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An analysis of production and marketing constraints in mushroom cultivation: A study of Basti district eastern of Uttar Pradesh

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Abstract

This study examined the challenges faced by mushroom growers in production and marketing. Garrett's ranking method was used to prioritize and analyze respondent data. Participants were selected through a multi-stage sampling process that combined purposive and random techniques in the Harraiya and Kaptanganj blocks. During the 2025-26 agricultural year, structured questionnaires facilitated personal interviews with 100 farmers. The data collected was categorized into two primary areas: (i) production constraints and (ii) marketing constraints. Production constraints revealed that pest and disease infestation was the most critical issue, with a Garrett score of 56.53. Following closely was the lack of institutional credit facilities, scoring 53.64. Other notable constraints included lack of awareness about input subsidies (51.91), uncertain whether phenomena (50.19), lack of knowledge about advanced production technology (48.10), high cost of spawn and other inputs (44.96) and lack of elite planting material (spawn) (41.67). These constraints were ranked II through VII in the production category. Among marketing constraints, the absence of cold storage facilities had the highest Garrett score (58.25). Price fluctuations and perishability (53.26) was the next most significant constraint, followed by menaces of middlemen (48.23), seasonal demand and high bargaining power (48.60), growers' lack of technical knowledge about processing (47.58), lack of knowledge about potential consumers (46.8), and delay and deduction of payment (44.28). These marketing factors were assigned ranks II, III, IV, V, VI, and VII, respectively.

Keywords: Mushroom cultivation, Production constraints, marketing constraints, Garrett's ranking technique, mushroom growers

1. Introduction

Button mushroom (*Agaricus bisporus*), part of the Agaricaceae family, is the most widely grown edible mushroom globally, holding a significant share of the world mushroom industry. It is prized for its nutritional value, medicinal benefits, appealing flavor and commercial significance. The white button mushroom is extensively cultivated under controlled conditions in Europe, North America, China and India, making it one of the most economically important edible fungi worldwide, (Usman *et al.* 2021) ^[8].

Fresh button mushrooms (*Agaricus bisporus*) are composed of about 92.4% water, containing 3.09 g of protein, 3.26 g of carbohydrates, 0.34 g of fat and 1.0–2.0 g of dietary fiber per 100 g fresh weight, providing 22 kcal of energy. They are also rich in vital vitamins, especially riboflavin (vitamin B₂), niacin (vitamin B₃), pantothenic acid (vitamin B₅) and vitamin D₂ after UV exposure. Additionally, they supply

minerals such as potassium, phosphorus, selenium, iron, copper and zinc. Due to their low fat and calorie content and the presence of bioactive compounds like β -glucans, ergothioneine and phenolics, button mushrooms are considered a valuable functional food with potential health benefits, as highlighted by Atila *et al.* (2017) ^[1].

Button mushroom (*Agaricus bisporus*) is not only a nutritious food choice but also a source of biologically active compounds. These compounds are known for their antioxidant, antimicrobial, anticancer, anti-inflammatory, antidiabetic, anti-hypercholesterolemic and immunomodulatory effects. The fruiting bodies provide high-quality proteins with essential amino acids, dietary fiber, polysaccharides, vitamins and minerals, all of which support human nutrition and well-being. Due to its health benefits and nutritional profile, global consumption of button mushrooms has grown significantly in recent years (Singh *et al.* 2025) ^[5].

Table 1: State-wise area, production of mushroom during 2023-24

Rank	State / Region	Production (000' MT)
1	Bihar	39.25
2	Odisha	35.40
3	Maharashtra	32.28
4	Uttar Pradesh	27.70
5	Uttarakhand	27.39

Source: Ministry of Agriculture & Farmers' Welfare, Government of India

1.1 Objective of the study

To identify production and marketing constraints faced by sample respondents and suggest suitable policies.

2. Materials and Methods

The study was conducted in Basti district, Uttar Pradesh, an area notable for its significant mushroom farming activities. Two blocks, Harraiya and Kaptanganj, were deliberately chosen because of their large number of active mushroom growers. A multi-stage random sampling method was used to select 100 respondents (2×5×10), ensuring proportional representation from both blocks and their villages. The goal was to identify challenges hindering the adoption of improved mushroom cultivation techniques among these farmers. A structured interview schedule aligned with the study's objectives and variables was used for organized data collection. Primary data were gathered through personal interviews and discussions with informants and experienced farmers knowledgeable about local mushroom cultivation, while secondary data came from reputable sources like the Krishi Vigyan Kendra (KVK) and the Food and Agriculture Organization (FAO) to supplement the primary data.

