DOCUMENTATION AND NUTRITIVE VALUE CALCULATIONS OF TRADITIONAL FOODS OF KERALA – KANNUR DISTRICT

PROJECT SUBMITTED

In Partial Fulfilment of the Requirement for the Award of the degree of

B.Sc NUTRITION AND DIETETICS

BY

ANAGHA MOHANAN (Register No:- SB21ND005)

HIBA NASRIN MA (Register No:- SB21ND023)

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DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS

ST. TERESA 'S COLLEGE (AUTONOMOUS)

ERNAKULAM

APRIL 2024

CERTIFIED AS BONAFIDE RESEARCH WORK

DEPT. OF CLINICAL NUTRITION AND DIETETICS ★ ERNAKULAM ★ ST. TERESA'S COLLEGE (AUTONOMOUS)

29/04/24

Signature of Internal Examiner

29/4/24

Signature of External Examiner

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DECLARATION

We hereby declare that the project entitled **"DOCUMENTATION AND NUTRITIVE VALUE CALCULATIONS OF TRADITIONAL FOODS OF KERALA – KANNUR DISTRICT"**, submitted in partial fulfilment of the requirement for the award of the degree of B.Sc Nutrition and Dietetics is a record of original research work done by me under the supervision and guidance of **Ms. Ani Thomas Thottan**, Assistant Professor, Department of Clinical Nutrition and Dietetics, Women's Study Centre, St. Teresa's College (Autonomous), Ernakulam and has not been submitted in part or full of any other degree/diploma/fellowship or the similar titles to any candidate of any other university.

Place: Ernakulam

Date: 29/04/2024

ANAGHA MOHANAN

HIBA NASRIN MA

LIYANA YOUNUS

CERTIFICATE

We hereby certify that the project entitled **"DOCUMENTATION AND NUTRITIVE VALUE CALCULATIONS OF TRADITIONAL FOODS OF KERALA – KANNUR DISTRICT"** submitted in partial fulfilment of the requirement for the award of the degree of B.Sc Nutrition and Dietetics is a record of original work done by **Ms. Anagha Mohanan, Ms. Hiba Nasrin MA and Ms. Liyana Younus** during the period of the study under my guidance and supervision.

Signature of the HOD

Ms. Surya M. Kottaram
Head of the Department
Department of Clinical Nutrition
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Signature of the Research Guide with Designation

Ms. Ani Thomas Thottan
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1. INTRODUCTION

“Let food be thy medicine and medicine be thy food”

-Hippocrates

Among the numerous features that separate the human species from other animals, the variety of foods that humans have produced and the research done on them may be the most notable. Animals eat for survival and instinct, but humans enjoy food beyond its basic function of providing enough nutrition for life. They also try to experiment with different flavors. For humans, eating is more intuitive than emotional. Food evokes a range of feelings in people, from the comforting scents of childhood that we love to the tantalizing images of food.

Eating is not only a biological process by which we are nourished, it is also a fundamental aspect of the meanings that people give to food and to their own lives: “Food choices are laden with meanings that figure importantly in humanity’s symbolic, social, ecological and economic worlds”(Arbit et al, 2017).

Andrea Borghini (2020) distinguishes four different positions or views of food: a physical perspective on food, wherein the inherent, natural qualities of the food products such as nutritional value, define what constitutes food. A personal perspective on food that maintains that something has to be consumed by at least one human in order for it to qualify as food. An authoritative perspective on food maintains that the definition of food is set by a higher authority such as religion. A social theory of food that upholds the idea that it is a category that is socially constituted.

Food culture has a rich history full of delectable turns and twists, which supports the idea that cultures of various nations can be examined by their cuisines. Sociocultural factors have traditionally influenced culinary preferences across a wide range of nations (Achaya KT, 2003).

For a very long time, every Indian country had a royal court attended by cooks. It was in these kitchens that new culinary inventions and adaptations of classic recipes were made. Commoners' cooks or housewives would attempt to replicate those recipes in their kitchens using whatever supplies they had on hand. Indian cuisine today is the outcome of that fortunate journey (Antani & Mahapatra, 2022).

Since traditional foods constitute the foundation of nourishment in many different cultures and societies, interest in them has always existed. According to the Royal Spanish Academy Dictionary, traditional means "that which follows the ideas, norms or past customs"; and it is relative to tradition (from Latin tradition and this in turn from tradere, meaning "to transmit," "to deliver") and refers mainly to the "transmission of news, literary compositions, doctrines, rites, customs, etc., made from generation to generation". To put it another way, it alludes to the idea of passing along knowledge, theories and practices, behaviors and attitudes to assure continuity throughout generations.

Traditional cuisine reflects a society's history, way of life, and culture. As observed by Slimani et al. (2002), there are differences in eating trends throughout countries even though we live in a globalized society. The analysis of traditional foods provides valuable understanding of dietary patterns and how they have changed.

In addition to serving as symbols of our culture, traditional foods may also provide health benefits which maybe since knowledge and wisdom of past generations living under difficult conditions have learnt how to optimize use of locally available ingredients to produce palatable foods and recipes with potential to improve human health (Trichopoulou et al., 2000). However, further research is required to document the reported beneficial health effects of traditional foods and to explain them in terms of generally accepted physiological mechanisms.

There are no reliable sources or texts which contain authentic information on traditional recipes that currently exist. Our effort here is to generate a study entitled **"Documentation and nutritive value calculations of traditional foods of Kerala – Kannur district"** with the following objectives:

1. To identify and collect information on the various traditional foods of Kannur district of Kerala

2. To document the methods of preparation of traditional foods.

3. To calculate the nutritional values of the selected traditional food.

2. REVIEW OF LITERATURE

The literature pertaining to the study on **"Documentation and nutritive value calculations of traditional foods of Kerala – Kannur district"** has been reviewed under the following heads:

2.1 History of Traditional foods

2.2 Overview of Traditional foods

2.2.1 Traditional foods across the world

2.2.2 Traditional foods across India

2.2.3 Traditional foods across Kerala

2.3 Importance of traditional knowledge

2.4 Health and nutritional aspects of traditional foods

2.5 Challenges and constraints affecting the use and production of traditional foods

2.6 Future scope of traditional foods

2.1 History of Traditional foods

Green, Rosemary (2016), refers to India as one among the oldest continuously existing civilizations, encompassing a wide range of religious beliefs, customs, traditions, socioeconomic classes, and agricultural methods coexisting peacefully for millennia.

Traditional foods often begin from indigenous communities living in mountains, plains, deserts, tropical and subtropical woods, and lengthy coastlines, which they manage and utilize for food, livelihood, and income generation (MoHFW and Ministry of Tribal Affairs, 2019).

According to Sarkar, P. (2015), Indian traditional cuisine has been cooked in various ways across the nation for a long time. In India, traditional knowledge regarding food processing, preservation methods, and therapeutic applications has been developed over many generations.

According to Subramanyam et al. (2010), India has a rich and incredibly diverse food supply, and the country's different cuisines are intimately related to social identity, religion, and

other cultural influences in addition to regional farming methods and a broad variety of food options. (2014) Vecchio et al.

When man ceased to be a food hunter, traditional food processing began in India (Potty, 1986). Every Indian group has a unique and distinctive approach to food (Achaya, 1998). As per Pratima (2000), India is recognized as the birthplace of timeless culinary mastery, boasting an extensive legacy of customary dishes. Traditional foods differed both globally and within an area, according to Pattanayak (1986).

Prehistoric food habits in India remain partly unknown. Information regarding these habits was derived from anthropological evidence and cave paintings found in various parts of Indian states such as Rajasthan, Gujarat, and Punjab (Piggott, 1950).

Fairservis WA (1983) comments that Written recipes may be one of the sources of determining the type of food eaten by the people then, but language remains a barrier, which is especially true in the case of prehistoric India. People's eating patterns tell the story of survival and a transition from hunter-gatherer communities to becoming an agrarian community. Piggott S. (1950).

Antani, V., & Mahapatra, S. (2022) discusses the decline of the Indus valley civilisation and the rise of Indo-Aryan's during the vedic period. They were majorly pastoralists utilising milk, curd and butter as food material. The Vedas make multiple references to sweetcakes known as apupa. Barley four was used to make apupa, or Malpua as it is now known. Cakes made of the fattened batter would be deep-fried in ghee. The fried cake was dipped in honey just before serving. Over time, other variations have emerged, and malpua is today served with a variety of sauces.

Antani, V., & Mahapatra, S. (2022) explores the introduction of Mughlai cuisine owing to Muslim Sind rulers from present-day Pakistan infiltrated India after 700 AD's . A cuisine involving multitude of culinary inspirations and innovations which is known for its rich, spicy curries and a fascination with meat, and has significantly influenced modern Indian cuisine. The Mughal royal kitchens were centres of culinary innovation, where recipes were refined and documented in cookbooks like the Ni'matnama. One of the earliest recording of Mughlai cuisine by ghiyath shah, the sultan of Malwa in the fifteenth century.

Thackston WM (2007) examines the wealth of knowledge regarding food and dining customs found in the memoirs of monarchs, such as the Akbarnama and the Baburnama. Dishes

like naan, kofta, jalebi sambusas, sikh, kabab, yakhni, and shurba show a strong Central Asian influence, with a focus on aromatic spices. More so than the health advantages of a vegetarian diet, socioeconomic and cultural reasons have contributed to the adoption of vegetarianism in nations like India (Kakade and Agte, 1997).

Ishwarappagol (2009) documented a wide variety of traditional convenience foods found in the various zones of North Karnataka. According to the survey, urbanites preferred typical convenience meals specifically ready-to-use foods, more than the rural group. These findings were documented across all regions. Foods made mostly of cereals predominated the category with ready-to-eat foods being made the most using cereals. The preparation of traditional convenience foods was severely impacted by the size, type, and number of generations living together in families.

Even though a large amount of Indian cuisine is vegetarian, many of the traditional recipes also contain fish, poultry, goat, lamb, and other meats. Various cultural groups that have inhabited India over time, such the Persians, Mughals, and European colonists, have also left their mark on Indian cuisine (IAS Charisma, 2013).

South Indians mixed cooked rice with curd and soaked it in water overnight to make a delightful morning dish (Subbalakshmi, 2005). One of the oldest medical systems in the world, Ayurveda, was developed as a result of the discovery of the beneficial qualities of traditional Indian diet (Sarkar et al. 2015).

2.2 Overview of Traditional foods

According to Rozin (2005), the meaning of food is determined by learning and cultural transmission. Functionally, food acts as a social vehicle, facilitating social distinctions and linkages. In addition, food takes on a culturally symbolic and moral significance.

Galli (2018) describes traditional food as that which is often passed down from generation to generation and is typically consumed during festive celebrations or events. It is prepared with little to no deviation from a culinary heritage, culture, or tradition.

Amilieny Hegnes (2013) stated that the term “Traditional foods” is a broad and dynamic concept which makes it difficult to properly define it. It is, however, possible to identify distinguishing characters that are common to them and these include the four dimensions: place, time, know-how and cultural meaning of foods.

Ramli et al. (2016) said that Malay traditional meals are continuously prepared and consumed by entire ethnic generations without undergoing a major alteration to their original flavors.

The European Parliament and the Council of the European Union (2012) define Traditional Food Products (TFPs) as items with a track record of at least 30 years on the local market, connecting culture, identity, and heritage (Committee of the Regions, 1996). These products derive quality and identity from the historical and geographical link between their place of origin and the local community, showcasing both dimensions (Balogh et al., 2016).

The definition of traditional food comprises four key aspects: (1) consumption during specific times or events; (2) tied to strong beliefs about nutritional and sensory qualities passed down through generations; (3) involving specific preparation methods following cultural heritage; and (4) closely associated with particular regions or countries (Boncinelli et al., 2017).

Edible greens in the form of leaves, stems, shoots, including marine algae, root vegetables, fleshy fruits (berries, pomes, drupes), edible wild mushrooms, grains, seeds, and nuts, as well as wild-harvested fish, insects and game were produced or collected to prepare indigenous foods. (Agrahar-Murugkar and Subbulakshmi, 2005; Chyne et al., 2019; Ghosh-Jerath et al., 2021).

