





# *Tinuktuk*, a Traditional Simalungun Food that Transcends Its Therapeutic Function

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## **ABSTRACT**

This study examines tinuktuk, a traditional Simalungun herbal preparation, not only for its therapeutic uses but also for the social and cultural meanings embedded in its everyday practice. Fieldwork was conducted in two contrasting settings: the rural area where tinuktuk is historically produced and consumed, and an urban context where its presence has spread beyond the Simalungun ethnic group. More than a culinary specialty, tinuktuk represents a distinctive form of local wisdom. The knowledge of its ingredients and preparation is passed orally—predominantly from mothers to daughters—sustaining both its characteristic taste and the values of care and mutual responsibility across generations. This intergenerational transmission strengthens family ties while fostering an awareness of bodily care, from postpartum recovery to maintaining overall physical resilience. Beyond its role in women's health, tinuktuk operates as a cultural symbol: an expression of maternal affection, a marker of communal solidarity, and a living heritage that interweaves traditional health practices with the Simalungun people's collective identity.

Keywords: tinuktuk, traditional food, herbal medicine, Simalungun

### ABSTRAK

Studi ini menelaah tinuktuk, ramuan herbal tradisional Simalungun, tidak hanya dari sisi khasiat terapeutiknya tetapi juga makna sosial dan kultural yang melekat dalam praktik sehari-hari. Penelitian lapangan dilakukan di dua konteks yang kontras: wilayah pedesaan tempat tinuktuk secara historis diproduksi dan dikonsumsi, serta kawasan perkotaan di mana keberadaannya telah meluas melampaui komunitas etnis Simalungun. Lebih dari sekadar kuliner khas, tinuktuk merepresentasikan bentuk kearifan lokal yang unik. Pengetahuan mengenai bahan dan cara pembuatannya diwariskan secara lisan—terutama dari ibu kepada anak perempuan—sehingga tidak hanya menjaga cita rasa khas dan teknik pengolahannya, tetapi juga menanamkan nilai kepedulian dan tanggung jawab bersama lintas generasi. Proses pewarisan ini memperkuat ikatan keluarga sekaligus menumbuhkan kesadaran pentingnya merawat tubuh, mulai dari pemulihan pasca-melahirkan hingga menjaga ketahanan fisik secara keseluruhan. Melampaui perannya dalam kesehatan perempuan, tinuktuk berfungsi sebagai simbol budaya: ungkapan kasih sayang keibuan, penanda solidaritas komunitas, dan warisan hidup yang memadukan praktik kesehatan tradisional dengan identitas kolektif masyarakat Simalungun.

Kata kunci: tinuktuk, makanan tradisional, tanaman kesehatan, Simalungun

Various types of traditional foods across the world are not consumed merely to meet nutritional needs and maintain health, but also embody profound social and cultural meanings. In many communities, the practice of preparing and consuming certain foods is closely tied to history, identity, and intergenerational relationships. In China, for instance, a wide range of traditional foods made from natural ingredients is often used as part of healing practices—both within the framework of Traditional Chinese Medicine (TCM) and through family recipes passed down from generation to generation. The belief in the efficacy of natural ingredients such as spices, roots, or herbal soups not only reflects a holistic understanding of health, but also illustrates how food serves as an essential medium for preserving local knowledge and sustaining cultural values that continue to thrive across generations (Chi et al., 2025; Du et al., 2025).

Food serves as a medium to express collective values such as solidarity, a sense of belonging, and reverence for ancestors, while at the same time preserving local knowledge passed down through generations. Thus, traditional foods go beyond their role as mere providers of biological needs; they form an integral part of the intangible cultural heritage that strengthens community identity and enriches the diversity of global culture.

In Indonesia, several types of food are widely recognized either as traditional dishes or as traditional herbal preparations (Fauziyyah et al., 2025; Prastowo et al., 2025; Purwandari et al., 2025). In North Sumatra, *tinuktuk*, a traditional preparation of the Simalungun ethnic group, offers a vivid example of the interweaving of food, health, and culture. This herbal mixture is believed to treat various internal ailments, particularly aiding postnatal recovery and warming the body. Nearly every woman who has just given birth is encouraged to consume *tinuktuk*, as it is thought to relieve fatigue and chills, accelerate uterine healing, refresh the body, improve blood circulation, and increase breast milk production. *Tinuktuk* is even believed to provide protection against disease. This belief is more than a traditional health practice—it reflects local wisdom that elevates *tinuktuk* as a symbol of familial care and collective concern for the mother's well-being.

