

From Consumer Need to Consumer Delight: A Consumer-Centric Approach to New Food Product Development



Report on Workshop on Plant Protein Workshop at University of Transdisciplinary Science and Technology (TDU), Bangalore

[Date: 2nd & 3rd June 2025]
[TDU Campus, Yelahanka, Bengaluru]

Secretariat, Coalition of Partners for Food Systems Transformation in India (CoFTI)

Abstract

The report is prepared by CoFTI Secretariat for the reporting purpose to the CoFTI core group and donors.

Gratitude to :

Prof. Gurmeet Singh, Dean Research and Outreach, The University of Trans-Disciplinary Health, Sciences and Technology (TDU), Dr. Shridevi Gothe, Asst Professor, Staff from scientific kitchen/labs and PhD scholars who have contributed a lot during the stay and helped our participants to get hands-on experience on various topics and address the queries on multiple aspects.

Agenda for the workshop

Day-1

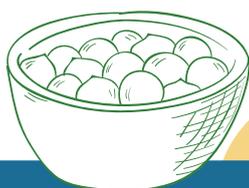
- Introduction
- Brief on plant protein and its requirements in human health and ecology
- How FPO/ SHG can create a business innovation on alternative plant protein using local resources
- Expectations from participants
- Field visit to Ayurveda garden to collect the wild plant and flower to prepare the green and plant based drink.
- Preparation of multi grain food items from millet and wild edibles.
- Visit to scientific lab and plant protein lab for machinery demonstration

Day-2

- Briefing of the day-1 and lecture on how plant protein can help reduce anemia
- Session on food standards and FSSAI regulations.
- Live demonstration on improvement of oil and ghee lifespan adding plant-based micronutrients.
- Live demonstration on preparation of Meyonies without using oil.
- Live demonstration of preparation of Protein barks using wild edibles
- Medicinal plant walk

Contents of the report

India's transformation of its food system from a highly deficit one in the mid-1960s to a self-reliant and marginally surplus system now is a story of success. However, as India looks towards 2030 and beyond, its food system faces many challenges ranging from increasing pressure on natural resources (soils, water, air, forests) to climate change, fragmenting land holdings, increasing urbanisation, and high rates of malnutrition among children.



To meet these challenges successfully, India needs the right mix of policies—ranging from investment-driven and price policy to income policy approaches—while promoting agricultural diversification towards more nutritious food. It also needs to build efficient and inclusive value chains, giving due importance to environmental sustainability.

More innovative technologies and ideas will be needed to 'produce more from less,' with the goal of feeding the most populous nation on this planet by 2030 in a sustainable manner. Markets and businesses will play an instrumental role in making this a reality.

One of the Action labs proposed under COFTI is "Food Business". This action lab aims to spotlight the role of business in fostering a sustainable food system especially

- Development appropriate knowledge commons for enabling sustainable enterprises
- Exploring sustainable value chains around plant and animal proteins
- Promotion of diversified value addition for high-end supply chains
- Promotion of community/farmer producer institutions for ensuring equity for farmers
- Promotion of wild edibles & wild-edible-based products for nutritional diversity, ecological diversity and livelihoods

In line with the COFTI mandate, this workshop at TDU was designed to give an exposure to the Women Self Help Groups (WSHGs) members who are primarily involved in millet-based business and processing. There were 33 participants selected from Odisha and they are mentored under guidance of Department of Agriculture and Farmers Empowerment and Department of Mission Shakti, Government of Odisha.

Day-1

The day started with an introduction of the participants and a thought-provoking brief on plant protein and the expectations from the workshop by Prof. Gurmeet Singh. After the introduction and context setting, Dr. Shridevi Gother, Assistant Professor at TDU, shared a brief presentation on the requirement of plant protein for humans and how it can help to balance the environment, forests, and ecology. India is one of the biggest countries dealing with diabetes and many chronic diseases, and the lack of protein and micronutrients in food has been unable to meet the per capita requirements of the body. As nutrition requirements differ from person to person and generation to generation, how to balance good food from local resources is a focal point for everyone to think about

After the presentation, all the participants visited the wild edible Ayurveda garden to explore the native collection of traditional and medicinal plants. Dr. Sridevi facilitated the exposure visit, and the participants were divided into three groups. Each group had to collect flowers, leaves, and grasses of their choice and then use them to prepare a plant-based edible that could be used as food, medicine, or a supplement to a hot beverage. After the tour, participants gathered at the scientific kitchen, where Dr. Sridevi and other experts guided all three groups in preparing the following items:



- *Kanchan leaf, flower, and other herbs*: Prepared into a green powder which can be used as a supplement in podi, chutney, or consumed with plain water.
- *Hibiscus flower for summer drink*: A blend of hibiscus flower with ice and a pinch of salt can be used as a refreshing summer drink that also supports liver health.
- *Amvla drink*: Made from amla and herbs, this can be consumed before meals as



(Pic-1: Searching of wild plants, Pic-2: Green Podi / Chutney, Pic-3: Hibiscus juice, Pic-4: Amla juice drink)

Session-2

After the preparation of the above items, Dr. Shridevi briefed the participants on how to preserve them and explained their lifespan, as well as their multiple uses.

