# Upheaving Livelihood Avenues through mushroom cultivation: Assessment of knowledge domain in trainees of Malappuram district as training effectiveness indicator


## ABSTRACT

**Mushroom cultivation as an enterprise seeks to circumvent constraints of land availability reining the livelihood opportunities. Capacity building programme on cultivation of oyster and milky mushroom was conducted for farmers of Malappuram district, Kerala to inculcate entrepreneurial urge. Data from ninety trainees of two batches were analysed to assess their knowledge gain on various aspects of mushroom cultivation. Structured questionnaire was used to collect the data on socio economic profile and a knowledge test was conducted to measure the change in knowledge employing a before-after method of comparison. The comparison testified a significant improvement in the knowledge domain of the trainees with respect to mushroom cultivation. Maximum gain in knowledge (94.44% and 93.33%) was observed for harvesting practices of mushrooms and identification of mushroom species, respectively. The study thus suggests training is a pivotal activity to improve the knowledge component, which serves as a spring board for their entrepreneurial endeavours in mushroom.**



***Key Words: Mushroom, training assessment, knowledge gain, socio-economic profile***


## 1. INTRODUCTION

"Every country in the world is affected by one or more forms of malnutrition. Combating malnutrition in all its forms is one of the greatest global health challenges" [1]. The burden of malnourished children in India is amongst the highest in the world and virtually twice that of Sub-Saharan African countries [2]. The problem of malnutrition is critical especially in case of women and children. For being a nation with large number of malnourished and underweight children (33 per cent of children below 3 years) [3], providing a nutrient dense diet is absolutely essential. To overhaul daunting challenge of nourishing the vulnerable population in the wake of ever-increasing population, depleting agricultural land, climate extremities, food safety concerns and water shortage, it is important to diversify the agricultural activities. "India is in a stage of nutrition transition. Being overweight and underweight are two common predicaments, but irrespective of them, micronutrient deficiency is at its peak and the leading reason may be the cereal-based food practices in India" [4]. "Indian diet is primarily based on cereals (wheat, rice and maize), which is deficient in protein. Mushroom is a panacea for protein deficiency woes and a comparable alternative to the non-vegetarian food. Mushrooms are rich source of important nutrients and bioactive components, including proteins, fibres, vitamins, minerals, and nutraceuticals, while also being low in calories, sodium, fat, and cholesterol" [5]. "They are proven to possess anti-allergic, anti-cholesterol, anti-tumor, and anti-cancer properties" [6].

Mushroom cultivation offers promising entrepreneurial avenues capable to weaken vulnerabilities of poverty and strengthen livelihoods through quicker and stable income generation opportunities. Owing to its inherent qualities including no land for cultivation, mushroom cultivation is a viable and attractive venture for both rural and urban farmers. Small-scale growing does not include any significant capital investment. Mushroom substrate can be prepared from any clean agricultural material in temporary clean shelters. Indirectly, mushroom cultivation delivers opportunities for improving the sustainability of small farming systems through recycling of organic matter as a growing substrate, which in turn is returned to the land as manure.

"Mushroom can be grown indoor, independent without sunlight, do not require fertile land and can be grown on a small scale as it does not include any significant capital investment" [7]. Mushroom cultivation will improve the socio-economic status of farm families and solve unemployment menaces of both illiterate and literate people. In the above context, Krishi Vigyan Kendra Malappuram has been ventured into training the farmers of the district on mushroom cultivation with regular intervals. Gauging the effectiveness of training is necessary to wipe out any errs in trainings conducted and scale up potentials of the programme. An attempt has been made to evaluate the knowledge gain among participants of mushroom cultivation training programme. An evaluation study of employment-oriented programme would help to throw more light on the possibility of improving the programme in future.

## 2. MATERIALS AND METHODS

Krishi Vigyan Kendra Malappuram organises regular training programmes for the farming community. Trainings on Mushroom cultivation are periodically held and the trainees were selected as per the prior request generated from among the trainees. People who are interested to attend the training contact KVK office either personally or through telephone. When the list reaches to fifty, trainings were imparted. The training programmes were conducted in local language and audio-visual aids were used for better understanding of mushroom cultivation. Hands-on-practice session was also included in each module. This study analyses knowledge gain from participants of two batches comprising ninety-six numbers during 2022. A questionnaire was formulated comprising of general information, background of participants and a set of 10 questions related to different kinds of mushrooms, nutritional importance of mushroom, diseases affecting mushroom, storage and harvesting of mushroom were used to evaluate the knowledge of trainees. For each correct answer one mark and for incorrect zero marks was given. All the questions were of multiple choices based and maximum attainable score of an individual was ten marks. A pre-training assessment was conducted to know the level of knowledge of participants regarding variety, diseases of mushrooms as well as their storage and preservation etc. Similarly, after completion of the training course, post training evaluation was performed in order to assess the knowledge gained by the trainees and effectiveness of training. After data cleaning only ninety questionnaires were found fit for further analysis. The scores obtained from pre and post-test were evaluated for gain in knowledge level by the participants and it was calculated by the standard formula as per [8]. The data were tabulated and analysed using frequency and percentages.

