

Mushroom consumption and purchasing behaviour in India: A study among selected respondents

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ABSTRACT

Edible mushrooms are going to be vegetables of future because of their nutritional and medicinal properties and their ability to produce high protein per unit area. However, mushroom as a vegetable is yet to find regular place among commoners. Meagre studies on perception of people on mushrooms and their consumption and purchasing behaviour are coming in the way to have thorough understanding about their prospects as an economic activity and demand in the market. The present investigation conducted over two years among 285 respondents who were trainees attending training on mushroom cultivation technology at Directorate of Mushroom Research, Solan (HP), India. Trainees' profile, their mushroom consumption behaviour, purchasing behaviour and non purchasing behaviour were studied and descriptive statistics was applied to analyse the data/information. The majority of respondents were male, educated, middle aged and belonged to medium to high income group. The mushroom consumption was found to be relatively less as perceived by themselves. White button mushroom was the most preferred variety followed by oyster mushroom and others. Colour, size and shape of mushroom were precedent over price in deciding their purchasing frequency. Nutritional qualities as well as adding variety to routine diet were equally important for their home consumption. The non purchasing behaviour of respondents highlights the non availability of fresh mushrooms in local market on regular basis. The study also reveals the opinion of people about mushrooms, which helps to arrive at suitable conclusions.

Keywords: Mushroom consumption, purchasing behaviour, descriptive analysis

The third-world countries are becoming vulnerable to shortage of food supply chiefly on account of increasing population and shrinking land available to agriculture. However, the imminent problem of malnutrition is equally threatening, as is shortage of food production. Such a predicament is forcing the policy makers to duly emphasise the importance of nutritious vegetables with higher productivity per unit land. Mushroom- being highly nutritious vegetable and cultivated indoor, has enough potential - although, unexploited till now - to offer timely solutions to the contemporary problems of food and nutritional security.

Mushroom is considered and propagated as complete health food owing to its high nutritive and medicinal value. Mushrooms are rich in proteins, dietary fibre, vitamins and minerals (Manikandan, 2011). On dry weight basis, different mushrooms contain 26-82 per cent carbohydrates and 12-35 per cent proteins. Presence of vitamin B and C, unsaturated fatty acids, amino acids and high K:Na ratio makes it ideal for heart patients, pregnant women, children and people suffering from infirmity. The obvious advantage of mushroom cultivation for farmers is its ability to use agricultural residues and less dependency on land.

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In India, though mushrooms are cultivated commercially since the 1970's and 80's, its consumption is hardly conspicuous till recently among the common people. The precise data on production and consumption of different edible mushrooms in India is lacking because of inadequate study in this area. Even the mushroom consumption behaviour studies are scarce causing obscure understanding about the perceptions and trends on mushroom consumption behaviour among people.

Moreover, the consumer preference and perception studies on mushrooms are vital as they lead us to develop appropriate extension methods to popularise mushrooms or promote particular variety of mushroom based on their preference in a locality. It is strikingly felt that, research thrust given to understand the marketing and consumption pattern of mushrooms is not commensurate to the significance it holds. Hence, need of the present study was felt to know the trends and perceptions about mushroom consumption and purchasing behaviour among the people.

MATERIALS AND METHODS

Present study was carried out during 2010-12 among participants of different national level training programs on mushroom cultivation technology. Selection of all the subjects for the study was deliberate to facilitate unbiased observations, as the trainees were randomly representing different states and regions of India. Data were collected using a structured and pretested questionnaire. The questionnaire was constructed keeping objectives of the study in mind. The questionnaire was a blend of closed ended and open ended questions to elicit objective data and to express free opinion wherever essential. Necessary care was taken to ensure objectivity in the data collection with appropriate instructions during the data collection.

The profile of the respondents was gathered with respect to age, sex, education, gross monthly income (as stated by the respondents), marital status, family size and the region they belong to in India.

The mushroom consumption behaviour was analysed based on the respondents' frequency of tasting different mushroom recipes, preference for mushroom variety, factors influencing their purchasing pattern and the consideration for mushroom consumption.

Three important recipes (Mushroom curry, Pickle/ Salad and any other recipe) were taken to analyse the respondents' frequency of testing them on six point likert scale. To know the preference for mushroom variety, five important varieties (White button, Oyster, Paddy straw, Shiitake and milky mushroom) cultivated commercially in different parts of India were considered. Only the first and second preferences of the respondents were considered for analysis. Preferences for varieties other than the five - cultivated commercially or grown naturally, were placed in 'Other' category. Three factors (Price, Colour, Shape and Size) were given to choose from, to know the important factors influencing the respondents' mushroom purchasing pattern. Principal consideration for opting to eat mushroom was analysed on three options (Good for health, add variety to routine diet and both).

