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Culinary heritage and health: The impact of traditional cooking vessels on flavour and nutritional value in south Indian cuisine

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Abstract

South Indian cuisine represents a rich blend of culture, tradition, and indigenous knowledge systems that have evolved over centuries. One of the most distinctive elements of this culinary tradition is the use of traditional cooking vessels made from natural materials such as clay, cast iron, brass, bronze, and soapstone. These vessels are not merely utensils but are integral components of the cooking process that influence the flavour, aroma, texture, and nutritional composition of food. In recent decades, modern cookware such as stainless steel, aluminium, and non-stick utensils has become dominant due to convenience, affordability, and ease of maintenance. However, the shift towards modern cookware has also raised concerns regarding the loss of authentic flavours and potential nutritional benefits associated with traditional cookware. This article examines the role of traditional cooking vessels in enhancing flavour development and improving the nutritional value of South Indian dishes. The study also explores the cultural significance and sustainability aspects of these vessels while highlighting their relevance in contemporary culinary practices. By analysing the interaction between cooking materials, heat distribution, and ingredient composition, this article emphasizes the importance of preserving traditional cooking methods as part of South India's culinary heritage.

Keywords: Cooking vessels, south Indian cuisine, nutritional value, culinary heritage

Introduction

South Indian cuisine is globally admired for its vibrant flavours, aromatic spices, and diverse range of dishes that reflect the cultural and geographical diversity of the region. States such as Tamil Nadu, Kerala, Karnataka, and Andhra Pradesh have developed distinctive culinary traditions that rely heavily on locally available ingredients such as rice, lentils, coconut, tamarind, and a variety of spices^[1]. While ingredients and recipes are often highlighted as the defining elements of South Indian cuisine, the role of cooking vessels in shaping the final characteristics of food is equally significant but often overlooked. Traditional cooking vessels have historically been designed to complement the cooking techniques and ingredients used in the region, ensuring that the preparation process enhances both flavour and nutritional value. For centuries, households across South India relied on cookware made from natural materials such as clay, cast iron, brass, bronze, and stone. These materials were chosen not only for their durability but also for their unique thermal and chemical properties that influence the cooking process. Unlike modern cookware, which is often designed primarily for convenience and speed, traditional vessels facilitate slow cooking and even heat distribution, allowing spices and ingredients to blend harmoniously. This slow and controlled cooking process is particularly important in South Indian cuisine, where complex spice combinations and layered flavours are essential to the identity of dishes such as sambar, rasam, fish curry, and various vegetable preparations^[2]. In modern kitchens, however, traditional cookware has increasingly been replaced by stainless steel and non-stick utensils that promise efficiency and minimal maintenance. While these modern materials offer practical advantages, they may not replicate the unique flavour profiles or nutritional interactions that occur when food is prepared in traditional vessels. Consequently, culinary experts and nutritionists have begun to re-examine the role of traditional cookware and its potential contributions to both health and gastronomic

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authenticity. Understanding the impact of these vessels is crucial not only for preserving culinary heritage but also for

promoting healthier cooking practices in contemporary society [3].

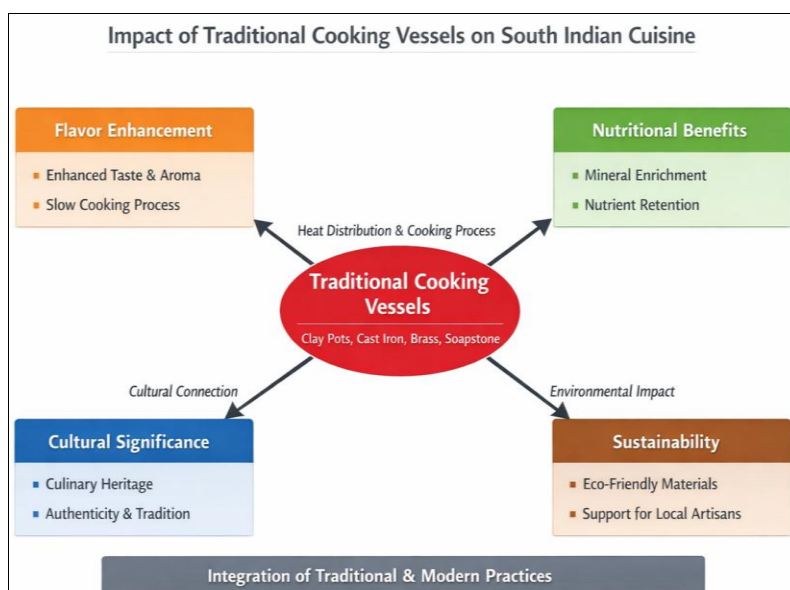


Fig 1: Impact of Traditional Cooking Vessels

Figure 1. Shows how flavour is enhanced with traditional cooking vessels and their practices, which not only enhances the aroma of the food, but also helps in retaining the nutritional content of the food. These vessels are eco-friendly and support the culinary heritage.