The trainees were classified based on their socio-economic profile as illustrated in Table 1.

$$\text{Gain in knowledge} = \frac{\text{Post training score- Pretraining score}}{\text{Pretraining score}} \times 100$$

## 3. RESULTS AND DISCUSSION

### Socio-economic profile

The participants differed in age, education, occupation and landholding. In these training programmes majority of the participants (57.78 %) were males in consonance with the study of Singh and Tanwar [9] and Sohi *et al*. [10]. The data (Table 1) showed that the age of participants was between 21 and 70 years. Only 7.78 per cent of trainees were in age group of 21-30 years whereas 18.89 per cent were in-between 61-70 years. Information with respect to caste showed that participants irrespective of caste system were involved in the training. The number of participants from OBC (73.33 %) and general category (16.67) was higher followed by scheduled caste (8.89 %) and scheduled tribe (1.11 %). Education level of the participants indicated that 58.89 per cent of participants studied upto higher secondary followed by 33.33 per cent participants were graduated and 5.56 per cent studied upto primary level. Only 2.22 per cent of the participants were illiterate. Family type of participants revealed that 68.89 per cent belonged to nuclear family and 31.11 percent came under joint family type. More than half of the trainees (62.22 %) have marginal land holding whereas very few farmers (1.11 %) were large landholders. Further, 36.67 per cent participants were from landless category and thus it was evident that mushroom farming enterprise does not require much land and therefore, landless farmers were found to be interested to adopt this enterprise to supplement their family income. About 75.56 per cent of the participants were from panchayath areas and 24.44 per cent form municipality areas of the district. These findings are in accordance with the study of Sohi *et al*. [10] and Singh and Tanwar [11].

**Table 1. Socio-economic profile of the respondents (n= 90)**

| Sl. No. | Particulars | Frequency (N=90) | Percentage (%) |
|---|---|---|---|
| 1. | **Gender** | | |
| | Male | 52 | 57.78 |
| | Female | 38 | 42.22 |
| 2. | **Age** | | |
| | 21-30 | 7 | 7.78 |
| | 31-40 | 25 | 27.78 |
| | 41-50 | 21 | 23.33 |
| | 51-60 | 20 | 22.22 |
| | 61-70 | 17 | 18.89 |
| 3. | **Education** | | |
| | Illiterate | 2 | 2.22 |
| | Primary 1-7 | 5 | 5.56 |
| | Higher secondary grade 8-12 | 53 | 58.89 |
| 4. | **Graduation** | 30 | 33.33 |
| | Caste | | |
| | General | 15 | 16.67 |

| | | | |
|---|---|---|---|
| | OBC | 66 | 73.33 |
| | Scheduled caste | 8 | 8.89 |
| | Scheduled tribe | 1 | 1.11 |
| 5. | **Family type** | | |
| | Nuclear family | 62 | 68.89 |
| | Joint family | 28 | 31.11 |
| 6. | **Agricultural land holding** | | |
| | Landless | 33 | 36.67 |
| | Marginal (<1ha) | 56 | 62.22 |
| | Small (1-2 ha) | 1 | 1.11 |
| 7. | **Resident** | | |
| | Panchayath | 68 | 75.56 |
| | Municipality | 22 | 24.44 |
| | Corporation | 0 | 0 |

### 3.1. Increase in level of knowledge

In pre-training assessment test, the knowledge range of different participants was 32.22 per cent regarding techniques used in mushroom production and 74.44 percent in case of knowledge about nutritional importance of Mushrooms. The overall knowledge level of respondents was found to be changed after the training. In post training evaluation it was observed that maximum knowledge gain of 94.44 per cent was observed in harvesting practices of mushrooms followed by knowledge gain of 93.33 per cent in identification of mushroom species. It was thus noticed that pre training knowledge score was not much satisfactory for all the aspects of training programme. However, the knowledge score gained by participants after training was more satisfactory in all aspects. Thus, it can be inferred that exposure to training had increased the knowledge of respondents with respect to all the sub-components of mushroom production. The reason behind the satisfactory gain in knowledge can be attributed to the educational background of participant, and interest shown by them. The factors which motivated the respondents to join the training programme were to adopt mushroom cultivation as an enterprise and to learn about mushroom growing techniques for self-consumption due to its nutritional importance.