A more recent definition considers traditional food products as those where key production steps occur at a national, regional, or local level, maintaining authenticity in recipe, raw material origin, and/or production process. These products have been commercially available for approximately 50 years and contribute to the gastronomic heritage (Kuhne et al., 2010).

The 2018 European Year of Cultural Heritage and the latest Special Eurobarometer 466 report from the European Commission (2017) reveal that over 50% of Europeans participate in cultural heritage or traditional activities. Although the most common forms of involvement include visits to monumental sites, museums, festivals, or residing in historic environments or cities, approximately 8% of individuals actively partake in traditional activities such as traditional cooking (Prutsch, 2018).

Traditional foods form an integral aspect of the cultural heritage in specific regions (Bhaskarachary et al., 2016; Ferguson et al., 2017). Moreover, they contribute to passing down cultural heritage to succeeding generations (Albayrak and Gunes, 2010).

The concept of traditional food is also influenced by eating habits. The definition of traditional foods is also applied to traditional ingredients and traditional preparation methods. The traditional consumption practices exhibit cultural variations; for instance, Arabs and Indians commonly use their hands for eating, whereas the Chinese and Europeans employ chopsticks and spoons.

The types of foods available continuously change over time, and traditional foods undergo reinvention and adaptation to meet new needs and requirements. Various terms such as local, original, typical, specialty, and others are employed to express the essence of traditional food (Verbeke et al., 2016).

Traditional foods may be part of everyday meals for some, but in specific countries or regions, they take on a distinctive character and are reserved for special occasions and festivities instead of being part of daily consumption (Vanhonacker et al., 2010).

Traditional foods hold a unique status because of their production methods, intricately linked with specific ingredients and distinctive production processes that have been handed down through generations (Kocman, 2018; Petrescu-Mag et al., 2020).

Traditional foods are those that have been consumed for numerous centuries (Akinola et al., 2020), intimately connected to a specific geographical region and the cultural traditions of a particular community (Jordana, 2000). These foods comprise a variety of categories, including cereals, fruits, leafy and root vegetables, and herbaceous plants. They can broadly be categorized as "domesticated/semi-domesticated" or "wild" foods based on their cultivation and origin (Akinola et al., 2020).

2.2.1 Traditional foods across the world

Ogi, a traditional fermented food made from cereals like maize, millet, and sorghum, is a staple in West African countries, including Nigeria, Ghana, and Ivory Coast, and is commonly consumed by both infants and adults (Umoh and Fields, 1981). In addition to its cultural importance and nutritional advantages, Ogi has been acknowledged indigenously for its therapeutic properties, specifically in addressing issues like diarrhoea (S.A. Laleye, 2003).

According to Surh etal. (2008), fermented foods have been a longstanding dietary tradition around the Korean peninsula, playing a crucial role in Korean food culture. These foods, including the globally adored kimchi, are imbued with nutritional and medicinal values. Kimchi, made primarily from napa cabbage, red chili powder, and various vegetables and spices enriched with functional lactic acid bacteria (LAB), offers diverse nutritional and nutraceutical benefits.

Yoshikatsu Murooka (2008) highlights the popularity of traditional fermentation products in Japan, including foods with probiotics, black rice vinegar, soy sauce (shoyu), miso, natto, and tempeh. These fermented foods are not only deeply rooted in Japanese culinary traditions but have also gained global recognition for their potential health benefits, contributing to the idea of promoting longevity.

Han (2003) emphasizes the significance of fermented soybean foods such as sufu and douchi, highlighting them as specific examples of traditional Chinese foods known to contain functional materials.Wari is a partially fermented legume-based product made from split black gram, combined with ingredients such as dried fenugreek leaves, coriander powder, cumin seeds, red chili powder, and black pepper (Kulkarni et al., 1997).

Several traditional fermented foods and beverage produced at household level in Zimbabwe include fermented maize porridge, fermented milk products like mukaka and amasi as well as non alcoholic cereal based beverages namely mahewu, tobwa and mangisi (Gadaya et al., 1999).The traditional foods consumed by Pakistanis include cereal based fermented foods like nan roti a semi leavened flat bread, andrana pancake made from rice flour and legume (Shah, 1986).

Kinema is a widely consumed food in Nepal, traditionally prepared through the natural fermentation of boiled soybeans. This traditional Nepali food shares similarities with other fermented products in the oriental cuisine, such as natto in Japan, thuanao in Thailand, and tempeh in Indonesia (Tamang et al., 1998; Nikkuni et al., 1995).

Som tum, a traditional Thai dish originating from Thailand, consists of a variety of ingredients, including raw papaya, tomatoes, chili, palm sugar, garlic, lime, and roasted peanuts. This dish has gained popularity across a diverse demographic and is now commonly consumed as a staple food. This dish holds potential in the health food sector due to its rich composition of glutamic acid, vitamin C, protease enzymes, and essential amino acids, contributing positively to human health (Gurnani N, 2013). Som tum serves as a significant

source of fiber, which acts as a prebiotic and contributes to gut health (Calvache J, 2016; Rahman A, 2013).

Tempe is a traditional fermented product originated in Indonesia and has been consumed by Indonesians for a long time as an affordable and cheap protein source. Soybean is the most commonly used material for making tempe, but in certain regions of Indonesia, alternative substrates such as other legumes and coconut waste have been employed in the tempe-making process (Vaidehi et al.,1996).

2.2.2 Traditional foods across India

Kalapana (2020) stated that the traditional Indian meals exhibit regional variations, incorporating a broad spectrum of foods from different food groups. The combinations of these foods in traditional Indian meals are well-balanced, complementing each other not only in terms of essential nutrients but also in terms of non-nutrient bioactive compounds.

Processed grain products, fermented foods, dehydrated products, pickles, chutneys, sauces, relishes, ground spices and spice mixtures, fried food products, dairy products, confections and sweets, and six other broad categories can be used to group Indian traditional foods. (2010, Srinivasan).

According to Agilandeswari and Mohan (2017), Rasam, a popular traditional South Indian soup, occupies a significant position in daily South Indian cuisine. Its Sanskrit name, "rasam," conveys the concept of "essential products of digestion". The preparation of Rasam involves using tamarind juice as a base, contributing to its recognized health advantages and promoting digestive well-being.

According to Rakesh Kumar (2018), mishti dahi or mishti doi is a popular sweetened fermented milk product with deep roots in the eastern parts of India, specifically in West Bengal, Assam, Bihar, and Orissa. It holds special significance during religious celebrations and is considered an auspicious offering for the commencement of journeys or important endeavors. Churpi is a hard variety of cheese, traditionally consumed by the people of Darjeeling hills and Sikkim in India, Nepal and Bhutan (Karki 1986; Tamang et al. 1988; Pal et al. 1993).

Handia, an undistilled fermented rice beverage or wine, is widely consumed throughout the state of Odisha, particularly by tribals. This popular beverage gains prominence during the

summer for its cooling effect on the stomach and as a source of high energy. According to Dhal et al. (2010), Handia is believed to aid tribals in achieving uninterrupted sleep by alleviating tiredness.

According to Ranjay K Singh (2006), the traditional foods of the Monpa tribe, primarily located in Arunachal Pradesh, are centered around yak milk, soybean (Glycine max Merrill.), buckwheat (Fagopyrum esculentum Moench), amaranthus, maize, barley, chilli, and various indigenous fruits and vegetables. These foods are not only nutritionally rich but also align with the ethnic preferences of the Monpa tribe.

The traditional rice beer of the Ahoms, known as Xaj or lao pani, is a customary beverage in the state of Assam. It serves as an energy booster for farmers after strenuous labor and is also enjoyed during significant ceremonial occasions within both family and society (Saikia et al., 2007).

Angchowk et al. (2009) made an attempt to study the traditional foods and beverages of Ladakh, and to bring forth those dishes and beverages, which are true representative of the region. The traditional foods and beverages included in the study were tagikhambir (browned sour dough bread), tagibushuruk (puffed unleavened bread) tagitsabkheer (ground sprouted wheat bread), sepheag/ (freshly sprouted wheat bread) etc. These recipes have been described in detail including their method of preparation.

According to Devi P (2009), the tribes in Manipur, including Nagas, Kukis, and non-tribal communities like Meitei and Meitei Pangals, consume a variety of traditional foods. These include boiled items, fermented dishes, and nutritionally rich foods prepared from indigenous crops, forest products, and both wild and domesticated animals. Traditional dishes like Iromba, Champhu, Kangshoi, Hawaichar, Soibum, Ngaree, Paknam, Chagem pomba, Kangshu, Hentak, Khazing, Heikak, and sticky rice chapatti/bread are commonly consumed. Alcoholic beverages like Yu, made from rice, are prevalent during tribal festivals.

Idli and dosa, the two significant South Indian breakfast items prepared with proper cereal - pulse combination. In South India, people enjoy a tasty breakfast by eating overnight-soaked cooked rice mixed with curd (Subbulakshmi, 2005).

In Maharashtra, poha is prepared with onion, potato, nuts, and pulses is a considered as traditional breakfast (Subbulakshmi, 2005). Bengal gram sattu, another traditional breakfast choice, is commercially made in Bihar and Uttar Pradesh (Mridula et al., 2007).

In North India, matar, a deep-fried snack made from maida, is widely popular (Bawa and Singh, 1998). According to Kalra et al. (1998), mathi is a significant traditional savory product highly favored among the people in Northern states.

2.2.3 Traditional foods across Kerala

Traditional and indigenous knowledge, upheld through local laws, customs, and traditions for centuries, has been passed down from generation to generation. It has played a crucial role in essential areas such as ensuring food security, advancing agriculture, and providing medical treatment. The significance of this knowledge, both for its originators and the global community, has gained increasing acknowledgment internationally (Aneena, 2009).

In Kerala, the influence of foreign cultures on cuisine is evident, as various religious communities, including Muslims and Syrian Christians, have shaped their distinct culinary styles. The Malabar region's Moplah cuisine, for instance, carries a unique flavor influenced by frequent visits from traders (Shyna K.P, 2001).

Kerala's culinary traditions prominently feature coconut, rice, tapioca, and spices like black pepper, cloves, cinnamon, and ginger. Cassava, introduced by the Portuguese, has become a staple in Kerala. The region is renowned for the Sadhya, a traditional feast served during the Hindu festival Onam, consisting of boiled rice and an array of vegetarian dishes on a banana leaf. Kerala cuisine also boasts a rich variety of seafood, including fish, prawns, mussels, and crabs, thanks to its extensive coastline (Aneena, 2009).

Vattayappam is a popular traditional fermented dish prepared by the Christian community of Central Travancore in Kerala and has a sacred tradition of being prepared during Christmas and on Easter eve (Emmanuel,2006).

Traditional festive foods of Kerala included vishu kanji and vishu katta prepared respectively by Nair and Ezhava communities, and neychoru and biriyani of Muslims and achappam, kuzhalappam and vattayappam of Christians (Shyna and Indira, 2003).

Noojum (2007) indicated endangered food items of Malabar areas of Kerala which constituted eendum pidi, pana verakiyathu, ottada, poola pathiri, koova theli, andikanji, poola puttu, and aleesa.

Traditional health foods of Kerala included garlic lehyam, onion lehyam, kozhi marunnu, pookula lehyam, paettiratti lehyam, puli lehyam and jaggery with dried ginger

consumed by pregnant and lactating women and pathila curry, uluva kanji, paal kanji,padachoru, kakkum kaya kanji, navara kanji, navadhanya kanji, marunnu kanji, curd rice,lemon rice, gingelly rice and coconut rice consumed during the month karkidakam and dhanu (Shyna and Indira, 2002).

Jose, (2007), Lalithambika (2007) and Ramani (2007) also indicated about different types of medicated kanji like uluva kanji, njavara kanji, karkidaka kanji, malar kanji, manjal kanji, navadhanya kanji, kurunthotti kanji, paal kanji as the traditional health foods prepared by elder women of Kerala.

Pal kanji is another traditional cereal and milk-based Kerala delicacy prepared with milk, and rice (Achuthan and Emmanuel, 2006). Pookula rasayana, a traditional health food of Kerala is used to improve the health of body and skeletal system of women after parturition (George et al., 2006).

