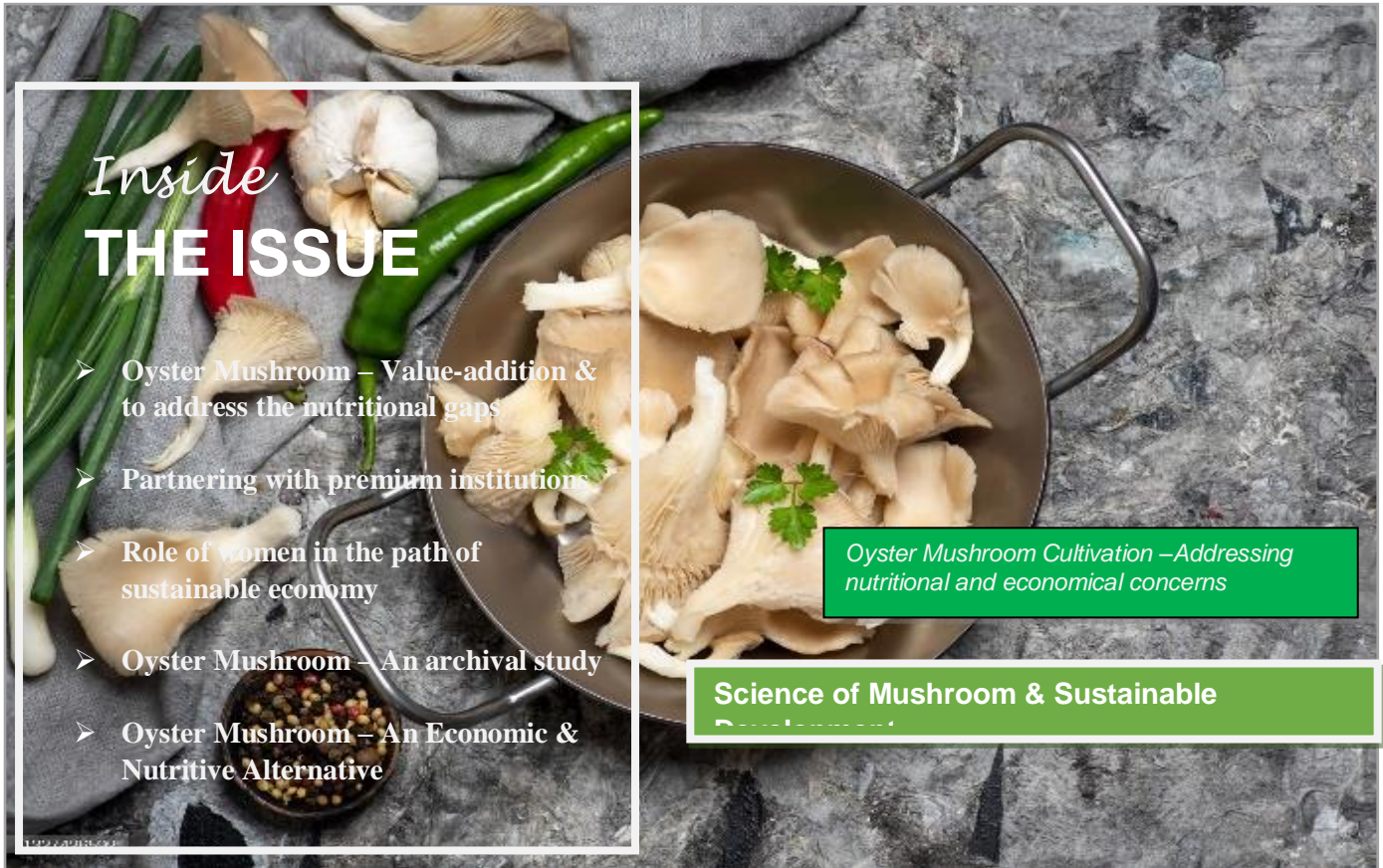


News letter

ISSUE | 06 | March – April, 2023



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Oyster Mushroom Cultivation – Addressing nutritional and economical concerns

Science of Mushroom & Sustainable Development

Addressing unemployment and malnutrition in tribal region of North Garo Hills, Meghalaya

PROJECT FUNDED UNDER SFURTI SCHEME OF MINISTRY OF MICRO SMALL & MEDIUM ENTREPRISES (MSME), GOVERNMENT OF INDIA AND FURTHER SUPPORTED BY GOVERNMENT OF MEGHALAYA



Megha Food – The CFC – Progress so far

Oyster mushroom cultivation in Meghalaya- building the foundation step-by-step



Oyster Mushroom – Nutrition and Economics

Teaching crucial skills to our farmers, especially women farmers on Oyster Mushroom and value-addition



Mushroom Cultivations – Your Questions Answered

Value-added products of Oyster Mushroom as a viable source of food and energy

OYSTER MUSHROOM – ITS IMPORTANCE

Megha Food Cooperative Society has always believed in the empowerment of communities through systematic long-term interventions, training and capacity building. The state-of-the-art mushroom cluster envisages to empower unskilled and semi-skilled mushroom farmers through value addition of oyster mushroom products thereby leading to an increase in the beneficiary income.

