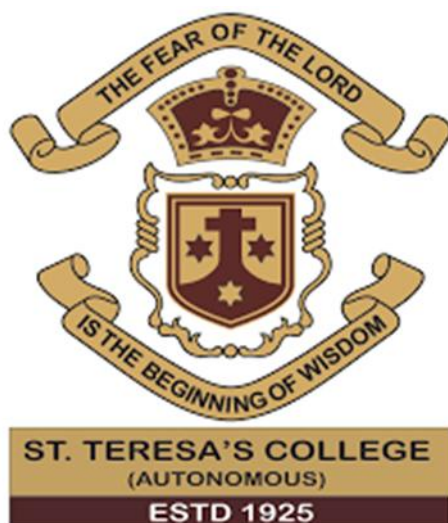


**DOCUMENTATION AND NUTRITIVE EVALUATION OF
TRADITIONAL FOODS OF KERALA – PALAKKAD DISTRICT**



PROJECT SUBMITTED

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

BY

ERIN BENNY

Register No - **SB20ND007**

DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS

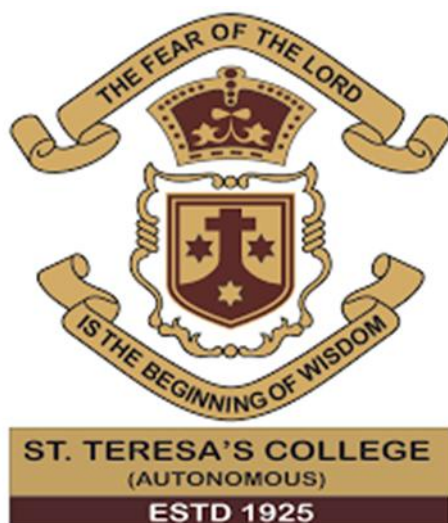
WOMEN'S STUDY CENTRE

ST. TERESA'S COLLEGE (AUTONOMOUS)

ERNAKULAM

APRIL 2023

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



PROJECT SUBMITTED

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

BY

ERIN BENNY

Register No - **SB20ND007**

DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS

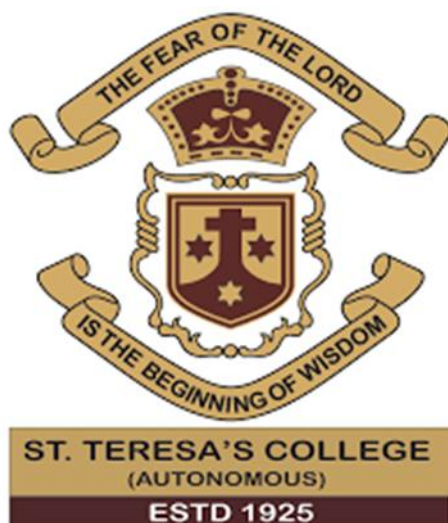
WOMEN'S STUDY CENTRE

ST. TERESA'S COLLEGE (AUTONOMOUS)

ERNAKULAM

APRIL 2023

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



PROJECT SUBMITTED

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

BY

ERIN BENNY

Register No - **SB20ND007**

DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS

WOMEN'S STUDY CENTRE

ST. TERESA'S COLLEGE (AUTONOMOUS)

ERNAKULAM

APRIL 2023

CERTIFIED AS BONAFIDE RESEARCH WORK

Signature of Research Guide

Signature of the External Examiner

DECLARATION

I hereby declare that the project entitled “**DOCUMENTATION AND NUTRITIVE EVALUATION OF TRADITIONAL FOODS OF KERALA – PALAKKAD DISTRICT**”, submitted in partial fulfillment of the requirement for the award of the degree of Bachelor's Programme in Clinical 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, 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

Erin Benny

Date: 18/04/2023

CERTIFICATE

I hereby certify that the project entitled “**DOCUMENTATION AND NUTRITIVE EVALUATION OF TRADITIONAL FOODS OF KERALA – PALAKKAD DISTRICT**”, submitted in partial fulfillment of the requirement for the award of the Degree of Bachelor's Programme in Clinical Nutrition and Dietetics is a record of original work done by **Ms. Erin Benny.**, 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
and Dietetics

St. Teresa's College
(Autonomous)

Signature of the Research Guide with designation

Dr. Soumya P.S

Assistant Professor

Department of Clinical Nutrition
and Dietetics

St. Teresa's College (Autonomous)
Ernakulam

ACKNOWLEDGEMENT

This project has been kept on track and has been seen through to completion with the support and encouragement of numerous people especially my friends and colleagues. I thank everyone who made the completion of this project, possible. I would like to thank all those who had contributed in ways they can, to complete my study.