However, like many other traditional food products, *tinuktuk* demonstrates a multifunctional role that goes beyond its therapeutic aspects (Wijesekara, 2025). The presence of food is no longer understood merely as a healing remedy in times of illness; it also carries socio-cultural values that strengthen intergenerational bonds, bind ethnic identity, and preserve distinctive culinary traditions. Therefore, this study seeks to explore the use of *tinuktuk* beyond its medicinal role, while also uncovering the social and cultural meanings that accompany it as an integral part of Simalungun community life.

#### 2. Methods

#### 2.1. Reserch Location

This study was carried out in two main locations, each representing a key dimension of the research: the place of origin where *tinuktuk* is traditionally produced and consumed, and the urban setting where the product has expanded beyond the Simalungun ethnic community.

The first location is Jalan Saribu Dolok, Nagori Bulu Pange, Merek Raya District, Simalungun Regency, North Sumatra Province. This rural area is predominantly inhabited by the Simalungun people and serves as the traditional center of *tinuktuk* production. Here, the preparation of *tinuktuk* relies on natural ingredients sourced from the surrounding environment. Fieldwork in this area focused on direct observation of the production process, in-depth interviews with local producers, and data collection on how *tinuktuk* is used in daily life, particularly within the context of traditional healing practices.

The second location is Medan City, the capital of North Sumatra Province and a major hub of trade as well as a melting pot of diverse ethnic groups and cultures. Medan was selected to explore the dissemination and acceptance of *tinuktuk* beyond its original Simalungun community. Research activities in this urban setting centered on tracing the product's introduction and marketing strategies, examining consumer perceptions of *tinuktuk* as a traditional herbal preparation, and identifying the distribution channels and key actors involved in promoting the product.

The research was conducted over a two-month period, from early April to the end of May 2025. This time frame was chosen to ensure the availability of informants in both locations, to coincide with the regular production activities in Bulu Pange, and to allow sufficient opportunity to build rapport with both producers and distributors. Such engagement was essential to obtain in-depth and contextually rich data. Moreover, the selected period enabled the researcher to observe the daily dynamics of both rural and urban communities, particularly in relation to the circulation and cultural significance of traditional health products.

## 2.2. Data Collection Techniques

This research employed three main data collection techniques—field observation, in-depth interviews, and literature review (Zaluchu, 2006). These methods were applied in an integrated manner to gain a comprehensive understanding of the production, use, and dissemination of *tinuktuk* both within the Simalungun community and beyond.

Field observation was carried out directly at the research sites, with a primary focus on Nagori Bulu Pange, Merek Raya District, the center of *tinuktuk* production. The observation was conducted in a passive-participant manner: the researcher was present to observe but did not actively engage in the production process. This included careful attention to every stage—from the selection of ingredients and processing techniques to packaging and marketing practices. In addition, observations extended to how *tinuktuk* is consumed in the community and how it is introduced to a broader audience in Medan City.

In-depth interviews were conducted using a semi-structured qualitative approach, which allowed the researcher to follow a prepared interview guide while remaining open to the flow of conversation and personal narratives from

informants. A total of 10 interviews were carried out, involving *tinuktuk* producers, users, and members of the Simalungun community.

Finally, a literature review was undertaken to strengthen the theoretical framework and provide academic context for the study. The reviewed materials included scholarly journals, ethnographic studies on the Simalungun people, research in medical anthropology, and key references on traditional healing practices in Indonesia.

#### 2.3. Data Processing Techniques

Data collected through in-depth interviews were processed in several systematic stages. All interview sessions—conducted both face-to-face and online—were digitally recorded to ensure accuracy. The recordings were then transcribed verbatim, meaning every spoken word was transferred into text without altering the structure or meaning, so that the original context of the informants' narratives was preserved.