Methodology

The present study adopts a qualitative and exploratory research design to examine the role of traditional cooking vessels in enhancing the flavour and nutritional value of South Indian cuisine. The research integrates culinary science, cultural analysis, and nutritional perspectives in order to understand how different materials used in traditional cookware influence food quality. The study focuses on commonly used traditional vessels such as clay pots, cast iron cookware, brass and bronze utensils, and soapstone vessels, which are widely recognized in South Indian households and traditional restaurants. These vessels were selected because of their historical significance and frequent association with authentic preparation of dishes such as sambar, rasam, fish curry, dosa, and vegetable gravies. The research relies on secondary data and observational analysis to develop a comprehensive understanding of the subject. Secondary sources include scholarly articles, culinary literature, ethnographic studies, nutrition research reports, and historical documentation related to South Indian cooking practices. These sources provide insights into the physical properties of traditional cooking materials, their interaction with food ingredients, and their influence on nutrient retention and flavour formation. In addition to literature-based analysis, the study incorporates culinary observation of cooking practices followed in traditional South Indian kitchens and restaurants. These observations help identify how cooking vessels affect factors such as heat distribution, cooking duration, moisture retention, and aroma development during the preparation of typical dishes. To examine the impact of cookware materials on nutritional value, the study reviews existing nutritional research that evaluates mineral transfer and nutrient retention during cooking. Particular attention is given to the role of cast iron cookware in increasing iron content in food and the ability of clay cookware to preserve moisture and prevent

nutrient degradation during slow cooking. The methodology also considers comparative analysis between traditional cookware and modern cookware such as stainless steel and non-stick utensils. This comparison highlights differences in cooking temperature, heat retention, and chemical interactions with food ingredients.

Data analysis in this study follows a thematic analytical approach. Information gathered from literature and observational evidence is categorized into major themes including flavour enhancement, nutrient retention, heat distribution, cultural significance, and sustainability. Each theme is examined in relation to specific types of traditional vessels used in South Indian cuisine. The findings are interpreted to identify patterns that explain how traditional cooking materials contribute to improved taste and nutritional quality of food. Through this approach, the methodology provides a comprehensive understanding of the culinary, nutritional, and cultural implications of traditional cooking vessels in South Indian food preparation.

Results and Discussion

Influence of Cooking Vessel Material on Heat Distribution

The analysis indicates that the material composition of traditional cooking vessels significantly influences heat distribution during cooking. Clay, cast iron, brass, and soapstone possess distinct thermal properties that determine how heat is absorbed, retained, and transferred to food. Clay and soapstone cookware heat gradually and distribute heat evenly, which promotes slow cooking and prevents sudden temperature fluctuations [5]. This characteristic is particularly beneficial for dishes such as sambar, rasam, and tamarind-based gravies that require gradual simmering for proper flavour development. Cast iron cookware, on the other hand, retains high heat for longer durations, making it suitable for roasting and frying dishes such as dosa and vegetable stir-fries. Compared with modern cookware, traditional vessels provide more consistent heat patterns that support uniform cooking and improved texture [6].

Enhancement of Flavour and Aroma

One of the most significant findings of the study is the

contribution of traditional cooking vessels to flavour enhancement in South Indian dishes. The porous structure of clay pots allows natural steam circulation and moisture retention, which intensifies the aroma of spices and herbs during cooking. Slow cooking in clay or soapstone vessels allows ingredients such as curry leaves, mustard seeds, tamarind, and coconut to release their essential oils gradually,

producing richer and deeper flavours. Similarly, cast iron cookware contributes to the development of desirable textures and roasted flavours due to its ability to sustain high cooking temperatures [7]. The results suggest that the material properties of traditional cookware interact with ingredients in ways that modern cookware often cannot replicate, thereby preserving the authentic taste of traditional recipes.