2.3 Importance of traditional knowledge

According to Edward (2017), one of the industries that is expanding quickly is traditional cuisine and healthy eating practices.

Jessica Christine Kwik (2008) introduces the term "traditional food knowledge" (TFK) to underscore the connection between traditional culture and thriving communities. Building on Goody's (1982) framework, which covers the phases of food provision and transformation, including growing, allocating, cooking, eating, and disposal, Kwik emphasizes the social transmission of knowledge and skills related to food provision. Over time, this aspect has become increasingly crucial for cultural survival, capacity building, food security, and the promotion of local biodiversity.

According to Ranjay et al. (2021), lesser-known native plant species and women, the primary keepers of dietary knowledge, play a crucial role in the food, nutrition, and livelihood security of India's traditional communities.

According to Ojha et al. (2022), Himalayan cultures exhibit a sophisticated system of agricultural and medicine use that not only offers sufficient nutritional diversity and nutrition but also ensures therapeutic security. This research examines the relationship between dietary variety and traditional agriculture as well as five food plants in the marginal hill communities of the middle Himalaya.

Boesi (2014) highlights the historical reliance of Tibetans on wild food plants to supplement their traditional diet, particularly among pastoralists. However, modernization and globalization have led to a decline in the consumption of these plants, especially in urban areas. Despite this, some locals have become experts in gathering natural resources, which are in high demand both domestically and internationally. These initiatives are beneficial, as wild food plants hold medicinal qualities valued in Tibetan medicine for treating illnesses.

Choudhary et al. (2015) assert that Ayurveda promotes traditional Indian foods, closely aligned with its dietary principles. Ayurvedic dietetics and traditional meals are so close that many Indian traditional health foods can be classified as ayurvedic foods. This review highlights regionally specific options and provides tailored dietary recommendations based on factors like age, health status and seasonal preferences. The wealth of information on traditional Indian and Ayurvedic health foods offers global benefits in an era of population globalization and international food trade.

Understanding traditional foodways from different cultures might assist dietitians' advise achieve acceptance even in cases where traditional eating does not give optimal health conditions. (Hyman, Guruge, et al. 2002; Pan, Dixon et al. 1999).

Aneena (2009) stated that elderly people were the major source of traditional meal products prepared in each community. Her study was based on the four districts of Kerala's central region-Ernakulam, Thrissur, Palakkad, and Malappuram.

According to Payyappallimana (2010), the UN's Decade of Education for Sustainable Development (DESD) aims to promote intercultural approaches and integrate traditional knowledge (TK) into sustainable development education. However, incorporating TK into Education for Sustainable Development (ESD) faces methodological and socio-political challenges. This paper explores the importance of and obstacles to integrating TK, using traditional medicine in Kerala, India, as a case study.

Jessica Christine Kwik (2008) reported in her study that traditional foods are highly valued and recreated amongst immigrant communities in Canada as they provided a link to their home countries. The communities do not fret on the lack of pre-requisite skills for the preparation of the same and are willing to set aside their time and effort to experiment and produce surprising results.

Traditional foods play a crucial role in addressing food and nutritional challenges in drought-prone regions like Africa, where high levels of undernourishment and insecurity persist (Rampa et al., 2020). For instance, Zimbabwe has faced severe drought-induced famines in the last two decades, exacerbating food and nutrition concerns (Chigavazira & Zandamela, 2021). Similarly, South African rural communities grapple with poor nutritional status and poverty (Omotayo et al., 2021). The consumption of traditional foods emerges as a significant contributor to alleviating hunger and malnutrition (Van der Hoeven et al., 2013).

Researchers have demonstrated that Traditional Food Products (TFPs) play a significant role in influencing consumer satisfaction and fostering loyalty, ultimately contributing to their return to specific destinations (Mohamed Shaffril et al., 2015). Consumer decision-making regarding TFP consumption is multifaceted, influenced by factors such as product familiarity, source, perceived worth, consumer lifespan, and purchasing power (Cacciolatti et al., 2015).

2.4 Health and nutritional aspects of traditional foods

LeVuong and his team conducted a study in which they found carotenes, fatty acids, and vitamin E in the oil of gac (Xoi gac), a traditional tree fruit in Southeast Asia. In a controlled trial involving children who consumed rice cooked with gac oil, there were noticeable improvements in the levels of blood hemoglobin and retinol, particularly benefiting children dealing with anemia (Vuong LT, 2001).

Encouraging the cultivation and consumption of traditional vitamin A-rich foods such as ivy gourd (Coccina sp) in local gardens demonstrated success in improving the retinol status of 10-13 year old children during a year-long food promotion program in Northeastern Thailand. The implementation of this traditional food-focused project resulted in noteworthy enhancements in retinol levels compared to communities that did not receive the intervention (Smitasiri S, 1999).

In Micronesia (region in Oceania), two species banana (Musa spp.) and one of taro (Cyrtosperma sp) are now being promoted among villages where more than half the children have been found with low serum retinol. These species, known as traditional weaning foods for infants, have been documented with high levels of beta-carotene (Englberger L,1999).

Among the Nuxalk Indigenous People in British Columbia, Canada, two years of studying the composition of traditional foods, coupled with a three-year educational

intervention, led to enhanced nutritional status for all age groups in terms of retinol, carotene, and folic acid (Kuhnlein HV,1997).

The study conducted by Bendangnaro Jamir and Chitta Ranjan Deb (2017) suggests that fermented Anishi is more nutritious compared to its raw form. It can be consumed not only as a food item but also for its potential therapeutic benefits, attributed to its high nutritional value and antioxidant capacity.

Libo Liu (2004) found that including douchi, sufu, dajiang, and soy sauce in one's diet can bring health benefits. These traditional fermented soybean products, which are essential components of people's diets, provide distinct flavors and enhanced nutritional benefits.

The traditional Mediterranean diet is considered optimal for individuals who have experienced a coronary infarct, and it does not promote obesity. Trichopoulou et al. (2007) reported that traditional foods play a vital role in the Mediterranean diet and contribute to its health-promoting characteristics.

Dahi, a traditional Indian dietary staple, is consumed as a refreshing beverage and is renowned for its firm curd texture and delicate flavor. Studies by Warrier and Sudhakaran (2006) have shown that regular dahi consumption offers various benefits, including improved appetite and vitality, relief from dyspepsia and intestinal disorders, mitigation of drug adverse effects, promotion of thiamine synthesis, reduction of cholesterol levels, facilitation of digestion for lactose-intolerant individuals, and potential contributions to cancer control.

Lalithambika (2007) highlighted the significance accorded to kanji, a traditional food in Kerala, in Ayurveda, particularly during diseased conditions due to its easy digestibility. Sharon et al. (2006) emphasized the nutritional importance of puttu, ada, and idiyappam, traditional breakfast foods in Kerala, known for their high protein, carbohydrate, and energy density.

Paal kanji, a traditional cereal and milk-based delicacy in Kerala, was reported to be rich in protein, phosphorus, vitamin C, thiamin, riboflavin, iron, calcium, choline, copper, manganese, and magnesium, with good digestibility (Achuthan and Emmanuel, 2006).

Chendamurian, a traditional banana delight from southern Kerala, was found to contain highly nutritious milk proteins, milk solids, and potassium, with laxative properties (Sudhakaran, 2006). Aneena and Indira (2007) reported the nutritional benefits of traditional

foods such as putu, laddu, ada, and coffee, prepared using rice bran as the main ingredient, indicating that these foods are rich in B-complex vitamins, fiber, calcium, and iron.

Traditional supplementary food was rich in all nutrients but excess amount of fat in the form of ghee was used in its preparation because of traditional belief that edible oils cause cough and ghee provides strength to the body (Girijamma et al., 2001). Kuhnlein et al. (2002) assessed 236 traditional foods from the Canadian Arctic for macronutrients, minerals, and fatty acids, revealing a significant presence of nutrients in these foods.

In southern India, green gram and chickpea are commonly germinated before being used in specific traditional salad dishes. This practice is known to enhance iron absorption, attributed to increased vitamin C content or reduced tannin or phytic acid content, or a combination of both factors (Tontisirin et al., 2002).

2.5 Challenges and constraints affecting the use and production of traditional foods

Traditional food items often carry a stigma of being associated with poverty. Battcock and Ali (1998) note that they face stiff competition from mass-produced Western foods, which enjoy a glamorous image.

With the blending of cultures and advancements in communication and transportation, people have developed a taste for specialized foods from other regions (Desikachar, 1998). Urbanization, rural-to-urban migration, increased literacy, rising incomes, and heightened consumer awareness have all influenced purchasing behaviors (Gopalan, 1994).

Greater purchasing power, shifts in socio-economic status, and changing lifestyles have also spurred the consumption of processed and convenience foods (Kumar and Anjaneylu, 1998). This changing social landscape in India has fueled demand for various convenience foods (Arya, 1998).

Ranjini et al. (2000) argue that food consumption patterns have undergone significant changes over the past five decades, with a notable increase in processed and convenience foods available to consumers. Indian culinary traditions often involve labor-intensive, time-consuming, and costly preparation of fresh food items (Desikachar, 1986; Kareem, 1986).

Osman (1986) observes that industrial production of traditional foods remains minimal compared to total consumption, with costs fluctuating based on importance and consumer

purchasing power. Many traditional foods are produced on a small scale in unhygienic conditions and lack quality control (Tokuji, 1986).

Distribution is often limited to specific areas due to rapid spoilage caused by unsanitary conditions. Hygiene and sanitation are often neglected during the handling and processing of traditional products (Goyal and Rajorhia, 1991).

Traditional foods are conceptually ambiguous, i.e., they defy a single, static definition. Over the years, 23 different definitions have emerged (spanning from 1995 to 2019), reflecting the complexity of this concept. These foods vary widely in specific characteristics, making it challenging to encapsulate them under a single umbrella.

According to Neufield H.T. et al. (2017); Elliot B. et al. (2012); National Collaborating Centre for Aboriginal Health (2020) and Skinner K. et al. mentions that traditional food systems are often land-based. reducing access to land and water has been identified as a significant barrier to acquiring or accessing traditional foods.

Richmond C. et al. (2008); Neufield H.T. (2017) and Elliot B. et al. (2012) stresses the fact that uprooting Indigenous communities from their traditional territories have negatively impacted the accessibility, availability, and use of traditional food sources. Cidro J. et al. (2015); Elliot B. et al. (2012) and Skinner K. et al. (2016) says that it has also been noted that those living in urban areas have reduced access to land and water which is where traditional foods usually exist.

Elliot B. (2012); First Nations Food, Nutrition, & Environment Study (2011) and Kuhnlein H.V. et al. (1997) mentions that environmental and climate changes have also been observed as factors that have decreased the ability of Indigenous People to acquire and rely on traditional food sources. Modern agricultural practices can lead to the loss of wild species and cultivated varieties of plants which were originally used in traditional food systems.

Elliot B. et al. (2012); First Nations Food, Nutrition, & Environment Study (2011) and National Collaborating Centre for Aboriginal Health (2020) discusses that environmental contaminants have also induced concern for reducing the safety of traditional food sources leading to diverse health effects such as neurobehavioral disturbances and can also affect the development, immune system, or kidneys, and they may be carcinogenic.

Elliot B. et al. (2012), First Nations Food, Nutrition, & Environment Study (2011), National Collaborating Centre for Aboriginal Health (2020), Skinner K. et al. (2016), highlight

economic barriers related to the cost of equipment and time needed for acquiring traditional foods. Non-mechanized and labor-intensive preparation methods may affect taste, texture, and appearance. Moreover, concerns about hygiene arise as hand-operated tools can introduce contaminants into the prepared food.

Neufield H.T. et al. (2017), Elliot B. et al. (2012) and Grey S. et al. (2014) highlight the loss of traditional knowledge in using traditional foods due to colonial laws and practices. These laws have restricted Indigenous Peoples' access to areas for hunting, fishing, and gathering traditional foods. The introduction of the residential school system by colonial governments notably impacted indigenous food systems and cultural traditions.

According to Asha John et al. (2019), trends in the food service sector are always evolving to reflect people's ever-changing demands and interests, much like in any other art form. For those who work in the foodservice industry, including chefs and restaurant owners, staying current with these trends is crucial.