Once transcription was complete, the texts were imported into NVivo, a qualitative data analysis software that facilitates the organization, coding, and interpretation of text-based data. Through NVivo, the researcher conducted thematic coding, identifying and labeling key themes, patterns, and categories emerging from the interview transcripts. The coded data were then mapped and synthesized to develop the central research themes.

## 2.4. Research Ethics

This study was conducted in accordance with the ethical principles of qualitative research, including informed consent, confidentiality, and integrity in reporting. Before each interview, informants were provided with a clear explanation of the study's objectives, the types of data to be collected, and the ways in which the data would be used. After receiving this information, all informants gave their voluntary consent, which was documented in the field notes.

To protect privacy, pseudonyms were used in all transcripts and reports. All audio recordings were securely stored and used exclusively for research purposes. The researcher also committed to maintaining the authenticity of the data, avoiding any manipulation, and presenting findings honestly and transparently, in line with the evidence gathered in the field. Throughout the process, the research upheld a deep respect for the local culture of the Simalungun community.

#### 3. Result and Discussion

## 3.1. Community Perspective

In this section, we present the views of community members who have traditionally used *tinuktuk*. One informant, identified as F, shared the following narrative:

"Yes, I know a little... *Tinuktuk* is actually a traditional Simalungun chili relish, but uniquely it also has medicinal value. In the past, the elders didn't just use *tinuktuk* as food, but also as a remedy for minor ailments, such as catching a cold or body aches. Usually the ingredients—like andaliman (*Sichuan pepper*), ginger, turmeric, and shallots—are pounded together."

Informant F's statement reveals that the use of *tinuktuk* is actually quite broad. This intergenerational practice was further explained by F,

"When I was little, if I had a fever or wasn't feeling well, my mother would often prepare *tinuktuk* mixed with warm rice, saying it could help with recovery. Sometimes she even rubbed it on the stomach. My mother truly believed in the natural healing properties of those spices."

*Tinuktuk* is indeed quite popular. Several other informants conveyed similar views,

"That's right... that's right. From what I've heard, this remedy is really effective in boosting—like boosting our immune system. Usually this remedy is popular among pregnant women. Because of this remedy—yes, (with a tone meant to convince us)—it boosts the immune system. And its use has been passed down from family to family, from generation to generation. Maybe in the Simalungun area many people sell this remedy, but most people usually learn about it from their families, from their parents. So most of the information comes from the parents." (Informant An)

"...tinuktuk can indeed be used for pregnant women. For us, especially the Simalungun people, tinuktuk is still considered something very beneficial. Especially for pregnant women or those giving birth, brother. This herbal preparation, or tinuktuk, is often given as an expression of family care, usually by parents or in-laws, with the intention of supporting natural recovery after childbirth. We believe that the natural ingredients in tinuktuk not only promote health but also offer freedom from chemical additives. That is why we consider tinuktuk safer and more suitable for its users." (Informant Al)

"And indeed, as far as I know Simalungun culture, it is quite often used for medicinal purposes, especially in the recovery of mothers during or after pregnancy. It is commonly used for women who have just given birth, to speed up the healing process, because the spices it contains have properties that help wounds heal quickly—especially internal wounds. So it is mainly used for postnatal recovery." (Informant R)

The interview findings above show that *tinuktuk* is viewed not only as an herbal remedy but also as a Simalungun cultural heritage of health practices imbued with meaning. The informants emphasized its benefits for strengthening the immune system, speeding up recovery for pregnant and postpartum women, and even helping to heal internal wounds. Their belief in its medicinal value is reinforced by the perception that *tinuktuk*'s natural ingredients are safer and "cleaner" than chemical medicines.

Knowledge of how to prepare and use this remedy is not acquired through formal institutions but is passed down within families, especially through parents and in-laws. This process of inheritance makes *tinuktuk* more than just a remedy—it becomes a symbol of familial affection and a marker of Simalungun ethnic identity. Thus, *tinuktuk* plays a dual role: as a traditional medicine that supports maternal health and as a cultural practice that nurtures social bonds and strengthens intergenerational solidarity among the Simalungun people.