Oyster Mushrooms are the 2nd most cultivated mushroom in the world which comprises of 25% of the world's mushroom production. Having a plethora of medicinal and nutritional benefits, these mushrooms are rich in unique flavor and nutrients such as carbohydrates, proteins, minerals and dietary fibres.

OYSTER MUSHROOM AS A NECESSITY

Mushrooms have huge nutritional and medicinal benefit that can be of immense help to the human population. It is widely known that the agricultural sector has played a huge role in the upliftment of the Indian economy since time immemorial. Despite the enhancement of the food safety and security measures being taken, achieving a healthy diet with the right proportion and quantities of calories, proteins, vitamins and minerals still remains incomplete. With increase in population, decrease in agricultural lands, drastic weather and climate changes, it has become imperative that we look for alternative sources of farming techniques. Spent mushroom substrate, the leftover remaining after different flushes of harvesting is either left abandoned or is discarded. Spent mushroom substrate can be used successfully as a medium for vermicompost, in agriculture or landscape to enrich soils. It can also be used as a growing substrate component on the productivity and growth of various vegetables and other horticultural crops. Economically disadvantaged people suffer from various kinds of ailments and diseases owing to a lack of a balanced diet. This gap can be bridged through proper cultivation and supply of Oyster Mushroom through involvement of the landless farmers. China is one of the largest producers and exporters of Oyster Mushroom. These mushrooms have gained widespread popularity through Chinese medicine. In such systems of traditional medicine, the mushroom is used to treat a variety of health conditions. Of the many health benefits that it provides, the most significant of those are that it enhances immunity power of the body, reduces risk of cancer, promotes heart health and lowers cholesterol. Approximately, 40 varieties of Oyster Mushroom are cultivated, notably, White, Grey, Pink, Yellow and Blue with each of the variety having its distinct flavour.

Being an agrarian community, a variety of raw materials are available in India for successful production of Oyster Mushroom. Moreover, the climate and environmental factors are conducive for proper growth of Oyster Mushroom. Considering these factors, business and marketing prospects of the mushroom seem brighter in the long run.



FROM THE EDITOR'S DESK

Dear Farmers & Friends,

We are excited to share that Megha Food has been growing & has started to become visible now. This issue is focussed on the production of Oyster Mushroom farming as an integral part leading towards the empowerment of the farmers especially women in the rural hinterlands of North-east India. Through this program, we aim to illuminate the society about the importance of Oyster Mushroom for our well-being and overall development. The cluster also aims to process the mushrooms into value added products which will cater not only to the protein and micronutrient requirements but will address the problems of shelf-life and post-harvest losses of mushroom.

Our women farmers have been the backbone of our program since Day 1 and through this program we aim to support and empower many more for a sustainable and equitable society.

As we strive ahead, we want to thank all our supporters, readers and well-wishers for their help and trust in us. Please continue to support us like this and we will be delighted to share the outcomes with you.

With Thanks & Best Wishes

Editor in-Chief

COLLABORATION WITH PROMINENT ENTERPRISES

Proper branding and marketing of the produce is one of the key initiatives to be undertaken in the cluster. As the mushroom industry continues to evolve, strong tie-ups with eminent enterprises and entrepreneurs of the region have also been carried out for robust mushroom marketing. Megha Food has tied hands with NIPRD, KVK Tura, Mushroom Development Foundation (Guwahati), Innotech Agropositkam (Guwahati) for technological and marketing support and hand-holding. Megha Food Cooperative society is continuously putting efforts for the promotion of the mushrooms nationally and internationally through public relations, retail communications, etc. This is achievable through the promotion of fresh mushrooms and its value added products through development and promotion of new products, working in tandem with other entrepreneurs and establishments, maintenance and quality assurance of the new products for customers, obtaining necessary certifications and licenses, distribution of information to the customers. Our partnerships with research institutes such as ICAR, KVK Tura has helped us in facilitating our farmers in the areas of Oyster Mushroom production, handling and marketing in order to make the farmers reliable, independent and confident to produce, harvest and market the mushroom they produce to enable themselves to have a dignified source of livelihood.