**Table 2. Gain in knowledge by the participants before and after mushroom cultivation training**

| Particulars | Pretraining assessment (PTA) Score | Per cent | Post training evaluation (PTE) Score | Per cent | Gain in knowledge |
|---|---|---|---|---|---|
| Identification of mushroom species | 40 | 44.44 | 84 | 93.33 | 110.00 |
| Medicinal properties of Mushrooms | 33 | 36.66 | 73 | 81.11 | 121.21 |
| Seasonal cultivation of Mushrooms | 54 | 60.00 | 78 | 86.66 | 44.44 |
| Harvesting practices of Mushrooms | 39 | 43.33 | 85 | 94.44 | 117.94 |
| Techniques used in Mushroom production | 29 | 32.22 | 77 | 85.55 | 234.48 |

| | | | | | |
|---|---|---|---|---|---|
| Nutritional importance of Mushrooms | 67 | 74.44 | 73 | 81.11 | 8.95 |
| Knowledge about spawn production | 50 | 55.55 | 78 | 86.66 | 56.00 |
| Pest and disease infestation in mushrooms | 22 | 24.44 | 74 | 82.22 | 236.36 |
| Storage practices of various kinds of mushrooms | 15 | 16.66 | 72 | 80.00 | 380.00 |
| Knowledge about new varieties | 13 | 14.44 | 56 | 62.22 | 330.77 |

## 4. CONCLUSION

Health of citizen is a key indicator of the progress of the nation. Ensuring a nutritionally superior diet is pivotal to combat malnutrition dilemma faced by the country. Supplementing the diet with protein sources could pave a way to overhaul protein deficiency induced under-nutrition woes. Incorporation of mushroom as protein supplement explicates the dietary challenges and opens up entrepreneurial avenues for the growers as well. As such, KVK has been periodically offering mushroom cultivation trainings to the farmers of the district. The present study assesses effectiveness the training programmes conducted for the knowledge gain aspect. Majority of the participants falls under 31-40 age category. More than half of the trainees have educational qualification up to higher secondary level and resides in nuclear families. Land holding size of 62 per cent participants were less than one hectare, shows suitability of mushroom cultivation as an income generation activity which does not succumb to the inadequacy of land availability. It can be concluded from the study that training is a very good tool for skill development of trainees and excellent training provides needed information to trainees and guidance to start and flourish mushroom enterprise. Due to low initial investment and high-income generation potential, mushroom production can be adopted by even landless farmers. Mushroom cultivation can be taken up by the farmer as cottage industry and thus it can be a source of additional income.

## REFERENCES


1. WHO [World Health Organisation]. Malnutrition. 2021. Accessed 31 January 2023. Available: https://www.who.int/news-room/fact-sheets/detail/malnutrition.
2. Pathak PK, Singh A. Trends in malnutrition among children in India: Growing inequalities across different economic groups. Soc. Sci. & Med.2011;73(4):576-585.
3. MOSPI. 2015. MDG India country report. Social Statistics Division. Ministry of Statistics and Programme Implementation. Government of India.
4. Law C, Fraser I, Piracha M. Nutrition transition and changing food preferences in India. J Agric Econ. 2020; 71: 118–143.

5. Das AK, Nanda PK, Dandapat P, Bandyopadhyay S, Gullon P, Sivaraman GK, McClements DJ, Gull0n B, Lorenzo JM. Edible Mushrooms as Functional Ingredients for Development of Healthier and More Sustainable Muscle Foods: A Flexitarian Approach. Molecules. 2021; 26(9):2463.
6. Jayachandran M, Xiao J, Xu B. A Critical Review on Health Promoting Benefits of Edible Mushrooms through Gut Microbiota. Int J Mol Sci. 2017; 18(9):1934.
7. Chadha KL, Sharma SR. Mushroom research in India History, infrastructure and achievements. Ins: Advances in Horticulture, (Eds. Chadha KL, Sharma SR.). Malhotra Publishing House, New Delhi;1995. 13: 1-29.
8. Ansari MR, Chandargi DM. Effectiveness of induction training programme organized for Assistant Agricultural Officers (Farm Women). J Ext Educ. 2000; 11(1): 2645-2650.
9. Singh K, Tanwar PS. Impact analysis of vocational training programmes on knowledge gain of ornamental fish culture trainees. Int J Pure Appl Biosci. 2018; 6(3):509-512.
10. Sohi HS, Tanwar PS, Singh K, Matharu KS. Int J Curr Microbiol App Sci. 2020; 9(8): 3297-3303.
11. Singh K, Tanwar PS. Impact of integrated fish farming vocational trainings on knowledge gain by trainees. J Entomol Zool Stud. 2020; 8(3):510-513.
12. ~~Kaur K. Impact of training course on knowledge gain of mushroom trainees. Journal of Krishi Vigyan. 2016;4(2):54-7.~~