

**DOCUMENTATION AND NUTRITIVE EVALUATION OF  
TRADITIONAL FOODS OF KERALA – ERNAKULAM DISTRICT**



**PROJECT SUBMITTED**

In the Partial Fulfillment of the Requirement for the Award of the Degree of  
B.Sc. NUTRITION AND DIETETICS

**BY**

**OSHIN K DAISON**

**Register No - SB20ND017**

**DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS**

**ST. TERESA'S COLLEGE (AUTONOMOUS)**

**ERNAKULAM**

**APRIL 2023**

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CERTIFIED AS BONAFIDE RESEARCH WORK

Signature of the Internal Examiner

Signature of the External Examiner

## DECLARATION

I hereby declare that the project entitled “**DOCUMENTATION AND NUTRITIVE EVALUATION OF TRADITIONAL FOODS OF KERALA – ERNAKULAM DISTRICT**”, submitted in partial fulfillment 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 **Dr. Soumya P.S.**, Assistant Professor, Department of Clinical Nutrition and Dietetics, 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

Oshin K Daison.

Date: 18/04/2023

## **CERTIFICATE**

I hereby certify that the project entitled “**DOCUMENTATION AND NUTRITIVE EVALUATION OF TRADITIONAL FOODS OF KERALA – ERNAKULAM 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. Oshin K Daison.**, during the period of the study under my guidance and supervision.

### **Signature of the HOD**

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OSHIN K DAISON

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## **1. INTRODUCTION**

**“Food is not simply organic fuel to keep body and soul together, it is a perishable art that must be savored at the peak of perfection.”**

**– E.A. Bucchianeri**

Food is a culture, emotion, hospitality, prestige and power and is closely knitted with tradition. Traditional knowledge is a community based functional knowledge system, developed, preserved and refined by generations through continuous interaction, observation and experimentation with their surrounding environment. It includes beliefs, values, and practices gathered from the practical experience of older generation, and its whole function is survival and development of culture of people.

Traditional foods, originated from ancestral kitchens are developed through ages, invented, modified, utilized and evolved to improve nutritional and social well-being of the people around the world. Most of them are culture specific, region specific, environment specific, community specific and season specific. These foods are socially, culturally and economically important and provide food security, enhance livelihood and improve nutritional and social well-being of people. Food culture arises out of the place of a people's origin, and so traditional local foods hold the potential to bind and stabilize communities and enable a cultural continuity through conserving their histories. Indian cuisine is represented as a wide spectrum of food cultures with distinctive regional differences and preferences (Achaya,1998).

Traditional food products are socially, culturally and economically important. These are developed on the basis of the domestic agricultural produce to meet the nutritional needs of the people and have great potential to develop new food industries. Moreover, traditional foods provide food security, enhance livelihood, improve nutritional and social wellbeing of people around the world, particularly the marginalized and vulnerable groups.

Rao and Srivastava (1998) defined traditional foods as those evolved out of necessity to make maximum use of local foods, utilizing available artifacts and expertise and carried down through generations.

Traditional food for a region is usually identified as the dietary system inherent within a culture that grows out of the social and natural resources available and accepted by the culture (Kuhnlein & Receveur, 1996). The definition is somewhat comprehensive since it involves socio-cultural factors such as the sourcing of materials and the preparation activities. Traditional food is a valuable part of a people's culture. It can be deduced from the literature that the various indigenous peoples in different regions who have assimilated with the local populace have tried all possible means to preserve and promote their traditional food, albeit with some difficulties because of environmental influences.

According to Preetam Sarkar *et.al* (2015), traditional Indian foods have been prepared for many years and preparation varies across the country. Traditional wisdom about processing of food, its preservation techniques, and their therapeutic effects have been established for many generations in India.

The substitution of traditional foods not only led to a loss of production of traditionally and culturally appropriate food, but also in the loss of traditional knowledge related to food production. It created serious health and socio-economic problems among community members (Diaz,2005). Hence, the traditional foods which reflect the rich heritage of regional cultures should be saved from extinction and the skills gained through generations have to be preserved.

Factors such as international migration, the communication revolution and culinary tourism have contributed to globalization of food habits and this has paved the path towards global food culture (Everett, and Aitchison, 2008). According to Hollingsworth (2000), traditional foods are now considered competitive products, with its unique materials and production techniques. Upliftment of these regional food items from local standards to global standards necessitates development of new policies and strategies for quality standardization.

The traditional Indian food culture should not be forgotten by every generation as it shows the identity of the Indian people itself in terms of culture and norms. Each of the instruments has its own tales and sentimental values along with it. Without them, the indian food will not have its own distinctiveness and cannot achieve the accomplishment that can be seen nowadays. Thus, several commendations should be made in supporting the cultures in order to preserve it for longer period.

There is 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 evaluation of traditional foods of Kerala – Ernakulam district” with the following objectives.

1. To identify and collect information on the various traditional foods of different districts of Kerala
2. To document their methods of preparation of traditional foods.
3. To evaluate the nutritional characteristics of the selected traditional food.

## 2. REVIEW OF LITERATURE

Literature relevant to the present study entitled “Documentation and quality evaluation of traditional foods of central zone of Kerala” is reviewed under the following heads.

- 2.1. Importance of traditional knowledge
- 2.2. History of traditional foods
  - 2.2.1. Traditional foods of India
  - 2.2.2. Traditional foods of Kerala
  - 2.2.3. Meaning, Concepts and Definition
  - 2.2.4. History and Ethical Background
- 2.3. Traditional foods of adequacy of different group
- 2.4. Health and nutritional aspects of traditional foods
- 2.5. Key challenges of traditional foods
- 2.6. Future scope of traditional foods

### 2.1. Importance of traditional knowledge

Ranjay *et al.* (2021) reported that the critical role of lesser-known local plant species in the food, nutrition and livelihood security of traditional community in India. Considering women as a major custodian in knowledge and practices on foods, a total of 90 traditional women and 60 key knowledgeable community members (thus a total of 150 participants) were selected from East Siang and Upper Siang.

Ojha *et al.* (2022) reported that himalayan communities illustrate a rich agriculture-medicine use system that not only provides adequate dietary diversity and nutrition but also delivers therapeutic security. This study explores the food-medicine interface as observed by the marginal hill communities in the central Himalaya with an aim to assess traditional agriculture and

food plants with relation to dietary diversity and nutritional and medicinal values based on comprehensive research.

According to Boesi (2014) tibetans have traditionally exploited few wild food plants. These mainly compensate for the lack of vegetables and fruit in traditional Tibetan diet, notably among pastoralists, and are far more important during famines as substitutes for roasted barley flour. Today few wild food plants are regularly consumed, less in the main towns and villages and moreso in remote areas and among pastoralists. Younger generations from towns have almost lost traditional botanical knowledge. Owing to modernisation and globalisation processes, many local people have specialised in collecting natural products increasingly demanded in China and abroad. Tibetan people strongly benefit from these activities. Tibetan medicine sees diet as a way of curing diseases and medical treatises describe therapeutic properties of several wild food plants that Tibetans nowadays consume.

Choudhary *et al* (2015) reported that traditional foods and their dietary guidelines are prescribed in Ayurveda. There is so much similarity in ayurvedic dietetics and traditional foods that many of the traditional health foods in India can be called ayurvedic foods. This review article introduces the concepts of ayurvedic health foods in India and describes several traditional health foods across various regions of India. Recommended dietary guidelines according to age and health condition of the consumer, and seasonal considerations are presented for each of the traditional health foods of India. In the era of globalization of the population and international food trading, health-conscious citizens around the globe will benefit from the wealth of knowledge on traditional Indian and ayurvedic health foods of Indian origin.

Aneena (2009) reported in her study “Documentation and quality evaluation of traditional foods of central zone of Kerala” was taken up with the objectives of identifying and collecting information on the various traditional foods of central zone of Kerala and documenting their mode of processing, and evaluating quality characteristics of the selected less used traditional foods. The study was conducted in four districts namely Eranakualm, Thrissur, Palakkad and Malappuram comprising the central zone of Kerala. Senior citizens who possess the details of traditional food

items and preparations in each locality were selected as the respondents. The respondents were categorised based on the communities they represent.

Payyappallimana (2010) described 'The United Nations' Decade of Education for Sustainable Development (DESD) aims, among other objectives, to foster and promote the mainstreaming of intercultural approaches within a social learning process through multi-sectoral, collaborative and interdisciplinary methods. Biological as well as cultural diversity are inherently linked and form an important part of the sustainable development education process. Traditional knowledge (TK), a central dimension of bio-cultural diversity, is also receiving increased attention in this context. However, there are several socio-political and methodological challenges of integrating TK in Education for Sustainable Development (ESD) programs. Using the case of traditional medicine from Kerala state, India, this paper attempts to highlight the importance of and the issues pertinent to such integration in a local context.

According to Ramesh Chandran (2016) one of the visible impacts of globalization in Kerala is the transformation of the food habits of urban population, particularly the youth. The urban dietary pattern visibly shows that there is a conspicuous shift from traditional foods to fast foods. Along with that is the larger consumption of processed foods and packaged fruit juices.

Asha John *et al.* (2019) reported that just like in any art form, trends in the food service industry are constantly shifting to reflect the ever changing interests and needs of people. Keeping up with these trends is highly important to restaurant owners, chefs, are really anyone working in the foodservice industry.