OYSTER MUSHROOM AS A STEPPING STONE TO ADDRESS THE NUTRITIONAL GAPS

Oyster Mushroom, in a span of a few years, has gained widespread popularity as a wholesome quality food to address the nutritional gaps of the region. Oyster Mushroom, as a food which provides wholesome nutrition while using materials that may be considered plays a major role in the self-sustaining economy we all have been striving for.

Our cluster consists of more than 50% women who are young and middle-aged. 47% of the women have children below the age of 6 years. It is this group which are very vulnerable in catching different ailments and diseases due to a lack of a balanced diet. Through this cluster program, Megha Food intends to bridge the nutritional gaps in the state and the region through systematic long-term interventions through the facilitation of Oyster Mushroom production, cultivation and consumption. The health and the medicinal benefits that one can get from the consumption of Oyster Mushroom is paramount. Through this program, we envisage a society where the rural population, especially women, are self-reliant and are active participants in bridging the health, nutritional and medicinal gaps in the region.

ECONOMIC VIABILITY OF OYSTER MUSHROOM TO ALLEVIATE POVERTY

Meghalaya is an agrarian state with more than 70% of the population directly or indirectly engaged in a variety of agricultural activities. A huge no. of people in the state especially adolescent girls and children suffer from acute protein malnourishment and anaemia. Reduced income coupled with increased expenditure on healthcare have created many challenges especially for the rural people who do not have access to the best of healthcare. Due to the high frequency of natural calamities and costly ways of doing conventional agricultural practices, the people of the state are very enthusiastic to develop an alternative source of livelihood which has a potential to generate high income. In this regard, Megha Food Cooperative Society paves the way for large-scale Oyster Mushroom production to alleviate poverty and malnourishment. As the harvesting takes little place and can be done at the household level only, it will allow and encourage many more farmers to take up this activity full-fledgedly. It is hoped that this venture will ensure food safety and security to many households of the region. As there is no usage of fertilizers and chemicals, and profit margins being comparatively high than the other cash crops, it has the potential to create many livelihood opportunities for the landless farmers. Thus, mushroom cultivation is becoming a popular activity for development programs targeting income generation among women.



VALUE ADDITION OF OYSTER MUSHROOM-ITS SIGNIFICANCE

Mushrooms are considered one of the vital source of protein and has huge nutritional and health benefit. But one of the downsides of this mushroom is that it has a very short shelf-life and hence mushroom cultivation & utilization is still very low. Thus it is required to process these mushrooms into value-added products which will not only be a wholesome food to eat for the masses but also solve the problem of perishability and post-harvest losses. Oyster Mushroom Industry as a cottage industry has a huge scope in Meghalaya as the overall climatic conditions and weather are conducive for the production of Oyster Mushroom. There is a huge demand for canned, dried, and fresh mushrooms including a lot of processed products that come out of Oyster Mushroom. There is great demand for fresh mushroom in the local market for consumption of tourists in hotels. Apart from fresh consumption of mushrooms, it can be exported as an organic brand to other countries.

Megha Food Cooperative Society, is using the opportunity and is providing a medium through the establishment of a common facility centre (CFC) being built at the cluster location. The CFC aims to bridge the gaps existing in the region & facilitate the growth and development of the SPV and the individual farmer members. The processing facility at the CFC will carry out value-addition activities such as production of dehydrated and canned mushroom, mushroom powder and mushroom pickle as the primary products. The cluster aims to reach out to the entire population and not just one entrepreneur to improve the livelihood and income generation activities for the farmers. Focussed on an integrated and a holistic approach to development, it aims to provide end-to-end support to the farmers of the area including access to technology, quality inputs, handholding and capacity building local value addition, access to funds and also access to markets both nationally and internationally.

With an annual production capacity of 1000 tonnes of mushroom production that is envisaged for the cluster, the value addition facility shall have a dehydration unit with 27,500 kg/year of dehydrated mushroom, dehydrated powder unit with a capacity of 27,500 kg/year of Oyster Mushroom Powder, Pickle unit with a production capacity of 200,000 kg/year of Oyster Mushroom Pickle.

The Cluster will also have a dedicated marketing and branding plan that shall provide all the marketing access support to the farmers by aggregating the farmers' produce & tie-ups with a wide range of bulk buyers including hotels and restaurants that require regular supply of mushroom throughout the year.

