

The "Bakar Batu" Cooking Technique in Papua as a Culinary Treasure of the Indonesian Archipelago

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ARTICLE INFO	ABSTRACT
Published: September 2026	<i>The Bakar Batu tradition in the Papuan highlands is a profound culinary and cultural manifestation, yet it remains largely understood through sociological and theological lenses rather than technical gastronomy. This research addresses the gap in scientific documentation regarding the Bakar Batu cooking technique, which is often overlooked as a sophisticated food processing system. Utilizing a qualitative library research method, this study synthesized data from ten scholarly articles to analyze the procedural, technical, and cultural dimensions of this tradition. The findings reveal that Bakar Batu is a highly structured thermal process involving the strategic selection of heat-retentive river stones, precise layering of moisture-rich leaves, and the creation of a pressurized, convection-like environment within an earth pit. This method enables simultaneous steaming and roasting, effectively tenderizing ingredients while maintaining nutritional integrity without external energy sources. Despite its ingenuity, this research is limited by its reliance on existing literature, which lacks empirical data on thermal efficiency and specific chemical transformations. Consequently, it is recommended that future studies incorporate experimental field observations to quantify heat transfer and mineral interactions. The implications of this research are significant, as it elevates Bakar Batu from a purely ritualistic practice to a recognized discipline within gastronomy science. By formalizing the technical procedures of this tradition, this study provides a foundational framework for preserving indigenous culinary wisdom, promoting sustainable cooking practices, and enriching the broader narrative of Nusantara's culinary heritage. This documentation serves as a vital resource for culinary practitioners, educators, and policymakers aiming to integrate traditional knowledge into modern gastronomy while ensuring the long-term preservation of Papua's cultural identity.</i>
Keywords: Bakar Batu, Cooking technique, culinary Treasure	

INTRODUCTION

The culinary traditions of the Indonesian Archipelago are a reflection of its geographical diversity and the profound philosophy of its people. Among the various food processing techniques, the "Bakar Batu" (stone-burning) tradition in the highlands of Papua occupies a unique and sacred position. This technique is not merely a conventional cooking method, but a cultural manifestation that integrates social, spiritual, and ecological aspects. Historically and sociologically, Bakar Batu has

become the gravitational center of Papuan life, particularly for highland tribes such as the Dani, Lani, and other indigenous groups. Various literatures have examined this tradition from diverse perspectives, ranging from the integration of Islamic and Christian values within the tradition, its role as a cultural tourism attraction, to government policies aimed at its preservation. However, behind this wealth of sociological and theological narratives, there exists a significant gap regarding the technical understanding of the culinary process itself (Widiyarto, S. 2024). Most previous studies have tended to position Bakar Batu as an object of anthropological, sociological, or theological study, while the culinary aspect—as a discipline encompassing technical precision, chemical transformation of food ingredients, and presentation management—has often been overlooked or discussed only superficially as a supplement to cultural narratives.

Previous research, such as that by Makatita et al. (2022) and Dute (2022), has successfully dissected how the Bakar Batu tradition serves as a meeting point between religious values and local culture, creating a unique harmony of cosmopolitanism. Similarly, studies by Manafe et al. (2022) and Loho & Sianipar (2025) have emphasized the theological aspects and Christian religious education in strengthening the hospitality of the Papuan people. From a tourism perspective, Elas (2018) and Herningsih (2018) have highlighted the importance of this tradition as a cultural tourism asset that requires policy protection. Nevertheless, a clear research gap emerges when seeking literature that specifically dissects Bakar Batu as a "Nusantara culinary technique." There is no study that deeply elaborates on how the thermal process occurring when hot stones come into contact with food ingredients affects texture, flavor profiles, and nutritional value from a scientific standpoint. Existing literature focuses more on "why" this tradition is performed (socio-cultural function), yet fails to comprehensively answer "how" this technique functions as a sophisticated and sustainable food processing system. This gap serves as the basis for the urgency of this research to fill the void in literature regarding traditional Papuan culinary techniques.

The novelty of this research lies in a paradigm shift in viewing the Bakar Batu tradition. While previous studies positioned Bakar Batu as an object of socio-cultural study, this research will contextualize it within the realm of gastronomy science. This novelty includes an in-depth analysis of the selection of stone types with optimal thermal conductivity, the arrangement of food layers that create simultaneous steaming and roasting effects, and how this technique maintains the nutritional integrity of local ingredients such as sweet potatoes, vegetables, and meat. By dissecting Bakar Batu as a culinary treasure of the Archipelago, this research will provide a new perspective that the Papuan people have possessed a highly advanced food processing system, capable of processing large quantities of food evenly without the use of electricity or gas, but rather by utilizing geothermal energy stored within the stones. This is a form of local wisdom that is highly relevant to be documented in the national culinary repertoire, while simultaneously providing scientific legitimacy to a tradition that has hitherto been understood only as a ritual.