The non-purchasing behaviour of consumers was analysed by giving possible reasons to choose from. The respondents were free to choose the multiple responses on this aspect as there could be more than one reason causing their non-purchasing of mushrooms. Descriptive statistics was applied to analyse and interpret the results.

RESULTS AND DISCUSSION

As mentioned before, the present investigation was necessitated considering the need to address the information gap on mushroom consumption behaviour and perception studies in India. Similar efforts were made by Lucier *et al.*, (2003) in the context of United States of America. Mayett *et al.*, (2006) while analysing the mushrooms consumption trends in Mexico, noted that, in spite of a steady

increase in mushroom production and consumption worldwide, a thorough understanding of consumption trends is not yet available. In developing countries, the importance of edible mushrooms within consumer preferences and perceptions has not been studied. Results of the present investigation are apposite in addressing the above concern. The results of the study are presented under different headings like profile characters of the trainees, frequency of

Table 1. Profile characters of respondents in the study

Sl. No	Criteria	Category	No. of respondents	Percentage
1	Participants of training programme	Farmers	146	30.53
		Entrepreneurs	87	51.23
		Scientists	52	18.25
2	Gender	Male	246	86.32
		Female	39	13.68
3	Age (In Years)	<20	6	2.11
		21-30	112	39.30
		31-40	85	29.82
		41-50	55	19.30
		>50	27	9.47
4	Education	10 std or below	33	11.58
		XII	38	13.33
		Graduate	100	35.09
		Post graduate	78	27.37
		PhD and others	36	12.63
5	Marital Status	Married	109	38.25
		Unmarried	176	61.75
6	Gross Monthly Income (In Rs)	< 10000	60	21.05
		10000-25000	71	24.91
		25000-50000	78	27.37
		50000-100000	44	15.44
		>100000	32	11.23
7	Family size (No of members in the family)	1	2	0.70
		2	11	3.86
		3	42	14.74
		4	112	39.30
		5	118	41.40
8	Participants from	Northern India (J&K, HP, Punjab, Haryana, Chandigarh, UP, UK, MP)	180	63.16
		Southern India (Kar, Ker, TN, AP)	34	11.93
		Western India (Guj, Raj, Mah, Goa)	41	14.39
		Eastern India (WB, Orissa)	23	8.07
		North- Eastern India	5	1.75
		Abroad	2	0.70

mushroom consumption, preference for variety, factors influencing mushroom purchasing behaviour and reasons for non purchasing behaviour.

Profile characters of the trainees

The trainees belonged to three different categories of training programmes. Out of the total 285 trainees, 146 belonged to farmers training, 87 belonged to entrepreneurs training and 52 belonged to training programmes for scientists. Majority of the trainees were male (H≈86 per cent), unmarried (H≈62 per cent), middle aged between 21-40 years (H≈69 per cent), and middle income group (H≈52 per cent with income between Rs 10,000-50,000). The trainees were mostly representing larger families than the smaller ones. The trainees in 10 different training programmes (five for farmers, three for entrepreneurs and two for scientists) conducted represented 25 Indian states, 2 Union territories and only 2 trainees were from abroad. Highest numbers of trainees were from Himachal Pradesh where the Directorate of Mushroom Research is located and the climate is considered most suitable for growing mushrooms naturally for most part of the year. From the North Eastern states (including Sikkim) only 14 trainees took part. The details of the trainees’ profile are presented in table 1.

Income and education level had positive association with mushroom consumption behaviour among the respondents. The coefficient of correlation for income and education with mushroom consumption frequency was 0.80 and 0.71 respectively.

Patterson (2003) reported that income, education and occupation level had significant association with mushroom consumption in USA. The findings of Mayett *et al.*, (2006) also followed same pattern in Mexico. In the present investigation also, the mushroom curry, mushroom salad/ pickles were tasted most frequently and frequently by the high income and high educated people. To add to these results, the trainees from North India were found to be frequent purchasers than the rest of the regions of the country. However, this needs to be studied separately on larger sample size to generalise the results.

