



Traditional Meat and Fish Preservation Practised by the Mising Community

Mridusmita Borthakur, Sanjoy Borthakur , Ranjit Kumar Saud and Manoranjan Neog

Krishi Vigyan Kendra, Golaghat, Assam (785 619), India



Corresponding  borthakursanjoy@gmail.com

 0009-0006-7458-3706

ABSTRACT

The present study was conducted from April, 2023 to March, 2024 in the Golaghat district of Assam, India to document and scientifically validate the traditional meat and fish preservation techniques practiced by the Mising community. These indigenous practices, primarily drying, smoking, and salting, had been developed through generations as adaptive strategies to local ecological conditions and play an important role in ensuring food availability, cultural continuity, and nutritional security among tribal households. Traditionally processed fish and meat samples were collected and subjected to biochemical analysis using standard analytical procedures. Proximate composition parameters, including moisture, ash, fat, fibre, protein, and carbohydrate content, along with mineral composition such as calcium and iron, were analyzed to assess their nutritional quality. Results indicated that dried fish contained 63.57 g 100 g⁻¹ of protein, 37.30 mg 100 g⁻¹ of iron, and 415.45 mg 100 g⁻¹ of calcium. Meat samples recorded 54.53 g 100 g⁻¹ protein, 19.10 g 100 g⁻¹ ash, 18.15 g 100 g⁻¹ fat, and 411.40 mg 100 g⁻¹ calcium. The findings demonstrated that traditionally processed fish and meat products served as significant dietary sources of protein and minerals with potential relevance for addressing nutritional deficiencies, including iron-deficiency anaemia, which remains a serious public health issue among women in Assam. The work also underscored the significance of preserving indigenous knowledge systems, as these traditions represent sustainable, low-cost, and environmentally aligned practices. The integration of such ancestral knowledge into contemporary nutrition and public health strategies could contribute to improve dietary security and cultural preservation in rural tribal communities.

KEYWORDS: Drying, ethnic food, iron-deficiency anaemia, mising, proximate composition, smoking

Citation (VANCOUVER): Borthakur et al., Traditional Meat and Fish Preservation Practised by the Mising Community. *International Journal of Bio-resource and Stress Management*, 2026; 17(4), 01-07. [HTTPS://DOI.ORG/10.23910/1.2026.6791](https://doi.org/10.23910/1.2026.6791).

Copyright: © 2026 Borthakur et al. This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License, that permits unrestricted use, distribution and reproduction in any medium after the author(s) and source are credited.

Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, author have full right to transfer or share the data in raw form upon request subject to either meeting the conditions of the original consents and the original research study. Further, access of data needs to meet whether the user complies with the ethical and legal obligations as data controllers to allow for secondary use of the data outside of the original study.

Conflict of interests: The author has declared that no conflict of interest exists.