Several informants also mentioned that *tinuktuk* is often used to prevent illness. One informant explained that when experiencing mild feverish symptoms, they would mix *tinuktuk* with an egg, and before long they felt better. Its specific use for women is illustrated in the following narratives,

"Yes, I have... back when I was a young girl, whenever I had stomach cramps during my period, my mother always made it for me..."

"I have. When I was pregnant, I often caught a chill and felt discomfort in my stomach. My mother told me to drink *tinuktuk*, but not too much—just a little, mixed into a cup of warm sweet tea. It immediately made my stomach feel very warm."

"After giving birth, I felt extremely weak. My mother gave me *tinuktuk*, saying it would help me recover. It really gave a deep warmth all the way to my stomach. It also helped the 'dirty blood' come out quickly after childbirth, and it even increased my breast milk production when I consumed *tinuktuk*."

These verbatim excerpts reveal the layered significance of *tinuktuk* as a traditional remedy deeply rooted in Simalungun women's health practices. The narratives of the three informants show that *tinuktuk* is present across key stages of a woman's reproductive cycle—from adolescence during menstruation ("stomach cramps during my period"), through pregnancy ("when I was pregnant, I often caught a chill"), to the postpartum period ("after giving birth, I felt extremely weak"). Its presence in each of these phases underscores *tinuktuk*'s function as a versatile herbal preparation that supports women's health and physical comfort during biologically sensitive moments.

In addition, the three experiences highlight the crucial role of mothers—or mamak—as guardians and transmitters of traditional knowledge. The expressions "mamakku selalu bikin itu" ("my mother always made it"), "disuruh lah minum itu tinuktuk dari mamak" ("my mother told me to drink tinuktuk"), and "dikasih lah itu tinuktuk" ("my mother gave me tinuktuk") indicate that knowledge of this herbal preparation is not acquired from medical professionals or formal institutions, but is instead passed down directly within the family. This points to a matrilineal pathway of transmission—woman to woman—that strengthens intergenerational bonds and reinforces the mother's role as the family's health guardian. The accounts from the three informants also emphasize the physical sensations and therapeutic effects: "langsung rasa hangat kali perut" ("immediately felt great warmth in the stomach"), "badan rasanya lemah kalikan" ("my body felt extremely weak"), "darah kotor cepat keluar" ("the 'dirty blood' came out quickly"), and "ASI pun makin banyak" ("my breast milk increased").

These descriptions show that the efficacy of *tinuktuk* is not only symbolically believed but also experienced in tangible bodily changes. The sensation of "warmth" emerges as a key expression—serving both as a subjective experience and as empirical evidence for these women that the herbal preparation is truly effective (Lubis et al., 2024; Susanti, 2018). Traditional experience provides local knowledge to the community of users so that, even without formal medical training, they are able to understand the properties of each ingredient (Harun et al., 2025; Setiarto et al., 2025).

From this information, *tinuktuk* emerges as more than just an herbal drink—it represents women's health knowledge that unites biological, social, and cultural dimensions. It functions as a means of physical recovery, a symbol of a mother's care and affection, and a body of traditional knowledge that affirms the identity and solidarity of Simalungun women from one generation to the next.

So potent is *tinuktuk* that another informant added an explanation that it is also used as a food accompaniment. This shows that *tinuktuk* is firmly embedded in the daily life of the Simalungun community. This is illustrated in the following narrative,

"All sorts of ways. Sometimes just with warm rice—it's really delicious. Sometimes I mix it with a boiled egg, even better. I've even eaten it plain without anything else, but only when I'm feeling energetic. Because it's spicy—but that's exactly what makes you recover quickly. It's like it gives your body a sudden jolt."