One of the obvious effects of globalization in Kerala, according to Ramesh Chandran (2016), is the change in the eating habits of the urban population, especially the youth. The dietary habits of metropolitan populations clearly demonstrate the noticeable transition from traditional to fast cuisine. The increased use of packaged fruit juices and processed foods goes hand in hand with that.

In a European study conducted by Almli et al. (2011), it was demonstrated that traditional food products generally enjoy a positive reputation among consumers. This favorable perception is associated with attributes such as high quality, distinctive taste, and safety. Moreover, the perception of traditional food products being costly and requiring a significant amount of time for preparation contributes to this negative view.

Neufield H.T. et al. (2017) and Skinner K. et al. (2016) noted that the decision to eat traditional cuisine is influenced by personal dietary preferences. Children's and young people's choice for traditional meals may be influenced by family, particularly if traditional foods are available in the household. Because traditional meals are typically shared through personal ties, access to them is thus closely linked to social contexts. However, since they have fewer connections to their family and the community, people who live in metropolitan regions frequently have fewer possibilities for sharing their cultural foods. (Neufield H.T. et al. (2017); Elliot B. et al. (2012); Skinner K. et al. (2016); Cidro J. et al. (2015)).

2.6 Future scope of traditional foods

Traditional foods, initially utilized primarily for seasonal occasions, banquets, or religious ceremonies rather than serving as staple food, have gained popularity as delicacy foods, as noted by Shin (1999). Hollingsworth (2000) foresaw a significant rise in spending on ethnic foods, estimating that one out of every seven dollars over the next decade would be allocated to this category. The author also predicted heightened competition among food manufacturers seeking to capture market share in rapidly expanding ethnic cuisines such as Thai, Caribbean, Mediterranean, and Indian.

Hill (2001) further emphasized the economic impact of locally-produced food items, highlighting that they contribute almost twice as much income to the local economy compared to the equivalent amount spent in a typical supermarket.

Banovic et al. (2010) conducted research revealing that consumers tend to view traditionally produced and nationally branded food products as superior in terms of product quality when compared to store-branded alternatives.

Balogh et al. (2016) found that consumers exhibit a willingness to pay a premium for traditional foods in comparison to mainstream products. This willingness to pay extra underscores the perceived value that consumers attach to traditional food items.

Ohiokpehai (2003) highlighted the potential of harnessing women's indigenous knowledge regarding traditional foods to enhance nutrition security. Despite the rich array of micronutrients present in the traditional food systems of indigenous communities, this valuable information often remained untapped in public health promotion and training programs. The lack of scientific coverage was identified as a barrier to incorporating this indigenous knowledge into broader health initiatives (Kuhnlein, 2003).

According to Parpia (2004), traditional processed foods constitute almost 75% of the processed foods available in the Indian market. These traditional foods are recognized as competitive products due to their distinctive materials and production techniques. There is a current trend of expanding efforts to export these traditional foods, as noted by Shin (2004).

Parpia (2004) notes that traditional processed foods account for a substantial portion of India's processed food market, highlighting their competitive edge due to unique ingredients and production methods and the expanding efforts to export them.

Over the past five to eight years, the traditional food market in India has experienced rapid growth, necessitating large-scale production and preservation. This surge is attributed to the potential for indigenous consumption, export opportunities, and the interest expressed by multinational companies (Dipali and Rodrigues, 2006). The ongoing process of rapid urbanization and the evolution of heritage food production technologies have led to the continuous introduction of traditional convenience and ready-to-serve foods into the market (Manjula et al., 2006).

Everett and Aitchison (2008) highlighted a correlation between a growing interest in food tourism and the preservation and enhancement of regional identity. The authors emphasized the importance of conserving traditional heritage, skills, and ways of life, underscoring the social and cultural benefits as well as the advantages associated with the production of local food.

Travelers are increasingly drawn to specialized forms of tourism, such as adventure, luxury, ethnic, indigenous, heritage, health, and various other emerging products. Their anticipation is to actively engage in and become immersed in the culture and heritage of the destinations they wish to visit (Divecha, 2012).

The food industry aims to create innovative products that follow modern trends and traditional method, catering to the preferences of today's consumers. Simultaneously, there is an effort to preserve the distinct identity of specific products, which hold significance as traditional items (Raquel et al., 2021).

Ohiokpehai (2003) suggests that leveraging women's indigenous knowledge of traditional foods could enhance nutrition security, although this valuable information is often underutilized in public health and training programs due to insufficient scientific backing (Kuhnlein, 2003). Everett and Aitchison (2008) highlight the link between increased interest in food tourism and the preservation of regional identity, emphasizing the importance of conserving traditional heritage, skills, and local food production.

3. MATERIALS AND METHODS

This chapter deals with the methods and tools followed in the various phases of the study and the details are presented under the following headings:

3.1 Locality of the study

3.2 Selection of subjects

3.3 Plan of study

3.3.1 Collection of information regarding traditional food habits in Kannur

3.3.2 Documentation of traditional foods in Kannur

3.3.3 Preparation of selected traditional foods in Kannur

3.3.4 To calculate the nutritive value of selected traditional foods in Kannur district

3.1 Locality of the study

Kannur district in Northern Kerala was chosen for the study for its rich culinary heritage deeply rooted in local culture. Situated along the coastal belt, it offers a diverse array of dishes, featuring both seafood and meat, reflecting its coastal and cultural influences. The region's cuisine is a unique blend of indigenous practices and influences from immigrant communities and colonial powers.

Five different locations within the district of Kannur were selected for the study, among which each household was visited to list out the traditional recipes they followed from ancestors. The selected localities are outlined in Table 1, providing pertinent data for the study.

Table 1: Localities selected for the study

Sl. No.	Localities selected
1	Irikkur
2	Kakkad
3	Payyanur
4	Taliparamba
5	Thalassery

3.2 Selection of subjects

For our study, we selected 20 people with experience and expertise in traditional food preparation from our study locality. As traditional food habits vary with respect to region, religion, etc., the selected individuals were mainly Hindus, Christians, and Muslims. There are certain differences in cooking styles among the different religions, so the selection from all three religions was helpful for our study.

A total of 20 people were selected as the subjects of the study, and the number of respondents belonging to each community is given in Table 2.

Table 2: Distribution of respondents selected for the study

Community	No. of subjects (n=20)	Percentage
Hindu	4	20%
Muslim	13	65%
Christian	3	5%

3.3 Plan of study

Based on the objectives of the study, the plan of the study was designed under various heads. The method of the plan of study is as follows:

3.3.1 Collection of information regarding the traditional food habits in Kannur

Survey methods, particularly in-person and telephone interviews, were used to gather information from the designated study locations about the traditional foods and eating habits of each community related to religious customs, festivals, and special occasions, as well as the ingredients and preparation methods.

The subjects were also asked a set of questions (attached as appendix 1) to further understand whether these traditional foods were associated with festivals, religious practices etc. Through this project, it was also possible to get familiarized with different traditional kitchen equipments and utensils including uruli, churner, bharani or canister, muram, mortar and pestle, arakallu, cheena chatti, or mann chatti or clay pot, kal chatti or stone pot, para or bushel, kooja or earthen pot etc.

3.3.2 Documentation of traditional foods in Kannur

The information gathered on various traditional cuisines on special occasions of different communities through interviews were tabulated. Additionally, information was obtained about the preparation techniques of a few classic dishes. The procedure was documented using both textual and photographic means. The history of selected traditional foods and the changes occurred to traditional food preparations were also collected from the skilled experts using time/trend line through in-person interviews. Furthermore, recipes were also collected from secondary data sources such as recipe books to further enrich the analysis.

Table 3 : 15 Traditional foods identified

Sl. No:	Traditional Foods
1	Alisa
2	Meen Pathiri
3	Pazham Nirachathu
4	Kakka Rotti
5	Thalassery Chicken Dum Biryani
6	Thari Kachiyath
7	Unda Puttu
8	Mutta Surka
9	Kinnathappam
10	Thenga Choru
11	Kaithachakka Pachadi
12	Pazham Pandathil
13	Coconut Jaggery Balls
14	Sweet Plantain Curry (Kayi Curry)
15	Muttamala

Out of the above foods, the following foods were selected for further study:

Table 4: Selected traditional foods

Sl. No:	Selected Traditional Foods
1.	Mutta Surka
2.	Alisa
3.	Kaithachakka Pachadi
4.	Pazham Nirachathu
5.	Kakkaroti
6.	Kinnathappam
7.	Sweet plantain curry (Kayi curry)
8.	Mutta maala
9.	Meen Pathiri
10.	Undaputtu

3.3.3 Preparation of selected traditional foods in Kannur

3.3.3.1 Mutta Surka

Ingredients: (7 servings)

- Raw rice -200gm
- Cooked rice -50 gm
- Egg -50gm
- Water -50 ml
- Salt -As required
- Coconut oil -75ml

Method of preparation:

1. Soak the raw rice for 6 hrs and drain well.
2. Add the soaked raw rice, cooked rice, egg, water and salt to a large blender jar. Grind until the mixture forms a very smooth paste, giving a batter of pouring consistency.
3. Heat oil in a deep wok. Pour 1/4 cup of batter into the hot oil.
4. When the fritter puffs up, turn it over using a slotted spoon. Cook until both sides are golden brown. Remove the fritter from the oil using a slotted spoon.
5. Repeat the process with the remaining batter.

Plate 1 : Mutta Surka

3.3.3.2 Alisa

Ingredients: (4 servings)

- Boneless Chicken – 200gm
- White Wheat -200gm
- Onion -60gm
- Garlic- 5gm
- Cinnamon sticks – 1 stick
- Cloves- 4nos
- Cardamom pods- 2nos
- Ghee- 30ml
- Cashew nuts-11gm
- Raisins-5gm
- Salt-As required

Method of preparation:

1. Soak the white wheat in water for 6-8 hours.
2. In a pan, combine diced chicken, soaked wheat, onion, garlic, spices, salt, and water. Mix well and simmer on low heat, stir frequently until the water is absorbed and the grains are soft. Depending on the quality of the wheat, this process can take up to an hour.
3. Remove the pan from the heat. Mash the contents with a wooden spoon to achieve a porridge-like consistency.
4. In another pan, heat 2 tablespoons of ghee. Fry the cashew nuts, raisins, and sliced onions until they turn golden brown. Finish by garnishing the potage with fried onions, cashew nuts, and raisins, then drizzle with the remaining ghee.

Plate 2: Alisa

3.3.3.3 Kaithachakka Pachadi

Ingredients: (4 servings)

- Pineapple-250gm
- Coconut, grated -200gm
- Shallots -5gm
- Curd-200 ml
- Red chilli powder – ½tsp
- Mustard seeds - ½tsp
- Cumin seeds -½tsp
- Turmeric powder- ¼tsp
- Water-250ml
- Salt-5gm
- Coconut oil -30ml
- Mustard seeds -½tsp
- Dry red chillies, chopped -2 nos
- Curry leaves – 1Sprig

Method of preparation:

1. In a pan, cook the pineapple with red chili powder, turmeric powder, salt, and water for 6-7 minutes. Meanwhile, grind coconut, shallots, cumin seeds, and mustard seeds with water into a coarse paste. Add this paste to the cooked pineapple.
2. Once the mixture boils, remove it from the heat and add lightly beaten yogurt to it. In a separate pan, heat coconut oil and add mustard seeds, dry red chilies, and curry leaves until fragrant. Pour this seasoning over the pachadi and mix thoroughly.

Plate 3 : Kaithachakka Pachadi

3.3.3.4 Pazham Nirachathu

Ingredients: (4 servings)

- Bananas- 600 gm
- Coconut, grated – 150gm
- Sugar- 45gm
- Cardamom powder- ½tsp
- Ghee - 60 ml
- Cashew nuts-11gm
- Raisins -10gm

Method of preparation:

1. Heat ghee in a pan, then add cashews and raisins. Fry them until they turn golden brown.
2. Add grated coconut, cardamom powder, and sugar to the pan. Saute the mixture over medium heat for a few minutes, then reduce the heat to low. Continue sauteing until the coconut achieves a light creamy colour. Stir the mixture thoroughly, then turn off the stove and transfer the prepared filling to a separate bowl.
3. Peel the bananas and make a shallow lengthwise slit on each. Then gently widen the slit using your fingers to create space for the filling, and carefully stuff each banana with a portion of the coconut filling.
4. Heat oil in another pan over medium heat, carefully place the stuffed bananas into the pan, and fry them until they turn golden colour, ensuring to turn them occasionally for even frying on all sides.