RECEIVED on 28th October 2025

RECEIVED in revised form on 02nd April 2026

ACCEPTED in final form on 20th April 2026

PUBLISHED on 27th April 2026

1. INTRODUCTION

Northeast India serves as a significant cultural and ethnic crossroads, characterized by its diverse indigenous populations and rich historical tapestry. Among these communities, the Mising tribe represents a prominent indigenous ethnic group primarily residing in the state of Assam. They are concentrated in the districts of Dhemaji, Lakhimpur, and parts of Golaghat, Jorhat, Sivasagar, Majuli, Dibrugarh, and Tinsukia. The term “Mising” is interpreted to mean “pure man” or “real man.” Linguistically, the Misings belong to the Tibeto-Burman language family and are constitutionally recognized as a Scheduled Tribe under the Constitution of India. Historical and literary sources within the community suggest that the Misings migrated to Assam during the 12th and 13th centuries A.D. Traditionally classified as a hill tribe, they have historically shown a preference for settling near riverbanks and mountainous terrains (Saikia and Verma, 2023). The cultural heritage of the Mising community is intricately linked to their agrarian lifestyle and dependence on natural ecosystems. Agriculture, particularly wet rice cultivation, forms the backbone of their economic and social life. One of the most important agrarian festivals of the Mising community is “Ali-Ai-Ligang,” celebrated during the spring season to mark the commencement of sowing. Traditional knowledge related to food processing, preparation, and preservation remains deeply embedded within the socio-cultural fabric of the community and is transmitted orally across generations. Among the various indigenous practices, traditional methods of meat and fish preservation, such as drying, smoking, and salting, have been widely practiced by the Mising community for generations. These techniques represent adaptive responses to the region’s humid subtropical climate, seasonal abundance of fish and meat, and periodic food scarcity during lean agricultural months. Several studies have emphasized the continuing importance of ethnogastronomy in maintaining cultural identity (Nath et al., 2024; Das and Deka, 2021). Traditionally preserved meat and fish are not confined to everyday consumption but also form integral components of festivals, rituals, and communal gatherings, thereby reinforcing social cohesion and cultural continuity. Within the broader ethnographic context of Northeast India, such practices illustrate the strong interlinkages between food, environment, and indigenous identity. Traditional preservation techniques help reduce spoilage, improve organoleptic properties, and maintain nutritional value, making these foods both culturally and nutritionally significant (Saikia and Verma, 2023). Validating these practices scientifically helps preserve indigenous knowledge and supports food security initiatives (Patil et al., 2014; Gogoi et al., 2020). In recent years, traditional food preservation practices of indigenous communities have gained scientific attention due to their

relevance to sustainable food systems, climate resilience and nutritional security. Several studies across Asia and Northeast India have highlighted that indigenous drying and smoking techniques not only enhance shelf life but also retain bioavailable proteins and minerals while minimizing dependence on external inputs (Hwang and Regenstein, 2021; Ghosh et al., 2020; Pradhan and Nath, 2022). Ethnic food systems have been recognized as critical repositories of indigenous knowledge that contribute to dietary diversity and micronutrient adequacy in marginalized populations (Nath et al., 2024). Furthermore, evidence suggests that traditionally processed animal-source foods may play an important role in addressing iron and calcium deficiencies, particularly among tribal and rural women of reproductive age (Hazarika et al., 2022; Nath et al., 2023; Let et al., 2024). Documentation and scientific evaluation of such practices are therefore essential for cultural preservation as well as for informing region-specific nutrition and public health strategies (Baruah et al., 2023; Kakati et al., 2023). Despite this growing recognition, systematic scientific evaluation of traditional meat and fish preservation practices among the Mising community of Assam remains limited. The present study was therefore undertaken to document traditional preservation methods practiced by the Mising community and scientifically assess the nutritional composition of their traditionally processed meat and fish.

2. MATERIALS AND METHODS

The experiment was conducted from April, 2023 to March, 2024 at the Golaghat district of Assam to study the traditional meat and fish preservation techniques practiced by the Mising community of Assam. The study was conducted in the villages where the people of the Mising community are concentrated, specifically in the Bokakhat Development Block, based on demographic, anthropogenic, and ethnic criteria. The socio-economic characteristics of the respondents were assessed using a pre-structured interview schedule, and the preparation processes were observed, recorded, and documented.

2.1. Biochemical analysis

The biochemical analysis encompassed proximate analysis, including moisture, ash, fat, fiber, protein, and carbohydrate content, as well as the assessment of mineral content, specifically calcium and iron, in dried fish and meat samples. These analyses were conducted in accordance with various standard analytical methods at the NABL-accredited Food Quality Analysis Laboratory of Tezpur University.

3. RESULTS AND DISCUSSION

The socio-economic characteristics of the studied population are presented in Table 1. The majority of respondents (77.27%) were women, reflecting their central

Table 1: Socioeconomic characteristics of the participants in the quantitative component of the study

