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Consumption pattern of processing, preservation and marketing of mushroom in Chhattisgarh

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Abstract
Since the ancient time, mushroom has been treated as a special kind of food. In historical ages, mushroom was considered not only a tasty seasoning but also a true and proper food closer to meat and eggs than to vegetable and said to be a complete food in certain instances. The Greeks regarded mushrooms as providing strength to "Warriors in Battle." The Chinese treasured mushrooms as health food, "The Elexir of life". In India too, the mushroom has been used as a food, mostly by the tribal people since the earliest times. The low cost simple technology of mushroom may give a good yield during short period of 20-25 days. Rural women will utilize their leisure time by cultivating and processing of mushroom. Marketing is also very important for mushroom due to its highly perishable nature. Packaging, transportation are other important factors before start to this venture.

A study was conducted in 7 districts of Chhattisgarh namely Ambikapur, Bilaspur, Dhamtari, Durg, Jagdalpur, Rajnandgaon and Raipur covering about 20 blocks to examine the level of "Rural Women participation in processing, preservation and marketing of mushroom". Mushroom is a good food supplement as they contain all essential minerals and vitamins. It provides increased resistance and immunity against early childhood infections and diseases. Mushroom also enhances food security at times of hunger. Women are having knowledge on wild mushroom (Especially women folk and tribes) and can well adopt to cultivate them in limited spaces.

In rural area men control most of the income since old times from farm produce but mushroom can be sold by women and need little capital input, thus attracting more women to this activity. Each operation of mushroom cultivation is a full time enterprise in itself like preparation of bed, spawn production, cultivation, processing, preservation and marketing.

The processing of mushroom is much important because it has a highly perishable character. The study revealed that except drying, the respondents were having low level of knowledge about other mushroom processing techniques. It was also found that Raipur, Durg and Rajnandgaon districts were well ahead in terms of knowledge about mushroom processing. Amongst the tribal dominated districts like Jagdalpur and Ambikapur, the respondents were less aware about mushroom processing and preservation practices, especially in wet processing and knowledge about various instruments, machine required for processing.

The poor status of knowledge about mushroom processing may be because of limited use of such processing practices as most of the respondents are growing mushroom in small units and its outcome may be just enough for their domestic consumption or for sale in local markets as fresh mushroom. The little amount of surplus mushroom was generally preserved by sun drying and was utilized within a week or two. However, the respondents of some progressive districts like Raipur and Durg were having sufficient knowledge about various processing methods. This may be due to their professionalism or big size of production unit. This clearly shows that respondents having high knowledge were ahead in also adoption of processing technologies. Accordingly, recommended that sufficient knowledge of scientific technology is a pre-requisite for adoption of such technologies.

Regarding marketing of mushroom, data revealed that majority (16.4%) of the total respondents prefer to sell their mushroom in local market where 15.4% grower sold their produce through retailers. Remaining 24.3% respondents reported that they sold their mushroom output in some other market of places. Thus, there exists ample scope of processing, preservation and marketing of mushroom in Chhattisgarh.

Keywords: Mushroom, preservation, marketing, rural women

Introduction
Every woman is an entrepreneur because she runs her house with great potential and planning. She manages and organizes not only her home front, but she has a capability to develop skill and patience to do other works, which can be performed outside also. Govt. of India is giving lot of emphasis on agro-based industries due to advantage of rural employment generation and gainful utilization.

According to National Family Health Services (NFHS) malnutrition in females coming in the age group of 5-49 years is 49 per cent, anaemia in adult females is 68 per cent and anaemia in adolescent girls is 70 per cent. Women play a vital role in this activity without compromising on their household responsibilities. Therefore, it is important that women are also aware of the appropriate technology by organizing mushroom training courses. Mushroom cultivation is environment friendly, as the agro forest and industry waste can be used to produce this protein rich food. There is vast scope to popularize mushroom production. Women can be effective mushroom growers as long as they are provided with support services and appropriate training from mushroom development centers. Post-harvest technology of mushroom is also an area, which is receiving a lot of attention. With the right training, women can go in to this venture and supplement their family income that contributes a high percentage of the labour in the field. Emphasis needs to be laid to diversify the income opportunity of women to raise their productivity and lighten their workload thus mushroom cultivation varied advantages. Each operation is a full-fledged enterprise in itself like preparation of bed, spawn production, cultivation, processing and marketing.