Plate 4: Pazham Nirachathu

3.3.3.5 Kakkaroti

Ingredients (4 servings):

For the rice dumplings

- Parboiled rice -500gm
- Aniseed – 1 tsp
- Cumin seeds -1tsp
- Green cardamom -2nos
- Coconut, grated - 50gm
- Shallots - 50gm
- Salt – As required

For the coconut paste

- Sunflower oil -15ml
- Coconut, grated -50gm
- Curry leaves- 1 sprig
- Shallots, chopped -30gm
- Aniseed, powdered -1tsp
- Turmeric powder – 1tsp

For the chicken gravy

- Chicken -500gm
- Onions -300gm
- Green chillies -50gm
- Ginger paste - 5gm
- Garlic paste - 5gm
- Curry leaves -1 sprig
- Coriander leaves, chopped – 1sprig
- Tomatoes -200gm
- Red chilli powder -1tbsp
- Coriander powder -1tbsp
- Turmeric powder -½tsp

- Cloves -4 nos
- Green cardamom – 2nos
- Cinnamon stick -1 no
- Ghee -15ml
- Shallots -15gm

Method of preparation:

For the rice dumplings:

1. Soak the rice in hot water for 3-4 hours, then wash and drain. Grind aniseed, cumin seeds, and cardamom to a powder.
2. Combine this powder with grated coconut, chopped shallots, and salt into the rice, and grind everything into a thick paste.
3. Oil your palm, form 1 cm diameter balls with a depression in the center, and place them on a plate or banana leaf. Steam the balls for 45 minutes, then let them cool.

For the coconut paste:

1. Heat 1 tablespoon of oil in a wok, then add grated coconut, curry leaves, shallots, aniseed, and turmeric. Stir well and roast until the coconut turns brown.

For the chicken gravy:

1. Stew the chicken with all other ingredients and enough water in a covered pan on low heat until the meat is tender. Add the coconut paste to this gravy and bring to the boil, then add the rice dumplings and allow it to simmer for 10 minutes.
2. While the dumplings simmer, heat ghee in a separate pan, sauté the chopped shallots until golden, then stir them into the gravy. Remove from heat and serve.

Plate 5 : Kakkaroti

3.3.3.6 Kinnathappam

Ingredients (4 servings):

- Basmati rice -100gm
- Jaggery -100gm
- Coconut, grated -200gm
- Water -150 ml
- Cumin seeds (Jeera) -½tsp
- Cardamom Powder (Elaichi) -1tsp
- Egg -60gm
- Oil, for greasing -5ml

Method of preparation:

1. Wash and soak basmati rice in water for 3 hours. After it is soaked, drain the rice and add to mixer along with grated coconut and water. Grind everything into smooth batter and pour it into a bowl and keep aside.
2. Add sugar, cardamom powder and egg to the mixer grinder and blend everything until combined. Pour this into the rice batter bowl.
3. Mix well until the batter reaches a medium consistency—neither too thick nor too thin. Strain to remove any coarse particles and pour the batter into greased steel bowl that fits inside the steamer.
4. Sprinkle cumin seeds on top of the batter, then place the bowl inside a steamer. Steam for 20-25 minutes or until it turns firm.
5. Once done, allow it to cool. Run a knife through the sides and invert to a plate. Slice, serve and enjoy this traditional sweet.

Plate 6 : Kinnathappam

3.3.3.7 Sweet plantain curry (Kayi curry)

Ingredients (4 servings):

- Chickpea lentil -100gm
- Raw rice -100gm
- Coconut, grated -200gm
- Large ripe plantain -150 gm
- Cardamom powder -½tsp
- Sugar-50gm
- Salt- A pinch

Method of preparation:

1. Boil the lentils until done, then strain and set aside.
2. Soak the rice for an hour. Drain it and grind it with one cup of water until smooth.
3. Add 1/2 cup water to the coconut and grind. Extract the first milk and set aside. Put back the squeezed coconut, add 4 cups of water and blend until smooth. Strain out the thin coconut milk.
4. Mix the ground rice mixture and thin coconut milk and start boiling the mixture.
5. As it heats, add the boiled lentils and chopped plantains and cook until the mixture thickens and the plantains are soft.
6. Add the first coconut milk, sugar, cardamom and salt and cook for another couple of minutes.
7. Serve warm.

Plate 7: Sweet plantain curry

3.3.3.8 Mutta Maala

Ingredients (6 servings):

- Eggs- 1000gm
- Water- 750ml
- Sugar- 500gm
- Green cardamom, powdered- 1tsp
- Salt- a pinch

Method of preparation:

1. Separate egg yolks and whites. Strain yolks through muslin into a bowl and beat lightly. Set whites aside.

2. Make a syrup with sugar and water. Bring it to the boil. Drop a little egg white into it. When the scum rises, remove it. Do this several times till the syrup is clear and has a one-string consistency.

3. Drip egg yolk through a tiny aperture using either a jackfruit leaf cone or coconut shell, or pierced plastic cup into boiling sugar syrup in a circular motion to form long strands. Let the strands set for about 3 minutes, then sprinkle cold water over them, lift them carefully with a long-handled spoon, and spread them on a tilted dish to drain excess syrup. Continue the process till all the yolk is used up.

4. Cool the sugar syrup. Whip the egg whites. Add the powdered cardamom, a pinch of salt and the cooled sugar syrup to the egg white. Pour the mix into a greased shallow dish and steam till done. Remove and cool. Cut into diamond-shaped pieces and serve with the egg yolk string.

Plate 8: Muttamala

3.3.3.9 Meen Pathiri

Ingredients (4 servings):

For the pathiri

- Parboiled rice- 400gm
- Coconut, grated- 50gm
- Aniseed powder- 1tsp
- Cumin powder- 1tsp
- Cardamom powder- ½tsp
- Shallots, sliced- 50gm

For the fish fry

- Seer fish fillets- 500gm
- Salt -As required
- Turmeric powder- ½tsp
- Red chilli powder- 1tbsp
- Oil for frying- 75ml

For the coconut paste

- Grated coconut- 85gm
- Cloves- 2nos
- Green cardamom – 2nos
- Aniseed- ½ tsp
- Cumin seeds- 1tsp

For the masala

- Oil- 45ml
- Onion, chopped- 300gm
- Green chilli, chopped- 5gm
- Curry leaves- 1sprig
- Chopped coriander leaves- 1sprig
- Ginger, minced- 10gm
- Garlic minced -2gm

- Tomato, chopped- 50gm
- Coriander powder- 1tbsp
- Red chilli powder- 1½tbsp
- Turmeric powder- ¼ tsp

Method of preparation:

1. Soak the rice in an open pan of hot water for 3–4 hours. Wash and drain. Add the next 5 ingredients to the rice. Grind to a very thick paste.
2. Marinate the fish for 15 minutes in a paste of turmeric and chilli powders and salt.
3. Heat oil in a frying pan and deep-fry the fillets. Grind the coconut with all the listed ingredients. Dilute the coconut paste with 100 ml of water.

   For the masala:
4. Heat 2 tbsp oil. Add chopped onions, green chillies, curry leaves and chopped coriander. Sauté for a few minutes till the onions turn transparent.
5. Add minced ginger and garlic, and the chopped tomato. When the tomato pieces soften, add the next 3 spice powders and stir. Add 200 ml water. When the gravy begins to simmer, add the coconut paste.
6. Cook the sauce for 5–10 minutes to reduce it. Slip in the fried fish and cook for 5 minutes. Remove from the heat. To assemble the pathiri:
7. Start by oiling your palm. Shape the rice paste into an orange-sized ball. Place the ball on a banana leaf or a square of aluminium foil. Flatten it to get a disc (5 in diameter, ¼ in thickness).
8. Spread some of the cooked masala on it and top this with a fish fillet. Using another banana leaf square, make a second, slightly smaller, disc.
9. Place this on top of the first one. Seal the edges by pressing with your fingertips. Repeat the process till the dough is used up. Steam the pathiri for 40–45 minutes. Cool, remove the leaves and serve.

Plate 9: Meen Pathiri

3.3.3.10 Undaputtu

Ingredients (4 servings):

- Prawns-250gm
- Ginger crushed- 20gm
- Garlic crushed- 20gm
- Red chilly powder- 1tsp
- Turmeric powder- 1tsp
- Black pepper powder- 1tsp
- Garam Masala powder- 1tsp
- Onion- 200 gm
- Green chilli- 15gm
- Tomato- 100gm
- Curry leaves- 1sprig
- Coriander leaves- 1sprig
- Salt- a pinch
- Oil- 10gm
- Rice powder-200 gm
- Water- 200 ml
- Grated coconut- 50gm

Method of Preparation:

1. Take prawns in an earthen pan.

2. Add red chili powder, turmeric powder, black pepper powder, and garam masala powder to the prawns.

3. Season with salt and add crushed ginger and garlic. Mix well.

4. Pour some water and cook the prawns on medium flame until they are well-cooked. Remove from the flame.

5. In another pan, heat oil. Add crushed ginger, crushed garlic, and green chilly.

6. Add onions with salt. Then, incorporate chopped curry leaves and tomatoes, mashing the mixture well.

7. Transfer the cooked prawns to this masala. Mix thoroughly.

8. Finally, sprinkle some coriander leaves and mix again. Switch off the flame and let it cool.

9. Boil 1 cup of water with salt. Add rice powder and mix well. Allow it to cook for 2-3 minutes on very low flame. Switch off the flame and let it rest for another 5 minutes.

10. Knead the mixture well. Make small balls using the dough and press them with your fingers.

11. Stuff each ball with the prawns masala, forming a round shape.

12. Grease a tray with oil. Coat the balls with grated coconut.

13. Place the Chemmeen Unda Puttu in a steamer and steam for 15 minutes. And it is ready to serve.

Plate 10: Undaputtu

3.3.4 To calculate the nutritive value of selected traditional foods in Kannur district

Macronutrients, encompassing carbohydrates, proteins, fats, and energy, constitute the fundamental components of our diet, providing the necessary fuel for bodily functions. Conversely, micronutrients are essential for various physiological processes, despite being required in smaller quantities.

The nutritive value of ten traditional Kannur foods is being assessed, with particular attention to macronutrients (carbohydrates, proteins, fats, and energy) and key micronutrients such as calcium, phosphorus, potassium, zinc, iron, and vitamin A.

Energy:

Energy, derived from food and beverages, fuels vital bodily functions like breathing, blood circulation, and muscle movement. It is stored as glycogen in the liver and muscles and released through the breakdown of food into adenosine triphosphate (ATP) which contains energy-rich phosphate bonds and powers cellular activities. When energy is needed, ATP is converted to adenosine diphosphate (ADP). Daily energy needs vary based on factors like age, sex, weight, height, and physical activity level, with the average adult requiring 2000-2500 kcal per day to maintain weight. Energy is typically measured in kilocalories (kcal) or kilojoules (kJ), with 1 kcal equivalent to 4.184 kJ.

Carbohydrates:

Carbohydrates, which are essential macronutrient, serve as the primary energy source for the body, especially for brain function and physical activity. Composed of carbon, hydrogen, and oxygen atoms, they exist in various forms including sugars, starches, and fibers. During digestion, carbohydrates break down into glucose, a simple sugar essential for cellular metabolism and ATP production. It's recommended that 45-65% of total daily calories come from carbohydrates. Each gram of carbohydrate, whether starch or sugar, provides around 4 kilocalories (kcal) of energy.

Proteins:

Proteins are vital for tissues, muscles, enzymes, hormones, and other vital molecules. Structurally, proteins are composed of amino acids, with nine essential ones that must be obtained through the diet, while the remaining 11 can be synthesized by the body. During digestion, proteins are broken down into these amino acids, which are then utilized for tissue

repair, enzyme synthesis, and metabolic regulation. The quality of dietary protein is assessed by its amino acid profile and digestibility. Animal-based sources like meat, poultry, fish, and eggs typically offer complete proteins with all essential amino acids while plants such as legumes, nuts, seeds, and grains can also contribute to overall protein intake when combined properly. The recommended daily protein intake for adults is about 0.8 grams per kilogram of body weight.