First and foremost, I thank God Almighty, for providing me all the strength and courage to complete this project.

I hereby express my sincere gratitude to Rev. Sr. Emeline CSST, Director, Rev. Dr. Sr. Celine E (Sr. Vinitha CSST), Provincial Superior and Manager, and Dr. Alphonsa Vijaya Joseph, Principal, St. Teresa's College (Autonomous) Ernakulam, for granting me the permission to commence this project in the first instance and for allowing me to continue the same.

I am highly indebted to the Head of the Department of Clinical Nutrition and Dietetics, Ms. Surya M Kottaram, for her support and encouragement throughout the study.

I also express my sincere and deep gratitude to my research guide, Dr. Soumya P.S. for the help and co-operation received from her during the entire programme. Her valuable suggestions, inspiring guidance and encouragement helped me complete my study more effectively. This project would have not been possible without her immense help.

Also, my sincere and hearty thanks to all the teachers of the Department of Clinical Nutrition and Dietetics for their valuable suggestions.

I thank my project partners, Ms. Misrin Vadakkumpala, without whose support, hard work and determination, I could not have completed the project.

I express my unreserved gratitude and thanks to the residents of Palakkad who helped me with my data collection.

I also wish to place on record my deep sense of appreciation and humble thanks to my beloved parents for their encouragement to withstand the stress and kind motivation in completing my project. Their unconditional love and support provided me all the courage to finish my study.

I would also like to thank all my well-wishers who deserve special mention for their never-ending love and prayers.

Once again, thanks to all those who gave me the strength, courage, motivation, guidance and suggestions for making my project a success.

ERIN BENNY

LIST OF CONTENTS

		Page No.
Chapter I	INTRODUCTION	1
Chapter II	REVIEW OF LITERATURE	4
Chapter III	METHODOLOGY	20
Chapter IV	RESULTS AND DISCUSSION	33
Chapter V	SUMMARY AND CONCLUSION	48
	REFERENCE	50
	APPENDIX	53

LIST OF TABLES

Table No.	Title	Page No.
1	Details of locations selected for the study	20
2	Distribution of respondents selected for the study	21
3	Collected traditional foods	23
4	Preference for traditional foods	34
5	Reasons for preference of traditional foods	35
6	Frequency of preparation of traditional food items	36
7	Frequency of preparation of traditional health foods	37
8	Traditional food items prepared by Hindus on special occasions	38
9	Traditional food items prepared by Muslims on special occasions	39
10	Traditional food items prepared by Christians on special occasions	41
11	List of traditional kitchen utensils and equipment	43
12	Nutritive value of selected traditional food products	45
13	Nutritive value of selected traditional beverage	46

LIST OF PLATES

Plate No.	Title	Page No.
1	Areerappam	24
2	Nannari sharbath	25
3	Muttayappam	26
4	Unniyappam	28
5	Kesari	30
6	Utensils and Equipments	44

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 – Palakkad 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 nutritive evaluation of traditional foods of Kerala - Palakkad district” 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 β -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 an globalisation enhance access to no 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 also 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 Palakkad

3.3.2 Documentation of traditional foods in Palakkad

3.3.3 Preparation of selected traditional foods in Palakkad

3.3.4 To develop a nutritive value of selected traditional foods in Palakkad district

3.1 Locality of the study

Palakkad district of central Kerala, was purposefully selected for the study as there exist wide diversity in food habits, religion, and culture and socioeconomic conditions. From the selected district 5 study locations were selected for the study and the list of identified study locations are given in Table 1.

Table 1. Details of locations selected for the study

S.No	Palakkad
1	Thrithala
2	Pattambi
3	Ottapalam
4	Mezhathur
5	Koottanad

3.2 Selection of sample

Elderly persons above the age of 60 years with expertise 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 experts were categorized based on the communities they represent. Thus three communities namely Hindu community (HI), Muslim (MU) and Christian (CH) with distinct regional and religious diversified culinary culture were selected purposefully. A total of 20 elderly persons were selected as the sample for the study and the number of respondents belonging to each community in each district is given in Table 2.