Edward (2017) reported that traditional food and healthy eating habits has been one of the fast-growing areas. All humans, both men and women, require food for their survival. However, both men and women indulge in food as if it were their sole purpose of existence. Hence, eating disorders are common among men and women.

## **2.2. History of traditional foods**

### **2.2.1. Traditional foods of India**

Traditional Indian foods have been prepared for many years and preparation varies across the country. Traditional wisdom about processing of food, its preservation techniques, and their therapeutic effects have been established for many generations in India. Food systems can deliver numerous biological functions through dietary components in the human body. Indian traditional foods are also recognized as functional foods because of the presence of functional components such as body-healing chemicals, antioxidants, dietary fibers, and probiotics.

Subramanyam *et al*, 2010 reported that, India has a rich and highly diverse food, and its various diets are well closely linked to social identity, religion and other cultural influences as well as local agricultural practices and wide range of food availability Vecchio *et al*, 2014.

Traditional food processing in India began when man ceased to be a food hunter (Potty, 1986). Each and every community in India have their own and distinct food ethos (Achaya, 1998). According to Pratima (2000), India has been the home for ageless culinary art, and had a rich heritage of a wide variety of traditional foods. According to Pattanayak (1986), traditional foods varied not only around the world but also within a region.

Vegetarianism in countries like India has been adopted mainly due to socio-economic and cultural factors rather than the health benefits of vegetarian diet (Kakade and Agte, 1997).

Egg halva is a traditional Indian sweet dish which is a combination of milk, liquid, whole egg and sugar (Kalra *et al*. 1998). Khoa is an important indigenous heat coagulated and partially dehydrated milk product (Sharma and Lal, 1999).

Documentation of vast range of traditional convenience foods across the different zones of North Karnataka was carried out by Ishwarappagol (2009). The study revealed that 162 traditional convenience foods (106 ready-to-eat and 56 ready-to-use) documented across the regions were preferred more among urbanites (134) compared to rural group (81). Cereal based foods dominated (60) the category (ready-to-eat 32, ready-to-use 28). Family size, type and number of generations living together negatively influenced the preparation of traditional convenience foods.



Khoa- jalebi, a unique traditional product of central India was studied by Pagote and Rao (2012). Devi and Kumar (2012), worked on the traditional, ethnic and fermented foods of different tribes of Manipur. The traditional foods of Manipuri's comprised of iromba, champhu, kangshoi, hawaichar, sibum, ngare, paknam, chagempomba, kungshu, hentak, khazing and heitak. Alcoholic beverages made up of rice, locally called as 'yu' are very common in almost all the festivals of the tribal people of Manipur.

Though a significant portion of Indian food is vegetarian, many traditional Indian dishes also include chicken, goat, lamb, fish, and other meats. Cuisine across India has also been influenced by various cultural groups that entered India throughout history, such as the Persians, Mughals, and European colonists (IAS Charisma, 2013).

Indian traditional foods are also recognized as functional foods because of the presence of functional components such as body-healing chemicals, antioxidants, dietary fibers, and probiotics. These functional molecules help in weight management and blood sugar level balance and support immunity of the body. (Hotz ,2007)

Indian traditional foods can be classified into eight broad categories: (1) processed grain products, (2) fermented foods, (3) dehydrated products, (4) pickles, chutneys, sauces, and relishes, (5) ground spice and spice mixtures, (6) fried food products, (7) dairy products, and (8) confections and sweets. (Srinivasan, 2010).

The cooked rice kept overnight in water was consumed as a delicious breakfast item by South Indians after mixing with curd (Subbalakshmi, 2005). Realization of functional properties of Indian traditional food eventually led to development of one of the world's oldest medicinal systems, the Ayurveda (Sarkar *et al.* 2015).

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.

### **2.2.2. Traditional foods of Kerala**

Traditional and Indigenous Knowledge have been used for centuries by indigenous and local communities under local laws, customs and traditions. It has been transmitted and evolved from generation to generation. Traditional knowledge has played, and still plays, an important role in vital areas such as food security, the development of agriculture and medical treatment. The importance of traditional and indigenous knowledge for its creators and for the world community at large, and the need to foster, preserve and protect such knowledge, has gained growing recognition at international level (Aneena,2009).

Foreign influence on the cuisine of Kerala is marked, with each religion from Muslims to Syrian Christians developing their own cuisine and style of preparation. The Moplah cuisine of the Malabar region has a distinct flavour, borrowed from the traders who regularly visited the region. Kerala cuisine has an abundance of coconut, rice, tapioca and spices like black pepper, cloves, cinnamon and ginger. The Portuguese introduced cassava, now widely eaten in Kerala. The region is also famous for its Sadhya, served at the Hindu festival Onam and consisting of boiled rice and a host of vegetarian dishes on a banana leaf. Kerala cuisine also features a lot of sea food like fish, prawns, mussels and crabs because of its long coastline.

### **2.2.3. Meaning, Concepts and Definition**

Kerala cuisine is a culinary style originated in the Kerala, a state on the southwestern Malabar Coast of India. Kerala cuisine offers a multitude of both vegetarian and non-vegetarian dishes prepared using fish, poultry and red meat with rice as a typical accompaniment. Chillies, curry leaves, coconut, mustard seeds, turmeric, tamarind, asafoetida and other spices are also used in the preparation.

Kerala, in the south-western part of India, is known for its rich heritage and cultural diversity. Situated along the Malabar coast, Kerala has had regular interaction with the West since ancient times. From the coming of the Arab traders to the Portuguese, and later the British, Kerala has witnessed it all. This greatly influenced the socio-cultural fabric of the region, making it one of the most diverse states of India.

Traditional foods are foods based on solid foundation of culture, customs and natural environment of a country or a region of the world and eaten by the people for a long time (Tokuji, 1986). Kuhnlein and Receveur (1996) defined a traditional food as food from a particular culture available from local resources and culturally accepted and includes socio cultural meanings, acquisition/processing techniques, use, composition, and nutritional consequences for people using the food.

Azarand (1996) defined traditional food as a specific food in a region whose raw materials are locally available and which is not used in other regions. Rao and Srivastava (1998) defined traditional foods as those evolved out of necessity to make maximum use of local foods, utilizing available artifacts and expertise and carried down through generations. According to Jordana (2000) a traditional product is a “representation” of a group, which belonged in a defined space, and is part of a culture that implies the cooperation of the individuals operating in that territory. The author also indicated that in order to be traditional, a product must be linked to a territory and it must also be part of a set of traditions, which will necessarily ensure its continuity over time.

Traditional food is at the core of indigenous cultures and economies and practices regarding harvesting, preserving and preparing food reinforce indigenous culture and identity (Damman et al., 2008).

#### **2.2.4. History and Ethical Background**

Food is an integral part of any culture-Bhagavad Githa says “from food do all creatures come into being”. Traditional food processing in India began when man ceased to be a food hunter (Potty, 1986). Traditional foods evolved hundreds of years ago are indispensable for majority of people (Tyn, 1986).

According to Achaya (1998) food choices and food habits are an outcome of cultural heritage and economic and social factors. The traditional foods and cuisines in India could be traced as far back as to the Aryan times, some even to the pre-Aryan times, with the Muslim and European influence contributing later to new dishes that enriched the native cuisine of India. The author also pointed out that every community in India had their own and distinct food ethos.

According to Azizi *et al.* (1998) traditional foods have evolved through centuries taking into consideration the prevailing climatic conditions, availability of local materials and socio-economic conditions. Parpia (1999) indicated that traditional Indian foods were developed as part of at least forty indigenous cultures over centuries.

Pratima (2000) reported that India is the home for ageless culinary art, and had a rich heritage of a wide variety of traditional foods. Traditional foods are an expression of culture, history and lifestyle (Slimani *et al.*, 2002).

Traditions, region and culture linked to the food products were considered as important quality features (Holt and Amilien, 2007).

The authors also indicated traditional and regional products as part of the national cultural heritage which hold the potential to bind and stabilize communities. According to Trichopoulou *et al.* (2007) investigation and registration of traditional foods contribute to the preservation of important elements of a nation's culinary heritage and culture and allows future generations, both from the native population and from other countries, to be acquainted with traditional foods.

### **2.3 Traditional foods of different groups**

Traditional Indian meal patterns differ from region to region, but all contain a wide range of foods, normally including foods from each food group. (Kalpana, 2020)

According to Somnath Basak *et al.* (2023) The recipes of traditional foods have been perfected, practiced, and handed over from generation to generation. A typical Indian “vegetarian” diet includes plant-based and dairy-based foods, while a “non-vegetarian” diet includes egg, fish, and meat. While the northern region is majorly dependent on wheat products, the eastern, north-eastern, and southern parts of India majorly depend on rice-based products.

According to Agilandeswari and Mohan (2017), Traditional South Indian foods provide a perfect combination of proteins from legumes and coconut, carbohydrates from rice, fats both visible and invisible from curry and fried savory items, vitamins and minerals from sprouted grams, and vegetables which contain functional components such as  $\beta$ -carotene, Vitamins C and

E, thiamine, tocopherol, and antioxidant compounds. *Rasam* is a traditional South Indian food, prepared using tamarind juice as a base, with a variety of spices. *Rasam*, with all its ingredients medicinally claimed for various ailments, is a functional food.