Fats:

Fats, or lipids, are essential macronutrients providing 9 kcal/g when metabolized. They serve as a concentrated energy source and are crucial for supporting cell structure, hormone production, and the absorption of fat-soluble vitamins. Structurally, fats consist of fatty acids bonded to glycerol and are categorized into saturated, unsaturated, and trans fats. Saturated fats, mainly from animal products, solidify at room temperature and are associated with a higher risk of cardiovascular disease. Unsaturated fats, abundant in plant oils, are heart-healthy and help lower cholesterol levels. Trans fats, found in partially hydrogenated oils, elevate the risk of heart disease and should be minimized in the diet. A balanced diet with a variety of fats from plant and animal sources promotes optimal health.

Calcium:

Calcium, a vital mineral, is crucial for maintaining strong bones and teeth, with 99% stored in these structures and the remaining 1% in blood, muscle, and other tissues. Beyond bone health, calcium supports muscle contraction, nerve transmission, blood clotting, and cell signaling. Dairy products such as milk, cheese, and yogurt are excellent dietary sources of calcium. The Recommended Dietary Allowance (RDA) for calcium varies, with adults typically needing 1000 mg per day and lactating women requiring 1200 mg daily.

Potassium:

Potassium is an essential mineral vital for various bodily functions, including nerve transmission, muscle regulation, and blood pressure control. It is naturally abundant in foods such as legumes, seeds, fruits, vegetables, and nuts, and can also be obtained through supplements. Potassium helps to maintain fluid balance inside the cells and works alongside sodium, which regulates levels outside the cells. The Recommended Dietary Allowance (RDA) for potassium is around 3500 mg per day for adults.

Phosphorous:

Phosphorus, a vital mineral present in all human cells, is primarily concentrated in bones and teeth, comprising 85% of their structure, with the remaining 15% distributed throughout blood and soft tissues. It's crucial for bone formation, energy metabolism, and acid-base balance, as well as DNA/RNA synthesis, cell membrane structure, ATP production, and enzyme activation. It is abundant in many foods, particularly in protein-rich sources such as meat, fish, poultry, dairy products, nuts, and seeds. The Recommended Dietary Allowance (RDA) for phosphorus is 1000 mg per day for adults.

Zinc:

Zinc is an essential mineral with vital roles in immune function, wound healing, DNA synthesis, and cell division. It supports growth and development during pregnancy, childhood, and adolescence, and acts as a cofactor for enzymes in metabolism and digestion. Good dietary sources of zinc include meat, shellfish, legumes, seeds, nuts, dairy products, and whole grains. The Recommended Dietary Allowance (RDA) for zinc is 17 mg/d for men, 13.2 mg/d for women, 14.5 mg/d for pregnant women, and 14 mg/d for lactating women.

Iron:

Iron is vital for oxygen transport, energy metabolism, DNA synthesis, and immune function, as well as essential for hemoglobin and myoglobin production, which carry oxygen in the blood and muscles. Adequate iron intake is particularly important for preventing iron deficiency anemia. Dietary iron has two main forms: heme and nonheme. Plants and iron-fortified foods contain nonheme iron only, whereas meat, seafood, and poultry contain both heme and nonheme iron. The Recommended Dietary Allowance (RDA) for iron varies: 19 mg/day for adult men, 29 mg/day for women, 40 mg/day for pregnant women, and 23 mg/day for lactating women.

Vitamin A:

Vitamin A, a fat-soluble vitamin, is vital for vision, immune support, cell growth, and reproduction. It comes in two forms: preformed vitamin A (retinol) from animal products and provitamin A carotenoids (like beta-carotene) from colourful fruits and vegetables. Retinol maintains healthy vision, particularly in low-light conditions, while carotenoids function as antioxidants. Beta-carotene, a precursor to vitamin A, converts to active retinol and is absorbed.

The Recommended Dietary Allowance (RDA) for vitamin A is 1000 micrograms per day for men, 840 micrograms per day for women, 900 micrograms per day during pregnancy, 950 micrograms per day during lactation, and 350 micrograms per day for children aged 6-12 months.

4. RESULTS AND DISCUSSION

Results of the present study on **"Documentation and nutritive value calculations of traditional foods of Kerala - Kannur district"** are presented in this chapter under the following headings:

4.1 Traditional food habits of different communities

4.1.1 Preference of traditional foods among different individuals

4.1.2 Reasons for preference of traditional foods

4.1.3 Frequency of preparation of traditional food items

4.1.4 Frequency of preparation of traditional healthy snacks

4.1.5 Traditional food items prepared on special occasions

4.1.6 Traditional kitchen utensils

4.2 Nutritive value calculations of traditional food items collected

4.1 Traditional food habits of different communities

Traditional foods evolved through hundreds of years, is still an inevitable segment of our culture. In every part of the society, people had diverse food habits which are strongly bound to the region, religion, economic status and cultural beliefs.

Kerala, known as the Emerald of the South, boasts not only natural beauty but also a rich culinary heritage. The traditional food patterns prevalent in Northern Kerala, especially in the Malabar region, are explored with a specific focus on Kannur. This study delves into the traditional foods of various communities and their significance during special occasions.

Traditional food habits of the respondents of different communities were ascertained with respect to the preference for traditional foods, reasons for the preference, frequency of preparation of traditional foods, traditional foods prepared during special occasions, frequency of preparation of traditional health foods and details of traditional kitchen utensils and equipment's used.

4.1.1 Preference of traditional foods among different individuals

The details regarding the preference for traditional foods among different individuals are given below in table 5.

Table 5: Preference of traditional foods

Preference	Number of subjects (n=20)	Percentage
Preferred	15	75%
Not Preferred	5	25%

Based on the data from the table, it is evident that among the total 20 respondents, 15 respondents (75 %) favoured traditional foods, while 5 respondents (25%) did not. This underscores the significance and popularity of traditional cuisine within the surveyed community.

4.1.2 Reasons for preference of traditional food

The details regarding the reasons for preference of traditional foods among different individuals are given in Table 6.

Table 6: Reasons for preference of traditional foods

Reasons	Number of subjects (n=15)	Percentage
Healthy	8	53.33%
Tasty	6	40%
No adulteration	5	33.33%
Less expensive	3	20%
Ingredients are locally produced	3	20%

Among the total of 15 respondents who preferred traditional foods, healthiness emerged as the most common reason for preferring traditional foods, cited by 8 respondents (53.33%), followed by 6 respondents (40%) indicating taste as a factor. Additionally, 5 respondents (33.33%) mentioned the absence of adulteration, while 3 respondents (20%) highlighted the

lower cost of traditional foods and the local sourcing of ingredients as a reason for preference. These data emphasize the importance of taste, healthiness, absence of adulteration, cost-effectiveness, and locally sourced ingredients in influencing the preference for traditional foods among the surveyed community.

4.1.3 Frequency of preparation of traditional food items

The frequency of preparation of different traditional foods by the different individuals for breakfast, lunch and dinner are given in Table 7.

Table 7: Frequency of preparation of traditional foods

Frequency	Number of subjects (n=15)	Percentage
Once a day	5	33.33%
Twice a day	5	33.33%
Thrice a day	5	33.33%

From the table, it is evident that among the 15 respondents surveyed, there is an equal distribution in the frequency of preparation of traditional food. Each frequency category, including once a day, twice a day, and thrice a day, is reported by 5 respondents, accounting for approximately 33.33% in each category. This indicates a balanced distribution of traditional food preparation frequencies among the surveyed respondents.

4.1.4 Frequency of preparation of traditional healthy snacks

The respondents who were found to have the following frequency of preparation for traditional healthy snacks, as indicated in Table 8.

Table 8: Frequency of preparation of traditional healthy snacks

Frequency	Number of subjects (n=15)	Percentage
Occasionally	14	93.33%
Never	1	6.66%

From the table, it is evident that out of 15 respondents, 14 respondents (93.33%) reported preparing traditional healthy snacks occasionally, while 1 respondents (6.66%) reported never doing so. These findings suggest that a significant majority of the respondents prepare traditional healthy snacks.

4.1.5 Traditional food items prepared on special occasions

Traditional foods prepared during special occasions by different communities are detailed in Tables 9 to 11.

4.1.5.1 Muslims

The details of traditional foods prepared by the Muslim community on special occasions are presented in Table 9.

Table 9. Traditional food items prepared by Muslims on special occasions

Occasions	Items
Marriage	Neichoru, biriyani, alisa, beef roast
5th and 7th day of demise	Kurry kurukkal
40th day of demise	Ghee rice and beef curry
Birthday	Meals with non-vegetarian items, kozhi ada
Ramadan	Pathiri, jeeraka kanji, chattipathiri, mutton ishtu, unnakkaaya, neichoru, biriyani, ari kadukka, thenga chor
Muharram	Wheat verakiyathu

The Muslim community gives importance to a variety of dishes on occasions related to marriage. Traditionally, the feast for guests during marriage includes items like neichoru, pathiri, beef curry or any other meat preparations and biriyani. During puthiyapla salkkaram, organized at the bride's house after marriage, a variety of dishes like unnakkaya, pazham nirachathu, mutta mala, mutta surukka, tharippola, pinjanathappam, kalathappam and different types of pathiri, are prepared for treating the puthiyapla (bride groom).

On the 28th day of a child's birth, the Muslim community removes their baby's hair completely and, on this day, raw meat especially beef or goat is distributed to close relatives. Birthdays are celebrated only in high income families. On these days, meat preparations are included along with the major meals of the day. When a family member dies, kanji or cooked

rice along with one or two vegetarian curries are served. On the seventh or fifteenth day after the demise, a special porridge made from raw rice flour and jaggery syrup, called kurry kurukkuka, is prepared. On the 40th day, ghee rice and beef curry are prepared and distributed to close relatives and family members.

For Noyambu thura, which marks the breaking of the religious fast observed in the evening during the month of Ramadan, a variety of special dishes namely jeeraka kanji, thari kanji, kuzhal pathiri, unnakkaya, niracha pathiri, aleesa and kalathappam are some of the typical traditional items prepared and served as snacks. Whereas pathiri is served with beef curry, mutton curry and varutharacha kozh curry for dinner. Variety of fried snacks are prepared and exchanged between friends, relatives and neighbours during this occasion including unniyappam, achappam, murukku etc. Muharram is celebrated with paalayikkappam and wheat verakiyathu.

4.1.5.2 Christians

The details of traditional foods prepared by the Christian community on special occasions are presented in Table 10.

Table 10. Traditional food items prepared by Christians on special occasions

Occasions	Items
Marriage, Betrothal, Birthday, Baptism, Holy communion Appam,	Beef stew, beef ularthiyathu, pulissery, neichoru, fish molly, vindaloo, mappas, biriyani, paachoru
Death	Vegetarian meals, kanji
7th day after demise	Vegetable stew, appam, steamed banana
40th day after demise, Annual Remembrance Day	Beef ularthiyathu, meen pattichathu, chicken mappas
Pethurtha	Pidi and chicken curry
Maundy thursday	Pesaha appam, vattayappam
Good friday	Kanji, payar, achaar
Easter	Appam, beef stew, beef cutlet, meen pattichathu, beef ularthiyathu, pulissery
Kozhukkatta saturday	Kozhukkatta

Christmas	Appam, beef stew, thaaraavu mappas, fish molly
25th day of religious 'vratha'	Inderiyappam
40th day of religious 'vratha'	Paachoru
Festivals related to Church (perunnal)	Beef stew, paalappam

For the betrothal function, paachoru is served first followed by appam and stew. Later, a regular Christian sadya with all the non-vegetarian dishes are served. On the marriage day, a traditional item called paachoru is served as a breakfast item along with a meat curry. Families of low-income groups serves kanji and beef ularthiyathu. Serving avilosu podi, achappam and kuzhalappam along with paachoru are also common among Christian community on the marriage day. Achappam, kuzhalappam, vattayappam, vellayappam, avilosu podi, avilosunda are also prepared on different occasions like betrothal and marriage for treating guests.