Frequency of mushroom consumption

All the 285 respondents responded on frequency of consuming three different recipes viz., mushroom curry, mushroom salad/pickle and other recipe. Out of these, 12 people never tasted mushroom curry and 60 never tasted pickle or salad and 84 never tasted other recipe of mushroom. The ‘never tasted’ response is very low for mushroom curry, where as it is higher for pickle/salad (H≈21.00 per cent) and other recipe (H≈30 per cent). For all the three listed class of mushroom recipe, the ‘most frequently’ has received relatively lesser score. This indicates that, apart from mushroom curry, other forms of mushroom recipes are not popular among the people and frequency of mushroom consumption is also on the lower side. Though, mushroom is an exotic vegetable, its popularity has been rising ever since its introduction of commercial cultivation in India starting from early 1980s. However, it is yet to find regular place in commoner’s kitchen. The

Table 2. Frequency of mushroom consumption by respondents (Figures in parenthesis are expressed as percent of respondents)

Sl. No	Mushroom Recipe	Never tasted	Very rarely	Rarely	Occasionally	Frequently	Most frequently
1	Mushroom curry	12 (4.21)	34 (11.93)	40 (14.03)	138 (48.42)	42 (14.73)	19 (6.66)
2	Pickle or salad	60 (21.05)	61 (21.40)	48 (16.84)	45 (15.78)	51 (17.89)	20 (7.01)
3	Other recipe	84 (29.47)	69 (24.21)	55 (19.30)	48 (16.84)	23 (8.07)	6 (2.11)

majority responses are accumulated between very rarely to occasionally for mushroom curry (H≈75.00 per cent) followed by other recipe (H≈60.00 per cent) and by pickle or salad (H≈54.00 per cent). This is also a case for identifying the reasons for limited consumption and identifying possible measures to improve the same among the people. The details of frequency of mushroom consumption are presented in table-2.

Preference for variety

The response of the participants on preference showed highly skewed results. Of all the trainees, 258 responded to this question. Out of these, 206 (H≈80 per cent) said white button mushroom is their first choice mushroom while only 42 (H≈20 per cent) preferred other varieties as their first choice. Among the 42 respondents preferring other varieties as their first choice, oyster mushroom received highest response (H≈9 per cent) followed by paddy straw mushroom (H≈5 per cent). Milky mushroom and shiitake mushroom was preferred by very few respondents as first preference. Among the ‘Other’ category, people indicated mostly mushrooms available in their local markets collected from their natural habitats. These included mostly *Gucchi (Morchella)*. Since, the white button mushroom was by far the highest preferred by 206

Table 3. Preferences of respondents for different mushroom varieties (Figures in parenthesis are expressed as percent of respondents)

Sl. No	Preference for variety	I preference	II preference
1	White button mushroom	206 (79.85)	40 (15.50)
2	Oyster mushroom	24 (9.30)	92 (35.65)
3	Paddy straw mushroom	13 (5.03)	59 (22.86)
4	Shiitake mushroom	3 (1.16)	34 (13.17)
5	Milky mushroom	4 (1.55)	17 (6.60)
6	Other mushroom	8 (3.10)	16 (6.20)
		258	258

respondents, the second preference of these 206 respondents assumes importance in determining the next preferred variety. Oyster mushroom was preferred next followed by paddy straw mushroom and shiitake mushroom in that order.

Patterson (2003) reported from a sample survey that, 94 per cent of consumers in USA preferred white button mushrooms followed by portabella and other mushrooms. Mayett *et al.*, (2006) reported that, white button mushrooms were the most widely consumed (77 per cent), while *Pleurotus* (22.1 per cent) and *Lentinula/shiitake* mushroom (0.2 per cent) represented a lower proportion in Mexico. Consumers from the high social level bought more mushroom species and product lines than the medium and low levels.

Factors influencing mushroom purchasing behaviour

Among the three factors mentioned, colour of the mushroom was influencing majority (H≈48 per cent) of the respondents’ opinion in purchasing the mushrooms. The next factor influencing the purchase was the shape and size (H≈28 per cent) where as price was influencing least (22 per cent) on their purchase. If Colour and size and shape of mushroom represents the quality of mushrooms, it can be assumed that, consumers preferred quality over price while purchasing

Table 4. Factors influencing the mushroom purchasing behaviour of respondents (Figures in parenthesis are expressed as percent of respondents)

Sl. No	Factor	I preference	II preference
1	Price	56 (22.6)	114 (45.96)
2	Colour	119 (47.98)	75 (30.24)
3	Shape and size	73(29.43)	59 (23.80)
		248	248

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Table 5. Important consideration of respondents while purchasing mushrooms

Sl.No	Consideration	Number	Per cent
1	Good for health (alone)	74	29.13
2	To add variety to the diet (alone)	52	20.47
3	Both	128	50.40
		254	100.00

mushrooms. However, for those colour or size and shape was most influencing factor, price was second most important factor (H≈46 per cent) influencing the purchase of mushrooms. Hence, price does matter at least in the second level for consumers. Hence, it is important to ensure their cheap availability in the market along with quality and freshness of the mushrooms.

