



Emergence of Packaged Fermented Fish in Manipur – The Case of Sengmai Ngari

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Abstract:

This study investigates the rise of packaged fermented fish, with a specific focus on *Sengmai Ngari* in Manipur, India. Fermented fish plays a pivotal role in the cultural and dietary landscape of Manipuris. Through a combination of semi-structured interviews, case studies, and participatory observation, the research delves into the traditional techniques of fish fermentation, encompassing sun-drying, washing, pressing, and packing in oil-coated pots for duration of at least six months. Traditionally, fermented fish is distributed in loose form, either wrapped in paper or carried in plastic bags. However, the transition to packaged forms has facilitated broader distribution, enhanced transportation, ensured product safety, and prolonged shelf life. The emergence of packaged fermented fish is driven by increasing demand from both local residents and those outside the state and nation. Additionally, it has emerged as a livelihood opportunity for numerous labourers engaged in the processing and packaging sectors, with the *Sengmai Ngari* enterprise alone providing employment to over 60 individuals. By catering to diverse consumer bases, this enterprise acts as a conduit between traditional gastronomy and contemporary preferences. Nonetheless, challenges persist, including sourcing raw materials, maintaining product quality and shelf life, and implementing adequate contamination prevention measures during handling. Nevertheless, packaging indigenous foods presents avenues for promoting local products in the global market. This study underscores the importance of preserving traditional practices while embracing modern packaging techniques to sustain and propagate indigenous culinary traditions.

Keywords: Contamination, enterprise, indigenous food, *sengmai ngari*, shelf life, traditional method

Introduction

Fermentation, as a process deeply entrenched in the cultivation of microorganisms on a large scale, has remained a cornerstone technique in food production and preservation across diverse regions (Stanbury, 2003). Its significance transcends mere preservation, offering a plethora of benefits ranging from intensified flavour profiles to improved digestibility and enriched nutritional and pharmacological attributes. Particularly in developing regions, where protein and vitamin deficiencies are prevalent, fermentation assumes critical importance as a means of addressing dietary challenges. Studies conducted in various developing regions have shed light on the pivotal role of fermentation in mitigating nutritional deficiencies and improving food security. For instance, research in sub-Saharan Africa has highlighted the use of fermented foods like millet and sorghum porridge in combating malnutrition and enhancing nutrient bioavailability (Ogunbanwo and Sanni, 2003). Similarly, investigations in Southeast Asia have underscored the significance of fermented soybean products in providing essential proteins and micronutrients to populations facing dietary inadequacies (Hesseltine, 1983).

Within the context of India's north-eastern states, such as Manipur, indigenous fermented foods form indispensable components of daily dietary practices (Sarojnalini et al., 1994). Staples like soybean, bamboo shoot, fish, and leafy vegetables undergo fermentation processes, imparting distinctive flavours and augmenting their nutritional profiles. The reliance on fermented foods in these regions underscores their cultural and dietary significance, serving as crucial sources of sustenance and nourishment for local populations amidst prevailing nutritional challenges.

Literature Review

Traditional fermentation practices are deeply embedded in the culinary fabric of Manipur, serving as vital components of cultural heritage and dietary traditions passed down through generations (Sarojnalini et al., 1994). Among these practices, the fermentation of fish holds a prominent place, being a dietary staple for various ethnic groups within the region. Dishes like *Ironba* and *Singju* epitomize the integration of fermented fish into local cuisine, playing a pivotal role in preserving culinary heritage amidst the encroachment of global fast food culture (Sarojnalini et al., 1994). *Ironba* is a mixture of *ngari*, mashed potato, local vegetables, chili and salt while *singju* is another popular green salad of *ngari* and varieties of local vegetables. The taste of any main dish cooked without oil is enhanced with *ngari* though there are numerous other dishes cooked with both. In recent years, the introduction of packaged fermented fish has catalysed a

significant shift in food processing and distribution dynamics across Manipur. This evolution is driven by the escalating demand for convenient, high-quality food products that retain traditional flavours while mitigating the challenges associated with the strong odour often associated with fermented fish. Similar trends towards packaged foods have been observed in developing regions worldwide, reflecting changing consumer preferences and the pursuit of convenience (FAO, 2013).

However, this transition is accompanied by its share of challenges. Entrepreneurs venturing into the packaging of fermented fish encounter various obstacles, from ensuring the sourcing of high-quality ingredients to mastering proper packaging techniques to uphold product integrity (Safar, Sopko, and Poklemba, 2018). Such challenges are prevalent among small and medium enterprises (SMEs) in developing regions, where limited resources and infrastructure often impede business growth (Safar, Sopko, and Poklemba, 2018). Addressing these hurdles is imperative for the sustainability and prosperity of packaged fermented fish ventures, underscoring the significance of understanding and mitigating barriers to growth in the sector.