During the death of a family member, kanji is prepared and served to the family members and relatives. On the 7th day of demise, a mediocre vegetarian sadya is served for the close relatives. Christian communities prepare only vegetarian dishes until the 40th day of demise and they avoid curd, ghee, milk, egg, buttermilk and liquor until the 40th day. On the 40th day, a typical traditional non vegetarian Christian sadya is given to the relatives.

For the annual Remembrance Day , a traditional non vegetarian sadya is prepared. The special items for Palm Sunday/Osana perunnal include kozhukkatta or peecham pidi. Porridge with rice flour, jaggery and sugar called paalu kurukku along with pesaha appam or indri appam are prepared on Maundy Thursday. The same dish, but without sugar called as pesaha kurukku is a specialty of Good Friday. Vattayappam and appam are prepared on the day of Easter.

For Christmas, vattayappam, muttayappam, vettappam, etc. are made at home and on Christmas day, a non-vegetarian feast is also arranged. The 25th day of religious vratha namely noyambu is observed before Christmas and is especially distinguished with the preparation of inderiyappam. It is a special dish based on rice flour to which coconut and seasonings are added. Pethratha day is observed on the day before the onset of the 50th day fast. On this day, some sects of Christians prepare pidi and chicken curry. On the 40th day of this religious vratha, chakkara paachoru are prepared. Festivals related to the church are celebrated by preparing a variety of dishes like vattayappam, achappam, kuzhalappam, thamukku, velichenna appam, kaliyadakka and vettappam.

4.1.5.3 Hindus

The details of traditional foods prepared by the Hindu community on special occasions are presented in Table 11.

Table 11: Traditional food items prepared by Hindus on special occasions

Occasions	Items
Marriage	Sadya, parippukari, boli and payasam, beetroot/kaithachakka pachadi
Chorunnu	Sadya
Menarche	Oil mixed with raw egg, rice mixed with ghee
Adiyantharam	Adiyanthira sadya
Sanjayanam (7th day after demise)	Idli and sambaar
Shradham	Shradha kanji, shradha puzhukku
Onam	Sadya, ada, varuthupperi
Vishu	Sadya, vishu kanji, vishu katta
Karkkidakam	Navadhanya kanji, cheeda, thavidu ada
Karkkidaka vavu	Ada, jaggery idliyappam
Uthradam	Ada, non vegetarian meals
Navarathri	Aval, malar, ada
Ekadasi	Gothambu kanji, chama kanji
Thiruvathira	Koovakurukku, ettangadi puzhukku
Karthika vilakku	Ada, appam, sweet potato/ colocasia root boiled
Attukal pongala	White rice and payasam
Temple festivals	Unniyappam, kinnathappam, murukku, avilosu podi, payasam, aval, poha,

For marriage, peridal, choroonu, and birthday, the Ezhava community prepares sadya in which major items include rice, pulinkary, kutherissery, erupuli, olan, injipuli and pickle. Sadya from Trivandrum wedding's also provides a dessert known as "boli", a sweet pancake made with besan flour which is mixed with payasam.

During the first menses, some sects of Hindu community give raw egg mixed with oil to young girls. For lunch and dinner, rice mixed with fatty ghee is also given.

During death, fasting is observed until cremation, after which kanji or black tea is served by close relatives of the family members. On the 7th day of demise, idli and sambaar are given as breakfast to close family. On the sixteenth day after the death of a family member, adiyanthiram is conducted with sadya almost similar to the marriage sadya.

To celebrate Kerala's prime festival Onam, Kerala Brahmins make ada as an offering to Thrikkakkarayappan, a God in the Hindu mythology. Rice flakes, karolappam, puffed rice, bananas, kadali pazham etc. are also kept as naivedyam for the God and later all these items are distributed among family members. From Atham onwards, sadya, the traditional feast is prepared with the most elaborate sadya on the day of Thiruvonam. Sadya from the southern side of Kerala is strictly vegetarian, whereas sadya from northern Kerala (Mappila region) includes fish in the form of curry or fry.

During the month of Karkkidakam, the Ezhava community prepares tamarind seed unda, jack fruit seed chuttathu, mango kernel flour ada, njavara kanji and marunnu kanji. Vishu is celebrated by preparing either Vishu kanji or Vishu puzhukku in which the major ingredient is jack fruit. Sadya is served for lunch on the day of Vishu. To celebrate Karthika, they prepare ada and appam as the special traditional items. Thiruvathira puzhukku is prepared on the auspicious day of Thiruvathira using elephant foot yam, colocasia and chinese potato (koorkka).

4.1.6 Traditional kitchen utensils

Information on traditional household utensils and equipment utilized by their families were collected and is presented in the Table 12.

Table 12: List of traditional kitchen utensils and equipments

Sl.no	Utensils and equipments	Purpose of use
1.	Bharani	For storage and fermentation
2.	Man chatti	For cooking
3.	Cheena chatti	Cooking and frying
4.	Ural	For pounding
5.	Uruli	For cooking
6.	Achappam achu	Moulding achappam
7.	Seva nazhi	For making noolappam
8.	Ottu kalam	Cooking rice
9.	Cherava	For scrapping coconut
10.	Unniyampam maker	To prepare unniyappam
11.	Mankudam	For cooking
12.	Ammikallu	For mashing and grinding

BHARANI

MAN CHATTI

PLATE 11

CHEENA CHATTI

URAL

PLATE 12

URULI

ACHAPPAM ACHU

PLATE 13

SEVA NAZHI

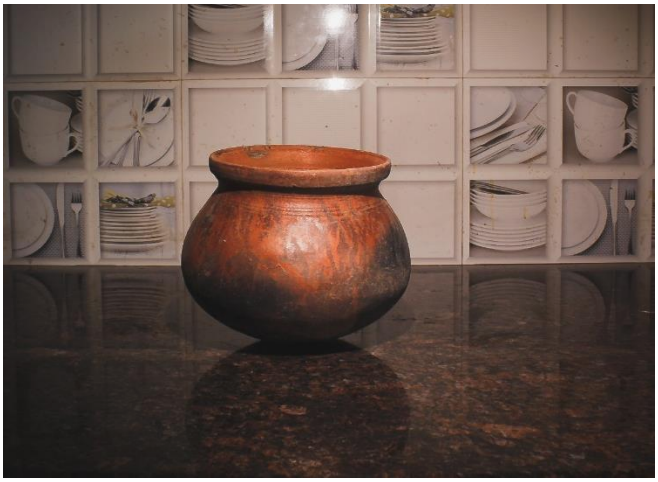
OTTU KALAM

PLATE 14

CHERAVA

UNNIYAMPAM MAKER

PLATE 15



MANKUDAM **AMMIKALLU**

PLATE 16

4.2 Nutritive value calculation of the traditional foods collected

Table 13. Nutritive value calculations of selected traditional foods (1 serving)

Sl. no	Name of food	Energy (Kcal)	CHO (g)	Protein (g)	Fats (g)	Ca (mg)	K (mg)	P (mg)	Zn (mg)	Fe (mg)	Vit A (mcg)
1.	Mutta surka	232.97	27.86	3.77	11.55	6.25	50.85	50.64	0.51	0.36	14.14
2.	Alisa	448.75	35.62	15.87	15.98	30.13	384.4	278.25	2.52	2.91	12.97
3.	Kaithachakka pachadi	329.56	10.68	3.81	30.29	85.54	279.37	89.33	0.35	0.93	3.47
4.	Pazham nirachathu	535.85	62.93	3.94	32.43	10.43	580.12	643.4	0.65	1.54	29.36
5.	Kakkaroti	837.41	111.27	40.6	24.5	56.23	988.21	460.41	2.55	2.53	86.82
6.	Kinathappam	417.28	43.65	6.3	7.5	40.29	298.05	117.19	0.84	2.23	31.58
7.	Sweet plantain curry	424.51	55.97	9.73	22.2	20.14	533.75	157.93	1.53	2.5	10.41
8.	Mutta Maala	581.16	83.23	13.26	21.97	109.81	108.85	459.43	1.39	2.84	461.54
9.	Meen Pathiri	1042.58	97.03	41.06	56.83	136.23	760.93	496.26	2.04	4.87	84.68
10.	Undaputtu	389.29	46.32	23.97	12.29	94.47	354.63	182.76	1.02	2.98	19.71

The nutritional compositions of 10 different traditional South Indian foods are outlined here. Meen Pathiri has the highest calorie content at 1042.58 kcal, while Muttasurka has the lowest at 232.97 kcal. Kakkarotti has the highest carbohydrate content at 111.27 gm, whereas Kaithachakka Pachadi, Mutta Surkka and Alisa have comparatively lower levels.

Protein content varies greatly among these foods, with Meen Pathiri leading at 41.06 gm and Mutta Surkka having the least at 3.77 gm. Despite the majority being non-vegetarian dishes, all offer sufficient fat content, Kinnathappam and Mutta Surka contain the least fat at 7.5 gm and 11.55 gm respectively, while Meen Pathiri has the most at 56.83gm.

Most dishes are rich in calcium, with Meen Pathiri containing the most at 136.23 mg and Mutta Surkka the least at 6.25 mg. Potassium content is highest in Kakkarotti and Meen Pathiri at 988.21 mg and 760.93 mg respectively, while Mutta Surkka has the least at 50.85 mg. Pazham nirachathu leads in phosphorus at 643.4 mg, while Mutta Surkka has the lowest at 50.64 mg.

Kakkarotti is notable for its zinc content at 2.55 mg, while Meen Pathiri boasts the highest iron content at 4.87 mg, and Mutta Surkka has the least at 0.36 mg. Among these dishes, Muttamaala has the highest Vitamin A content at 461.54 mcg, while Kaithachakka Pachadi has the least at 3.47 mcg.

5. SUMMARY AND CONCLUSION

The study titled **" Documentation and nutritive value calculations of traditional foods of Kerala – Kannur district"** aimed to identify, document, and evaluate the traditional foods of the region, along with their preparation methods and nutritional characteristics. Respondents, representing diverse age groups and genders, were selected based on their knowledge of local culinary traditions.

Information regarding food preferences, reasons for preference, consumption frequency, occasions for preparation, and customary inclusion of traditional foods for various meals and snacks was gathered from these individuals. The study also investigated transitions in traditional food patterns and preparation methods over time.

A majority of respondents expressed a preference for traditional foods due to their perceived health benefits and taste. A survey was conducted among 15 respondents who preferred traditional foods to understand the frequency of traditional food preparations. Out of all the responses, 33.33% prepared traditional foods once a day, another 33.33% prepared traditional foods twice a day, and the remaining 33.33% reported preparing traditional foods thrice a day.

The same participants were also asked if they prepared traditional healthy snacks to which 93.33% of the participants responded that it was done occasionally. 6.66% of the participants reported that traditional healthy snacks were never prepared in their households.

Traditional foods are often interwoven with religion and culture; hence, details were collected about the consumption of traditional foods on religious occasions and festivals. Unnakkaya, pazham nirachathu, mutta mala, mutta surukka, mutta marichathu, kozhi nirachathu, valayappam, tharippola, pinjanathappam, neichoru, beef curry kalathappam, and many kinds of pathiri were among the significant traditional foods consumed by Muslims on special occasions. Hindus traditionally consumed sadya, Vishu kanji, thiruvathira puzzhukk, cheeda, ada, aval, unniyappam, murukku, and Vishu katta on special occasions. Traditionally, Christians would eat appam, beef stew, mappas, fish molly, vindaloo, paachoru, and beef ularthiyathu on special occasions.

The use of traditional equipments in the preparation of foods has been dwindling due to the emergence of technological innovations which has significantly reduced the time and effort. The respondents were also asked about the traditional utensils used for the preparation of these

dishes and the most common utensils used were Bharani, Manchatti, cheena chatti, ural, Seva Nazhi, uruli, unniyappam maker, achappam achu, ammikkallu, mankudam, cherava, ottukalam.

From the traditional foods items collected, 10 traditional foods namely Mutta surka, Alisa, Kaithachakka Pachadi, Kayi curry, Kinnathappam, Kakkarotti, Muttamaala, Meen pathiri, Undaputtu were selected.