Table 1: Traditional vessels and their impact on food

Vessel Name	Primary Material	Typical Dishes	Flavour & Nutritional Impact
Kal Chatti	Soapstone	Sambar, Avial, Greens (Keera Kootu), Curd	Imparts earthy flavour; neutralises acidity of spices/tamarind; adds minerals.
Eeya Chombu	Pure Tin	Rasam	Gives a distinct, sought-after flavour and aroma. As per Ayurveda,
Uruli	Bell Metal (Copper & Tin alloy)	Chakka Varatti (Jackfruit Halwa),	Provides even, slow heat for deep, caramelised flavours.
Irumbu Kadai	Cast Iron	Frying, seasoning, general purpose curries	Naturally fortifies food with iron, helping to maintain healthy haemoglobin levels. Provides high, even heat for perfect searing.
Clay Pot (Man Panai)	Earthen Clay	Pongal, general curries, rice	Porous nature allows slow, uniform heat circulation, making food aromatic and retaining nutrition.

Nutritional Implications and Mineral Enrichment

The findings also indicate that traditional cookware may contribute to improved nutritional value of food through mineral enrichment and nutrient preservation. Cast iron cookware has been widely documented to increase the iron content of food during cooking, especially when acidic ingredients such as tomatoes or tamarind are used [8]. This process can contribute to addressing iron deficiency, which remains a significant nutritional issue in many populations. Clay cookware further supports nutritional benefits by enabling low-temperature cooking that helps retain vitamins, minerals, and antioxidants in vegetables and lentils. Unlike certain non-stick cookware that may release synthetic chemicals at high temperatures, traditional vessels made from natural materials are generally free from artificial coatings, thereby reducing potential health risks. Beyond their functional benefits, traditional cooking vessels also play an important role in preserving cultural identity and culinary authenticity [9]. The continued use of clay pots, cast iron pans, and soapstone vessels reflects centuries-old cooking traditions passed down through generations in South Indian households. These vessels are often associated with traditional recipes and festive foods that are integral to regional culture. The results highlight that the use of traditional cookware not only enhances the sensory qualities of food but also strengthens cultural connections with ancestral culinary practices. Many traditional restaurants now intentionally use these vessels to recreate authentic flavours and maintain the heritage of regional cuisine. The study also reveals the environmental advantages associated with traditional cooking vessels. Materials such as clay, stone, iron, and brass are natural and durable, often lasting for decades when properly maintained. These materials are biodegradable or recyclable, making them environmentally sustainable alternatives to some modern cookware that may contribute to household waste. Additionally, traditional vessels support local craftsmanship and rural industries, as many of these utensils are handmade by artisans using traditional techniques [10]. The revival of traditional cookware therefore contributes not only to culinary authenticity but also to sustainable production and consumption practices. While traditional cooking vessels offer numerous benefits, their integration into modern kitchens requires adaptation to contemporary lifestyles. Factors such as maintenance requirements, fragility of clay cookware, and longer cooking times may discourage widespread use. However, the growing awareness of health

benefits and cultural value has led to renewed interest in traditional cookware among chefs, nutritionists, and households. The findings suggest that combining traditional vessels with modern cooking methods may provide an effective approach to preserving culinary heritage while meeting the practical demands of modern life [11].

Traditional Cooking Practices

Traditional cooking vessels used in South Indian kitchens reflect a deep understanding of local materials, cooking techniques, and dietary needs. Among the most widely used vessels are clay pots, cast iron pans, brass and bronze utensils, and soapstone cookware. Each of these materials possesses unique physical and chemical characteristics that influence the cooking process and the resulting quality of food. Clay pots, commonly referred to as manchatti, have been a staple in South Indian kitchens for generations. These pots are made from natural clay and are known for their porous structure, which allows steam and moisture to circulate within the vessel during cooking. This characteristic creates a natural steaming effect that enhances the flavour and aroma of dishes [12]. Clay pots are particularly popular for preparing tamarind-based gravies, fish curries, and lentil stews, as the gradual heating process helps the spices infuse deeply into the ingredients. Cast iron cookware is another essential component of traditional South Indian cooking. Cast iron tavas and kadas are widely used for preparing dosa, uttapam, and various stir-fried dishes. The ability of cast iron to retain and distribute heat evenly makes it ideal for cooking foods that require high temperatures and consistent heat. In addition to its thermal properties, cast iron is also valued for its nutritional benefits, as it can release small amounts of dietary iron into food during cooking. Brass and bronze vessels are traditionally used for boiling milk, cooking rice, and preparing festive dishes such as sweets and special curries. These metals conduct heat efficiently and are believed to enhance the taste and texture of certain foods. Soapstone cookware, often known as kalchatti, is another traditional material valued for its exceptional heat retention. Soapstone vessels absorb heat slowly and release it gradually, making them particularly suitable for slow-cooked gravies and curries [13].

