



HORTSON
Ogbomoso
2023



PROCEEDINGS OF THE

41st
ANNUAL
Conference

**HORTICULTURAL SOCIETY OF NIGERIA
(HORTSON)**

Theme

**Application of Science, Technology and
Artificial Intelligence in Production
and Practices of Horticulture**

DATE

November 12 - 16, 2023

VENUE

**LADOKE AKINTOLA UNIVERSITY OF TECHNOLOGY,
OGBOMOSO**

EDITORS

**Akanbi, W.B., Olaniyi, J.O., Olabiyi, T.I.,
Olatunji, O.O., Ipinmoriti R.R., Adesina, J.M.,
Ajayi, E.O. and Ojo, O.O.**



ASSESSMENT OF THE AVAILABILITY AND AFFORDABILITY OF MUSHROOM RAW-MATERIALS IN IBADAN METROPOLIS

S.A. Oladoja^{1*}, O.I Ajewole², Akintunde-Alo, D.A.² and Ibe R.B.¹

¹National Horticultural Research Institute, Ibadan, Nigeria

²Department of Social and Environmental Forestry, University of Ibadan, Ibadan, Nigeria

*Corresponding email: sulaimanoladoja@gmail.com

ABSTRACT

Mushroom is regarded as mother of all vegetables because of its roles in human nutritional supply with abundant number of essential vitamins, minerals and protein. However, there is dearth of information on what goes into its domestication, therefore this study assessed the availability and affordability of raw-materials for mushroom production in Ibadan metropolis with a view to encourage sustainable production for economic growth. Ibadan metropolis was purposively chosen based on the abundance of various institutions who are actively involved in the production of mushroom and presence of some trained farmers who are into the production. Information was elicited from 36 mushroom producers with the aid of structured questionnaire. Data were analysed using descriptive statistics such as frequencies and percentages. Findings revealed that 58.3% respondents rarely had materials for mushroom production whenever they intend to produce, 50% respondents cannot afford relevant materials needed for the production, while 30.5% respondents revealed that spawn production cost between 500-1,000 naira. Also, lack of capital and favourable environment are key factors contribution to no increase in mushroom production. It is therefore recommended that basic and necessary production materials be made available and accessible to producers at subsidized rates. In order to enhance production, credit support should be made available to producers at affordable interest rates.

Keywords: *Mushroom production, availability of mushroom, production materials, affordability of mushroom production materials*

INTRODUCTION

Mushroom, a very nutritious horticultural crop that double as non-timber forest product is generated from lignocelluloses waste materials rich in crude fibre and protein. (Adedokun and Okomadu, 2017) The amount of protein in mushroom is double than any other vegetables. Hence, it is called vegetable protein. In fact, mushroom contains low fat, low calories and good vitamins (Jiao-Jiao *et al.*, 2016) Mushroom is a source of extra ordinary power, virility and is used in the preparation of many continental dishes. It is a good source of protein, vitamins and minerals and contain about 85-95% water, 3% protein, 4% carbohydrates, 0.1% fats and 1% minerals and vitamin, this made mushroom to be regarded as game changer (Osuafor and Edeh, 2020).

Mushroom possesses multifunctional and medicinal properties; therefore, a culture of mushroom could be a source of additional income for the families on small scale farms with active participation of members (Osemwegie and Okhuoya, 2014). According to (Osuafor *et al.*, 2021), mushroom production is a useful way of earning income when climate change makes farming less reliable. In order to increase revenue, ensure food security and improve living conditions in the face of poor crop

yields brought on by the effects of climate change, farmers can make an effort to grow protein-rich mushrooms. Mushroom is congenial for their flavour, economic and ecological values, and medicinal attributes for many years (Gupta *et al.*, 2018)

Mushroom can be cultivated easily in home yards because it requires a small space to grow thereby serve as means of creating employment, particularly for rural women and youths in order to improve their social status (Osemwegie and Okhuoya, 2014). The natural habitat of mushroom ranges from farm land, forest and newly cleared lands, pieces of wood found in several place. Naturally, the availability of mushroom is seasonal, depending on the species some may be available just at the onset of rains, others during the rains, some when the rains are winding up. By practicing mushroom production, farmers can contribute successfully and significantly to the economic development of the country (Stamets, 2020) It also provides additional work for the farmers during winter months when the farming schedule is light. So, mushroom production plays a vital role on socio-economic development of those who are involved in the production (Zhang *et al.*, 2014).

According to National Farmers Information Service

(NAFIS, 2021), Nigeria produces 300 tonnes of mushrooms per year and has a market demand of 1200 tonnes, this means that many consumers of mushroom which include homes, hotels, and kitchens import from elsewhere, this implies that the supply within Nigeria does not meet up with the demand. In this case, there is market demand but insufficient supply within the country, hence the need to research on the availability and cost of raw-materials for the production of mushroom in the study areas.