Idli, is a popular steam cooked traditional Indian food prepared from a wet ground fermented batter of rice and black gram dhal (in the ratio of 3:1) by steaming in a mold. It is famous for its soft, spongy texture, desirable sour taste and characteristic aroma. (Nisha *et.al.*, 2005)

*Dosa* is another fermented dish like *idli* mainly found in the south Indian region. It is a highly seasoned pancake, contains rice and black gram as primary ingredients. *Nannari sharbat* is a traditional herbal beverage prepared using the roots of *Decalepishamiltonii*. In Ayurveda the plant is called *Ananthamula*. Beverage is used in summer time for thirst quenching and it acts as a hepatoprotective agent, which is good for stomach health, (Preetam Sarkar *et.al.*, 2015)

South Indian parotta is wheat flour-based circular, unleavened, multi-layered flat bread. It is one of the staple food items in the southern states of India. Parotta is made from wheat flour, salt, water, and oil for spreading of the dough; however, optional ingredients such as sugar and egg are also used in the preparation of parotta. (Dasappa and Gandham Venkateshwara Rao, 2021)

## **2.4 Health and nutritional aspects of traditional foods**

### **2.4.1. Health and nutritional advantages of traditional foods**

Proximate and mineral composition of 30 traditional and popular Indian foods were evaluated by Prasad *et.al.* (2000) and indicated that traditional foods provided approximately 350-660 Kcal/100 g and found that the lead and aluminium content of traditional foods were well below the permissible limits. Pattan *et.al.* (2001) evaluated the nutritional qualities of madeli, a traditional ready to eat sweet product and found that it contained 6.98g protein, 4.4g fat, and 1.19g of crude fibre per 100g and had a shelf life of 21 days. Khakhra Consumed for breakfast, snack or in the main meal was considered as a carrier of dietary fibre and minerals (Shirsath and Landge, 2006). Sattu, the nutritious popular traditional food of North India is an energy drink with medicinal properties like prevention of gastritis and sunstroke (Prakash and Swamy, 2006).

Modakams prepared during Ganesh Chaturthi and Naivedyam prepared during Gokulashtami complemented amino acids and provided good quality protein (Subbulakshmi, 2005). Halubayi, the traditional processed food product of Karnataka was found to be highly nutritious with good protein, carbohydrate and vitamins (Nagaraja, 2006). Kulkarni *et.al.*(2006) indicated the nutritional advantages of chakli, sev, khara gritters, laddu and hurigalu the traditional snack items of Karnataka.

Traditional supplementary foods consumed by lactating women of Gujarat namely wheat rab, budh gond ka soonthad high energy, protein and fibre respectively Mulimani *et.al.*, (2001). The authors also indicated superior nutritional quality of kotta and battisaladu. Gupta *et.al.*, (2003) observed high calcium, iron, zinc, copper and phosphorus in ajwain followed by gondpanjiri, kangni andhalwathe traditional foods consumed by lactating women of India. The authors also indicated better protein and starch digestibility in traditional supplementary foods.

Lalithambika (2007) indicated the importance given to kanji, the traditional food of Kerala in ayurveda especially in diseased conditions due to its easy digestibility. Sharon *et.al.*(2006) indicated the nutritional significance of puttu, ada, and idiyappam, the traditional breakfast foods of Kerala with high protein, carbohydrate and energy density. Paal kanji, a traditional cereal and milk based Kerala delicacy was reported to be rich in protein, phosphorous, vitamin C, thiamin, riboflavin, iron, calcium, choline, copper, manganese and magnesium with good digestibility (Achuthan and Emmanuel, 2006). Chendamurian, the traditional banana delight of southern Kerala was found to contain highly nutritive milk proteins, milk solids and potassium and had laxative properties (Sudhakaran, 2006). The nutritional advantages of traditional foods namely putu, laddu, ada and coffee prepared using rice bran as the main ingredient were reported by Aneena and Indira (2007) and indicated that the foods had good amount of B complex vitamins, fibre, calcium and iron.

Nutritional advantages and the importance of traditional foods in Human physiological activities were indicated by Shin (2004).

Kuhnlein *et al.* (2002) evaluated 236 Canadian Arctic foods for macronutrients, minerals and fatty acids and indicated a considerable amount of nutrients in these traditional foods. A study conducted by Evans *et.al.*, (2003) on 36 traditional and imported foods of Tonga indicated that people preferred traditional foods and perceived traditional foods as more nutritious.

Considerable micronutrients were found in traditional foods namely karat banana and pulque prepared from Agave species, and gac fruit (Kuhnlein, 2004). The water extract prepared from the brown algae, the traditional food of Noto area in Japan, had strong antioxidant activity (Kuda, *et al.* 2005).

Rasala, the dahi based milk product with good nutritional and medicinal attributes was found to be effective against bleeding disorders, burning sensation and thirst (Warrier and Sudhakaran, 2006). Karkkidakamarunnu kanji, a traditional herbal concoction, was found to be beneficial for the purification of the body and soul, providing nourishment to the whole body and augmenting the immune status Asha *et.al.* (2006). Pulissery, a prominent culinary item prepared from curd in Kerala, had health promoting and therapeutic properties with the nutritional benefits of fermented milk products (Shifa, 2006). Vijayakrishnan (2007) indicated excellent medicinal value of Kerala sadya and reported that the combination of pepper, cumin seeds and curd in Kalan, a side dish of the traditional sadya gave protection against three doshas of ayurveda. Sour curd used in Kalan was reported to be good for digestion and pepper and cumin seeds avoided gastritis and acted as antimucotic agent.

Uauy *et al.* (2001) indicated the protective effect of traditional diet in chronic diseases and obesity. Li *et.al.* (2004) observed functional materials in traditional fermented soybean foods namely sufu and douchi. Apparent health benefits of traditional Greek foods were reported by Trichopoulou *et.al.* (2007). The traditional Mediterranean diet of Greece was associated with reduced total mortality as well as reduced mortality from coronary heart disease and cancer (Trichopoulou, *et al.*, 2007).

#### **2.4.2. Impact of dietary transition on health and disease**

The nutrition transition had direct implications in the upsurge of non-communicable diseases (Zimmet, 2000). Dietary transition refers to changes in the quantity and composition of the diet due to improved economic development leading to lack of physical activity, weight gain, lifestyle changes, development of diabetes mellitus, high blood pressure and increased risk of heart diseases and some forms of cancer (Seshadri, 2005).

South Indian food is mainly based on Idli and dosa enhances probiotic activity. Indian traditional rasam has high antipyretic, hypoglycemic (Preethikaa and Brundha, 2018) and reduces hypertension (Alleyne *et al.*, 2005). Some Indian foods are proven to cure cancer also (Brundha and Pathmashri, 2019). Food especially made from beet root is proven to have a significant effect on haemoglobin value. Doctor check ups also suggest eating healthy food improves the health of the patient in many ways (Varshini and Brundha, 2020), (Timothy, Samyuktha and Brundha, 2019). Inclusion of clove to food has a beneficiary effect on teeth.

In developing countries, the rate of obesity, diabetes, cardiovascular disease and cancer increased as a consequence of urbanisation and socioeconomic changes (Albala *et al.*, 2001 and Popkin *et.al.*, 2001). Jimaima *et al.*, (2001) reported an increased consumption of introduced foods and an increased prevalence of diabetes among the indigenous population. The authors also indicated increased incidence and prevalence of non-communicable diseases due to deviation from the traditional food consumption pattern and traditional lifestyle. Lako (2001) also observed increased incidence and prevalence of non-communicable diseases among Fijians due to drastic changes in the dietary pattern and deviation from the traditional food consumption pattern and traditional lifestyle.

Direct relationship between decreased consumption of traditional foods and decreased physical activity with obesity and related chronic diseases was observed by Uauy *et.al.*, (2001) and Kuhnlein *et al.* (2004). Yusuf *et al.* (2001), Kuhnlein *et al.* (2002) and Kumanyika *et al.* (2002) also documented the relationship between the dietary changes associated with urbanisation and globalisation and increased prevalence of numerous obesity-related chronic diseases around the developing world, including diabetes and cardiovascular diseases.

Consumption of market food and decreased consumption of traditional food, coupled with decreased physical activity, resulted in increased incidence of obesity and its correlated diseases like diabetes, heart disease and dental caries. Kuhnlein (2003) indicated that in addition to obesity and other associated diseases, increased consumption of industrially processed foods lead to poor intake of micronutrients.

Urbanisation and westernisation forced people to give up their traditional food habits and inclusion of high saturated fat containing processed foods leading to various health



hazards (Roy, 2001). As an impact of westernisation, Blazose (2002) indicated that traditional plant-based cuisines became energy dense due to increased proportion of animal food and fat and decreased proportion of plant foods.

Mendez *et al.* (2004) compared the diets in urban areas with traditional diet and indicated increased consumption of fat and more prevalence of obesity among low and middle income groups residing in urban areas. Damman *et al.* (2008) also indicated increased prevalence of chronic disease among indigenous communities due to nutrition transition characterized by a rapid westernisation of diet and lifestyles.

Transition in the dietary pattern characterized by shift towards high intake of calorie, saturated fat and cholesterol was observed by Schmidhuber (2004). Substantial decline in the intake of potassium was observed due to consumption of westernised diet by Demigne *et.al.*(2004) when compared to traditional diet. Seshadri (2005) also indicated the presence of high sodium content in processed foods compared to their natural counterparts and its health impact. Nutrition related problems due to consumption of processed, ready to cook and ready to serve foods among career women was pointed out by Subbulakshmi (2005) due to their increased purchasing power and lack of time for cooking traditional foods.