### 3.2. Producers' Perspective

The perspective of the producers who make *tinuktuk* is equally noteworthy, as reflected in the following account,

"Now it's my child who makes it, but in the past there were many of us (women in small-scale enterprises). I'm not stingy with knowledge—there used to be a lot of us here. But what happened? I learned because someone taught me. Even when there are many of us, we shouldn't be jealous; we should be friends. We compete in a healthy way, but they (the people I taught) treated me like an enemy. Wait, I'll get you a brochure of the ingredients... (five minutes later this woman returned, showing photos on her phone of the ingredients and explaining the preparation process). Here's how: first the ingredients are cleaned, then sliced thinly. After that they are dry-roasted (sangrai), except for the andaliman (Sichuan pepper) and asam kecombrang (torch ginger souring agent), which are not roasted. The rice is roasted until it turns yellow; when it's slightly yellow, it's removed. Then the pepper is roasted. After that, the pepper and the roasted rice are combined and ground into something like flour. Yesterday, the Department of Industry and Trade and the university gave us a grinding machine, similar to the kind used for making meatballs. After grinding into a flour-like texture, the other spices are also sautéed and stirred together, then left to rest overnight. If you grind them while still hot, the mixture won't last long. After resting overnight, it's ground again—twice, except for the pepper and rice which are ground three times. On the third grinding, everything is combined, and that's the final result."

The interview with this producer shows how the ingredients and processing steps are central to the social meaning of traditional cooking practices. The informant deliberately displayed photos of the ingredients on her phone and described each stage of the process—starting from cleaning and thin slicing to the special technique of dry-roasting the spices. The specific note that only *andaliman* and *asam kecombrang* are not roasted reflects detailed and carefully preserved local knowledge, where each ingredient is treated differently according to its unique properties.

Similarly, roasting the rice and pepper "until yellow" and then grinding them "like flour" indicates a precise understanding of the desired texture and aroma. This demonstrates that the composition of *tinuktuk* is guided by the informant's deep culinary knowledge. Her explanation about "letting it sit overnight" before the final grinding further reveals that time and temperature are not merely technical steps but part of traditional wisdom to ensure that the spice mix remains durable and of high quality.

Thus, the entire narrative of ingredients and techniques is not just a recipe but a form of culinary heritage that carries historical continuity (Alejandria et al., 2019). Tetapi At the same time, it reflects a social relationship: the informant stressed that she is not "stingy with knowledge" and is willing to share the details of the recipe even though she has at times been regarded as an "enemy," perhaps because of competition. In this way, the ingredients and their preparation serve a dual function: as a cultural identity passed down through generations and as a medium of solidarity and trust within the community (Ishtiaq et al., 2024; Tadesse et al., 2025).

### 4. Conclusion

Tinuktuk is not merely food; like other traditional dishes, it embodies a distinctive local character (Rathna Priya et al., 2019). As a local product, this traditional herbal preparation has played an important role in strengthening intergenerational bonds, as knowledge of its ingredients and methods of preparation is orally transmitted from mothers to daughters and continually practiced within the family sphere. This process of transmission not only preserves its unique flavors and techniques, but also instills values of togetherness and a sense of responsibility for safeguarding one's own health and that of loved ones. Moreover, tinuktuk fosters a positive perception of the importance of caring for the body—ranging from postpartum recovery to the maintenance of physical resilience—while serving as a medium for expressing affection during significant moments in women's lives. In this way, tinuktuk stands as part of the social relationships and cultural identity of the Simalungun people: it signifies familial care, reinforces community solidarity, and symbolizes local wisdom that integrates traditional health practices with profound social meaning.

## References

- Alejandria, M. C. P., De Vergara, T. I. M., & Colmenar, K. P. M. (2019). The authentic balut: history, culture, and economy of a Philippine food icon. *Journal of Ethnic Foods*, 6(1), 16. https://doi.org/10.1186/s42779-019-0020-8
- Chi, M.-H., Ko, C.-Y., Chi, T.-W., Huang, C.-R., Lin, J.-G., Chao, J., & Huang, S.-S. (2025). Ethnobotanical survey of herbal medicines for anti-COVID-19 used by traditional Chinese medicine pharmacies in Taiwan. *Frontiers in Pharmacology*, 16. https://doi.org/10.3389/fphar.2025.1586334
- Du, Y., Yang, Y., Wang, G., Zhou, N., Xun, W., Yang, C., Tang, S., Tan, J., & Liao, G. (2025). Unveiling the formation mechanism of characteristic components in steam pot chicken soup with sanchi-ginseng based on HPLC, GC–MS combined with metabolomics. *Food Chemistry: X*, 30, 102933. https://doi.org/10.1016/j.fochx.2025.102933
- Fauziyyah, A., Rahma, A. S., Hakiki, D. N., & Utama, Q. D. (2025). Historical and health insights into wedang uwuh: a traditional Indonesian beverage. *Journal of Ethnic Foods*, 12(1), 30. https://doi.org/10.1186/s42779-025-00291-5
- Harun, N., Waheed, M., Rubab, S. S., Arshad, M., Haq, S. M., Arshad, F., Hussain, S. M., Bukhari, I., Shoaib, M., Fatima, K., Bussmann, R. W., Hashem, A., Al-Saif, A. M., & Abd-Allah, E. F. (2025). Ethnomedicinal documentation of plants used for gastrointestinal disorders in Sahiwal District Pakistan. *Scientific Reports*, 15(1), 30683. https://doi.org/10.1038/s41598-025-15632-2