MATERIALS AND METHOD

Study area

This study was carried out in Ibadan metropolis. Ibadan is the state capital of Oyo state Nigeria, It has a population of 3,720,643 people according to the (2006) census and it is the most populous city in Nigeria after Lagos and Kano. It is the largest city by geographical area with 128 km inland northeast of Lagos and 530 km southwest of Abuja, the federal capital, and is a prominent transit point between the coastal region and the areas in the hinterland of the country. The city covers a total area of 3,080 square kilometers (1,190 sq mi), the largest in Nigeria: (Olanrewaju *et al.*, 2018). There are eleven local governments in Ibadan; the metropolitan area comprises five (5) urban local governments' areas in the city and six (6) semi urban local governments in the lesser city. The five urban local governments include; Ibadan-north, Ibadan North-east, Ibadan North-west, Ibadan South-east and Ibadan South-west while six semi-urban consists of Akinyele, Egbeda, Ido, Lagelu, Ona-ara and Oluyole (Olanrewaju *et al.*, 2018).

Sources and types of data

The study made use of primary data which were obtained through the use of structured questionnaire designed for generating data for the study area. The data collected from mushroom producers includes the following: demographic characteristics such as age, sex, household size, marital status and religion, availability and affordability of raw materials, types of mushroom cultivated and factors responsible for increase in production among others.

Sampling technique

The study made use of multistage sampling technique. The first stage was the purposive selection of Ibadan metropolis because of the high demand for fresh mushroom and mushroom products. The second stage involves the purposive selection of some organizations in Ibadan who are known to be the areas where mushrooms were been produced, these sites were also known for training and capacity building on mushroom production such as Forestry Research Institute of Nigeria (FRIN),

National Horticultural Research Institute (NIHORT), ZARTECH, the Department of Crop Protection & Environmental Biology, and Department of Botany at University of Ibadan, Ibadan, Nigeria as well as the random selection of individual mushroom producers based on reference by the above named organizations. In all a total of thirty-six (36) respondents were sampled for the study.

Analytical technique

In order to achieve the set objectives for this study, data were analysed using descriptive statistics such as frequency and percentages.

RESULT AND DISCUSSION

Socio-demographic characteristics of respondents

As observed from the results on Table 1, majority (61.1%) of the respondents were male, married (91.7%), within the age bracket 45-54 years (52.8%), are of the Christian religion (61.1%) and have between 1-10 years of experience in mushroom production. The implication of these results is that married people are more involved in mushroom production, this can be connected to the more responsibility attached to married people, they need extra income to cater for the wellbeing of their immediate family and other social responsibility. Also, young people were not showing interest in the production of mushroom in the study area, which may be as result of unavailability of social amenity to encourage young people into the farming system. Studies have shown that rural-urban migration by young people had leads to a shift in the roles of farming and collection of non-timber forest product such as mushroom to the hands of older people taking the lead in the collection of non-timber forest product (Hechat *et al.*, 2015). On the years of experience, the result indicates that the low years of experience might have contributed to low production of mushroom in Ibadan metropolis.

Availability and affordability of mushroom raw materials

Results also revealed that, more than 50 percent of the respondents claim that they rarely had materials available for mushroom production (Table 2). This may be connected to lack of loans, incentives and credit facility to people engaging in farming activities couple with inflation ravaging most communities in the country According to the research work of Neelam *et. al.*, (2013), important things to note before going into mushroom production include availability of materials needed for production including finance and ability to identify strategic area where mushrooms are been sold.

Results on Table 2 also revealed that 50.0% of the respondents believe that the necessary materials needed for production are affordable while the remaining half believe they are not. Additionally, oyster mushroom was the most cultivated in the study area thus affirming the result of Tolera and Abera (2017) that oyster mushroom are cultivated in different parts of the world. It also revealed in Table 2 that oyster mushroom was the most patronized (97.2%) mushroom by consumers.

Factors responsible for increased production

As shown in Table 3, more than 50 percent of the respondents affirmed that mushroom production increased within the last 2 years prior to the study and that market patronage was responsible for the increase. On the other hand, 63.9% arrogated the lack of increase in production to lack of capital and unfavourable environment (19.4%). Also majority do not make use of unskilled labour probably due to the technicality of mushroom production. Cost of producing spawn which is one of the key materials for mushroom production is between N500-1000 (30.5%) followed by N1501-2000.

Production method

Majority of the respondents affirmed that necessary materials needed to train people on mushroom production are not available and that such training cannot be done free of charge (Table 4). Also, a larger proportion of the sampled were satisfied with the reliability of the sterilization methods used in production and do not employ any special method during harvest. More than 80 percent cultivate mushroom on land especially in the garden (control environment), while only 11.1% picked their own from the forest.

CONCLUSION

Mushroom is an important horticultural and non-timber forest product which plays very important roles in improving the food and nutrition security of most developing countries such as Nigeria. Nigeria's sources of exchange and economic stability can be improved and achieved if proper attention is given to mushroom production. Findings from the study indicate that necessary materials needed for mushroom production are not readily available and affordable. Also lack of capital and favourable environment are key factors contribution to no increase in mushroom production. It is therefore recommended that basic and necessary production materials be made available and accessible to producers at subsidized rates. In order to enhance production, credit support should be made available to producers at affordable interest rates.