Use of mushroom as a food at home

The findings compiled in Table 1 show that more than 81 per cent of the total respondents often used the mushroom as a food item. Dramatically, 18.6 per cent of the total respondents reported that they were not using mushroom in their diet although they were producing the same. The respondents from Ambikapur, Durg, Jagdalpur, Bilaspur and Raipur districts preferred mushroom recipes, while few respondents from Rajnandgaon, Dhamtari, Raipur and Bilaspur districts were not using mushroom as a food item.

The mushroom consumption amongst the traditional Chhattisgarhi houses is still not so common. Various conservative families are still not consuming the mushroom due to one or other reasons, although they were engaged in mushroom production process. A slight change in traditional thinking was observed in the villages because only few respondents were found to be hesitating in mushroom consumption and rest of the major population were utilizing mushroom in their diet.

Frequency of mushroom consumption

The mushroom consuming pattern is compiled in Table 1. The findings interestingly revealed that out of the total respondents, more than 57 per cent of them were consuming mushroom once or twice in a month. The percentage of frequent mushroom consumers was found only 10 while, more than 30 per cent of the total respondents rarely consumed mushroom in various forms. The respondents of Jagdalpur, Durg and Bilaspur districts were found amongst the frequent mushroom consumer and contrary to this the respondents of Dhamtari, Rajnandgaon and Durg districts were relatively less mushroom consumers.

Table 1: Distribution of respondents according to use of mushroom as food, frequency and consumption of mushroom in various forms

S. No.	Particulars	Raipur	Durg	Rajnand-gaon	Dham-tari	Bilas-pur	Ambika-pur	Jagadal-pur	Total	
									No.	%
a.	**Use of mushroom as a food at home**									
1	Yes	63 (84.0)	31 (86.1)	27 (62.8)	27 (79.4)	27 (84.4)	26 (92.9)	27 (84.4)	228	81.4
2	No	12 (16.0)	5 (13.9)	16 (37.2)	7 (20.6)	5 (15.6)	2 (7.1)	5 (15.6)	52	18.6
b.	**Frequency of consumption of mushroom**									
1	Once in a week	-	8 (22.2)	1 (2.3)	5 (14.7)	6 (18.8)	-	8 (25.0)	28	10.0
2	Once in a fortnight	25 (33.3)	8 (22.2)	9 (20.9)	10 (29.4)	9 (28.1)	4 (14.3)	7 (21.9)	72	25.7
3	Once in a month	23 (30.7)	10 (27.8)	18 (41.9)	8 (23.5)	9 (28.1)	14 (50.0)	8 (25.0)	90	32.1
4	Once in 3 months	19 (25.3)	5 (13.9)	9 (20.9)	5 (14.7)	8 (25.0)	10 (35.7)	5 (15.6)	61	21.8
5	In more time	8 (10.7)	5 (13.9)	6 (14.0)	6 (17.7)	-	-	4 (12.5)	29	10.4
c.	**Consumption of mushroom in various forms**									
1	Salad	-	-	2 (4.7)	-	-	-	-	2	0.7
2	Vegetable	46 (51.1)	25 (69.4)	28 (65.1)	33 (73.3)	24 (75.0)	26 (92.9)	30 (93.8)	212	75.7
3	Soup	5 (5.6)	4 (11.1)	2 (4.7)	4 (8.9)	-	-	2 (6.3)	17	6.1
4	Others	39 (43.3)	7 (19.4)	11 (25.6)	8 (17.8)	8 (25.0)	2 (7.1)	-	75	26.8

Note: Figures in parentheses indicate percentage to total respondents

The consumption frequency of mushroom is largely affected by various factors, hence these frequencies may vary from individual to individual and from society to society. This may also be governed by the own mushroom production capacity and market surplus also.

Various forms of mushroom consumption

The similar table (Table 1) shows that more than 75 per cent of the total respondents reported that they often used mushroom vegetables in their diet. The consumption of mushroom as fresh salad and in the form of soup was reported by only 0.7 and 6.1 per cent of the total respondents, respectively. A considerable number of respondance (22.6%) was consuming mushroom in various other forms like pakoda, pulav, badi etc. The district wise distribution of respondents was more or less similar to the total scenario, except the respondent of Bilaspur and Ambikapur districts, who were not using mushroom soup in their diet pattern.