Sl. No.	Particulars	Urban (N=110)	
		No	Percentage
1.	Gender		
a)	Male	25	22.73
b)	Female	85	77.27
2.	Age		
a)	25-35	8	7.27
b)	35-45	15	11.82
c)	45-55	26	20.00
d)	55-75	73	60.91
3.	Education		
a)	Under matric	23	20.90
b)	HSLC passed	29	26.40
c)	HS passed	33	30.00
d)	Graduate	18	16.40
e)	Post graduate	7	6.40
4.	Occupation		
a)	Service	10	9.09
b)	Business	21	19.09
c)	Farming and household task	79	71.82
5.	Type of work		
a)	Sedentary	25	22.73
b)	Moderate	69	62.73
c)	Heavy	6	5.45
6.	Food habit		
a)	Vegetarian	3	2.73
b)	Non- Vegetarian	107	97.27

role in food preparation and traditional knowledge retention. Given that elderly individuals were often regarded as key custodians of traditional knowledge and practices (Borah et al., 2021), the study focused on individuals aged between 35 and 75 years. Notably, a majority of the respondents (60.91%) were within the age group of 65-75 years. Similar demographic patterns were reported in ethnographic studies in Assam (Das et al., 2019; Baruah et al., 2021). In terms of educational attainment, the majority of the population under study had completed higher secondary education, followed by those with a High School Leaving Certificate (26.40%), below matriculation (20.9%), undergraduate degrees (16.40%), and postgraduate degrees (6.40%). Agriculture constituted the primary source of livelihood among the Mising community, which was also reflected

in the occupational profile of the respondents, where the majority were engaged in farming. Consistent with broader Assamese dietary patterns, rice was identified as the staple food among the Mising population. As members of an agrarian society, most individuals reported involvement in moderate physical labour. Dietary practices were predominantly non-vegetarian, with meat and fish forming integral components of daily meals. The study found that 97.27% of participants consumed a non-vegetarian diet, while only 2.73% identified as vegetarian.

Shivaji et al. (2015) reported that sun drying is the most ancient and cost-effective method of fish processing worldwide. In the studied population, sun-drying and smoking represented the most prevalent traditional methods of food preservation. These communities commonly employed a combined approach of sun-drying and smoking to preserve fish and meat, particularly during the monsoon season. In this study, Puthi fish (*Puntius spp.*), which were abundantly available during the monsoon, were primarily used for drying. Bhuyan (2016) reported that for preservation, small-sized fatty fishes having low market value were generally preferred. Typically, surplus fish remaining after daily consumption were preserved for future use. As the agricultural lands of these tribal communities are predominantly located near beel (wetland) areas, substantial quantities of fish were harvested during the monsoon, enabling the preservation of a significant portion for use during lean periods. The sun-drying process involved exposing the fish to direct sunlight until their body moisture evaporates due to solar heat. In contrast, smoking was generally conducted indoors, where fish were dried over a controlled fire, allowing the heat to remove moisture content effectively. Kalita et al. (2020) also documented sun-drying and smoking as common fish preservation practices in southwestern Assam. Recent studies had confirmed the nutritional and cultural relevance of smoked foods among tribal communities (Pradhan et al., 2022; Baruah et al., 2023). Sun-drying reduced moisture levels to below 10%, preventing microbial degradation. Smoking imparted a range of desirable flavour compounds, particularly phenols, aldehydes, and organic acids that enhanced the sensory quality and shelf-life of the products, as also reported by Das and Deka (2021). Similar findings were documented in studies highlighting the formation of characteristic smoky aromas and antioxidant compounds during traditional smoking processes (Ghosh et al., 2020; Pradhan and Nath, 2022; Hwang and Regenstein, 2021). These methods were sustainable, cost-effective and environmentally friendly. Nutritional and cultural relevance of smoke-dried foods among tribal communities were well documented (Baruah et al., 2023).

Once dried, fish and meat were typically stored in woven

bamboo containers or earthen pots, which helped protect them from insect infestation and environmental degradation. Before consumption, dried meat was often rehydrated by soaking in water and was commonly incorporated into traditional curries and soups prepared with locally sourced herbs. This not only enhanced the flavour but also contributed to the nutritional value of these ethnic dishes. The traditional processing practices and representative preserved products of the Mising community are illustrated in Figure 3, showing fish drying, dried fish products, meat drying and dried meat curry.