The importance of this research is also driven by the challenges of modernization that threaten the sustainability of traditional techniques (Widiyarto, S. 2025). Without accurate technical documentation, there is a risk that knowledge regarding material selection, heating duration, and presentation management will be eroded by modern cooking methods that are more practical but lack philosophical and ecological value. Therefore, this research does not merely aim to preserve the tradition, but also to elevate the status of Bakar Batu into a culinary standard that can be studied, replicated, and appreciated by the wider community, both nationally and internationally. By positioning Bakar Batu as a culinary treasure of the Archipelago, we are asserting that Indonesia's identity is not only built by the spices in palace kitchens, but also by cooking techniques born from the closeness of the Papuan highland people to their environment. This research will serve as a bridge between oral traditional knowledge and technical-scientific culinary practice, thereby making a tangible contribution to the development of knowledge in the field of Indonesian gastronomy.

Through a descriptive-qualitative approach, this research will delve deeply into every stage of the process, from stone selection and firewood preparation to the arrangement of food ingredients in the earth pit. By integrating data from field observations and in-depth interviews with customary

practitioners, this research is expected to compile a systematic technical guide on the Bakar Batu tradition. This will enrich the literature on Nusantara culinary arts, which has long been dominated by cooking techniques from the western part of Indonesia. Ultimately, this research is expected to serve as a reference for academics, culinary practitioners, and tourism developers in understanding the essence of this tradition more holistically. Thus, the primary objective of this research is to identify and document in detail the Bakar Batu cooking technique in Papua as part of the culinary wealth of the Archipelago that possesses high technical, cultural, and educational value.

METHOD

The research steps include: (1) Identification, collecting 10 articles related to the Bakar Batu tradition from academic databases; (2) Selection, screening to ensure the articles are relevant to culinary and cultural aspects; (3) Classification, categorizing data based on variables of processing techniques, ingredients, and philosophical values; (4) Analysis, conducting a critical synthesis to identify the gap between sociological narratives and technical culinary aspects; and (5) Interpretation, concluding the findings to document the Bakar Batu technique as a culinary treasure of the Indonesian Archipelago. This qualitative approach allows the researcher to understand the essence of the tradition through in-depth interpretation of the literature, thereby producing a systematic description of the procedures and educational values of this traditional cooking technique.

RESULT AND DISCUSSION

The culinary tradition of "Bakar Batu" (stone-burning) in the highlands of Papua represents a sophisticated and highly structured food processing system that transcends mere survival, functioning instead as a complex integration of thermodynamics, communal social engineering, and cultural identity. To understand the technical nuances of this practice, one must examine the systematic stages of the process, which have been documented through various socio-cultural lenses by scholars such as Asso et al. (2026), Tigau and Budianto (2026), and Elas (2018). The process begins with the meticulous preparation of the site, where the selection of a suitable open ground or pit is determined by environmental factors such as wind direction and accessibility, ensuring both safety and the efficient management of the communal gathering. This initial phase is not merely logistical; it sets the stage for the collective labor that defines the Papuan highland social fabric, as noted by Makatita et al. (2022) and Dute (2022) in their studies on the intersection of religious values and local traditions.

Following the site selection, the gathering of materials serves as the technical foundation of the culinary process. The selection of river stones is critical; these stones must possess specific geological properties—such as high thermal conductivity and structural integrity—to withstand extreme heat without shattering. These stones are arranged alongside high-calorific firewood, which is ignited to reach temperatures sufficient to turn the stones into glowing embers. This phase highlights the indigenous knowledge of material science, where the practitioners demonstrate an intuitive understanding of heat retention. As highlighted by Herningsih (2018), the government's interest in preserving this tradition is rooted in its status as a cultural asset, yet the technical mastery required to manage these materials remains an under-researched aspect of the culinary arts. The preparation of food ingredients, which typically includes sweet potatoes, taro, various greens like cassava and papaya leaves, and protein sources such as chicken or pork, is a collaborative effort that reinforces the communal bonds described by Manafe et al. (2022). This stage is essential for ensuring that the ingredients are prepared in a manner that allows for uniform cooking, reflecting a deep-seated understanding of food preparation and portion management.

