 and Fig. 1.



**Fig. 1.** Mean sensory evaluation scores of milky mushroom powder incorporated chapati.

texture (8.25±0.96) and overall acceptability (7.85±0.87).

In a similar study conducted by Mishra *et al.* (2018) in the mushroom fortified chapati, the sensory results of chapati varied from color (8.42±0.07), texture (8.32±0.08), flavor (8.31±0.07), taste (8.37±0.07) and overall acceptability (8.37±0.00) which were higher than the present study due to the change in the mushroom variety used and proportion of mushroom powder is varied.

All the formulations were found significantly different ( $p < 0.01$ ) when observed statistically. Relatively, the 15% milky mushroom powder incorporated chapati scored the highest sensory attributes when compared with the control chapati.

## CONCLUSIONS

The current investigation can conclude that the addition of milky mushroom powder to regularly consumed foods like chapati can boost the nutritious value. The 15% milky mushroom powder inclusion in the wheat flour was considered the most appreciated formulation based on the sensory results. Due to the nourishing value of mushrooms, new food products made from them must become popular and accessible to consumers of all ages.

## FUTURE SCOPE

Young entrepreneurs can start mushroom cultivation to increase their revenue. An awareness must be created among consumers about the positive effects of consuming mushroom value-added foods.

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**Conflict of Interest.** None.

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