MUSHROOM FARMING: TODAY'S FARMING TREND

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Introduction

Mushroom farming is becoming a trending and emerging agri-enterprise that plays a significant role in improving nutritional security, sustainable resource utilization, and farm income. Mushrooms are fungi, which are cultivated on organic substrate and don't require arable land, making them suitable for the region having scarcity of land. Because of their short crop cycle, ability to use agricultural waste, and high biological efficiency, mushroom cultivation is widely adopted around the world (Chang & Miles, 2004).

Global Scenario of Mushroom Production

In the last few decades, there is significant increase in mushroom farming. According to FAOSTAT, global mushroom production increase from 12 million tonnes in 2000 to over 42 million tonnes by 2021, showing that mushroom farming rose by 3 times ((Food and Agriculture Organization of the United Nations [FAO], 2022)., 2022). China itself contributes about 75 % (varies yearly) of total world mushroom production, followed by countries like Poland, Netherland and India (Royse et al., 2017).

The expansion in the global edible mushroom market is due to the rise in demands of consumer for plant-based protein and functional foods, with an annual growth rate exceeding by 6 % (Royse et al., 2017; FAO, 2022).

- **Status of India in Mushroom Production**

In India, mushroom farming shifted from seasonal acidity to the commercial agri industry. Production in India has been significantly increased from 50,000 tonnes in the 1990s (Sharma et al., 2017) to approximately 230,000 tonnes by 2022-21 (ICAR, 2021). Currently, India ranks in the top five mushroom-producing countries worldwide.

Button mushroom (Agaricus bisporus) has the command over production in India, which is nearly 70 -75 % of the total output. Oyster mushrooms (Pleurotus spp.) contribute 15 20% while other mushrooms like milky mushroom (Calocybe indica) and paddy straw mushroom (Volvariella volvacea) together contribute in rest of the production (Annepu & Gupta, 2018).

- **Distribution based on Region in India**

In India Mushroom production is concentrated within states with better infrastructure and market access. Northern states such as Punjab, Haryana, Uttar Pradesh, and Himachal Pradesh are major producers of button mushrooms because of their favourable climatic conditions. Whereas states like Odisha and Bihar have emerged as leading producers of milky and oyster mushrooms due to low input requirements and availability of crop waste (ICAR, 2021).

Recent studies show that eastern India contributes about 35 %of total national mushroom production, telling its role in employment and livelihood generation for marginal and small farmers (Annepu & Gupta, 2018).

- **Economic Importance of Mushroom Farming**

Mushroom farming requires no arable land, low input, and high return value. A small-scale unit of 100-150 bags of oyster mushroom or milky mushroom can give a return of Rs 60,000–₹80,000 per crop cycle, depending on market price and their management practices (Singh & Kamal, 2019).

Commercial button mushroom units with maintained environmental conditions can produce 20 -30 kg per square meter annually, giving them an advantage over the traditional crops (ICAR, 2021).

This enterprise also gives employment throughout the year, specifically for women and youths of rural areas, as it requires labour for substrate preparation, harvesting, and further processing.

- **Nutritional Value of Mushroom**

Mushrooms are a nutrient-dense functional food. Fresh mushrooms have 20 -3 0 % of protein on a dry weight basis, comparable to the pluses (Kakon et al., 2012). They have a high amount of minerals like selenium, potassium, phosphorus, also rich in B complex vitamins, with the benefits of low fat and cholesterol levels.

For example, 100g of fresh button mushrooms gives around 2.2 g of carbohydrates, 3.1 g of protein, and 22 kcal, making them suitable for diet-conscious people (Chang & Miles, 2004).

- **Sustainability and Environmental Benefits**

Mushroom cultivation helps to move towards sustainable agriculture by reusing agricultural residues like wheat straws, paddy straws, sawdust, and maize cobs. It is seen that approximately 1 ton of dry organic residue can give us a yield of 600 -800 kg of fresh mushrooms, solving problems like environmental pollution and residue burning (Royse et al., 2017).

In addition, organic substrates can be used as organic manure or animal feed, improving the circular economic cycle.

- **Institutional and Technological Support for Mushroom Cultivation**

In India, institutions such as the Directorate of Mushroom Research (DMR), ICAR, and many State Agricultural Universities provide support to farmers in mushroom production. Recently, there have been technological advancements in spawn production, composting methods, and climate control systems (ICAR, 2021).

As an extension, KVK (Krishi Vigyan Kendras) organise training programmes to increase adaptation of mushroom practice technologies specifically in peri-urban and rural areas (ICAR, 2021).

- Challenges Faced in Mushroom Cultivation
- Although mushroom farming holds huge potential, it also faces multiple challenges, including post-harvest losses (around 20–25%), short shelf life, price fluctuations, and a lack of cold storage facilities (Thakur et al., 2016). Along with less awareness, insufficient technical knowledge, and the initial cost for setup, these limitations limit farmers from practicing mushroom cultivation on a large scale.

- **Outlook of mushroom cultivation**

The prospect of mushroom cultivation is promising, as customer demand is steadily increasing, driven by the need for medicinal and nutraceutical mushrooms, value-added products, and export demand. A combination of climate-controlled production systems, processing units, and a responsible supply chain will further improve mushroom farming itself. With policy support and a boost to mushroom entrepreneurship, mushroom farming can play a significant role in doubling farmers' incomes and securing nutritional security (ICAR, 2021).