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### Knowledge on Ngari (Fermented fish) production and management practices in Imphal West district of Manipur

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#### Abstract

The present study was conducted on Production and management practices of Ngari (fermented fish) in Imphal West district of Manipur, in the session 2023-2024. A total number of 120 respondents were selected randomly from Sekmai Village under Lamshang Block as it is the place where most of the production of Ngari (fermented fish) takes place. The primary data was collected using pre-structured interview schedule and appropriate statistical analysis were done to obtain the suitable results. The study inferred that 43.33 percent of the respondents are of middle age group, 38.33 percent were educated up-to primary school. It was revealed that 37.50 percent of the respondents are engaged in agriculture and labour, 43.33 percent have cemented house. It was found that 43.33 percent of the respondents have 1-2 acres of land and majority (53.33%) have nuclear family type with 41.67 percent of the respondents annual income as 50,001 to 1,00,000 rupees. It shows that majority (68.33%) of the respondents have medium level mass media exposure, 45.83 percent have medium level of extension contact, majority (61.67%) of the respondents have medium level knowledge toward production and management practices of Ngari. Age, education, occupation, type of house, annual income, land holding, extension contact and mass media exposure were found positively and significantly correlated with the knowledge of the respondents.

**Keywords:** Ngari, fermentation, improved production practices, Manipur

#### 1. Introduction

Fermentation is a traditional food preservation method and is widely used for improving food safety, shelf life, and organoleptic and nutritional attributes. Fermented fish are produced and consumed in different parts of the world and are an integral part of many food cultures. Furthermore, fermented fish are a source of interesting microbes and are an important industry in many countries. Traditional fermentation of fish is an indigenous technology for long-term preservation adopted by ethnic tribes of north-east India. The nutritional composition in terms of protein, carbohydrate and lipid as well as moisture content and pH value showed variation between the pre- and post-fermented fish.

Ngari is a traditional fermented fish product of Manipur, a state in northeastern India. During its production, fish (*Puntius sophore* Hamilton) usually from the family Cyprinidae, are cleaned and rubbed with salt, dried in the sun for 3–4 days, washed briefly and spread on bamboo mats. A layer of mustard oil is applied to the inner wall of an earthen pot, which is filled with dried fish and traditionally pressed tightly by foot. The pot is sealed airtight and then stored at room temperature for 4–6 months. It is kept for more than a year at room temperature. Ngari is eaten daily as a side dish with cooked rice. It is sold in local markets in earthen pots.

The traditional process of Ngari production can take several months, and requires close monitoring to ensure that the fish is properly fermented and preserved. However, there have been efforts to modernize and improve the process to ensure food safety and quality. It is an excellent source of minerals, amino acids, and protein. Antioxidant, probiotic, and anti-hypertensive qualities may be present in the product. However, if the product is fermented and processed improperly, there is a risk of food poisoning through cross-contamination. It is believed to have anti-inflammatory, antimicrobial, and analgesic effects.

Through the production and utilization of Ngari, the Sekmai people may additionally have get entry to common healthcare practices, lowering their medical fees and improving their overall well-being. Its cultivation can be integrated into sustainable agriculture practices, promotion environmental conservation and lowering the reliance on chemical inputs. By adopting Ngari cultivation, the Sekmai human beings can diversify their agricultural activities and enhance their resilience in opposition to climate exchange and market fluctuations.

#### 2. Research Methodology

Descriptive research design was used for this study. The research was carried out purposively in Lamshang block of

Imphal West, Manipur. Sekmai village was chosen purposively based on maximum area under the production of Ngari. As a sample for the study, one hundred and twenty respondents were chosen randomly.

**3. Objectives of the study**

- To determine the socio-economic profile of the respondents.
- To ascertain the knowledge of the respondents about production and management practices of Ngari (fermented fish).

**4. Method used for data collection**

The primary data were collection through personal interview with the help of pre tested interview schedule, and secondary data was obtained from books, journals, reseach paper etc. The collected data were classified, tabulated and analyzed in light of the objectives for suitable conclusion.

**5. Data statistical analysis**

The collected data was converted to 3 point score (Likert Scale) and tabulated. The evaluation of the data and the relationship between the independent and dependent variables was done using Mean, Frequency, Percentage and Correlation.

**6. Results and Discussion**

Table 1 shows that 43.33 percent of the respondents are of middle age group and 38.33 percent of the respondents were educated up-to primary school. It was revealed that 37.50 percent of the respondents are engaged in agriculture and labour and 43.33 percent of the respondents have cemented as their housing pattern. It was found that 43.33 percent of the respondents have 1-2 acres of land and majority (53.33%) have nuclear family type with 41.67 percent of the respondents annual income as 50,001 to 1,00,000 rupees. It was found that majority (68.33%) of the respondents have medium level of mass media exposure.

