Himachal Journal of Agricultural Research
Volume 51, Issue 2, December 2025; pp. 316–320; DOI: 10.18311/HJAR/2025/53870
INFORMATICS JOURNALS
Agricultural Economics

Spatiotemporal Analysis of Edible Mushroom Consumption Patterns in Selected Districts of Himachal Pradesh

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Abstract

Mushrooms valued for their rich nutritional and health benefits, are increasingly recognized as functional foods and sustainable dietary choices. Despite this, their regular inclusion in Indian diets remains limited. This study surveyed 100 households across four districts of Himachal Pradesh to assess consumption patterns, preferences and barriers to edible mushroom use. Results indicate that most households consume mushrooms infrequently typically once or twice a month with a strong preference for button mushrooms (*Agaricus bisporus*) purchased from local markets. Other varieties like oyster or wild mushrooms are rarely consumed reflecting limited market diversity and consumer awareness. Key barriers to increased consumption include high prices, short shelf life, poor storage and unavailability, while cultural factors play lesser role. The study underscores the need for improved supply chains, storage facilities and public awareness to promote regular mushroom consumption. Enhancing these factors could make mushrooms a more prominent and sustainable part of local diets.

Keywords: Constraints, Consumption, Diet, Mushrooms, Survey

Mushrooms belong to a diverse group of fungi that have been recognised for centuries for their culinary uses and medicinal benefits (Nidhi *et al.* 2023; Thakur *et al.* 2023). Recent scientific studies have emphasized the extensive benefits of mushroom establishing them as important functional food and promising nutraceuticals (Lysakowska *et al.* 2023). Mushrooms are an excellent source of high-quality protein, dietary fiberand essential vitamins such as B-complex, Cand D (Dhiman *et al.* 2025). In addition to their nutritional value, they contain a range of bioactive compounds including β-glucans and phenols which contribute to their recognized health-promoting properties (Ogwu *et al.* 2025). With their minimal environmental impact and ability to grow on agricultural waste, mushrooms stand out as an eco-friendly and sustainable food option (Bringye *et al.* 2021). Despite their well-documented nutritional and environmental benefits mushroom consumption in India remains limited often restricted to urban populations or individuals with a health-conscious lifestyle (Shirur *et al.* 2014). Gaining insights into consumer behaviour is therefore critical to closing this gap and promoting mushrooms as an integral part of everyday diets (Shirur *et al.* 2015). Many consumers are still unaware of the nutritional benefits mushrooms offer, while others are discouraged by inconsistent availability, weak supply chains or cultural perceptions that frame mushrooms as non-essential or unfamiliar food items. These issues are further compounded by the perishability of fresh mushrooms which poses

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Manuscript received: 30.07.2025; Accepted: 19.08.2025

logistical challenges in areas lacking adequate cold-chain infrastructure.

Socio-economic factors such as income, education and urban residence strongly influence dietary habits including the frequency of mushroom consumption (Patterson 2003; Mayett *et al.* 2006). Households with higher education levels and better market access are more likely to view mushrooms as part of a health-conscious or gourmet lifestyle. However, such trends are not yet widespread and there is a shortage of comprehensive, grassroots-level data on mushroom consumption behaviour within Indian households. This gap limits the effectiveness of targeted interventions and the development of sustainable market strategies. Moreover the trainings conducted by various government and non- government organizational helps to bridge the gap between growers and consumers to some extent by creating awareness among the respondents (Sud *et al.* 2013). This study aims to address that shortfall by investigating the mushroom consumption patterns of 100 households. It explores how frequently mushrooms are consumed, which varieties are preferred, where consumers source them and what challenges limit their use.

MATERIALS AND METHODS

The study was conducted across four districts of Himachal Pradesh *i.e.* Kangra, Mandi, Hamirpur and Solan to assess mushroom consumption behaviour and gather related socio-demographic information. A total of 100 participants from these districts took part in the survey ensuring a representative subset of the local population. A systematically organised questionnaire was designed in accordance with the study's primary objectives. The questionnaire included clearly defined, closed-format questions to ensure consistency in responses. To ensure the data collected was unbiased and reliable, thoughtful measures were taken throughout the process. Clear, consistent instructions were provided to guide the participants which helped to maintain neutrality and integrity during data collection. Information about each respondent was collected in relation to their age, gender, level of education, self-reported gross monthly income, marital status, family size, and the specific district of Himachal Pradesh they belonged to (Shirur *et al.* 2014).