The traditional processing steps involved in the preservation of fish and meat among the Mising community are illustrated in Figures 1 and 2, respectively. Figure 1 depicted the sequential process of fish drying. The flow chart highlighted the community's reliance on ambient environmental conditions and low-cost inputs, reflecting an ecologically adaptive preservation system. Figure 2 presented the traditional method of meat drying. The combined effect of drying and smoking, as shown in the flow chart, contributed to improved shelf life, flavour development and nutritional retention. These flow charts clearly demonstrated

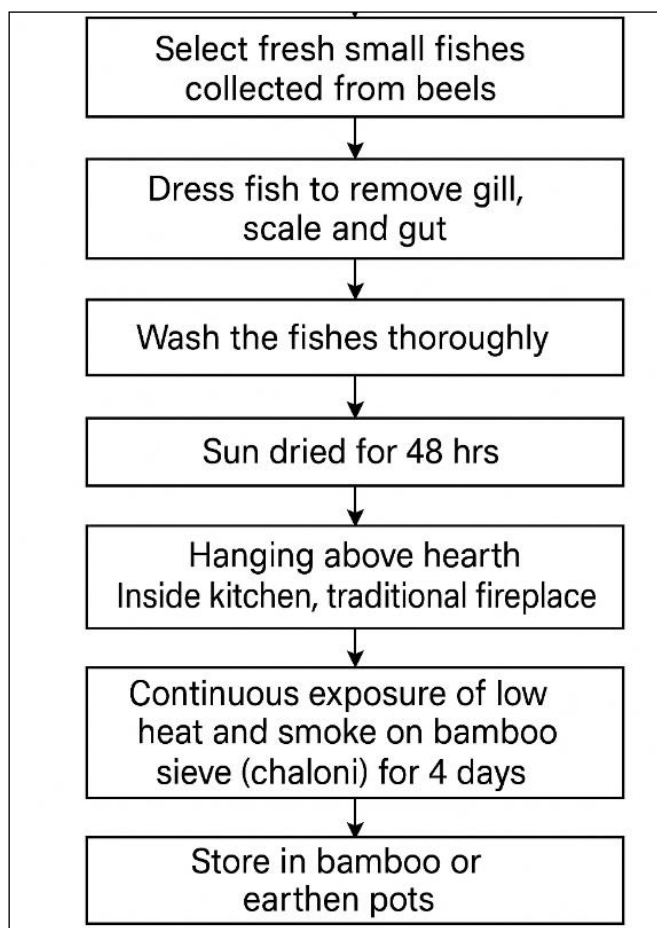


Figure 1: Flow chart showing the method of drying of fish

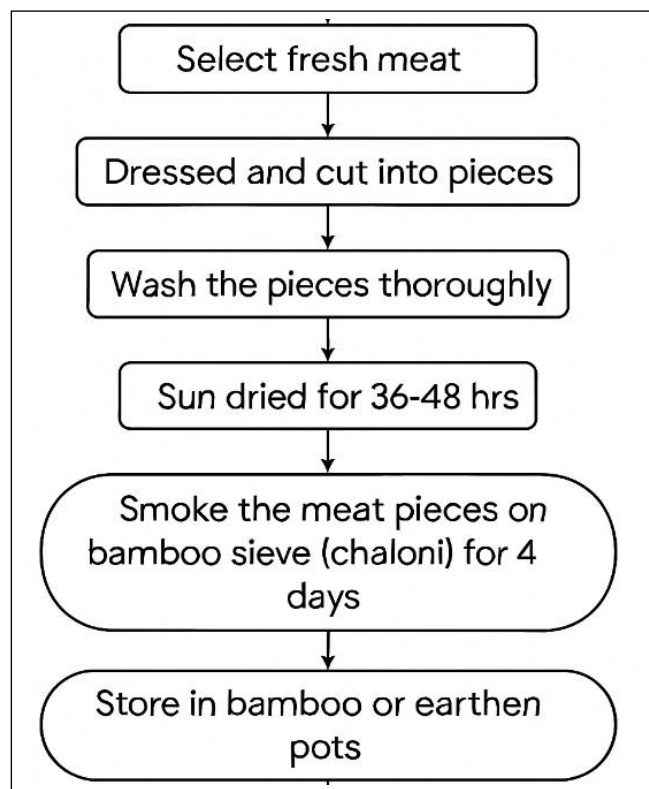


Figure 2: Flow chart showing the method of drying of meat

the systematic nature of indigenous knowledge and the scientific rationale underlying traditional preservation practices adopted by the Mising community.