Reasons for non-purchasing behaviour

Along with the mushroom purchasing behaviour of consumers, the non purchasing behaviour is equally important as it gives useful

insights in analysing the reasons for lesser consumption of mushroom among the consumers.

The possible reasons causing the non-purchase of mushrooms are presented in decreasing order of their responses in table-3. Non availability of mushrooms in the local market and lack of fresh mushrooms in the market are two prime reasons of non purchase of mushrooms by the respondent consumers. Of all the respondents, more than half said that, non availability of mushrooms in the market hinders their purchasing frequency. Nearly 40 per cent said that mushrooms available in market are not fresh. The third reason in the order is about the respondents' unawareness about making different recipes from the mushrooms. Non availability of different varieties of mushrooms is another important cause of their non-purchasing. This category of respondents (H≈28 per cent) wishes to taste different varieties of mushrooms on occasions. However, they are not finding them in the market is a cause for non-purchase.

Table 6. Reasons for non purchase of mushrooms among the consumers (in decreasing order of frequency)

Sl. No	Statement	Total responses	Per cent of respondents
1	Non availability of mushrooms in the market hinders my purchasing frequency	149	52.28
2	Mushrooms available in the market are not fresh	112	39.30
3	Do not know how to make different mushroom recipes	81	28.42
4	Non availability of different varieties of mushrooms in the market hinders my purchasing behaviour	79	27.72
5	Unaware about their nutritional properties	68	23.86
6	Higher price of Mushrooms compared to other vegetables hinders my purchasing frequency	65	22.81
7	All family members do not like mushrooms	34	11.93
8	They cannot be stored for longer duration	28	9.82
9	It is not tasty	22	7.72
10	Fear about mushrooms being poisonous	9	3.16
11	Mushrooms are grown on compost	7	2.46
12	It is non vegetarian food	6	2.11

Nearly one fourth of the respondents are unaware about the nutritional and medicinal qualities of mushrooms. Though, the education level of respondents in the present study is relatively high, their unawareness about the nutritional and medicinal qualities of mushrooms is surprising. This calls for emphasising on publishing regular articles on nutritious aspects of mushrooms in vernacular print medium. About 22 per cent said that, they avoid purchasing mushrooms as they feel that the prices of mushrooms are much higher than other vegetables. The surveys by Lucier *et al.*, in the 1990s and early 2000 in USA though, helped nutrition experts and policy analysts; they were unable to explain how price influences mushroom consumption. They also do not differentiate between the characteristics of consuming and non-consuming individuals (Patterson, 2003).

The last three ranked responses in non purchasing behaviour analysis are kind of myths about the mushrooms among the public.

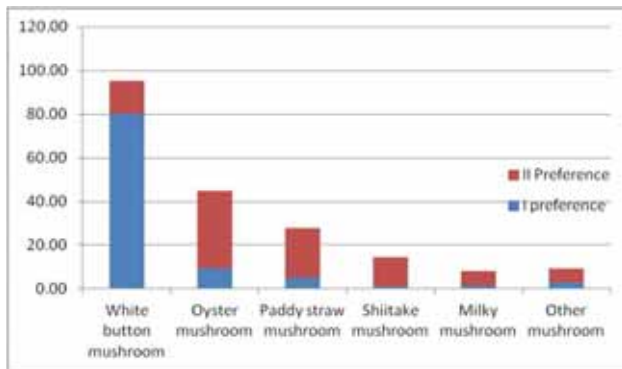


Fig. 1. Preferences of respondents (in per cent) for different varieties of mushrooms

Their less frequency though is comforting; it should be seen in the background of mostly literate respondents. Hence, it would be an interesting study to analyse the perception among the general public on these aspects in different regions of the country. Though, the results of the present study are not apt for generalising for whole of India, it might serve as a lead for researchers to probe further to generate information focusing on specific mushrooms in different regions of the country.

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