The table 2 shows that majority of the respondents (50.83%) fully known the type of fish for Ngari production, 27.5% of the respondents partially known the type of fish and 21.67% of the respondents not known about the type of fish for Ngari production. It revealed that majority (52.5%) of the respondents are partially known about the key ingredients and additives used in fermentation process. It revealed that majority (80.00%) of the respondents fully knows about the environmental factor for the fermentation. It revealed that majority (78.33%) of the respondents fully knows about how to ensure the quality and hygiene of fermented fish products. It revealed that majority (52.5%) of the respondents partially know about the best season for fermented fish. It shows that majority (95%) of the respondents fully knows about the desired fermentation characteristics. It revealed that majority (78.33%) of the respondents fully knows about the traditional aspects of Ngari production. It was found that majority (95.00%) of the respondents fully knows the motives to get involved in Ngari production. It shows that 46.67% of the respondents

partially knows about the innovation introduced in Ngari production. It revealed that 39.17% of the respondents not knows about the unique methods employed in drying process. It shows that majority (81.67%) of the respondents fully knows the perception about consumers preference for fermented fish. It reveals that 39.33% of the respondents partially knows about the factors which contribute to the growth of Ngari production. It shows that majority (60.00%) of the respondents not knows about any collaborative efforts or shared knowledge within the community regarding Ngari production.

**Table 1:** Socio-economic characteristics distribution of respondents

Category	Frequency	Percentage
<b>Age in years</b>		
Young (18-35)	21	17.5
Middle (36-55)	52	43.33
Old (Above 56)	47	39.17
<b>Education</b>		
Illiterate	22	18.33
Primary School	46	38.33
High School	40	33.33
Secondary School	7	5.83
Graduation	5	4.17
<b>Occupation</b>		
Agriculture	30	25.00
Agriculture + Labour	45	37.50
Agriculture + Business	37	30.83
Agriculture + Service	08	6.67
<b>Family Type</b>		
Nuclear	64	53.33
Joint	56	46.67
<b>Type of house</b>		
Hut	21	17.5
Semi- cemented	47	31.17
Cemented	52	43.33
<b>Annual Income (in rupees)</b>		
Low (Below 50,000)	24	20.00
Medium (50,001-1,00,000)	50	41.67
High (Above 1,00,000)	46	38.33
<b>Land holding</b>		
Up to 1 acre	19	15.84
1-2 acres	52	43.33
Above 2 acres	49	40.83
<b>Extension contact</b>		
Low (6-7)	18	15.00
Medium (8-9)	55	45.83
High (10-11)	47	39.17
<b>Mass media exposure</b>		
Low (6-8)	27	22.5
Medium (9-11)	82	68.33
High (12-14)	11	9.17

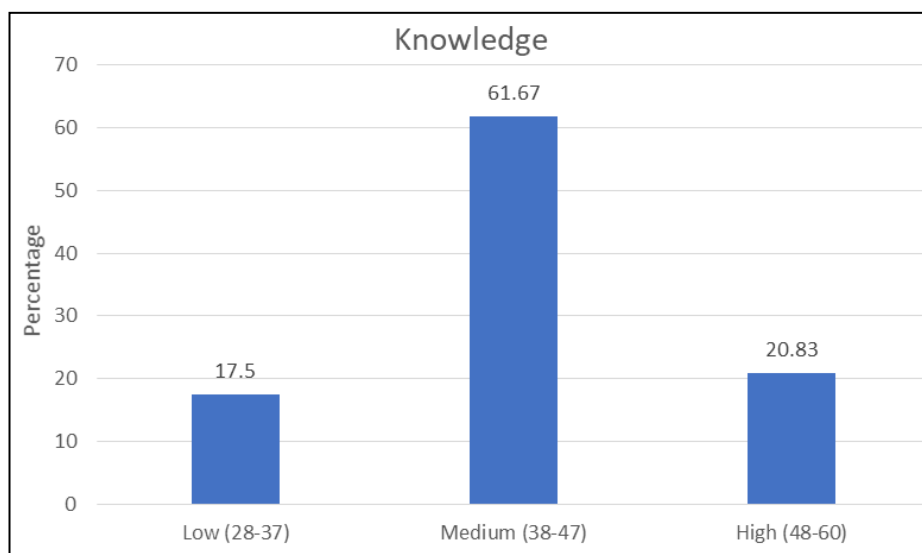
**Table 2:** Knowledge of the respondents about the production and management practices of Ngari