- Ishtiaq, M., Sardar, T., Hussain, I., Maqbool, M., Mazhar, M. W., Parveen, A., Ajaib, M., Bhatti, K. H., Hussain, T., Gul, A., Azeem, M., Khanum, H., Moussa, I. M., Ullah, F., Elansary, H. O., Thind, S., & Sridhara, S. (2024). Traditional ethnobotanical knowledge of important local plants in Sudhnoti, Azad Kashmir, Pakistan. *Scientific Reports*, 14(1), 22165. https://doi.org/10.1038/s41598-024-73431-7
- Lubis, R. F., Zaluchu, F., Bangun, S., & Simatupang, I. (2024). Marsidudu, a model of maintaining the ethnicity identity beyond traditional practice of warming up postpartum mothers. *Cogent Arts & Humanities*, 11(1). https://doi.org/10.1080/23311983.2024.2313844
- Prastowo, I., Ahda, M., Aprilia, N., & Dhaniaputri, R. (2025). Kecombrang (Etlingera elatior), a revivingly popular Indonesian culinary herb. *Journal of Ethnic Foods*, 12(1), 29. https://doi.org/10.1186/s42779-025-00290-6
- Purwandari, U., Hidayati, D., Rahman, A., Nurhidayah, E. S., Purwantini, I., Prasetya, E. C., Nurhayati, N., Pujimulyani, D., Jayus, J., Ruriani, E., Suswati, E., Arimurti, S., Suryani, C. L., Kanetro, B., & Setiarto, R. H. B. (2025). Exploring the profile of amino acids and ethnography study in the biodiversity of tempeh as fermented foods of Indonesia. *Journal of Ethnic Foods*, *12*(1), 25. https://doi.org/10.1186/s42779-025-00285-3
- Rathna Priya, T. S., Eliazer Nelson, A. R. L., Ravichandran, K., & Antony, U. (2019). Nutritional and functional properties of coloured rice varieties of South India: a review. *Journal of Ethnic Foods*, *6*(1), 11. https://doi.org/10.1186/s42779-019-0017-3
- Setiarto, R. H. B., Octaviana, S., Perwitasari, U., Fathoni, A., Juanssilfero, A. B., & Suprapedi. (2025). Exploring the historical and food technology aspects of Se'i traditional smoked meat dish from East Nusa Tenggara, Indonesia. *Journal of Ethnic Foods*, 12(1), 21. https://doi.org/10.1186/s42779-025-00284-4
- Susanti, N. (2018). Influencing Factors of Post Partum Mothers to do marsidudu at the area of Cubadak Health Centre, District Pasaman in 2018 [in Bahasa]. Stikes Fort de Kock.
- Tadesse, D., Masresha, G., & Lemlemu, M. (2025). Medicinal Plants Used to Treat Evil Eye Illness in Ethiopia: A Systematic Review. *The Scientific World Journal*, 2025(1). https://doi.org/10.1155/tswj/5498700
- Wijesekara, P. D. (2025). An exploration of the porridge tradition in Southern Sri Lankan culture. *Journal of Ethnic Foods*, 12(1), 27. https://doi.org/10.1186/s42779-025-00288-0
- Zaluchu, F. (2006). Metodologi Penelitian Kesehatan. Cipta Pustaka Media.