The cluster will also focus extensively on the marketing aspect through advertisement and publicity via marketing brochures, website, Farmers' App, Joint participation in national and international exhibitions, business delegations, Brand development and promotion, etc. Adoption of new technologies, interventions and 1st level processing facilities such as cleaning, drying, sorting, bagmaking, value addition and packaging are already in place; facilities already in place for bag making, dehydration, powdermaking, new and improved farmer grow house.

For proper marketing, it is also important that the product should be of high quality with proper details of its nutrition, ingredients, manufacturing and expiry date, date of packaging, etc. The packaging material should also be of a good quality. The package should also be attractive and should appeal to the customers.

The quality of the processed product is also very important. Thus, it is necessary to attain different licenses and certifications such as FSSAI, GAP, GMP, HACCP, TQM to name a few. For large-scale commercial production, it is important that all the products are of the same taste, flavour and aroma because consistency is the key.

Processed products will have a longer shelf life thus enabling the cluster to produce consistent and year-round products. This will generate a continuous flow income for the farmers thereby generating a consistent livelihood away from the existing scattered and dynamic one.

Thus, it can be concluded that mushroom production and value-addition can be a very appropriate option for these rural farmers as it is highly nutritive and has a good economic viability. Perfectly suitable for consumption right for people across all ages and gender, mushroom cultivation has the ability to change the fate of so many people of the region.



KNOW YOUR MUSHROOM PRODUCTS



1. **DEHYDRATED MUSHROOM** – One of the most popular variety of mushroom where the water content is significantly reduced. The dried produce can be further processed to prepare a variety of products. Sundrying, cabinet drying are the most popular forms of drying techniques. Mushrooms have approx. 90% of moisture and drying takes away most of the moisture content making the mushrooms light. They should be dried in dust-free areas having no diseases and pests. One of the major advantages of drying is that it increases the Vit. D content of the mushrooms. Dried mushrooms may be further used to make other products, one of the most popular being Mushroom Powder. It can also be sauted and cooked according our taste buds.

2. **MUSHROOM POWDER** – For making mushroom powder, dried mushroom are made into powder in a machine called the pulverizer which typically grind the coarse materials into fine ones. This powder is then fortified with other items such as milk powder, corn flour, sugar, salt, etc. Addition of these items make the product more delectable.

3. **CANNED MUSHROOM** – Canning is a process with the help of which mushrooms can be stored for almost a year. It is used for long-term preservation. The canning process starts with cleaning followed by blanching which means putting the items into boiling water for sometime and then filling the can with brine solution which contains salt and citric acid primarily. It then undergoes sterilization followed by cooling, labeling & packaging. This method is very simple and economical and can be used for a longer duration of time.

4. **MUSHROOM PICKLE** – The essential ingredients required to make pickles are mushroom, onion, oil, ginger, garlic and salt, red chillies, vinegar. The process is simple; firstly, the mushroom are cut into small pieces and then fried in the oil. Finely chopped onion and ginger are also fried and is then mixed to the mushroom. Other items such as chillies, salt, garam masala are then added to the mix and kept in the sun for 2-3 days. As canning is not always possible to do especially in rural areas, many a times people go for pickle preparation

5. **MUSHROOM PRESERVE** – After the mushrooms are graded, washed and blanched in KMS solution. The blanched mushroom is then put in Brix solution and refrigerated overnight. The preserve should have a sugar solution of 70° Brix and therefore the preserve is regularly dipped in sugar solution for atleast a week. The preserve is then drained out of the sugar syrup and then filled in a container containing sugar syrup of 68° Brix. The containers are then sealed airtight and then stored.

6. **MUSHROOM CANDY** – Method of preparation for a candy is similar to that of the preserve but the sugar solution is impregnated with a higher degree of sugar solution, approx. 75° Brix into the product. It is partially dried to get the chewy texture. Best period is upto 8 months for storage.

7. **MUSHROOM CHIPS** - For this product, mushrooms are cut and then blanched. The mushrooms are then dipped overnight in a citric acid solution. After draining off the solution, the mushrooms are then dried. Then it is fried in oil and good quality chips are prepared. After mixing the spices, the chips are then packed in polypropylene packets and sealed. Mushroom chips are in high demand among the consumers because of its crispiness and taste. It also comes in different flavours in the market. Mushroom chips are also a good source of some B vitamins, selenium, antioxidants, fibre and Vit. D. They provide these nutrients with low calories and very less fat.