## **2.5 Key Challenge in the production and use of Traditional foods**

Oniang'o(1999) indicated that the faster the people adapt to the new globalized food patterns, the less likely traditional knowledge will be transferred to the next generation. Traditional foods and food habits were progressively replaced by the globalized food culture of the multinational corporations leading to disastrous impact over the past several decades stated by (Zimmet, 2000).

Indigenous and traditional foods and food systems were found to disappear, leading to significant loss and threat to personal health and security at the regional and international level (Kuhnlein, 2003). Diaz (2005) stated that substitution of traditional foods not only led to a loss of production of traditional and culturally appropriate food, but also led to loss of traditional knowledge related to food production.

Evans *et al.* (2003) indicated one of the important effects of globalisation as the increased reliance on imported foods, rather than traditional foods. The impact of globalisation of food industry on the food habits and dietary patterns of people of Tanzania, Asia, Latin America and some African nations and Korea were reported by Kinabo (2004): Erdos(2004): Roe (2004): and Shin (2004)

Urbanisation and globalisation enhance access to non traditional foods due to changing prices and production practices, as well as trade and marketing practices (Lang, 1999; Evans *et al.*, 2003 and Chopra, *et al.*, 2002).

Foreign investment had contributed to the rise of fast food restaurants and western-style supermarkets, which also influenced consumer food choices by offering greater variety, quality, convenience and competitive prices in high-value added foods (Regmi and Gehlar 2001; Reardon, *et al.*, 2003).

Increased purchasing power, change in socio-economic status and life styles were considered as the factors which contributed to enhanced consumption of processed and convenience products (Kumar and Anjaneyalu, 1998). Ranjini *et al.* (2000) also indicated the availability of processed foods as the main reason for the tremendous change in the modern day consumption pattern of convenience and fast foods.

The diversity of India is reflected in diverse nature of traditional foods and this restricts the market potential of traditional foods (Chaudhry, 2006). Kulkarni and Unnikrishnan (2006) observed limited shelf life as the key challenge in the marketing of traditional products.

Bedekar (2006) indicated that majority of traditional Indian processed foods were made most unhygienically in unorganized sector with an adoption of low level of mechanization. The main challenge in the traditional food industry according to Ramesh (2006) was the design of machineries because of lack of adequate data on engineering properties of traditional foods. stability was reported as the prime challenges in traditional food industry (Chaudhry, 2006).

## 2.6 Future scope of Traditional foods

Traditional foods, used more as seasonal and banquet food or for religious ceremonies rather than as staple food, had become popular as a delicacy food (Shin,1999). According to Hollingsworth (2000) one of every sevenfold dollar over the next decade would be spent on ethnic food. The author also predicted that food manufacturers would compete for market share in the faster growing ethnic cuisines like Thai, Caribbean, Mediterranean and Indian. According to Parpia (2004) the value of traditional processed foods accounts for nearly 75 per cent of the processed foods in the market in India. Since, traditional food has been considered as a competitive product, with unique materials and production techniques, efforts to export them are expanding nowadays (Shin, 2004). Traditional food market in India had witnessed a rapid growth over last five to eight years and large scale production and preservation of traditional foods had become the need of the hour due to the scope of these products for indigenous consumption, export purposes and the interest showed by multinational companies (Dipali and Rodrigues, 2006). With rapid urbanisation and advancement of heritage food production technologies, traditional convenience and ready to serve foods were pouring in the market from time to time (Manjula *et al.*, 2006).

Ohiokpehai (2003) indicated that women's indigenous knowledge on traditional foods could be harnessed to improve nutrition security. Though, the traditional food system of indigenous people contained a wealth of micro nutrients, in public – health promotion programmes and health training programmes, this information was not used due to lack of scientific coverage (Kuhnlein, 2003)

Everett and Aitchison (2008) indicated correlation between increased levels of food tourism interest and the retention and development of regional identity. The authors ago stressed the conservation of traditional heritage, skills and ways of life, the social and cultural benefits and the benefits of the production of local food.

Jacob (2007) examined the role of NGOs in the economic and community development of Kerala. A case study of Peermade Development Society (PDS), one of the prominent and major NGOs in Kerala in the Peermade Taluk of Idukki district, was undertaken. NGOs are somewhat stable groups with defined activities and programmes and have, barring some exceptions, an urge

and also an exposure to the horizontal and sometimes vertical linkages within and across their chosen sectors of activity.

Tourists are gradually moving towards niche travel like adventure, luxury, ethnic, indigenous, heritage, health and many other such new tourism products. They look forward to experience and to be part of the culture and heritage of the destinations they seek to explore (Divecha, 2012).

Nanotechnology is the emerging revolution having great potential in every sectors from mechanics to medicine including food industry. It is the study of manipulation and control of matter on atomic and molecular scale having at least one characteristic dimension in nanometer mostly ranging from 1 to 100 nm (Chellaram *et al.*, 2014). It can even be used to detect food pathogens acting as food quality and safety indicators (Bott, Stormer and Franz, 2014). In food processing, nanoencapsulation of food (nano-sized) ingredients, nutritional supplements.

Nowadays, high technologies are widely adopted into agricultural production, biological diversity conservation and crop improvement. (Thao, 2016). The Indian foodservice market is projected to grow at a rate of 10.3% during the forecast period (2018–2023). Food industry of Kerala is also booming at a high rate so importance of this highly immense as it will help us in understanding the various changes under going in this industry. (Sujith and John, 2019)

Under present circumstances, conventional breeding techniques are not sufficient. Innovation in plant breeding is critical in managing agricultural challenges and achieving sustainable crop production. Novel plant breeding techniques, involving a series of developments from genome editing techniques to speed breeding and the integration of omics technology, offer relevant, versatile, cost-effective, and less time-consuming ways of achieving precision in plant breeding. Opportunities to edit agriculturally significant genes now exist as a result of new genome editing techniques. (Fiaz *et al.* (2021).

The food industry seeks development of new products that follow modern trends and traditional method and are able to conquer today's consumers, while at the same time maintaining the identity of specific products, valued as traditional. (Raquel *et al.*, 2021)

### 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 sample.

3.3. Plan of study.

3.3.1. Collection of information regarding traditional food habits in Ernakulam.

3.3.2. Documentation of traditional foods in Ernakulam.

3.3.3. Preparation of selected traditional foods in Ernakulam.

3.3.4. To develop nutritive value of selected traditional foods in Ernakulam district.

#### 3.1 Locality of the study

Ernakulam district of Central Kerala was purposely selected for the study. Ernakulam district is presently the Central business district of Kerala. Its food habits have been influenced by immigrant populations from all over the country. The influence of colonizers in ancient India including the British, the Dutch, the Portuguese and the Arabs can be found in its traditional cuisine. Being a coastal district, the cuisine here mainly revolves around seafood. Meats are also quite popular here. The following localities were namely selected:

Table 1: Localities of the study

Sl. No	Localities selected
1.	Vypin
2.	Fort Kochi
3.	Bolghatty
4.	Vaduthala
5.	Edappally

### 3.2. Selection of sample

Population above the age of 45 years with knowledge in traditional food preparations were also selected randomly from each study locality. As traditional food habits differ with respect to region, religion, and caste, the selected samples were categorised based on the communities they represent. A total of 10 people, belonging to different communities like Hindus, Muslims and Christians were selected.

Table 2. Distribution of respondents selected for the study

Sl. No	Hindus	Muslims	Christians	Total
1.	5	8	12	25

### 3.3 Plan of study

Based on the objectives of the study, the plan of the study was designed. The study comprised the following headings:

- 3.3.1. Collection of information regarding traditional food habits in Ernakulam.
- 3.3.2. Documentation of traditional foods in Ernakulam.
- 3.3.3. Preparation of selected traditional foods in Ernakulam.
- 3.3.4. To develop nutritive value of selected traditional foods in Ernakulam district.

#### 3.3.1. Collection of information regarding the traditional food habits in Ernakulam.

From the identified study locations, information regarding the traditional foods and food habits of each community associated with religious customs, festivals, special occasions, the ingredients and their methods of preparation, were collected through questionnaires that contained information about the same.

The samples were also interviewed to collect further details on their childhood experiences involving the traditional foods, different festivities and special foods prepared during those occasions, foods they consumed during their school life, etc. We were also shown different traditional kitchen equipments and utensils including 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 Ernakulam.

From the questionnaire and interviews, the details of different traditional foods of different communities were identified and a list of traditional foods thus identified is given in table. We also gathered detailed information of method of preparation of selected traditional foods. Documentation of the process through photographic and written methods was done. 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.