Sl. No.	Statements	Evaluation		
		Fully Known F (%)	Partially Known F (%)	Not Known F (%)
1.	Type of fish is used for Ngari (fermented fish) preparation.	61 (50.83%)	33 (27.5%)	26 (21.67%)
2.	Key ingredient and additives used in the fermentation process	34 (28.33%)	63 (52.5%)	23 (19.17%)
3.	Environmental factors consider during fermentation.	96 (80%)	15 (12.5%)	9 (7.5%)
4.	The quality and hygiene of fermented fish product	94 (78.33%)	16 (13.33%)	10 (8.33%)
5.	Season best for fermented fish.	34 (28.33%)	63 (52.5%)	23 (19.17%)
6.	Desired fermentation characteristics	114 (95%)	6 (5%)	0
7.	Recommended fermentation period	25 (20.83%)	54 (45%)	41 (34.17%)
8.	Traditional aspects of Ngari production	94 (78.33%)	16 (13.33%)	10 (8.33%)
9.	Motivation get involved in Ngari production	114 (95%)	6 (5%)	0
10.	Innovation or improvement for Ngari production	41 (34.17%)	56 (46.67%)	23 (19.16%)
11.	Unique methods or techniques in the drying process	33 (27.50%)	40 (33.33%)	47 (39.17%)
12.	Challenges encounter in Ngari production	42 (35.00%)	52 (43.33%)	26 (21.67%)
13.	Perceptions about the consumer preference for fermented fish	98 (81.67%)	22 (18.33%)	0
14.	Factors which contribute to the growth of Ngari production?	33 (27.50%)	47 (39.17%)	40 (33.33%)
15.	Collaborative efforts or shared knowledge within the community regarding Ngari production	9 (7.50%)	39 (32.50%)	72 (60.00%)

F=Frequency %=Percentage

**Table 3:** Knowledge level of respondents towards Ngari production practices of the respondents (N=120)

Knowledge level		
Category	Frequency	Percentage
Low (28-37)	21	17.5
Medium (38-47)	74	61.67
High (48-60)	25	20.83
Total	120	100.00



**Fig 1:** Knowledge of Ngari production practices of the respondents

From the above table and figure 1, it was found that the level of knowledge of respondents of Ngari production practices is medium i.e. 61.67% followed by high 20.83% and low 17.5% respectively. The similar results were also observed by Ringphami *et al.*, (2021)<sup>[6]</sup>.

**Table 4:** Association between selected independent and dependent variables

Sl. No.	Variables	Correlation Coefficient ('r' Value)
1.	Age	0.675910389*
2.	Education	0.503250244**
3.	Occupation	0.525197464**
4.	Housing Pattern	0.426515742*
5.	Land holding	0.623890084**
6.	Type of family	0.649083542*
7.	Annual income	0.670413353**
8.	Mass media exposure	0.695211767**
9.	Extension contacts	0.716211281**
** = Significant at 0.01 level of probability * = Significant at 0.05 level of probability		
NS = non-significant		

Based on the analysis of Table 4 it was observed that several variables, are positively and significantly correlated with the knowledge of the farmers towards improved production practices of Ngari. These variables include education, occupation, land holding, annual income, mass media exposure and extension contact. The correlation was found to be statistically significant at a probability level 0.01%. Additionally, age, housing pattern, and type of family were also positively and significantly correlated with the respondents' knowledge, but at a slightly lower probability level of 0.05%.

**Conclusion**

It was concluded that 43.33 percent of the respondents are of middle age group and 38.33 percent of the respondents were educated up-to primary school. It was revealed that 37.50 percent of the respondents are engaged in agriculture and labour and 43.33 percent of the respondents have cemented as their housing pattern. It was found that majority 43.33 percent of the respondents have 1-2 acres of land and majority (53.33%) have nuclear family type with 41.67 percent of the respondents annual income as 50,001 to 1,00,000 rupees. It shows that majority (68.33%) of the respondents have medium level mass media exposure. It reveals that 45.83 percent of the respondents have medium level of extension contact. The study shows that majority (61.67%) of the respondents have medium level category knowledge level toward production management practices of Ngari. The factors influencing the knowledge of the respondents towards Ngari production and management practices were age, education, occupation, type of family, land holding, annual income, mass media exposure and extension contact, which were directly correlated with knowledge towards production practices of Ngari.

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