The study explored mushroom consumption behaviour by analysing the types of mushrooms people preferred, the key factors that influenced their buying decisions and the reasons they chose to include mushrooms in their diets. Mushroom consumption patterns showed considerable variation among respondents with intake classified into five distinct frequency groups *i.e.* daily, several times per week, once weekly, one to two times per month and occasionally. To assess preferences for mushroom varieties, the study focused on three key types *i.e.* white button (*A. bisporus*), oyster (*Pleurotus* spp.) and wild mushrooms that are cultivated across various regions of Himachal Pradesh.

RESULTS AND DISCUSSION

The investigation was prompted by a noticeable lack of comprehensive research on how Indian consumers perceive and incorporate mushrooms into their diets. Although, commercial mushroom cultivation has been practiced in India since the 1970s and 1980s, their inclusion in everyday meals remains sporadic. This is especially true in rural and semi-urban areas, where limited awareness and accessibility continue to hinder regular consumption (Shirur *et al.* 2014). A study conducted by Shah (2021) in Gujarat found that around 16% of participants believed mushrooms to be non-vegetarian and this shows a reflection of how cultural myths and misinformation still shape food choices. The survey which included 213 respondents from various age groups, revealed that such misconceptions are especially common in communities where vegetarianism is deeply rooted. While the study sheds light on important regional attitudes and its scope is limited to a specific geographic area and does not fully represent the diversity of beliefs found across India. Consequently, there is a strong and ongoing need for broader, nationwide research efforts that can guide the development of inclusive policy frameworks and support well-informed awareness initiatives.

Respondent Profile

The survey covered 100 households, revealing key demographic, social, and economic characteristics relevant to mushroom consumption behaviour. Most respondents were male (93%), with female participation limited to 7%. The average age of household heads

was 58 years, indicating a predominantly mature demographic engaged in decision-making related to food. Caste distribution showed that 78% of households belonged to the General Category while 21% were from Scheduled Castes and only 1% from Scheduled Tribes. A significant majority (75%) lived in nuclear family settings which may influence food diversity and consumption patterns due to smaller household sizes. In terms of food preferences, 55% of respondents followed a vegetarian diet, while 45% identified as non-vegetarian. All participants identified as Hindu, suggesting cultural homogeneity in religious practices within the study area. Educational attainment was relatively high with 55% of household heads being graduates or postgraduates, 25% completing higher secondary education and only 3% reporting no formal schooling. This education level could play a role in food awareness and openness to dietary diversity.

Occupational profiles showed that 28% of household heads were employed in government services, 31% worked in private-sector jobs, 19% were engaged in trade or business, and 14% were self-employed. Only 8% reported no formal employment. Most spouses were not engaged in income-generating work, possibly indicating traditional gender roles in household dynamics.The majority of households (35%) reported a monthly income between ₹1–2 lakhs, while 18% exceeded ₹2 lakhs. Despite this, 65% spent less than ₹10,000 per month on food and no household reported monthly on non-food expenses exceeding ₹20,000which highlighting relatively conservative spending habits even among higher earners. Most households were composed of two males and two female members, reflecting balanced gender ratios and suggesting medium-sized nuclear families as the dominant structure (Table 1).

Table 1. Socio-demographic characteristics of survey respondents in selected districts of Himachal Pradesh

S. No.	Criteria	Category	No. of Respondents
1.	Participants of training programme	Govt. employ	28
		Private firm	31
		Businessman	19
		Self- employed	14
		Non- working	8
2	Gender	Male	93
		Female	7
3	Education	Illiterate	Nil
		Read and write only with no formal education	03
		Primary	05
		Matriculation,	12
		Higher secondary +1 and +2),	25
		Graduate and above	55
4	Gross monthly income (In Rs.)	Upto 50,000/-	34
		50,000/- to 1 lakh	13
		1 lakh to 2 lakhs	35
		More than 2 lakhs	18
5.	Participants from	Mandi	20
		Kangra	30
		Hamirpur	30
		Solan	20
6.	Monthly total expenditure of the household (Rs.)		
i.	On Food items	Upto 10,000/-	65
		10,000/- to 20,000/-	35
		More than 20,000/-	Nil
ii.	On Non-food items	Upto 10,000/-	100
		10,000/- to 20,000/-	Nil
		More than 20,000/-	nil