As all the participants are primarily involved in millet processing and value addition, the second session focused on how to create a multi-millet grain sweet dessert/ladoo which contains multiple vitamins and minerals and can help supplement protein and micronutrients. The multigrain recipe included dry fruits, dry-roasted sorghum, sesame seeds, ragi grain, little millet, jaggery, ghee, dry ginger, and herbs. This recipe was prepared without using water, so the shelf life of the product can last up to 90 days due to its very low moisture level. This can be a sellable model for SHG members who are preparing millet-based snack items. It can be prepared using readily available ingredients and can also be scaled for commercial purposes by SHG members.





(Pic-5: roasting of ingredients, Pic-6: preparation of recipe, Pic-7: raw form of laddoo, Pic-8: ready to eat laddoos)

This recipe can be fed to lactating mothers and anemic patients, the multigrain will help to address the nutrition requirements and due to low sugar and high fiber content this can be consumed by people of every age.

Session-3

After the lunch break, the team went on an exposure visit to the food processing labs and observed the machinery that creates ragi noodles/barks with less than 10% moisture. With instant input, the machine can create different types of noodles, and due to the low water content, the barks can be converted back into millet powder and used for making rotis, noodles, snacks, and other items. This machine has a unique compression strength that can prepare any grain into noodle-sized barks, which can then be stored and used as required. Temperature and moisture can be managed as per the requirement and depending on the use.

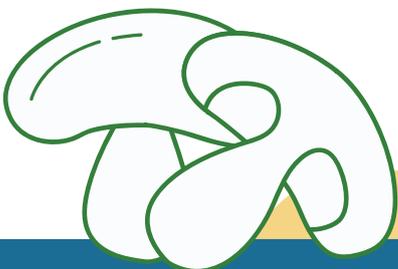
DAY 2

Session-1

The second day started with reflection sharing of the 1st day from the participants and learning they gather from day-1. The context setting and agenda sharing was done by Dr. Sridevi Gothe.

Session-2

Dr. Shovan Ganguly briefed the participants on the minimum food safety standards and the regulations by FSSAI, the licensing process for the same and the manufacturer licence along with safety protocols. Participants asked questions on the regulation of packaging for food with longer shelf life, and raw materials which were being sold by them. The packaging standard rules were shared by him addressing the question of participants.



Session-3

Dr. Gurmeet Singh briefed the participants on the requirements of the machine and how the machine pressure and temperature works for a human being and how the same can be used when we process the food. He gave the example of a pressure cooker and mixer grinder that helps to prepare mayonnaise or milkshake for ice cream. He also briefed on the mix of fat content in the milk can improve the life span of the milk-based products.

A demonstration on improvement of oil texture and how to improve the oil reuse process which can help SHG members to prepare items with longer shelf life. Dr. Swasthi Mudgal, Asst professor TDU gave a live demonstration on the preparedness of the process of oil.



This technique involved adding 50 g of amla powder, 10–15 g of fenugreek powder, and 50 g of water into 1 liter of regular sunflower oil, along with a teaspoon of salt, and heating the mixture for about 20 minutes until the ingredients settled at the bottom of the hot pan under the oil. Later, the oil needed to be filtered and the extract separated. Once cooled, the oil's color and texture changed, becoming slightly thicker. It could then be used at least 4 to 5 times, as micronutrients and protein had been added to the oil. The fried snack items also had an improved shelf life due to the added nutrients, which helped stabilize the oil for up to 90 days.

(Pic-9: Demonstration of oil shelf life preparedness and Pic-10: Live demonstration of the same.)

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Session-4

Participants learned about preparation of oilless mayonnaise and ice cream.

Session-5

In the last session, a live demonstration on the low-moisture extrusion machine was conducted to prepare plant protein barks in the Wet Pilot Plant Lab. The ingredients used were ragi powder, amla, methi, dal flour, and some other herbs, which were measured and poured into a twin-screw extrusion machine. The machine produced sheets of protein barks with 20% moisture content, which were then placed in a dry oven for 20–30 minutes. The texture of the plant protein resembled chocolate bars or snack-sized pieces that could be consumed as a protein supplement. Each 5-inch protein bark contained 20% protein, making it highly beneficial for health and suitable for marketing in local shops. These barks can be produced using local resources and small customized machines.



(Pic-11: Plant protein barks before shifting into the oven for dry)



Dr. Gurmeet explained that if any WSHG member wants to set up a plant for plant protein, support can be provided for machine customization, R&D, training, and packaging. A local-level training and R&D lab can also be established to promote this initiative. He suggested that the CoFTI team come up with an idea on how further collaboration can be pursued so that plant protein products can be popularized and produced at the local level.

Session-6

In the last session of the 1.5-day workshop, a medicinal plant walk was organized by TDU to provide an overview of native plants that were traditionally part of Ayurveda and used as household remedies. The walk helped participants recognize the value of certain medicinal plants, how they can be conserved at the local level, and how they can be used to produce plant protein or alternatives to protein, thereby becoming a part of food businesses.