Table 3 : Different traditional foods

Sl. no	Different traditional foods
1.	Beef pachakkaya ittuvechath
2.	Avalosunda
3.	Pulissery
4.	Fish molly
5.	Beef Vindaloo
6.	Mappas
7.	Prawn ball curry
8.	Cheeda
9.	Mutton chaps
10.	Meen peera pattichathu
11.	Beef stew
12.	Beef ularthiyath
13.	Ariyunda
14.	Chutta ada
15.	Payarunda
16.	Meen thilapichathu
17.	Diamond
18.	Pachoru
19.	Sharkkara appam
20.	Erissery

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

Table 4: Selected traditional foods

<b>Sl. No</b>	<b>Selected traditional foods</b>
1.	Pachoru
2.	Diamond
3.	Sharkkara appam
4.	Beef stew
5.	Meen peera pattichathu
6	Beef ularthiyath
7.	Ariyunda
8.	Beef vindaloo
9.	Mutton chaps
10.	Meen thilapichathu



### 3.3.3 Preparation of selected traditional foods in Ernakulam

#### 3.3.3.1 Pachoru

##### Ingredients (4 servings)

- Rice – 1 cup [ 250 g]
- Grated coconut – 1\2 cup [ 125 g]
- Jaggery – 150 g
- Cumin seeds – 2g
- Salt – as needed

##### Preparation

- Take 1 cup of raw rice and 3 cup of water into the pressure cooker and pressure cook it by adding salt.
- After 3 whistles; add ½ cup of grated coconut and cumin seeds into the pressure cooker.
- Heat the jaggery with water in another pan and add that diluted jaggery into the pressure cooker.
- Mix all together within the pressure cooker and serve it hot.



Plate 1: Pachoru

### 3.3.3.2 Diamond (snack)

#### Ingredients (6 servings)

- Wheat flour refined – 1 cup [250 g]
- Egg - 2 -100 g
- Sugar – 1\4 cup [ 60 g]
- Hot water – as needed
- Oil – 1\4 cup [ 60 ml]

#### Preparation

- Take 1 cup of wheat flour refined (Maida) and 1/2 eggs.
- Mix the flour and egg with ¼ cup of sugar in hot water.
- Make it as a consistency of chapati dough.
- Role this dough and then cut it in the shape of diamond.
- Then deep fry it in the oil and serve it as a snack.



Plate 2: Diamond

### **3.3.3.3 Sharkkara Appam (steamed rice cake)**

#### **Ingredients – Batter making (6 servings)**

- Raw rice – 1 cup [ 250g]
- Yeast – 1.5 tbsp
- Ice cubes – as needed
- Water – as needed

#### **Ingredients**

- Appam batter – 1 cup [ 250 g]
- Grated coconut – 1 cup [ 250 g]
- Jaggery - 150 g
- Crushed cardamom – as needed
- Raisins – 10
- Salt – as needed
- Oil – 1 tbsp [ 5 ml]
- Water – as needed

#### **Preparation – Batter making**

- Soak 1 cup of raw rice for 6 hours; wash and drain the rice and keep aside.
- Dissolve the yeast and 1 tbsp of sugar in ½ cup of water.
- Then you need to grind the raw rice in several batches and add few tablespoon of cooked rice with very little water; also add some ice cubes while grinding.
- While grinding the last batch you need to add yeast solution into the mixie.
- Leave this batter for 5-8 hours in a bowl.

## Preparation – Appam

- Transfer the batter into another bowl and then add 1 cup of grated coconut.
- Heat the jaggery with some water and dilute it; then add this to the batter bowl.
- Also add some crushed cardamom into it; then mix the batter well.
- Pour this batter into the steamer and allow to steam it.
- When it becomes half cooked; add some raisins into it and close the steamer and allow to cook it.
- After 15-20 mins take out the Appam from the steamer and serve it.



Plate 3: Sharkkara Appam

### 3.3.3.4 Beef stew

#### Ingredients (4 servings)

- Beef – 500 g
- Cardamom – 4 no.s
- Cinnamon – 1 inch piece
- Cloves – 4 no.s
- Peppercorns – ½ tsp
- Carrot – 95 g (2 no.s)
- Onion – 90 g (1 no.s)
- Curry leaf – as needed
- Green chilli – 23 g (4 no.s)

- Ginger – 11 g (1 tbsp)
- Thick coconut milk – ½ cup
- Thin coconut milk – 3 cups
- Potato – 230 g (2 no.s)
- Cardamom powder – 1 tsp
- Pepper powder – 1 tsp
- Coconut oil – 1 ½ tbsp

### Preparation

- Cook beef adding cardamom, cinnamon, cloves and peppercorns.
- Cook carrot and potato.
- Sauté sliced onion, curry leaves, green chilly and ginger in coconut oil.
- Add pepper powder.
- To this, add cooked beef, potato and carrot.
- Pour thin coconut milk.
- Allow it to boil. To this add cardamom powder.
- Add thick coconut milk.
- Once it starts boiling, off the flame.
- Serve hot.



Plate 4: Beef Stew

### 3.3.3.5 Meen peera pattichathu

#### Ingredients (4 servings)

- Anchovies – 500 g
- Green chilli – 15 g
- Shallots – 24 g (6 no.s)
- Ginger – 7 g
- Garlic – 8 g (3 no.s)
- Curry leaves – 1 sprig
- Grated coconut – 105 g (1 ½ cup)
- Fish tamarind – 18 g (3 no.s)
- Coconut oil – 1 tbsp
- Chilli powder – 1 tsp
- Turmeric powder – 1 tsp
- Salt – to taste
- Water – ½ cup

#### Preparation

- Coarsely grind all the ingredients except the fish, fish tamarind and curry leaves.
- Take a heavy bottom pan and mix the fish with the ground coconut paste and fish tamarind. Mix well.
- Add water.
- Cook over medium flame for 5 minutes.
- Add coconut oil and mix well. Cook for 10 minutes after which, off the flame.
- Serve hot.



Plate 5: Meen Peera Pattichathu

### 3.3.3.6 Beef ularthiyathu

#### Ingredients (4 servings)

- Garlic – 10 g
- Ginger – 8 g
- Green chilli – 15 g
- Onion – 90 g
- Beef – 500 g
- Shallots – 42 g
- Coconut oil – 1 tbsp

#### Preparation

- In a pressure cooker mix beef, onion, crushed garlic, crushed ginger, chilly and turmeric. Cook for 25 minutes.
- After the whistle is heard, in a frying pan add coconut oil.
- Add shallots and sauté well.
- Add chilly powder, coriander powder and garam masala powder.
- Add cooked beef.
- Mix well and cook for about 5 minutes.
- Off the flame.
- Serve hot.



Plate 6: Beef Ularthiyathu

### 3.3.3.7 Ariyunda

#### Ingredients (3 servings)

- Coconut – 106 g (1 cup)
- Rice – 188 g (1 cup)
- Jaggery – 124 g (3/4<sup>th</sup> cup)

#### Preparation

- Dry roast rice. Grind it to a powder.
- Grind together coconut and jaggery. Add this to the rice powder.
- Mix well.
- Roll the mixture into balls.



Plate 7: Ariyunda



### **3.3.3.8 Beef vindaloo**

#### **Ingredients (6 servings)**

- Distilled white vinegar - ¼ cup
- Garlic paste - ¼ cup
- Ginger paste - 3 tablespoons
- Plain yogurt - 2 tablespoons
- Salt - 2 tablespoons
- Ground black pepper - 1 tablespoon
- Ground red pepper - 1 tablespoon
- beef cut into 1-inch cubes – 1 kg
- Vegetable oil - ¼ cup
- Onion, chopped – 2 nos
- Water – 1 cup

#### **Preparation**

1. Whisk the vinegar, garlic paste, ginger paste, yogurt, salt, black pepper, and red pepper together in a mixing bowl. Mix in the beef cubes until evenly coated. Cover the bowl with plastic wrap, and marinate in the refrigerator overnight (or at least 30 minutes).
2. Heat the vegetable oil in a large pot over medium heat. Cook and stir the onions in the hot oil until they soften, turn translucent, and begin turning golden brown, about 10 minutes. Add the beef cubes, and cook, stirring frequently until the meat is no longer pink on the outside, about 10 minutes more.
3. Pour in the water, and bring to a simmer. Cover and reduce heat to medium-low; cook until the beef is tender, about 40 minutes.



Plate 8: Beef Vindaloo

### 3.3.3.9 Mutton chaps

#### Ingredients (6 servings)

- Coconut oil – 5 tbsp
- Ginger – 1 tbsp (finely chopped)
- Garlic – 1 tbsp (finely chopped)
- Green chilli – 2 to 3 nos (Slitted)
- Coriander powder – 1 tbsp
- Curry leaves – few
- Coriander leaves – few
- Red chilli powder – 1 to 2 tbsp
- Turmeric powder – 1/2 tsp
- Black pepper powder – 1 tsp
- Garam masala powder – 1/2 tbsp
- Fennel powder – 1 tsp
- Tomato – 2 to 3 numbers, sliced
- Water – 1/2 cup
- Mutton chops – 800 gms (cut into halves)
- Onion – 1 cup, sliced
- Lemon juice – 1 tsp
- Salt – as needed

## Preparation

- Add coconut oil (2-3 tbsp) into a pressure cooker.
- Once the oil is hot, add ginger, garlic, green chilli and curry leaves. Saute till golden brown.
- Add coriander powder and saute for few seconds. Then add Red chilli powder, turmeric powder, black pepper powder, garam masala powder and fennel powder. Saute till fragrant.
- Add the sliced tomatoes and saute till tomatoes are soft.
- Then add water, salt and mutton chops into it. Mix well and cook till 5-8 whistles.
- In a pan, add coconut oil ( 2 tbsp), sliced onion and salt – saute will dark brown.
- Remove it from the pan.
- Transfer the cooked mutton to the same pan. Cook over low flame for few minutes.
- Then add the fried onion, curry leaves and coriander leaves.
- Cover and continue to cook over low flame till it is dry and brown in colour.
- Finally add lemon juice and curry leaves to the cooked mutton.
- Stir well and serve hot.