Mushroom Consumption Behaviour and Preferences

Mushroom consumption was found to be infrequent across the sample. The majority of households consumed mushrooms only 1-2 times per month or occasionally with no household reporting daily consumption. Only 7% of respondents indicated eating mushrooms several times a week (Table 2). This reflects findings by Shirur *et al.* (2015) who noted that mushrooms are often treated as occasional rather than staple foods in Indian diets. With respect to varietal preference, all 100 households consumed only *A. bisporus* (button mushrooms). No respondents reported consuming oyster, milky, or wild varieties. This limited preference underscores a lack of awareness and market diversity,

Table 2. Frequency pattern of household mushroom consumption (based on 100 respondents) in selected districts of Himachal Pradesh

Scale	No. of Person
Everyday	Nil
1 time a week	16
Several times a week	7
1-2 times a month	48
Occasionally	32

as supported by previous studies (Shirur *et al.* 2014). The dominance of button mushrooms also reflects trends in consumer familiarity and availability rather than dietary exploration.

Sourcing patterns showed that local markets supplied 90% of mushrooms while 10% were purchased from street vendors. No household reported sourcing mushrooms directly from farms or cultivating them at home indicating a clear reliance on retail availability (Table 3). The combination of educated, income-stable households and low diversity in mushroom types consumed suggests that accessibility and cultural familiarity, rather than affordability or awareness of health benefits, may be central barriers to expanding mushroom use. This aligns with the cultural perceptions highlighted in Shah (2021), where misconceptions such as viewing mushrooms as non-vegetarian and continue to influence consumer behaviour, particularly in traditionally vegetarian communities.

Constraints in Mushroom Purchase Behaviour

While more people are beginning to recognise mushrooms as both a nutritious and eco-friendly food option, they still aren't a regular part of most household meals. This section takes a closer look at the specific reasons shared by 100 surveyed households for why mushrooms are not frequently purchased. Based on the responses gathered from 100 households, several reasons emerged for why consumers choose not to purchase mushrooms. The most cited constraint was their higher price compared to other vegetables, which led 45% of households to view mushrooms as an occasional luxury rather than a routine purchase. Additionally, storage issues were a concern for 38% of respondents, as mushrooms have a short shelf-life and spoil quickly without refrigeration (Table 4).

Limited availability in nearby markets also discouraged 30% of households from purchasing mushrooms regularly, especially in rural or semi-urban areas where supply is inconsistent. Cultural factors still play a role for a smaller segment, 2% of respondents reported religious beliefs, such as considering

Table 4. Constraints in mushroom consumption (average of 100 households) behaviour of respondents in selected districts of Himachal Pradesh

Constraints	No. of Respondents
Due to higher prices compared to other vegetables.	30
Due to storage problems: Mushrooms can't be stored for longer duration.	25
Less availability in nearby mandi/ markets.	30
Religious belief/ consider mushrooms as non- vegetarian food.	2
Consider mushroom unsafe (poisonous) for consumption.	0
Do not like the taste of mushrooms.	7
Lack of awareness on cooking method.	0
Mushrooms available in the market are not fresh.	6
Unaware about health benefits and nutritional properties.	Nil
Mushrooms are not edible.	Nil

Table 3. Consumption of mushrooms during last 30 days in the household (average of 100 households) in surveyed districts

Mushroom	Quantity Consumed (Kg)	Price/ kg	Place of Purchase			Other Source
			Local Market	Street Hawker	Gathered	
Button mushroom	100	100-120	90	10	Nil	Nil
Oyster mushroom	Nil	Nil	Nil	Nil	Nil	Nil
Wild mushroom	Nil	Nil	Nil	Nil	Nil	Nil

mushrooms non-vegetarian, as a deterrent. Taste preferences influenced 7% of households who simply did not enjoy the flavour or texture of mushrooms. Meanwhile, 0% indicated they lacked knowledge of how to cook mushrooms, suggesting that awareness and culinary familiarity remain barriers. Lastly, 6% noted that mushrooms available in their area were not fresh. These findings underscore that improving affordability, availability, freshness, and awareness could collectively enhance consumer adoption of mushrooms as a regular dietary component.

CONCLUSION

Based on household-level data from Himachal Pradesh, the study concludes that while awareness of mushrooms as a food item exists, their routine consumption remains relatively low. Households primarily relied on button mushrooms sourced from local markets, with consumption limited to once or twice a month. High prices, lack of reliable storage options, and inconsistent market availability were identified as the most significant barriers. Cultural resistance and taste preferences played a comparatively minor role. These findings suggest that improving accessibility, affordability and storage infrastructure along with awareness initiatives tailored to regional preferences could help integrate mushrooms more sustainably into local diets and strengthen their role in Himachal's agri-food landscape.

Conflict of Interest: The authors do not have any conflict of interest.

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