The biochemical analysis of fish and meat samples was carried out to determine their proximate composition, including moisture, ash, fat, fiber, protein, and carbohydrate contents, along with the quantification of mineral levels, specifically calcium and iron. The analyses were conducted using established standard procedures at the NABL-accredited Food Quality Analysis Laboratory, Tezpur University, Assam. The analytical results are presented

Table 2: Nutritional values of traditionally processed fish and meat sample of mising community of Assam

Parameters	Products	
	Fish Sample	Meat Sample
Moisture	9.24 g 100 g ⁻¹	7.24 g 100 g ⁻¹
Ash	17.02 g 100 g ⁻¹	19.08 g 100 g ⁻¹
Fat	8.81 g 100 g ⁻¹	18.15 g 100 g ⁻¹
Fiber	0.77 g 100 g ⁻¹	0.40 g 100 g ⁻¹
Protein	63.57 g 100 g ⁻¹	54.53 g 100 g ⁻¹
Carbohydrate	0.59 g 100 g ⁻¹	0.60 g 100 g ⁻¹
Iron	37.30 mg 100 g ⁻¹	11.68 mg 100 g ⁻¹
Calcium	415.45 mg 100 g ⁻¹	411.40 mg 100 g ⁻¹

in Table 2. The dried fish samples exhibited a protein concentration of $63.57 \text{ g } 100 \text{ g}^{-1}$ of the dried sample, alongside iron and calcium concentrations of $37.30 \text{ mg } 100 \text{ g}^{-1}$ and $415.45 \text{ mg } 100 \text{ g}^{-1}$, respectively. These findings suggested that dried fish was a rich source of essential nutrients, particularly protein and minerals such as calcium and iron. Given the substantial iron content, dried fish could be considered a potential dietary component to improve iron intake among populations at risk of iron deficiency. Anaemia, characterized by low haemoglobin levels, remains a significant public health concern in Assam, particularly among women and children, as reported in the National Family Health Survey-5 (NFHS-5), where a high prevalence of anaemia among women has been documented (Anonymous, 2019–2021). Borthakur et al. (2023) reported that nearly 66% of women in Assam are affected by anaemia, with a notably higher prevalence in rural areas compared to urban centers, particularly impacting those in the 40–49 years age group. Although the present study did not directly assess the clinical impact, the nutrient profile of dried fish supported its inclusion in dietary interventions aiming to address micronutrient deficiencies, particularly iron-deficiency anaemia, aligning with findings from Northeast India (Hazarika et al., 2022; Nath et al., 2023). Their rich iron content suggested potential in reducing anaemia prevalence in the region (Let et al., 2024). Hot smoking of fish resulted to the loss of protein along with weight loss (Bhuiyan et al., 1986). However, smoked fish was rich in protein as well as low in calories. It not only improved the organoleptic qualities of the fish but also extends shelf life and delay the onset of bacterial and fungal attack. Smoked deposited on the fish in the process had preservative effect since it contains formaldehyde, phenol, and other substances evolved from woody smoke (Stansby, 1965). Thus, the smoking process gave a unique taste, colour, and flavor.

Fresh meat is a rich source of protein but is highly perishable. In ancient times, Mising people relied on hunting; they often gathered large quantities of meat in a single outing. To prevent wastage and ensure future availability, preservation techniques were employed, among which drying was commonly preferred due to its convenience and its ability to enhance the flavour of the meat. Drying removed moisture from the meat, thereby inhibiting microbial growth and slowing down biochemical reactions, which helped extend shelf life and improved meat quality. Mising people generally dried it gradually under natural conditions ambient temperature, humidity, air circulation, and direct sunlight, followed by smoking. This traditional drying method involved a slow dehydration process of meat pieces cut into uniform shapes to ensure even drying across the batch. As water evaporated, the meat lost weight and undergoes physical changes, such as shrinkage of muscle and connective tissue. Consequently, the meat became smaller, thinner, somewhat wrinkled, and its texture transformed from soft to firm or even hard. Intensive meat smoking was always a combination of two effects, drying the meat by reducing its moisture content through hot air and the condensation of smoke particles on the meat surface, together with their penetration into the inner layers of the product, and both have preservative effects and enhanced the shelf life of the product. The proximate analysis of meat samples showed a protein content of $54.53 \text{ g } 100 \text{ g}^{-1}$, with an ash content of $19.08 \text{ g } 100 \text{ g}^{-1}$ and a fat content of $18.15 \text{ g } 100 \text{ g}^{-1}$. The calcium and iron concentrations were measured at $411.40 \text{ mg } 100 \text{ g}^{-1}$ and $11.68 \text{ mg } 100 \text{ g}^{-1}$, respectively. These results indicated that traditionally processed meat also offers considerable amounts of key macronutrients and minerals necessary for maintaining nutritional adequacy. Dried meat can meet the daily requirement of protein and micronutrients and can address malnutrition effectively, echoing results of similar