The core of the Bakar Batu technique lies in the thermal transformation process, which begins once the stones have reached their peak temperature. Using long wooden tongs, the practitioners carefully maneuver the red-hot stones, creating a thermal core that will act as the primary cooking agent. The layering process, or "stacking," is a masterclass in culinary engineering. The arrangement typically follows a specific sequence: a base layer of heat-resistant green leaves is laid down to provide moisture and prevent direct charring, followed by a layer of hot stones, then the food

ingredients, and finally another layer of leaves and stones. This alternating structure creates a pressurized, enclosed environment that mimics the function of a modern convection oven or a pressure cooker. By sealing the entire stack with earth, the practitioners effectively trap the geothermal energy, allowing the food to undergo a simultaneous steaming and roasting process. This method ensures that the heat penetrates the ingredients evenly, preserving the nutritional integrity and unique flavor profiles that characterize Papuan highland cuisine. As Loho and Sianipar (2025) suggest, this process is also a medium for fostering hospitality, where the act of cooking becomes a shared responsibility that culminates in a communal feast.



Fig. 1 Cooking Hot Stone

The cooking duration, which spans several hours, is a testament to the patience and precision inherent in this traditional method. During this time, the trapped heat facilitates a slow-cooking process that breaks down complex starches in tubers and tenderizes fibrous proteins, resulting in a texture and taste that cannot be replicated by modern rapid-cooking methods. The opening of the pit is a ceremonial moment that marks the transition from the technical labor of cooking to the social act of consumption. The distribution of the food is governed by traditional protocols, ensuring that the meal serves as a mechanism for social cohesion and conflict resolution. Throughout this entire cycle, the Bakar Batu technique functions as a sustainable food processing system that requires no external energy sources such as electricity or fossil fuels, relying entirely on the intelligent application of natural resources.



Fig. 2 Cooking Hot Stone With Cassava etc

Despite the wealth of literature focusing on the sociological, theological, and educational dimensions of Bakar Batu, there remains a significant opportunity to further explore the scientific principles governing this technique. The existing research, while excellent in documenting the "why" of the tradition, provides a foundation upon which future studies can build to explain the "how." By documenting the specific thermal properties of the stones used, the optimal moisture levels provided by the leaf layers, and the chemical changes that occur within the food during the long-duration steaming process, researchers can elevate Bakar Batu to a recognized discipline within gastronomy science. This research aims to bridge the gap between traditional oral knowledge and technical documentation, ensuring that the wisdom of the Papuan ancestors is preserved for future generations. By framing Bakar Batu as a legitimate culinary technique, we acknowledge the ingenuity of the Papuan people and their contribution to the broader tapestry of Indonesian culinary heritage. This documentation is not merely an academic exercise; it is a vital step in ensuring that the technical skills required to perform this tradition are not lost to the pressures of modernization. As we move forward, the integration of traditional practices with scientific inquiry will allow for a more holistic understanding of how indigenous cultures have mastered the art of cooking in harmony with their environment. Ultimately, the Bakar Batu tradition stands as a powerful symbol of the resilience, creativity, and communal spirit of the people of Papua, offering a unique perspective on the potential for sustainable and culturally rich culinary practices in the modern world. Through this systematic analysis, we aim to provide a comprehensive guide that honors the technical, cultural, and educational significance of this remarkable culinary treasure.

CONCLUSION

The Bakar Batu tradition is a sophisticated culinary system that integrates indigenous material science with communal social values. As a result of this research, the optimal "hot stone" cooking method is defined by a precise, multi-layered approach. First, select high-density river stones capable of retaining heat without fracturing. Second, prepare a pit lined with heat-resistant, moisture-rich leaves to create a natural steaming environment. Third, arrange ingredients in a specific sequence—alternating layers of leaves, hot stones, and food—to ensure uniform heat distribution. Finally, seal the pit with earth to create a pressurized, convection-like chamber, allowing the food to cook slowly for several hours. This method ensures that the ingredients are tenderized while preserving their nutritional integrity and distinct earthy flavor profile. However, this research acknowledges several limitations. Primarily, the study relies on a library research approach, which, while effective for synthesizing existing knowledge, lacks direct empirical measurement of thermal variables such as precise internal pit temperatures or the specific mineral composition of the stones used. Furthermore, the qualitative nature of the literature reviewed focuses heavily on the socio-religious significance of the tradition, often leaving technical culinary data to be inferred rather than explicitly measured. There is also a geographical limitation, as the research generalizes the practice across the Papuan highlands, potentially overlooking subtle variations in technique between different tribes or specific ecological zones. Future studies should incorporate experimental field observations to quantify the heat transfer efficiency and chemical changes in the food during the cooking process. Despite these limitations, this research successfully bridges the gap between cultural anthropology and gastronomy science, elevating Bakar Batu from a mere ritual to a recognized, sustainable culinary technique. By documenting these procedures, this study provides a foundational framework for future researchers to explore the scientific ingenuity inherent in Nusantara's traditional food processing methods, ensuring that this invaluable heritage is preserved with both technical accuracy and cultural respect.

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