Plate 9: Mutton Chaps

### 3.3.3.10 Meen thilapichathu

#### Ingredients (2 serving)

- Fish – 500 gms – Cut into pieces
- Shallots – 1/2 Cup
- Ginger – 2 Inch piece
- Green chilli – 1 No
- Curry leaves – 2 Stem
- Turmeric powder – 1/2 Teaspoon
- Kashmiri chilli powder – 3 Tablespoon
- Tomato chopped – 1
- Salt – As required
- Coconut oil – 2 Tablespoon

#### Preparation

- Crush shallots, ginger, and green chilli coarsely using a pestle and mortar.
- Heat oil in a pan and saute the crushed ingredients.
- Add turmeric powder and red chilli powder and saute for a minute in low flame.
- Add water (around 2.5 cups or for the gravy required), tomato and salt. Let it boil.
- Add cleaned fish pieces when boiling. Add curry leaves.
- Cook in low flame with the pan covered.
- Gently stir the curry now and then without breaking the fish pieces.
- When done, add some coconut oil on the top of the curry, swirl the pan and switch off the flame.
- Let the pan be covered for at least 5 minutes and then serve.



Plate 10: Meen Thilapichathu

### **3.3.4 To develop a nutritive value of selected foods in Ernakulam**

The nutrients that we are selected for analyzing the nutritive value for each recipe are based on the high nutritive content present in that recipe; which include: Energy, protein, fat, carbohydrates, iron, calcium, phosphorus, potassium, magnesium, sodium, zinc.

#### **Energy**

Energy is the ability to do work or produce heat. In the context of nutrition, it refers to the energy we get from food and beverages, which our bodies use for all activities, including breathing, circulating blood, and moving our muscles. Energy formed in mitochondria of the cell is actually stored in our liver and muscle cells and readily available as glycogen. The energy from the breakdown of food is stored in the body in the form of a high energy compound, adenosine triphosphate (ATP). ATP is also known as energy currency.

#### **Carbohydrate**

Carbohydrates are the main source of energy for the body. They are the sugars, starches, and dietary fiber that occur in plant foods and dairy products. Carbohydrates, or carbs, are sugar molecules. Along with proteins and fats, carbohydrates are one of three main nutrients found in foods and drinks. Your body breaks down carbohydrates into glucose. Glucose, or blood sugar, is the main source of energy for your body's cells, tissues, and organs. Glucose can be used immediately or stored in the liver and muscles for later use. It is generally recommended that people consume between 45-65% of their total calories in the form of carbohydrates per day.

#### **Protein**

Protein is a nutrient your body needs to grow and repair cells, and to work properly. Protein is found in a wide range of food and it's important that you get enough protein in your diet every day. Protein from food comes from plant and animal sources such as: meat and fish, eggs, dairy products, seeds and nuts, legumes like beans and lentils. Proteins are made up of building blocks called amino acids. There are about 20 different amino acids that link together in different combinations. Your body uses them to make new proteins, such as muscle and bone, and other compounds such as enzymes and hormones. It can also use them as an energy source.

## **Fat**

Fat is a source of essential fatty acids, which the body cannot make itself. Fat helps the body absorb vitamin A, vitamin D and vitamin E. These vitamins are fat-soluble, which means they can only be absorbed with the help of fats. Any fat that's not used by your body's cells or turned into energy is converted into body fat. Likewise, unused carbohydrates and proteins are also converted into body fat. All types of fat are high in energy. A gram of fat, whether it's saturated or unsaturated, provides 9kcal (37kJ) of energy compared with 4kcal (17kJ) for carbohydrate and protein.

## **Calcium**

Calcium is a mineral most often associated with healthy bones and teeth, although it also plays an important role in blood clotting, helping muscles to contract, and regulating normal heart rhythms and nerve functions. About 99% of the body's calcium is stored in bones, and the remaining 1% is found in blood, muscle, and other tissues. The Recommended Dietary Allowance (RDA) for calcium for women 19-50 years of age is 1,000 mg daily; for women 51+, 1,200 mg. For pregnant and lactating women, the RDA is 1,000 mg. For men 19-70 years of age, the RDA is 1,000 mg; for men 71+ years, 1,200 mg.

## **Potassium**

Potassium is a mineral found in the foods you eat. It's also an electrolyte. Electrolytes conduct electrical impulses throughout the body. Potassium plays a role in the function of the kidneys, the heart, the muscles, and the transmission of messages through the nervous system. The U.S. Dietary Reference Intakes state that there is not enough evidence to establish a Recommended Dietary Allowance (RDA) for potassium. For women 14-18 years of age, the AI is 2,300 mg daily; for women 19+, 2,600 mg. For pregnant and lactating women, the AI ranges from 2,500-2,900 depending on age. For men 14-18 years of age, the AI is 3,000 mg; for men 19+, 3,400 mg. It is estimated that the average daily intake of potassium in adults is about 2,320 mg for women and 3,016 mg for men.

## **Magnesium**

Magnesium, an abundant mineral in the body, is naturally present in many foods, added to other food products, available as a dietary supplement, and present in some medicines (such as antacids and laxatives). Magnesium is required for energy production, oxidative phosphorylation, and glycolysis. It contributes to the structural development of bone and is required for the synthesis of DNA, RNA, and the antioxidant glutathione. The Recommended Dietary Allowance (RDA) for adults 19-51+ years is 400-420 mg daily for men and 310-320 mg for women. Pregnancy requires about 350-360 mg daily and lactation, 310-320 mg.

## **Sodium**

Salt, also known as sodium chloride, is about 40% sodium and 60% chloride. It flavors food and is used as a binder and stabilizer. It is also a food preservative, as bacteria can't thrive in the presence of a high amount of salt. The human body requires a small amount of sodium to conduct nerve impulses, contract and relax muscles, and maintain the proper balance of water and minerals. It is estimated that we need about 500 mg of sodium daily for these vital functions. Guidelines for Adequate Intakes (AI) of sodium were established based on the lowest levels of sodium intake used in randomized controlled trials that did not show a deficiency but that also allowed for an adequate intake of nutritious foods naturally containing sodium. For men and women 14 years of age and older and pregnant women, the AI is 1,500 milligrams a day.

## **Zinc**

Zinc is a trace mineral, meaning that the body only needs small amounts, and yet it is necessary for almost 100 enzymes to carry out vital chemical reactions. It is a major player in the creation of DNA, growth of cells, building proteins, healing damaged tissue, and supporting a healthy immune system. The Recommended Dietary Allowance (RDA) for adults 19+ years is 11 mg a day for men and 8 mg for women. Pregnancy and lactation require slightly more at 11 mg and 12 mg, respectively. UL: The Tolerable Upper Intake Level is the maximum daily intake

unlikely to cause harmful effects on health. The UL for zinc is 40 mg daily for all males and females ages 19+ years.

## **Iron**

Iron is a mineral that is naturally present in many foods, added to some food products, and available as a dietary supplement. Iron is an essential component of hemoglobin, an erythrocyte (red blood cell) protein that transfers oxygen from the lungs to the tissues. 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. Heme iron, which is formed when iron combines with protoporphyrin IX, contributes about 10% to 15% of total iron intakes in western populations. The amount of iron you need is: 8.7mg a day for men over 18. 14.8mg a day for women aged 19 to 50. 8.7mg a day for women over 50.

## **Phosphorus**

Phosphorus is a mineral that makes up 1% of a person's total body weight. It is the second most abundant mineral in the body. It is present in every cell of the body. Most of the phosphorus in the body is found in the bones and teeth. It plays an important role in how the body uses carbohydrates and fats. It is also needed for the body to make protein for the growth, maintenance, and repair of cells and tissues. Phosphorus also helps the body make ATP, a molecule the body uses to store energy. The UL for phosphorus for adult men and women ages 19-70 years old is 4,000 mg daily, and for older adults 71+ years, 3,000 mg daily. The UL for pregnant and lactating women ages 14-50 years is 3,500 and 4,000 mg, respectively.



## **4. RESULTS AND DISCUSSION**

Results of the present study on “Documentation and nutritive evaluation of traditional foods of Kerala- Ernakulam 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 of different communities

#### 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 health foods

#### 4.1.5 Traditional food items prepared on special occasions

#### 4.1.6 Traditional kitchen utensils

### 4.2 Nutritive value calculation of traditional food items collected

### **4.1 Traditional food habits of different communities**

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, religious festivals and rituals, frequency of preparation of traditional health foods and details of traditional kitchen utensils and equipments used.

#### **4.1.1 Preference of traditional foods of different communities**

The details regarding the preference for traditional foods among different communities are given in the Table 5.

Table 5: Preference of traditional foods by different communities

Communities [n]	Preferred	Not preferred
Christians [12]	8 [66.6]	4 [33.3]
Muslims [8]	5 [62.5]	3 [37.5]
Hindus [5]	5 [100]	-

Numbers in parenthesis are percentage.

It was found that all respondents of Hindus were preferred the traditional foods and only [66.6] percentage of Christians preferred traditional foods and only [62.5] percentage of Muslims preferred these types of traditional foods.

In a study by Aneena (2009), it was reported in a study that all respondents of Hindus and Christians preferred traditional foods. Majority of the respondents in Zehavi (94.29%), Scheduled Caste, (61.11%), and Muslim (88.89%) communities also gave preference to traditional food.