Traditional kitchen of the mising community



Process of fish drying of the mising community

Figure 3: Continue...



Process of fish drying of mising community



Dried meat product of the mising community



Dried fish product of mising community



Dried meat curry

Figure 3: Photographs of process and products of fish and meat preservation by the Mising community

regional studies (Pradhan et al., 2022; Kakati et al., 2023). Overall, the nutrient profiles of the traditionally processed fish and meat samples indicated their potential to serve as valuable dietary sources of protein and minerals, particularly for populations vulnerable to nutritional deficiencies.

4. CONCLUSION

The study documented and scientifically validated traditional meat and fish preservation practices followed by the Mising community of Assam. Sun-drying and smoking were identified as ecologically adaptive and nutritionally beneficial methods that significantly contributed to dietary protein and mineral intake. Laboratory analyses confirmed the high protein, calcium and iron content of traditionally processed products, supporting

their nutritional relevance. The findings highlighted the importance of conserving indigenous knowledge systems and demonstrated their potential integration into sustainable nutrition and food security frameworks for tribal communities.

5. REFERENCE

- Baruah, C., Borah, D., Pegu, A., 2023. Nutritional relevance of smoked foods among tribal communities. *Journal Of Ethnic Foods*, 10, 33. <https://doi.org/10.1186/S42779-023-00062-3>.
- Baruah, D., Acharjee, B., Gogoi, R., Deka, P., 2021. "Namsing: A traditional fermented fish product of mising tribe in Gohpur, Assam, India". *Uttar Pradesh. Journal of Zoology* 42(24) 722–27. [Doi: 10.56557/](https://doi.org/10.56557/)