REFERENCES

- Adedokun O.M, Okomadu CA.(2017) Wild and domesticated mushroom consumption in Nigeria. *African Crop Science Journal*. 2010; 25:123-131.
- Gupta, S., Summuna, B., Gupta, M. & Annepu, S.K. (2018). Edible mushrooms: Cultivation, bioactive molecules and health benefits. Bioactive molecules in Food, 1-33. In J.M. Mérillon, & K. Ramawat (Eds). Bioactive Molecules in Food. pp. 1-33. Reference Series in Phytochemistry. Springer, Cham. https://doi.org/10.1007/978-3-319-545288_86-1
- Jiao-Jiao Z , Ya Li, Tong Z, Dong-Ping Xu, Zhang, Sha Li and Hua-Bin Li(2016). Bioactivities and Health Benefits of Mushrooms, National Library of Medicine, National Center for Biotechnology Information.
- NAFIS (2021). Mushroom farming: Goldmine with promising bumper harvest, The Guardian Newspaper, Business Agro, October, 2021.
- Olanrewaju R.M, Tilakasiri, S.L and Bello, F.B, (2018) Community perception of deforestation and climate change in Ibadan, Nigeria. *Journal of University of Ruhuna*, (1). Pp 26-36
- Osemwegie, O.O, and Okhuoya, J.A. (2014). Eco-diversity mushrooms in rubber plantations and a lowland forest. LAP Lambert Academic Publishing, Germany. 200pp.
- Osuafor, O.O. and Edeh, O.C. (2020). Yam farmers' adaptation practices towards climate change disaster in Cross River State, Nigeria. *American International Journal of Agricultural Studies*, 3(1), 1-13.
- Osuafor, Ogonna O., Enete, Anselm A., Ewuzie, Peace O. & Elijah, Samuel T. 12 Oni, J.O., Basse, G.A., Agba, M-I.O. & Markson, A-A.A. (2021). Amino Acids Composition of Some Wild Edible Mushrooms from Southern Cross River State, Nigeria. *Asian Journal of Biology*, 12(2), 24-32.
- Stamet P. (2020). Mycelium Matters: How Mushrooms Can Address Climate Change. <https://www.bbc.com/storyworks/climate-academy/mycelium-matters>
- Tolera, K.D. and Abera, S. (2017). Nutritional quality of oyster mushroom (*Pleurotus ostreatus*) as affected by osmotic pretreatments and drying methods. *Food Science and Nutrition*, 5(5), 989-996.
- Zhang, Y, Geng, W, Shen, Y, Wang, Y. and Dai, Y. (2014). Edible mushroom cultivation for food security and rural development in China; bio-innovation, technological dissemination and marketing sustainability, 6, 2961-2973.

Table 1: Distribution of respondents by demographic characteristics

Variables	Frequency (n=36)	Percentage (%)
Sex		
Male	22	61.1
Female	14	38.9
Age		
25-34	6	16.7
35-44	11	30.5
45-54	19	52.8
Marital status		
Single	3	8.3
Married	33	91.7
Religion		
Christian	22	61.1
Islam	14	38.9
Years of experience (Years)		
1-10	34	94.4
11-20	-	-
21-30	1	2.8
31-40	1	2.8

Source: Field survey (2023)

Table 2: Availability and affordability of mushroom raw materials

Variable	Frequency (n=36)	Percentage (%)
Availability of production materials		
Readily available	15	41.7
Rarely available	21	58.3
Materials affordability		
Yes	18	50.0
No	18	50.0
Type of mushroom cultivated		
Chanterelles	2	5.6
Oyster	34	94.4
Type of mushroom mostly purchased by consumers		
Oyster	35	97.2
Chanterelles	1	2.8

Table 3: Factors responsible for increased production

Variable	Frequency (n=36)	Percentage (%)
Production increase in the last 2 years		
Yes	21	58.3
No	15	41.7
Factors responsible for production increase		
Customers' demand	11	30.5
Market	24	66.7
Increase in staff number	1	2.8
Factors responsible for no increase in production		
Lack of capital	23	63.9
Low demand	2	5.6
Unfavourable environment	7	19.4
Unavailability of spawns	1	2.8
Lack of awareness	3	8.3
Use of unskilled labour		
Yes	7	19.4
No	29	80.6
Cost of spawn production (Naira)		
Less than 500	5	13.9
500-1000	11	30.5
1001-1500	6	16.7
1501-2000	9	25.0
>2000	5	13.9

Source: Field survey (2023)

Table 4: Production method

Variable	Frequency (n=36)	Percentage (%)
Availability of necessary training materials		
Yes	11	30.6
No	25	69.4
Mushroom training can be done for free		
Yes	1	2.8
No	35	97.2
Satisfied with the reliability of sterilization method		
Yes	29	80.6
No	7	19.4
Use special method for harvesting mushroom		
Yes	5	13.9
No	31	86.1
Use land for production		
Yes	31	86.1
No	5	13.9
Hectares of land used for production		
Less than 1ha	30	83.3
1-2 ha	6	16.7
Cultivation method		
Scattered in the field	5	13.9
Garden	29	80.6
Pick in the forest	2	5.5

Source: Field survey (2023)