#### 4.1.2 Reasons for preference of traditional food

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

Table 6: Reasons for preference of traditional foods

Reasons	Christians [12]	Muslims [8]	Hindus [5]
Healthy	12 [100]	8 [100]	5 [100]
Tasty	9 [75]	8 [100]	4 [80]
No adulteration	5 [41.6]	6 [75]	4 [80]
Less expensive	-	1 [12.5]	1 [20]
Ingredients are locally produced	3 [25]	-	1 [20]

Numbers in parenthesis are percentage.

All respondents belong to Christians and Hindus preferred traditional foods because of its health benefits. All respondents of Muslims are preferred traditional foods due to its taste and health benefits. 75% of Christians and 80% of Hindus preferred due to its taste. 41.6% of Christians, 75% of Muslims and 80% of Hindus preferred traditional foods as there was no adulteration in it. Less expensive was one of the reasons for choosing traditional food for 12.5% Muslims and 20% Hindus. 25% of Christians and 20% of Hindus are preferring it because of the ingredients are locally available.

It was reported that all respondents belonging to the Hindus who gave preference to traditional foods indicated that they preferred traditional foods because of their health benefits and all the Christians preferred traditional foods since they are very tasty. Most of the respondents who preferred traditional foods indicated that they preferred traditional foods since they are not adulterated.

Among 227 respondents in a study reported that; 62.11 and 52.42 per cent of respondents considered that they are healthy and tasty and 69.16 and 12.78 per cent preferred traditional foods due to their purity without any adulteration and low cost.

### 4.1.3 Frequency of preparation of traditional food items

The frequency of preparation of different traditional foods by the different communities for breakfast, lunch and snacks are given in Table 7

Table 7: frequency of preparation of traditional foods

Frequency	Christians [8]	Muslims [5]	Hindus [5]
Daily	5 (62.5%)	3 (60%)	5 (100%)
Weekly thrice	1 (12.5%)	2 (40%)	0
Weekly twice	2 (25%)	0	0

Numbers in parenthesis are percentage.

From the table, it is evident that 62.5% of Christians prepared traditional food items daily, 12.5% of Christians weekly thrice and 25% of Christians weekly twice. 60% of Muslims who preferred traditional foods prepared traditional foods daily and 40% prepared them weekly thrice. All the Hindus who preferred traditional foods, prepared and consumed traditional food items on a daily basis.

In a study conducted by Aneena (2009), it is clear that all respondents of Kerala Brahmin and Scheduled Caste communities prepared traditional food items daily for breakfast. Majority of the respondents belonging to Tamil Brahmin (88.57%), Zehavi (65.72%), Hindus of Palakkad (82.50%) and Christian (91.43 %) communities also prepared traditional breakfast items daily. However, only 47.22 per cent of respondents belonging to Muslim community prepared traditional food items daily for breakfast. Altogether it was found that 81.78 per cent of respondents prepared traditional food items daily for breakfast.

#### 4.1.4 Frequency of preparation of traditional health foods

The frequency of preparation of traditional health foods by the respondents who preferred traditional food items was found to be as follows:

Table 8: Frequency of preparation of traditional health foods.

Frequency	Christians [8]	Muslims [5]	Hindus [5]
Occasionally	4 (50%)	1 (20%)	2 (40%)
Never	4 (50%)	4 (80%)	3 (60%)

Numbers in parenthesis are percentage.

From the table, it is evident that 50% of the Christians who preferred traditional foods was found to prepare traditional health foods occasionally and the remaining 50% never prepared any. Likewise, 20% of the Muslims who preferred traditional food items prepared them occasionally and 80% did not prepare any traditional health food. 40% of the Hindus who preferred consuming traditional foods prepared traditional health foods occasionally and the remaining 60% never prepared any.

In a study conducted by Aneena (2009), it was indicated that none of the respondents of Tamil Brahmin and Ezhava communities prepared traditional health foods at home. Majority of Scheduled Caste (77.78%) and Christian (80%) respondents also did not prepare traditional health foods at home. About 73.33 per cent of Kerala Brahmin, 77.50 per cent of Hindus of Palakkad and 88.89 per cent of Muslim respondents indicated that they prepared traditional health foods at home occasionally.

#### 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 foods prepared by Muslims on special occasions

Occasions	Items
Marriage	Pahari, neichoru, biriyani, meat preparations
5 <sup>th</sup> and 7 <sup>th</sup> days of demise	Kurru kurukkal
40 <sup>th</sup> day of demise	Ghee rice and beef curry
Birthday	Meals with non vegetarian items
Noyambu thura	Kuzhal pathiri, unnakkaya, niracha pathiri, biriyani, ghee rice
Ramadan	Pathiri, ghee rice, biriyani
Muharram	Wheat verakiyathu

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

On the 40<sup>th</sup> day of the birth of a child, the Muslim community removed their baby's hair completely and, on this day, raw meat was distributed to close relatives. Birthdays were celebrated

only in high income families. On those days, meat preparations were included along with the major meals of the day.

During the death of a family member, kanji or cooked rice along with one or two vegetarian curries were served. On the seventh or fifteenth day of demise, a special porridge was prepared out of raw rice flour and jaggery syrup, which was called kurry kurukkuka. On the 40<sup>th</sup> day, ghee rice and beef curry were prepared and distributed to close relatives and family members.

For Noyambu thura, which is the breaking of 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 were some of the typical traditional items prepared and served.

On the day of Ramadan (perunnal) a religious festival celebrated by Muslims, a grand feast was arranged in all households in which the major items prepared included pathiri, neichoru, and biriyani. Beef curry or mutton curry were also served as side dishes. Variety of fried snacks were prepared and exchanged between friends, relatives and neighbours during this occasion. Muharram was 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	Beef stew, beef ularthiyathu, pulissery, neichoru, fish molly, vindaloo, mappas, biriyani, paachoru
Death	Vegetarian meals, kanji
7 <sup>th</sup> day after demise	Vegetable stew, appam, steamed banana
40 <sup>th</sup> day after demise Annual Remembrance Day	Beef ularthiyathu, meen pattichathu, chicken mappas
Easter	Appam, beef stew, beef cutlet, meen pattichathu, beef ularthiyathu, pulissery
Christmas	Appam, beef stew, thaaraavu mappas, fish molly
25 <sup>th</sup> day of religious 'vratha'	Inderiyappam
40 <sup>th</sup> day of religious 'vratha'	Paachoru
Festivals related to Church (perunnal)	Appam, Beef stew

For the betrothal function, paachoru was served first followed by appam and stew. Later, regular Christian sadya with all the non-vegetarian dishes was served.

On the marriage day, a traditional item called paachoru was served as breakfast item along with a meat curry. Families of low-income groups served kanji and beef ularthiyathu. Serving avilosu podi, achappam and kuzhalappam along with paachoru were also common among Christian community on marriage day. Achappam, kuzhalappam, vattayappam, vellayappam, avilosu podi, avilosunda were also prepared on different occasions like betrothal and marriage for treating guests.

During the death of a family member, kanji was prepared and served to the family members and relatives. On the 7<sup>th</sup> day of demise, a mediocre vegetarian sadya was served for the close



relatives. Christian communities prepared only vegetarian dishes until the 40<sup>th</sup> day of demise and they avoided curd, ghee, milk, egg, buttermilk and liquor till the 40<sup>th</sup> day. On the 40<sup>th</sup> day, a typical traditional non vegetarian Christian sadya was given to the relatives. For the annual Remembrance Day also a traditional non vegetarian sadya was prepared.

The special items for Palm Sunday and Osana perunnal included kozhukkatta or peechem pidi. Porridge with rice flour, jaggery and sugar called paalu kurukku was prepared on Maundy Thursday. The same dish, but without sugar called as pesaha kurukku was a specialty of Good Friday. Vattayappam and appam were prepared on the day of Easter. For Christmas, vattayappam, muttayappam, vettappam, etc. were made at home and on Christmas day a non-vegetarian feast was also arranged. Twenty fifth day of religious vratha namely ambathu noyambu was observed before Christmas and was especially distinguished with the preparation of inderiyappam. It was a special dish based on rice flour to which coconut and seasonings were added. On the 40<sup>th</sup> day of this religious vratha, chakkara paachoru was prepared. Festivals related to churches were 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, Peridal, Birthday, Chorunnu	Sadya
Adiyantharam	Adiyanthira sadya
Shradham	Shradha kanji, shradha puzhukku
Onam	Sadya, ada, varuthupperi
Vishu	Sadya, Vishu kanji, Vishu katta
Karkkidakam	Navadhanya kanji, cheeda, thavidu ada
Karkkidaka vavu	Ada
Uthradam	Ada, non vegetarian meals
Navarathri	Aval, malar, ada
Ekadasi	Gothambu kanji, chama kanji
Thiruvathira	Koovakurukku, ettangadi puzhukku
Karthika	Ada, appam
Temple festivals	Unniyappam, kinnathappam, murukku, avilosu podi

For marriage, peridal, choroonu, and birthday, the Ezhava community prepared sadya in which major items included rice, pulinkary, kutherissery, erupuli, olan, injipuli and pickle. During death, fasting was observed until cremation, after which kanji or black tea prepared at a nearby house was served to the family members. On the sixteenth day after the death of a family member, adiyanthiram was conducted with sadya almost similar to the marriage sadya avoiding papadam, plantain and payasam.