KNOW YOUR MUSHROOM PRODUCTS

8. **MUSHROOM BISCUIT** - Oyster Mushroom is a good source of making biscuits. These biscuits which are quite delicious and nutritious to eat are made from flour, mushroom powder, ghee, sugar, baking powder, salt, etc. The dry ingredients are finely ground and then fat and sugar are added. Water is added to make the mixture homogenous. The dough formed is then cut into various shapes of biscuits to be made. These raw biscuits are then kept in a hot oven at 180 ° C for 20 minutes and then taken out and allowed to cool. The biscuits are then packed in attractive packages and then sold.

9. **MUSHROOM NUGGETS** - For the preparation, mushroom powder is mixed with water and is made into a paste. Red chilli powder and salt are also added to the mix. The paste is then made into the shape of balls and is then put for drying. These are then further deep fried and consumed immediately or used for further preparation of dishes.

10. **MUSHROOM PAPADAM** - Papadam which is a thin, crispy Indian snack which is mainly made from black gram bean flour, either fried or cooked until crunchy. It is usually supplemented with mushroom in dried or in powdered form in the batter for making papadam. Adding mushrooms make the papadam a highly nutritious and healthy food with ample protein content. It is mostly fried for 60-90 sec in edible oil for consumption.

11. **MUSHROOM FORTIFIED CORN EXTRUDATES** - Extrusion is a high temperature short time cooking technique used to produce a variety of products from different food ingredients. Mushroom fortification in extrudates is done by mixing mushroom powder.

12. **MUSHROOM FORTIFIED CAKES** - This cake is prepared by fortifying dry mushroom powder in the flour. The other ingredients required to bake the cake remain the same.

13. **MUSHROOM BASED SAUSAGES** - For making the sausage, cleaned and heat-treated raw mushroom are chopped and is mixed with fat, spices, materials and other additives. It is then filled into a casing skin and is then submitted to washing, drying and smoking. Binding agents such as carrageenan, soya protein concentrate, casein or xanthan gum are primarily used.

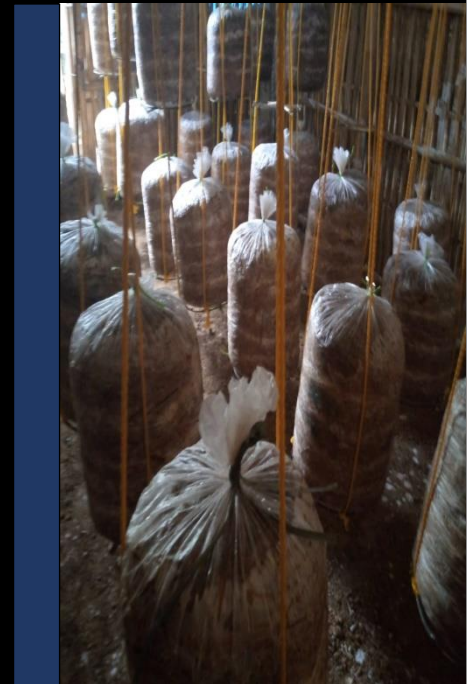
14. **MUSHROOM FORTIFIED INSTANT NOODLES** - Mushroom fortified ready-to-cook noodles of high quality and delicious taste can be prepared by mixing the noodle dough with mushroom powder.

15. **MUSHROOM SALAD** - Mushrooms can be used in salads in sauté form. It is lightly fried before serving.

16. **MUSHROOM TOMATO SOUP** - Tomato soup can be prepared and mushrooms can be added as a supplementary product. The main ingredients used are tomato, mushroom, onion, garlic, corn flour, butter, salt and pepper.

17. **MUSHROOM PAKODA** - The main ingredients used for making the pakoda are fresh mushrooms, flour, onion, ginger, cooking oil, salt, green chillies. The mushrooms should be blanched before frying it. The rest of the ingredients are made into a paste and is then added to the mushroom before deep frying it. It can be consumed as is or with sauce.

18. **MUSHROOM VEGETABLES** - Mushroom used as a vegetable is very popular these days. Other vegetables may also be added while preparing the vegetable dish or it may be solely used. We should try to not over fry mushrooms as it tends to get harder if fried for a longer stretch of time.



SNIPPETS FROM THE FIELD





PROJECT



- Funding Agency: SFURTI Scheme of Ministry of Micro Small & Medium Enterprises (MSME), GoI
- State Support Agency: Meghalaya Basin Management Agency (MBMA), GoM
- Nodal Agency: Indian Institute of Entrepreneurship (IIE), Guwahati
- Technical Agency: Madhukar Livelihood Foundation, New Delhi
- Implementing Agency: Mendipathar Multipurpose Cooperative Society, NGH, Meghalaya