Objectives

The study aims to provide an anthropological perspective on the packaging of fermented fish at the Sekmai Dry Fish Fermentation Center in Sekmai, Manipur and also examining the challenges and opportunities associated with packaged fermented fish. Specifically, it is: i) to investigate the anthropological aspects of the packaging process of fermented fish at Sekmai Dry Fish Fermentation Center in Sekmai, Manipur; ii) to examine the cultural significance and dietary practices associated with the consumption of indigenous fermented foods in north-eastern states of India, particularly Manipur; iii) to assess the nutritional benefits and socio-economic implications of traditional fermentation practices, focusing on their role in addressing dietary challenges in developing regions; iv) to explore the motivations and drivers behind the emergence of packaged fermented fish in Manipur, analysing the shift in food processing and distribution dynamics; v) to identify the challenges faced by entrepreneurs in the packaging of fermented fish, including sourcing high-quality ingredients, mastering packaging techniques, and ensuring product integrity; and vi) to evaluate the potential opportunities and prospects for packaged fermented fish ventures in developing regions, highlighting the importance of addressing barriers to growth for sustainable business development.

Materials and Methods

Study Setting: The research was carried out at the Sekmai Dry Fish Fermentation Center located in Sekmai, a town situated in the Imphal West district of Manipur.

Participants: The study involved interviews with various stakeholders associated with the Sekmai Dry Fish Fermentation Center. This included the proprietor of *Sengmai ngari*, along with his wife who played a role as his business assistant. Additionally, manual labourers involved in the packaging process and retailers of the fermented fish product were also interviewed.

Data Collection: Data was collected through structured interviews using a pretested questionnaire. Interviews were conducted with the aforementioned stakeholders to gather insights into their roles, experiences, and perspectives regarding the production and distribution of fermented fish.

Secondary Data Sources: Secondary information related to the process of producing fermented fish was gathered from various sources including books, reports, and other available literature. This secondary data provided supplementary insights into the fermentation process, industry trends, and relevant background information.

Ethical Considerations: Prior to conducting interviews, ethical considerations were adhered to ensuring informed consent was obtained from all participants. Confidentiality and anonymity of participants were maintained throughout the study. Additionally, permissions were sought from relevant authorities for accessing the Sekmai Dry Fish Fermentation Center and conducting interviews.

Data Analysis: The data obtained from interviews and secondary sources were analysed using qualitative methods. Thematic analysis was employed to identify recurring themes, patterns, and insights emerging from the data. The qualitative analysis aimed to provide a comprehensive understanding of the practices, challenges, and opportunities associated with fermented fish production in the Sekmai region.

Limitations: It is important to acknowledge potential limitations of the study, including the reliance on self-reported data from stakeholders, which may introduce biases. Additionally, the scope of the study was limited to a specific geographic area and may not be fully generalizable to other regions.

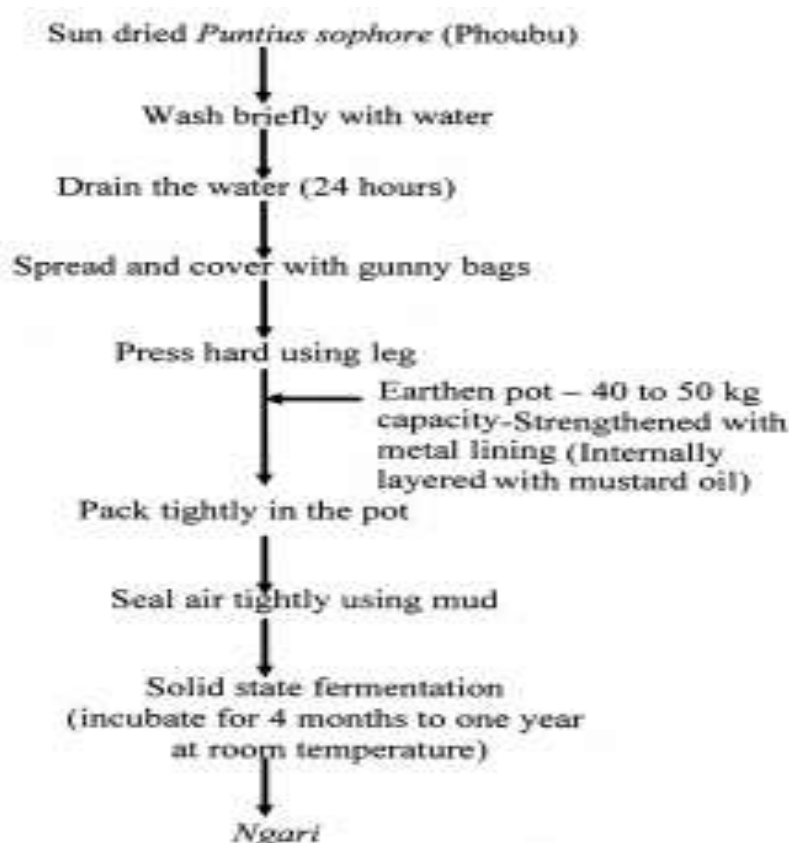


Figure - 1: Chart for *ngari* preparation (source: www.researchgate.net)