Influence of Traditional Vessels on Flavour Enhancement

One of the most significant contributions of traditional cooking vessels is their ability to enhance the flavour of food.

The interaction between cooking materials and ingredients plays a crucial role in shaping the taste, aroma, and texture of dishes. Traditional cookware facilitates a slower cooking process, which allows the flavours of spices, herbs, and other ingredients to develop gradually and harmoniously. Clay pots, for example, provide a unique cooking environment that promotes the retention of moisture and natural juices. The porous nature of clay allows heat to penetrate gently and evenly, preventing ingredients from burning or overcooking. As a result, dishes prepared in clay pots often exhibit richer and more balanced flavours compared to those cooked in modern metal cookware. Similarly, soapstone vessels contribute to flavour enhancement by maintaining consistent cooking temperatures ^[14]. The slow heating and cooling

properties of soapstone allow spices and aromatics to release their essential oils gradually, creating deeper and more complex flavour profiles. Cast iron cookware, on the other hand, is particularly effective for roasting and sautéing because it can sustain high temperatures for extended periods, enabling ingredients to develop caramelized surfaces and enhanced taste. The use of traditional vessels also contributes to the preservation of authentic culinary textures. For instance, dosa prepared on a well-seasoned cast iron tava often develops a crisp exterior and soft interior that is difficult to replicate using non-stick pans. Such sensory qualities highlight the importance of cookware material in defining the gastronomic experience of South Indian cuisine ^[15].