- Upjoz/2021/V42i243208.
- Bhuiyan, A.K.M.A., Ratnayake, W.M.N., Ackman, R.G., Stability of lipid and polyunsaturated fatty acid during smoking of Atlantic mackerel (*Scomber scomber*). *Journal of the American Oil Chemists' Society* 63(3), 324–328. Doi: 10.1007/BF02546038.
- Bhuyan, D., 2016. Some indigenous fish preservation techniques are practised in Jorhat district, Assam, India. *International Journal of Advanced Biotechnology and Research* 7(1) 55–58. Available at: https://bipublication.com/files/IJABR-V7I1-2016-06_Dhiramani%20Bhuyan.pdf.
- Borthakur, M., Neog, M., Borthakur, S., Saikia, R., Hazarika, D., Begum, A., Sharma, A., Islam, A., 2023. Nutrition garden: a sustainable model for improved nutrition security of rural mass of Assam, India. *Journal of Krishi Vigyan* 11(Suppl), 149–155. Doi:10.5958/2349-4433.2023.00074.0.
- Das, S., Deka, P., 2021. Traditional smoking and drying methods in rural assam: processes and socio-economic dimensions. *Journal Of Rural Studies* 85, 120–130. Doi: 10.1016/J.Jrurstud.2021.03.010.
- Ghosh, S., Borah, R., Sarmah, B., 2020. Chemical and sensory characteristics of traditionally smoked fish from northeast India. *Journal of Food Processing and Preservation* 44(12), E14987. <https://doi.org/10.1111/Jfpp.14987>.
- Gogoi, R., Narah, P., 2021. Cultural significance and storage practices of dried fish in assamese cuisine. *Journal of Food Culture and Ethnobotany* 6(2), 45–58. Doi: 10.1007/S41055-021-00145-9.
- Hazarika, R., Nath, P., Deka, N., 2022. Proximate composition and nutrient retention in dried fish species from northeast India. *Journal of Applied Aquaculture*. 34(2), 95–104. Doi: 10.1080/10454438.2021.1999002.
- Hwang, C.C., Regenstein, J.M., 2021. Effects of Smoking on the physicochemical and sensory attributes of meat and fish products. *Comprehensive Reviews in Food Science and Food Safety* 20(2), 1234–1256. <https://doi.org/10.1111/1541-4337.12713>.
- Kakati, M., Saikia, P., Dutta, B., 2023. Proximate composition and mineral content of dried meats from indigenous breeds in Assam. *Journal of Animal Research* 13(4), 521–528. Doi: 10.5958/2277-940X.2023.00102.7.
- Kalita, S., Kalita, K.D., Das, B.K., 2020. Traditional fish preservation in south-western Assam, India. *Journal of Humanities and Social Science* 25(11), 9–21. DOI: 10.9790/0837-2511080921.
- Let, S., Tiwari, S., Singh, A., Chakrabarty, M., 2024. Prevalence and determinants of anaemia among women of reproductive age across aspirational districts of India. *BMC Public Health* 24, 17789. Doi: 10.1186/S12889-024-17789-3.
- Nath, K.D., Nickhil, C., Borah, D., Pandiselvam, R., Deka, S.C., 2024. Preparation, characterization, and nutritional analysis of napham: an indian traditional smoke-dried-fermented fish paste. *Journal of Food Biochemistry*. Article ID 7410065. Doi: 10.1155/2024/7410065.
- Nath, P., Borah, D., Deka, S.C., 2023. Nutrient retention in traditional smoke-dried fish products of Assam. *Journal of Ethnic Foods* 10(1), 33. Doi: 10.1186/S42779-023-00062-3.
- Anonymous, 2019–2021. NFHS-5 (National Family Health Survey-5), India, 2019–21. Assam state factsheet. International Institute for Population Sciences (IIPS) And ICF. 2021. Available at: https://dhsprogram.com/pubs/pdf/FR374/FR374_Assam.pdf. Accessed on 12.06.2024.
- Patil, P.V., Taware, S.P., Kulkarni, D.K., 2014. Traditional knowledge of broom preparation from bhor and mahad region of western Maharashtra, India. *Bioscience Discovery* 5(2) 218–220. Doi: 10.1186/1746-4269-3-20.
- Pradhan, K., Nath, S., 2022. Influence of traditional smoking on phenolic compounds and oxidative stability of dried fish. *Food Chemistry* 370, 130989. <https://doi.org/10.1016/J.Foodchem.2021.130989>.
- Pradhan, R., Saikia, P., Kakati, M., 2022. Nutritional profile of dried meats in tribal diets. *Journal of Food Science and Technology* 59(3) 678–685. Doi: 10.56042/Ijtk.V21i4.1045.
- Saikia, B., Verma, S., 2023. Exploring the traditional cuisine and cultural heritage of the Khamti and Mising communities of Assam, India, *Annals Of Multidisciplinary Research, Innovation and Technology (AMRIT)* 2(2), 78–82. Available at: https://adtu.in/files/current_issue/vol2_issue2/vol2-issue2-article012.pdf.
- Shivaji, C., Dudhmal, D., Pandurang, K., Pathan, K., 2015. Traditional methods of fish processing by fisher tribes in the Godavari River basin, (MS) India. *Science Research Reporter* 5(2), 192–197. <https://www.researchgate.net/publication/322204179>.
- Stansby, M.E., 1965. Cured fishery products. In: Stansby, M.E. (Ed.), *Industrial fishery technology*. Krieger Publishing Co. (reprint), New York, pp. 323–335. Available at: Google Books record; NOAA Fishery Publications index (confirms Chapter 25, pp. 323–335). Available from: https://books.google.co.in/books/about/Industrial_Fishery_Technology.html?id=RYQwywEACAAJ&redir_esc=y.