Since, mushroom was advocated as an alternative vegetable for meeting the requirement of vegetable protein and carbohydrates and also due to belonging of respondents from rural community the mushroom vegetables and other recipes were more popular rather than soup or salad, since, these items are still not much common in the diet system of village families.

Social acceptability of mushroom

The social acceptability of mushroom and its other products is given in Table. Social acceptability deals with the liking of an individual as individual or as member of social system. As regard to mushroom species, the findings show that oyster mushroom is leading with 92 per cent of social acceptability index over paddy straw mushroom having 74.9 per cent social acceptability index. It shows that amongst various castes, classes and gender, the oyster mushroom was preferred more amongst the respondents especially for consumption as a fresh

vegetable or as any other means. The use of mushroom as fresh vegetable was ranked first followed by use as other products with 84 and 56.4 per cent social acceptability index. The deviation of response in this index is because of a sizable chunk of respondents were not accepting the mushroom as fresh or in processed form but among those who liked the mushroom vegetable and other products also liked these items to a medium to high extent. The findings pertaining to choice of mushroom by family members, depicted in the same table show that the gents were giving higher acceptability of mushroom than the ladies in their diet system. However, the children showed lowest social acceptability of mushroom than the ladies and gents. However, the children were showing lowest social acceptability of mushroom and its products may be because of new conceptual nature of mushroom and also due to many of the ladies (particularly old ones) not preferring this modern vegetable to a great extent. Various classes of society were also given different social acceptability of mushroom. The findings compiled in the same table show that mushroom and its products were most acceptable to the people of low income group having 87.1 per cent social acceptability index. A remarkable percentage of (69.4%) people belonging to high income group also gave their weightage for mushroom and its other products in their diet.

This situation raised may be because of less number of alternative self-produced vegetable available for the people of low income group, hence not only men or women, mushroom and its products were also liked by the children belonging to low income group while it may also worth credible to state here that high income people mostly liked some selected items of mushroom such as soup, salad or papad etc.

Table 2: Distribution of respondents according to social acceptability of mushroom

S. No.	Particulars	Overall acceptability				Social acceptability index (%)
		Nil	Low	Medium	High	
A.	Mushroom species					
1)	Paddy straw mushroom	-	50 (17.9)	111 (39.6)	119 (42.5)	74.9
2)	Oyster mushroom	-	-	67 (23.9)	213 (76.1)	92.0
B.	**According to use**					
1)	Use as vegetable	83 (29.6)	25 (8.9)	75 (26.8)	177 (63.2)	84.0
2)	Use of processed mushroom	110 (39.3)	108 (38.6)	49 (17.5)	13 (4.6)	29.2
3)	Other products	27 (9.6)	72 (25.7)	141 (50.4)	40 (14.3)	56.4
C.	**According to family members**					
1)	Gents	3 (1.1)	21 (7.5)	68 (24.3)	188 (67.1)	85.8
2)	Ladies	5 (1.8)	36 (12.9)	83 (29.6)	156 (55.7)	79.8
3)	Children	21 (7.5)	30 (10.7)	103 (36.8)	126 (45.0)	73.1
D.	**Preference in society**					
1)	High income group	12 (4.3)	23 (8.2)	175 (62.5)	70 (25.0)	69.4
2)	Medium income group	-	41 (14.6)	76 (27.1)	163 (58.2)	81.2
3)	Low income group	1 (0.4)	30 (10.7)	45 (16.1)	204 (72.9)	87.1

Note: Figures in parentheses indicate percentage to total respondents

Economics viability of mushroom and its products

The data compiled in Table 3 clearly stated that the economic viability index of oyster mushroom was 92.1 per cent in comparison to 56.5 per cent about paddy straw mushroom. Similarly, the dry mushroom occupied more than 79 per cent economic viability index over 46.5 per cent of wet preserved mushroom and other mushroom products secured 56.5 per cent index of economic viability.