Results and Discussion

Ngari, traditionally referred to as *utong-nga*, is a fermented delicacy derived from *Puntius sophore* (Ham), locally known as *phabou* (Jeyaram et al., 2009). The process begins with the importation of raw materials from Gujarat, Assam, and Bangladesh, facilitated either through cash payments or credit transactions via intermediaries. Selection of high-quality raw materials is meticulously undertaken through personal visits to these sourcing centers, typically conducted between October and January. Upon arrival, the raw materials undergo processing using porous bamboo baskets to facilitate drainage, followed by transfer to gunny bags for pressing to eliminate excess water and crush the head and bones. Subsequently, the crushed fishes are packed into earthen pots known as *chaphu*, each with a capacity of approximately 45-50 kg, and the inner surface is coated with mustard oil. This oiling process is deemed crucial as it is believed to induce anaerobic conditions within the pot, essential for fermentation. Fresh pots require 8-10 coats of oil application at regular intervals, while used pots necessitate only one coat. Once prepared, the pots are tightly sealed using polythene sheets, fish scales, oil slurry, mud, and cow dung slurry. The mouths of the pots are filled with cover paste and overlain with a cover leaf, ensuring airtight enclosure (Figure - 2 to 5). These tightly sealed pots are then stored in dark, ambient conditions at room temperature for a minimum of four months, extendable up to twelve months for optimal fermentation (Jeyaram et al., 2009; Singh et al., 2010). Upon completion of the fermentation period, the pots are opened, emitting a characteristic aroma indicative of successful fermentation, with the content exhibiting a shelf life of 12-18 months, ready for consumption.

The selection of fermented fish for packaging, priced at rupees 120 per 250gm, undergoes rigorous testing to ensure quality and longevity. Salting and sealing samples in packets for three months assess their condition, with the option for extension to six months for increased reliability. To maintain consumer confidence, packets are marketed with three-month validity from the date of packaging. Packaging materials, including three-layered packets procured from Delhi, play a pivotal role in preserving the quality of the product. These packets, composed of nylon, LLDPE, and aluminium with a thickness of 40 microns, are highly recommended for preserving oily, sticky, and bony contents. Additionally, the procurement process involves collaboration with experienced food packaging firms and dealers, ensuring the selection of optimal materials and techniques. The packaging process, executed by local women labourers on a daily wage basis, prioritizes hygiene and safety measures. Their selection is based on meticulous observation of personal habits and dedication, with mandatory use of nets and masks during work to maintain sanitation standards. The packaged product is sold at varying rates, with a current profit margin of rupees 10 per kg (4 packets), indicating a favourable return compared to loose sales. To sustain long-term production, efforts are underway to establish direct contact with Bangladesh for a consistent supply of raw materials, ensuring the continuity of *ngari* production in the region. (Jeyaram et al., 2009; Singh et al., 2010).

Conclusion

The production and packaging of *ngari*, deeply rooted in tradition, entail a meticulously crafted process aimed at preserving quality and extending longevity. Commencing with the importation of raw materials from diverse regions like Gujarat, Assam, and Bangladesh, this intricate process involves meticulous selection of premium fish and rigorous processing techniques. Raw materials undergo drainage, pressing, and packing into earthen pots, where they are meticulously coated with mustard oil to initiate crucial anaerobic conditions essential for fermentation. Following the airtight sealing of pots, they undergo storage in dark, ambient conditions for a minimum of four months, fostering optimal fermentation. Upon the completion of the fermentation period, the distinctive aroma emitted by *ngari* signifies successful fermentation, marking its readiness for consumption with a shelf life spanning 12-18 months. The selection of fermented fish for packaging undergoes stringent testing to guarantee quality and longevity, with samples subjected to salting and sealing for assessment. Packaging materials, notably three-layered packets sourced from Delhi, play an indispensable role in preserving the product's integrity, particularly given its oily, sticky, and bony nature.

Execution of the packaging process by local women labourers prioritizes hygiene and safety measures, ensuring adherence to sanitation standards. The evident profitability of *ngari* packaging underscores its potential for aspiring entrepreneurs, albeit with the caveat of meticulous market research and a steadfast commitment to quality. Sustainable long-term production necessitates the establishment of direct relationships with raw material suppliers, especially from Bangladesh, ensuring a consistent and affordable supply chain. This underscores the imperative of strategic planning, unwavering dedication to quality, regulatory compliance, and collaboration with pertinent authorities and agencies to foster an enabling business environment for *ngari* production and packaging ventures. While *ngari* packaging presents promising opportunities, success hinges on a holistic approach encompassing meticulous planning, unwavering commitment to quality, and collaborative engagement with stakeholders to navigate challenges and capitalize on market opportunities effectively.



Figure - 2: Pots with ready-to-pack *ngari*



Figure - 3: *Ngari* in inner layers of packaging



Figure - 4: *Ngari* in its final packaged form



Figure - 5: Ready for distribution packet

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