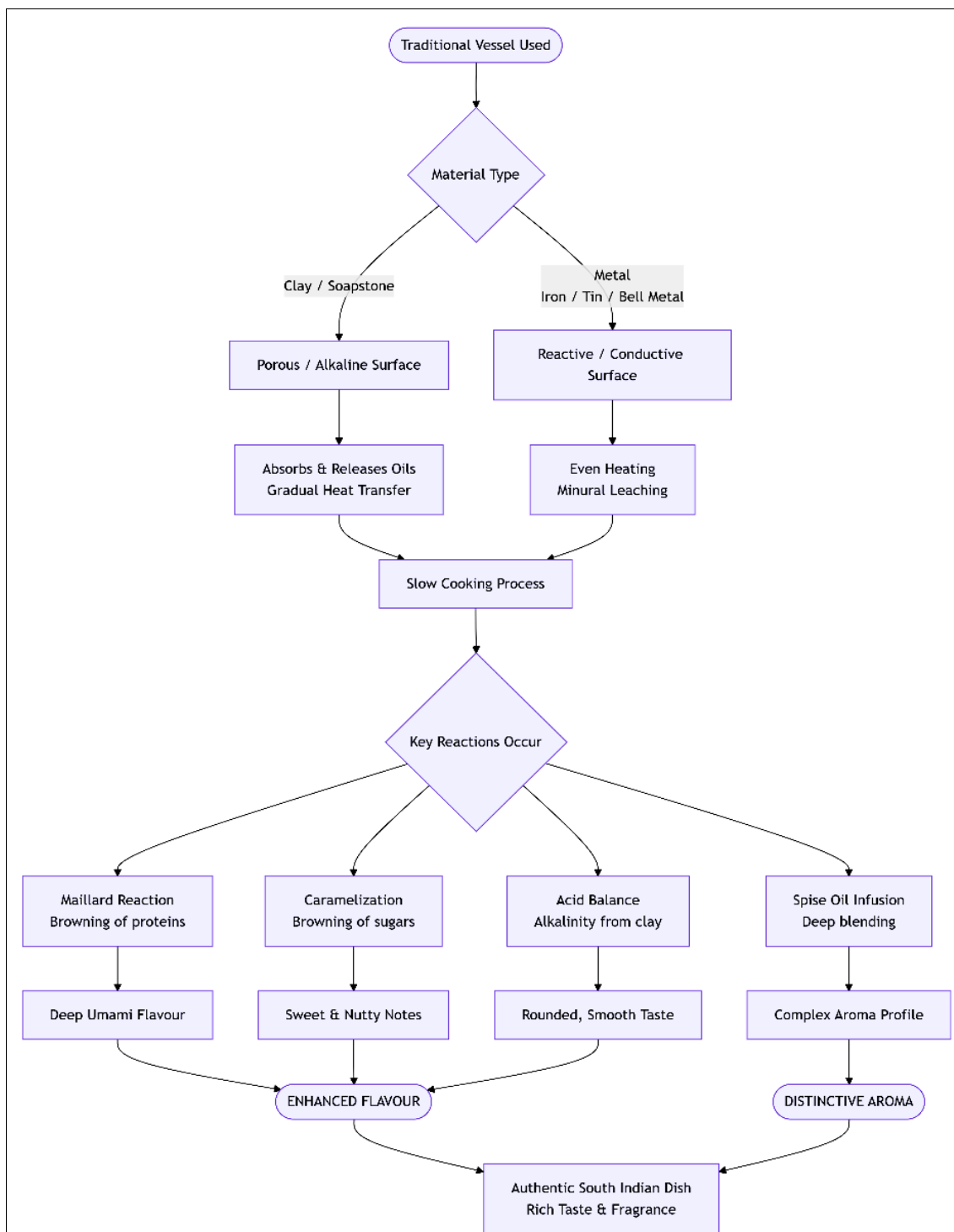


Fig 2: Aroma and Flavour from traditional Vessels

Nutritional Implications of Traditional Cookware

In addition to enhancing flavour, traditional cooking vessels can significantly influence the nutritional value of food. One of the key benefits is the natural enrichment of food with essential minerals during the cooking process. Cast iron cookware, for instance, can increase the iron content of food, particularly when cooking acidic dishes such as tomato-based curries or tamarind gravies. This characteristic is especially beneficial in regions where iron deficiency is a common nutritional concern. Clay cookware offers another important nutritional advantage by preserving the natural nutrients present in ingredients^[16]. Because clay pots facilitate slow cooking at moderate temperatures, they help retain vitamins, minerals, and antioxidants that might otherwise be lost during rapid high-temperature cooking. Moreover, clay vessels are free from synthetic coatings or chemical additives, making them a safer alternative to certain modern cookware that may release harmful substances when overheated. Soapstone and brass vessels also contribute indirectly to nutritional quality by promoting gentle cooking techniques that preserve the structural integrity of ingredients. Slow cooking ensures that vegetables, lentils, and grains maintain their natural nutrient content while developing desirable textures and flavours. Consequently, traditional cookware not only enhances the sensory appeal of food but also supports a more balanced and nutrient-rich diet^[17].

Cultural Heritage and Sustainability

Traditional cooking vessels are deeply intertwined with the cultural heritage of South Indian communities. These utensils are often handcrafted by skilled artisans using techniques that have been passed down through generations. The continued use of such cookware represents a living connection to ancestral culinary practices and local craftsmanship. From an environmental perspective, traditional vessels are also more sustainable than many modern alternatives. Materials such as clay, stone, and metal are natural and biodegradable or recyclable, reducing their environmental impact. Unlike disposable or chemically coated cookware, traditional vessels are designed to last for decades when properly maintained^[18]. The revival of interest in traditional cookware is closely linked to broader movements promoting sustainable living and cultural preservation. Restaurants specializing in authentic regional cuisine increasingly use traditional vessels to recreate original flavours and cooking methods. Similarly, many households are returning to traditional cookware as part of a broader effort to adopt healthier and more environmentally conscious lifestyles^[19].

Challenges and Contemporary Relevance

Despite their numerous advantages, traditional cooking vessels face several challenges in modern kitchens. Many of these utensils require careful handling, seasoning, and maintenance to ensure durability and optimal performance. Clay pots, for example, can crack if exposed to sudden temperature changes, while cast iron cookware requires regular seasoning to prevent rust. Modern lifestyles characterized by limited cooking time and convenience-oriented practices have also contributed to the decline in the use of traditional cookware. However, growing awareness of health benefits and culinary authenticity has led to a gradual resurgence of interest in these vessels. Contemporary manufacturers are now producing improved versions of traditional cookware that combine traditional materials with modern design features, making them more accessible and

user-friendly^[20].

Conclusion

This study proves that the traditional cooking vessels play a vital role in shaping the flavour, texture, and nutritional value of South Indian cuisine. Materials such as clay, cast iron, brass, bronze, and soapstone possess unique thermal and chemical properties that enhance the cooking process and contribute to the authenticity of regional dishes. Beyond their culinary benefits, these vessels also represent cultural heritage, artisanal craftsmanship, and environmentally sustainable cooking practices. In an era dominated by modern cookware and fast-paced lifestyles, revisiting traditional cooking methods offers valuable insights into healthier and more flavourful food preparation. Preserving and promoting the use of traditional cooking vessels can help maintain the rich culinary legacy of South India while supporting nutritional well-being and sustainable living. The integration of traditional knowledge with contemporary culinary practices may therefore serve as an important pathway toward preserving both cultural identity and food quality in the modern world.

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