Table 3: Distribution of respondents according to economic viability of mushroom and its products

S. No.	Particulars	Overall economic viability				Economic viability index (%)
		Nil	Low	Medium	High	
1.	**Fresh mushroom**					
a)	Paddy straw mushroom	36 (12.9)	74 (26.4)	109 (38.9)	61 (21.8)	56.5
b)	Oyster mushroom	-	7 (2.5)	60 (21.4)	213 (76.1)	91.2
2.	**Processed mushroom**					
a)	Dry mushroom	12 (4.3)	29 (10.4)	80 (28.6)	159 (56.8)	79.3
b)	Wet preserved mushroom	62 (22.1)	75 (26.8)	113 (40.4)	30 (10.7)	46.5
3.	Mushroom products (Market)	38 (13.6)	94 (33.6)	63 (22.5)	85 (30.4)	56.5

Note: Figures in parentheses indicate percentage to total respondents

These findings represent the perception of all the respondents about mushroom and its products. It is therefore clear from the table 2 that respondents may perceive that cultivation of oyster mushroom were more profitable and income generating rather than paddy straw mushroom. Similarly, the sales of dry mushroom were perceived easier than the wet preserved mushroom because of consumer preference and food choice of mushroom consumers. With regards to mushroom products, the respondents half heartedly perceived that the mushroom products like badi, pickle, papad, masale etc. are much marketable because the consumer of local and nearby markets generally prefer fresh mushroom rather than its other products.

Future scope of mushroom and its products

The findings related to scope of various mushroom items in near future are depicted in Table 4. It shows that most scope were perceived (88.5%) by the respondents for spawn production of mushroom because most of the mushroom growers were dependent on other firms and institutions for obtaining quality spawn. The scope of oyster mushroom was reported quite higher than the paddy straw mushroom in near future also with 87 percentage of scope. Regarding the type of

mushroom production, the respondents perceived that the demand of fresh mushroom followed by dry mushroom will be continued greater than the wet preserved mushroom because of feasibility of fresh as well as dry mushroom in the Indian diet system. A high demand of mushroom was depicted by the respondents in future also due to its high medicinal importance (85.8%). The future demand of mushroom for papad and pickle making was conceptualized as 69.3 and 61.9 per cent, respectively. About 50 per cent scope has been predicted for making of mushroom spices.

Table 4: Distribution of respondents according to future scope of mushroom and its products

S. No.	Particulars	Overall scope				Total scope (%)
		Nil	Low	Medium	High	
1.	Seed production	-	12 (4.3)	73 (26.1)	195 (69.6)	88.5
2.	**Mushroom species**					
a)	Paddy straw mushroom production	20 (7.1)	62 (22.1)	80 (28.6)	118 (42.1)	68.6
b)	Production of oyster mushroom	-	15 (5.4)	79 (28.2)	186 (66.4)	87.0
3.	**Type of mushroom**					
a)	Fresh mushroom	-	22 (7.9)	55 (19.6)	203 (72.5)	88.2
b)	Dry mushroom	6 (2.1)	63 (22.5)	97 (34.6)	114 (40.7)	71.3
c)	Wet preserved mushroom	49 (17.5)	85 (30.4)	114 (40.7)	32 (11.4)	48.7
4.	**Use of mushroom in other form**					
a)	For medicine	-	39 (13.9)	41 (14.6)	200 (71.4)	85.8
b)	For papad	-	60 (21.4)	138 (49.3)	82 (29.3)	69.3
c)	For spices (Masala)	32 (11.4)	97 (34.6)	130 (46.4)	21 (7.5)	50.0
d)	For pickles	13 (4.6)	78 (27.9)	125 (44.6)	64 (22.9)	61.9

Note: Figures in parentheses indicate percentage to total respondents.

Conclusion

The majority of the respondents sell their outputs in local market mostly daily or twice in a week. They usually sold up to 6 kg of mushroom at a time. The additional mushroom was generally utilized at home mostly because of non-availability of mushroom processing unit.

Most of the respondents were using mushroom as a food in their home according to its availability, fortnightly or monthly as an ingredient of vegetable.

The economic viability of oyster mushroom was found very high (91.2%). Similarly, the dry mushroom was found more viable than the wet preserved mushroom.

Majority of the respondents gave high rank to oyster mushroom regarding social acceptability. The mushroom was found to be more acceptable as vegetable amongst both genders of family members as well as all income groups. The farm women did not get to understand fully the benefits associated with mushroom farming and processing. There is a need to emphasize in detail the benefits of mushroom during the training so that the farmers can weigh between the benefits and claims before they make a choice

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