The nutritional compositions of these traditional South Indian foods were calculated. Meen Pathiri has the highest calorie content at 1042.58 kcal, while Muttasurka has the lowest at 232.97 kcal. Kakkarotti has the highest carbohydrate content at 111.27 g, whereas Kaithachakka Pachadi, Mutta Surkka and Alisa have comparatively lower levels.

Protein content varies greatly among these foods, with Meen Pathiri leading at 41.06 g and Mutta Surkka having the least at 3.77 g. Despite the majority being non-vegetarian dishes, all offer sufficient fat content, Kinnathappam and Mutta Surka contain the least fat at 7.5 g and 11.55 g respectively, while Meen Pathiri has the most at 56.83g.

Most dishes are rich in calcium, with Meen Pathiri containing the most at 136.23 mg and Mutta Surkka the least at 6.25 mg. Potassium content is highest in Kakkarotti and Meen Pathiri at 988.21 mg and 760.93 mg respectively, while Mutta Surkka has the least at 50.85 mg. Pazham nirachathu leads in phosphorus at 643.4 mg, while Mutta Surkka has the lowest at 50.64 mg.

Kakkarotti is notable for its zinc content at 2.55 mg, while Meen Pathiri boasts the highest iron content at 4.87 mg, and Mutta Surkka has the least at 0.36 mg. Among these dishes, Muttamaala has the highest Vitamin A content at 461.54 mcg, while Kaithachakka Pachadi has the least at 3.47 mcg.

In conclusion, the nutritional assessment of traditional foods reveals a substantial richness in both macro and micronutrients, underscoring the diverse culinary heritage of Kannur. Throughout this study, particular emphasis was placed on selecting foods that could be faithfully replicated under current conditions without compromising their quality. Moreover, the documentation of these traditional foods served to safeguard them from the threat of extinction. Looking ahead, there is a need for further research to meticulously document, replicate, and promote the traditional foods of Kannur. By popularizing such initiatives, we can contribute to the conservation of Kerala's traditional cuisine.

REFERENCES

- Al-Khusaibi, M., & Rahman, M. S. (2019). Traditional foods: Overview. In *Food Engineering Series* (pp. 1-8).
- Aneena E.R. 2009. Documentation and quality evaluation of selected traditional foods of central zone of Kerala. Kerala Agricultural University, Thrissur
- Antani, V., & Mahapatra, S. (2022). Evolution of Indian cuisine: a socio-historical review. Journal of Ethnic Foods, 9(1).
- Banigo, E. O. I., & Müller, H. G. (1972). Manufacture of OGI (A Nigerian Fermented Cereal porridge): Comparative evaluation of corn, sorghum and millet. Canadian Institute of Food Science and Technology Journal, 5(4), 217–221.
- Cidro, J.; Adekunle, B.; Peters, E.; Martens, T. Beyond food security: Understanding access to cultural food for urban Indigenous people in Winnipeg as Indigenous food sovereignty. *Can. J. Urb. Res.* 2015, *24*, 24–43.
- Devarajan, A., & MohanMarugaRaja, M. K. (2017). A comprehensive review on Rasam: A South Indian traditional functional food. Pharmacognosy Reviews, 11(22), 73.
- Elliott, B.; Jayatilaka, D.; Brown, C.; Varley, L.; Corbett, K.K. "We Are Not Being Heard": Aboriginal Perspectives on Traditional Foods Access and Food Security. J. Environ. Public Health 2012, 2012, 1–9.
- First Nations Food, Nutrition, & Environment Study. Available online: http://www.fnfnes.ca/docs/FNFNES draft technical report Nov 2 2019.pdf
- Gadaga, T., Mutukumira, A. N., Narvhus, J., & Feresu, S. B. (1999). A review of traditional fermented foods and beverages of Zimbabwe. International Journal of Food Microbiology, 53(1), 1–11.
- Galli, F. (2018). Traditional food. In Elsevier eBooks (pp. 3–24).
- Grey, S.; Patel, R. Food sovereignty as decolonization: Some contributions from Indigenous movements to food system and development politics. *Agric. Hum. Values* 2014, *32*, 431–444.

- Guerrero, L., Guárdia, M. D., Xicola, J., Verbeke, W., Vanhonacker, F., Żakowska-Biemans, S., Sajdakowska, M., Sulmont-Rossé, C., Issanchou, S., Contel, M., Scalvedi, M. L., Granli, B. S., & Hersleth, M. (2009). Consumer-driven definition of traditional food products and innovation in traditional foods. A qualitative cross-cultural study. *Appetite*, *52*(2), 345–354.
- Hanemaayer, R., Anderson, K., Haines, J., Lickers, K. R. L., Xavier, A. L., Gordon, K., & Neufeld, H. T. (2020). Exploring the Perceptions of and Experiences with Traditional Foods among First Nations Female Youth: A Participatory Photovoice Study. International Journal of Environmental Research and Public Health, 17(7), 2214.
- Jamir, B., & DEB, C. R. (2017). Nutritional and microbiological study of Anishi: a Traditional fermented food product of Nagaland, India. Journal of Advances in Food Science & Technology, 4(3), 113–121
- Kar, S. (2022). Indigenous Fermented Foods and Beverages of Odisha, India: an Overview.
- Komariah, K., Razzaq, A., Nugraheni, M., Lastariwati, B., & Mahfud, T. (2020). The antecedent factor of tourists' intention to consume traditional food. Geojournal of Tourism and Geosites, 32(4), 1209–1215.
- Kuhnlein, H. V. (2003a). Promoting the nutritional and cultural benefits of traditional food systems of Indigenous People. PubMed, 56, 222–223
- Kuhnlein, H. V., & Receveur, O. (1996). Dietary change and traditional food systems of Indigenous peoples. Annual Review of Nutrition, 16(1), 417–442.
- Kuhnlein, H. V., Chan, H. M., Leggee, D., & Barthet, V. J. (2002). Macronutrient, mineral and fatty acid composition of Canadian Arctic traditional food. Journal of Food Composition and Analysis, 15(5), 545–566.
- Kuhnlein, H.V.; Receveur, O. Dietary Change and Traditional Food Systems of Indigenous Peoples. Annu. Rev. Nutr. 1997, 16, 417–442.
- Kwik, J. C. (2008). Traditional Food Knowledge: Renewing culture and restoring health.

- Li-Te, L., Luo, Y., & Saito, M. (2004). Function of traditional foods and food culture in China. Jarq-japan Agricultural Research Quarterly, 38(4), 213–220.
- Liu, L., Chen, X., Hao, L., Zhang, G., Zhao, J., Chun, L., Yang, Y., Rao, J., & Chen, B. (2020). Traditional fermented soybean products: processing, flavor formation, nutritional and biological activities. Critical Reviews in Food Science and Nutrition, 62(7), 1971–1989.
- Moyo, A., Amoah, F., & Van Eyk, M. (2023). Consumer behavior research on traditional foods in Africa: A scoping review. Cogent Business & Management, 10(2)
- Murooka, Y., & Yamshita, M. (2008). Traditional healthful fermented products of Japan. Journal of Industrial Microbiology & Biotechnology, 35(8), 791–798
- National Collaborating Centre for Aboriginal Health. Available online: https://www.ccnsa-nccah.ca/docs/emerging/FS-TraditionalDietsHealth-Earle-EN.pdf
- Neufeld, H.T.; Richmond, C.A.M.; Southwest Ontario Aboriginal Health Access Centre. Impacts of place and social spaces on traditional food systems in southwestern Ontario. Int. J. Indig. Health 2017, 12, 93–115.
- Nugroho, D., Surya, R., Janshongsawang, J., Thinthasit, A., & Benchawattananon, R. (2023). Som tum, the famous ethnic food of Thailand: its benefit and innovations. Journal of Ethnic Foods, 10(1).
- Nutritional composition of traditional supplementary foods consumed by lactating women. (1988, October 1). PubMed.
- Patra, J. K., Das, G., Paramithiotis, S., & Shin, H. (2016). Kimchi and other widely consumed traditional fermented foods of Korea: a review. Frontiers in Microbiology, 7.
- Platel, K. (2020). Functional foods in Indian tradition and their significance for health. In Elsevier eBooks (pp. 87–98).
- Ramli, A. M., Zahari, M. S. M., Halim, N. A., & Aris, M. H. M. (2016). The Knowledge of Food Heritage Identity in Klang Valley, Malaysia. *Procedia - Social and Behavioral Sciences*, *222*, 518–527.
- Reinders, M. J., Banović, M., & Guerrero, L. A. (2019). Introduction. In Elsevier eBooks (pp. 1–26)

- Richmond, C.; Ross, N. The determinants of First Nation and Inuit health: A critical population health approach. Health Place 2009, 15, 403–411.
- Robidoux, M.A.; Batal, M.; ImbeauIt, P.; Seabert, T.; Blais, J.M.; Pal, S.; Haman, F. Traditional foodways in two contemporary northern First Nations communities. Can. J. Native Stud. 2012, 32, 59.
- Romulo, A., & Surya, R. (2021). Tempe: A traditional fermented food of Indonesia and its health benefits. International Journal of Gastronomy and Food Science, 26, 100413.
- Sarkar, S. (2008). Innovations in Indian fermented milk products — a review. Food Biotechnology, 22(1), 78–97.
- Sharma, S. (2010). Assessing diet and lifestyle in the Canadian Arctic Inuit and Inuvialuit to inform a nutrition and physical activity intervention programme. Journal of Human Nutrition and Dietetics, 23(s1), 5–17.
- Sheehy, T., Kolahdooz, F., Roache, C., & Sharma, S. (2015). Traditional food consumption is associated with better diet quality and adequacy among Inuit adults in Nunavut, Canada. International Journal of Food Sciences and Nutrition, 66(4), 445–451.
- Shyna. K.P. 2001. Traditional food habits of different communities in Thrissur district. MSc (Home Science) thesis, Kerala Agricultural University, Thrissur, 128p
- Skinner, K.; Pratley, E.; Burnett, K. Eating in the City: A Review of the Literature on Food Insecurity and Indigenous People Living in Urban Spaces. Societies 2016, 6, 7.
- Srinivasan, K. (2010). Traditional Indian functional foods. In Nutraceutical science and technology (pp. 51–84).
- Tekic, D., Smugovic, S., Novakovic, A., Ivanovic, V., Petrovic, M., Banjac, M., Dercan, B., Tesanovic, D., Ciric, M., Cabarkapa, I., Ciric, I., Sarac, V., & Maravic, N. (2023). Traditional food products on the local market - consumption conditional on the characteristics of management and restaurant facilities in tourism of Vojvodina (Serbia). Frontiers in Sustainable Food Systems
- Trichopoulou, A. (2007). Mediterranean Diet, Traditional Foods, and Health: Evidence from the Greek EPIC Cohort. Food and Nutrition Bulletin, 28(2), 236–240

APPENDIX 1

QUESTIONNAIRE TO ELICIT INFORMATION REGARDING TRADITIONAL FOODS

1. Name:

2. Age:

3. Sex: Male/ Female

4. Mostly used traditional preparations for breakfast ?

……

5. Mostly used food item for lunch/ dinner?

……

6. What are the snack that were used during your childhood?

……

7. What is the traditional recipe that you know or followed till now?

Snack/ Beverage/Others

8. How to prepare it?

……

……

……

……

……

9. Traditional food item used for special occasions?

……

10. Do you use traditional foods for any remedies?

Yes/No

11. If yes, what is it? …….

12. How often do you prepare traditional healthy snacks?

(Occasionally/Never)

13. How do you typically obtain traditional spice powders for your cooking?

(Local markets /Homemade)

14. What were the different dry products used for lunch/dinner?

(Papads/Vattals/Vadakams/Kondattams/Others)

15. Do you make it from home?

Yes/ No

16. Do you had any traditional kitchen utensils/equipment's now?

…….

17. Are you using it now? If no, give reason

……

18. If you had to choose, which type of food do you tend to prefer more often: traditional or non-traditional?

(Traditional/Non traditional)

19. Major reasons for preferring traditional food ?

(Healthy/Tasty/No adulteration/Less expensive/Ingredients are locally produced)

20. How often do you prepare the traditional food ?

(Once a day/Twice a day/Thrice a day)