To celebrate Kerala's prime festival Onam, Kerala Brahmins made ada as an offering to thrikkakkarayappan, a God of the Hindu mythology. Rice flakes, karolappam, puffed rice, banana, kadali pazham etc. were also kept as naivedyam for the God and later all these items were distributed among family members. From Atham onwards, sadya, the traditional feast was

prepared with the most elaborate sadya on the day of thiruvonam. During the month of Karkkidakam, Ezhava community prepared tamarind seed unda, jack fruit seed chuttathu, mango kernel flour ada, njavara kanji and marunnu kanji.

Vishu was celebrated by preparing either Vishu kanji or Vishu puzhukku in which the major ingredient was jack fruit. Sadya was served for lunch on the day of Vishu.

To celebrate Karthika, they prepare ada and appam as the special traditional items.

#### 4.1.6 Traditional kitchen utensils

Information on traditional household utensils and equipment used were collected and the list is presented in Table 12. It was seen that different traditional kitchen utensils like churner, bharani, arakallu, kooja, etc. were used by the families.



Plate 11: Traditional kitchen utensils

Table 12. List of traditional kitchen utensils and equipment

<b>Sl.no</b>	<b>Utensils and equipment</b>	<b>Purpose of use</b>
1.	Arakallu	For mashing and grinding
2.	Bharani	For storage and fermentation
3.	Cheena chatti	Cooking and frying
4.	Churner	For churning
5.	Kal chatti	For preparing curries
6.	Kooja	For cooling water
7.	Mann chatti	For cooking
8.	Muram	For grading, sorting and cleaning
9.	Para	For measuring food items

#### 4.2 Nutritive value calculation of the traditional foods collected

Table 13. Nutritive value calculation of traditional food

Sl .no	Name of food	Energy (kcal)	CHO (g)	Protein (g)	Fat (g)	Ca (mg)	K (mg)	P (mg)	Zn (mg)	Fe (mg)
1.	Beef stew	287.23	12.64	26.43	14.25	-	-	-	-	3.14
2.	Meen peera	259.25	55.01	37.13	47.79	125.13	-	-	-	6.61
3.	Beef ularthiyathu	231.15	4.32	25.615	12.25	-	-	-	4.85	2.70
4.	Ariyunda	512.9	84.26	7.86	15.49	-	-	-	-	3.01
5.	Beef vindaloo	594.21	4.3	31.47	50.74	36.58	-	-	-	4.68
6.	Mutton chaps	403.88	4.09	25.3	30.12	208.73	-	-	-	3.34
7.	Meen thilapichathu	382.9	4.33	49.83	18.34	38.73	-	-	-	1.81
8.	Pachoru	489.79	83.56	6.93	13.6	47.94	332.2	110.4	-	-
9.	Diamond snack	305.66	41.21	6.59	12.4	18.39	82.05	79.96	-	-
10.	Sharkarappam	409.85	56.73	5.4	17.64	33.26	270.68	87.4	-	-

Macro nutrients and micro nutrients of 10 different traditional foods are mentioned here. Among these food items *Beef vindaloo* has highest calorie (594.2 kcal) and the lowest one is *Beef ularthiyathu* (231.15 kcal). Almost all food items have sufficient amount of carbohydrates but the highest of these are *Ariyunda* (84.26 g) and the lowest one is *Meen thialpichathu*, *Beef ularthiyathu*, *Beef vindaloo* and *Mutton chaps*.

Highest protein content is noticed in *Meen thilapichathu* (49.83 g) and the lowest of these are in *Sharkarappam* (5.4 g). Other traditional foods have a protein content between 6.59 to 37.13 g. As there are more of non-vegetable food items that we selected; so that all food items selected have enough amount of fat content present in it. Among these traditional foods the lowest fat content present in *Diamond snack* and *Beef ularthiyathu* (12.4 and 12.25 g); and the highest is in *Beef vindaloo* (50.74 g).

Most the traditional foods contain high amount of calcium. *Mutton chaps* contained highest amount of it. i.e. (208.73 mg). *Diamond snack* contained the lowest amount (18.39 mg). Potassium content is assessed only in food items that contain more of potassium. Highest amount of potassium present in *Pachoru* (332.2 mg). *Sharkarappam* also had high amount of potassium (270.68 mg). Lowest amount among this is present in *Diamond snack* (82.05 mg).

Phosphorus content is mostly present in the *Pachoru* (110.4 mg) and the lowest amount of it in *Diamond snack* (79.96 mg). Amount of zinc present in *Beef ularthiyathu* is (4.85 mg). Another micronutrient is iron that mostly present among this food is in *Meen peera* (6.61 mg). Lower amount is noticed in *Meen thilapichathu* (1.81 mg).

In a study by Aneena (2009), it was reported that the sodium content of other traditional foods varied from 0.016 to 9.49 mg per 100 g. The potassium content of traditional foods varied from 0 to 566.71 mg 100g<sup>-1</sup>.

## 5. SUMMARY AND CONCLUSION

The present study entitled “Documentation and Nutritive Evaluation of Traditional Foods of Kerala – Ernakulam District” was undertaken with the aim of identifying and collecting information on the information regarding the traditional foods and food habits of each community associated with religious customs, festivals, special occasions, the ingredients and their methods of preparation. Ernakulam district of Central Kerala was selected for the study. Ernakulam district is presently the Central business district of Kerala and being a part of “the land of Spices,” Ernakulam brings forward a unique culinary proficiency, with the tastiest variety of food that remains appreciated by the rest of the world. Population above the age of 45 years with knowledge in traditional food preparations were also selected randomly from each study locality to collect the relevant information. The respondents were categorised into different communities like Hindus, Muslims and Christians.

It was found that all respondents of Hindus preferred traditional foods and only [66.6] percentage of Christians preferred traditional foods and only [62.5] percentage of Muslims preferred these types of traditional foods. Respondents belonging to the Christian and Hindu communities preferred traditional foods because of its health benefits. All respondents of Muslims preferred traditional foods due to its taste and health benefits. 75% of Christians and 80% of Hindus preferred these foods due to its taste. 41.6% of Christians, 75% of Muslims and 80% of Hindus preferred traditional foods as there was no adulteration in it. Less expensive was one of the reasons for choosing traditional food for 12.5% Muslims and 20% Hindus. 25% of Christians and 20% of Hindus prefer it because the ingredients are locally available. On collecting data on the frequency of preparation of traditional foods, it was found that, 62.5% of Christians prepared traditional food items daily, 12.5% of Christians weekly thrice and 25% of Christians weekly twice. 60% of Muslims who preferred traditional foods prepared traditional foods daily and 40% prepared them weekly thrice. All the Hindus who preferred traditional foods, prepared and consumed traditional food items on a daily basis. It was also found that 50% of the Christians who preferred traditional foods was found to prepare traditional health foods occasionally and the remaining 50% never prepared any.



Likewise, 20% of the Muslims who preferred traditional food items prepared them occasionally and 80% did not prepare any traditional health food. 40% of the Hindus who preferred consuming traditional foods prepared traditional health foods occasionally and the remaining 60% never prepared any.

As traditional food habits were highly diversified and these items have strong link with religious and cultural practices, the food patterns of different communities during special occasions, festivals/rituals were also studied. The important traditional food items of Muslims on special occasions included unnakkaya, pazham nirachathu, mutta mala, mutta surukka, mutta marichathu, kozhi nirachathu, valayappam, tharippola, pinjanathappam, neichoru, beef curry kalathappam and different types of pathiri, The important traditional food items of Hindus on special occasions included sadya, Vishu kanji, cheeda, ada, aval, unniyappam, murukku, Vishu katta. The important traditional food items of Christians on special occasions included appam, beef stew, mappas, fish molly, vindaloo, paachoru, beef ularthiyathu.

The nutritive value of these foods were also calculated. It was found that among these food items *Beef vindaloo* contained the highest calories (594.2 kcal) and *Beef ularthiyathu* (231.15 kcal) contained the lowest calories. *Ariyunda* (84.26 g) contained the highest carbohydrates and *Meen thilapichathu*, *Beef ularthiyathu*, *Beef vindaloo* and *Mutton chaps* contained the lowest amount of carbohydrates. *Meen thilapichathu* (49.83 g) contained the highest protein content and *Sharkarappam* (5.4 g) contained the lowest amount. The lowest fat content was present in *Diamond snack* and *Beef ularthiyathu* (12.4 and 12.25 g); and the highest was in *Beef vindaloo* (50.74 g). Phosphorus is present in the highest amount in *Pachoru* (110.4 mg) and the lowest amount was in *Diamond snack* (79.96 mg). The amount of zinc present in *Beef ularthiyathu* is (4.85 mg). Iron was present in highest amounts in *Meen peera* (6.61 mg). Lower amount was noticed in *Meen thilapichathu* (1.81 mg).

Hence, it can be concluded that even though there is a rich treasure of diversified traditional foods in Ernakulam many of them are undergoing several changes. Transitions and modifications occurred in the traditional food habits and food patterns. In the present study, the documentation of traditional foods was done with an aim to protect these items from getting endangered. Future work could be conducted to document, replicate and popularize the traditional foods of Ernakulam.

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# APPENDIX

## Questionnaire for Traditional Recipe

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 any traditional food items for health care?

Yes/No

11. If yes, what is it? .....

12. How often do you prepare traditional healthy food ?

( Occasionally/Never )

13. How do you keep seasonal food for long period without getting spoilage?

.....

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. Which type of food do you prefer mostly ?

( 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 ?

( Daily/Weekly thrice/Weekly twice )