2.1 Constraints Analysis: Garrett's Ranking Technique

This method involved asking respondents to rank all factors. The resulting ranking was then converted into a score value using the following formula: (Supriya *et al.*, 2012; Kumar *et al.*, 2023; Verma *et al.*, 2025; Gupta *et al.*, 2025; Sujitha *et al.*) [7, 4, 9, 3, 6].

$$\text{Percent Position} = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where:

R_{ij} = Rank given to the i^{th} constraint by the j^{th} respondent

N_j = Total number of constraints ranked by the j^{th} respondent

The percentage position is converted to scores by consulting the table provided by Garrett and Woodworth (1969). Then, the scores for each individual were summed for each factor and the total and mean values were calculated. The most influential factors were identified by ranking the mean scores of all factors in descending order. Factors with the highest mean value were deemed to be the most significant.

3. Results and Discussion

3.1 Production Constraints Faced by Mushroom Growers

Table 2 presents Garrett's ranking technique for identifying

and prioritizing the main constraints faced by mushroom growers, based on perceived severity. Infestation of pests and disease were identified as the most severe, ranking first with a Garrett mean score of 56.53, indicating significant challenges to both yield and quality. The lack of institutional credit facilities was the second most critical constraint, with a Garrett mean score of 53.64, reflecting difficulties in obtaining timely and affordable financial support for mushroom farming. Lack of awareness about the input's subsidy ranked third, with a mean score of 51.91, indicating limited extension services, subsidies and technical assistance. Uncertain weather phenomenon ranked fourth, with a score of 50.19, demonstrating the environmental sensitivity of mushroom cultivation. Lack of knowledge about advanced production technology ranked fifth, with a score of 48.10, highlighting the need for training and skill development. High cost of spawn and other input was the sixth constraint, with a score of 44.96, suggesting that rising production costs negatively impact profitability. Lastly, Lack of elite planting material (spawn), with a score of 41.67, was considered a less severe but still notable constraint affecting production.

Table 2: Production Constraints Faced by Mushroom Growers

S. N.	Constraints	Mean Score	Rank
1.	Infestation of pest and disease	56.53	I
2.	Lack of institutional credit facilities	53.64	II
3.	Lack of awareness about the input's subsidy	51.91	III
4.	Uncertain weather phenomenon	50.19	IV
5.	Lack of knowledge about advanced production technology	48.10	V
6.	High cost of spawn and other input	44.96	VI
7.	Lack of elite planting material (spawn)	41.67	VII

3.2 Marketing Constraints Faced by Mushroom Growers

Table 3 presents the marketing constraints encountered by mushroom growers. The most critical issue was the Absence of cold storage facilities, which had a Garrett mean score of 58.25, forcing growers to sell their mushrooms immediately after harvest at lower prices due to their perishable nature. Price fluctuation and perishability were the second most significant constraints, with a mean score of 53.26, indicating that price volatility significantly impacts growers' income and profitability. Menaces of middlemen ranked third, with a score of 48.60, suggesting limited direct access to markets and reliance on intermediaries, which reduces profits. Seasonal demand and high bargaining power ranked fourth at 48.23 points, indicating limited consumer awareness and seasonal fluctuations that constrain market expansion. Growers are not technically sound about processing, ranked fifth, with a score of 47.58, indicating that, although limited, value-added processing is perceived as a less severe constraint than others. Lack of knowledge about potential consumers ranked sixth, with a score of 46.80, indicating that growers lack timely market prices, demand data and marketing opportunities. Delay and deduction of Payment seventh with the lowest score of 44.28, highlighting financial difficulties caused by late payments from traders.

Table 3: Marketing Constraints Faced by Mushroom Growers

S. N.	Constraints	Mean Score	Rank
1.	Absence of cold storage facilities	58.25	I
2.	Price fluctuation and perishability	53.26	II
3.	Menaces of middlemen	48.60	III
4.	Seasonal demand and high bargaining power	48.23	IV
5.	Growers are not technically sound about the processing	47.58	V
6.	Lack of knowledge about the potential consumers	46.80	VI
7.	Delay and deduction of Payment	44.28	VII

4. Conclusion

The study identified main production and marketing constraints faced by mushroom growers in Harriya and Kaptanganj blocks of Basti district, Uttar Pradesh. Among production constraints, infestation of pest and disease was ranked first (Garrett score 56.53), followed by lack of institutional credit facilities (53.64), lack of awareness about input subsidies (51.91), uncertain whether phenomena (50.19), lack of knowledge about advanced production technology (48.10), high cost of spawn and other inputs (44.96) and lack of elite planting material (41.67). In the marketing domain, the absence of cold storage facilities was the most critical constraint (Garrett score 58.25), followed by price fluctuation and perishability (53.26), menaces of middlemen (48.60), seasonal demand and high bargaining power (48.23), lack of technical knowledge about processing (47.58), lack of knowledge about potential consumers (46.80) and delay and deduction of payment (44.28). These findings suggest the need for strengthening institutional credit services, improving extension support, establishing cold storage infrastructure and promoting direct market linkages to enhance the profitability and sustainability of mushroom cultivation in the region.

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Competing Interests

The authors have declared no competing interests.

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