Table 2. Distribution of respondents selected for the study

S.No	Communities	Palakkad
1	Hindu	8
2	Muslim	7
3	Christian	5
4	Total	20

3.3 Plan of study

3.3.1 Collection of information regarding traditional food habits in Palakkad

3.3.2 Documentation of traditional foods in Palakkad

3.3.3 Preparation of selected traditional foods in Palakkad

3.3.4 To develop a nutritive value of selected traditional foods in Palakkad district

3.3.1 Collection of information regarding traditional foods habits in Palakkad

For the collection of information regarding the traditional foods of Palakkad we used a questionnaire which collect information regarding the preparation , the occasions in which they are prepared , their shelf life and also about the equipment's which were used for the preparation of the selected traditional foods years before (like mud pot etc.) . Through the questionnaire we also got information regarding the traditional food habits of each community associated with religious customs ,festivals , special occasions , rituals , the changes that happened in the method of preparation over year's.

3.3.2 Documentation of traditional foods in Palakkad

From the questionnaire that we have used to collect information regarding the traditional foods , the details of different traditional foods of different communities were identified.Thus the identified traditional food recipes are given in Table 3. Indepth interviews were also conducted with experts to collect information regarding method of preparation of selected traditional foods. The documentation of the process through photographic and written methods was done. Through the questionnaire we also collected information regarding the history of selected traditional foods and also the changes that has occurred to the traditional food preparation. The information regarding the shelf life of different traditional foods and also the occasions in which they are prepared were also collected using the questionnaire.

Table 3. Collected traditional food recipes

S.No	Items
1	Areerappam
2	Muttayappam
3	Unniyappam
4	Kala kala
5	Murukku
6	Neyyappam
7	Koova payasam
8	Kesari
9	Nannari sarbath
10	Uralappam

3.3.3 Preparation of selected traditional foods in Palakkad

1. Areerappam

Ingredients:-

Jaggery – 250 grams; grated

Water – 2 cups

Coarse rice flour – 2 cups

Salt to taste

Grated coconut – 1.25 cup

Cumin seeds – 1 tsp.

Powdered cardamom – 1/2 tsp.

Oil for deep-frying

Method:-

1. Boil 2 cups of water along with the grated jaggery and allow the jaggery to melt.
2. Stir in the rice flour, salt, cumin seeds, coconut and cardamom powder. Cook on low heat till the whole thing comes together as a mass.
3. Knead the dough well when it is still hot.
4. The next day, make balls from the dough. Shape each ball into a roundel with a hole in the center.
5. Areerappam has the same size and shape of uzhunnuvada.
6. Deep fry in hot oil on medium low heat till dark brown on both sides.
7. Serve warm. They would be crispy outside but soft inside.



Plate 1 -Areerappam

2. Nannari sharbath

Ingredients:-

Nannari syrup- 4 tablespoons

lemon juice - 1 tablespoon

Water- 2 cups

Method :-

1. Take 3 to 4 tablespoons of nannari syrup in a glass.
2. Squeeze some lemon juice. You can add about $\frac{1}{2}$ to 1 tablespoon of lemon juice.
3. Pour water and mix well.
4. Add some ice cubes. if using cold water, then you can skip ice cubes. You can also add some soaked sabja seeds in the sharbath. The addition of sabja seeds will make the drink more cooling.
5. Serve nannari sharbat



Plate 2- Nannari sarbath

Muttayappam

Ingredients:-

1 cup- Raw rice

1- egg

1 -Onion

2 -Green chilly

2g- Coriander leaves

1/2 tsp- salt to taste

100ml- oil

Method:-

1. First soak rice over night.
2. Grind it along with very little water. The batter should be in a thick consistency.
3. Add 1 egg and blend it again.
4. Pour it into a bowl and add chopped onion, green chilly, coriander leaves and salt. Mix well.
5. Pour a small laddle full of batter into the hot oil and deep fry until light brown in color.
6. Serve muttayappam



Plate 3- Muttayappam

3. Unniyappam

Ingredients:-

2 -Ripe Banana

1- cup Jaggery

1 cup- Water

2 cup- Rice Flour

2 tsp -Cardamom Powder

1 tsp -Dry Ginger Powder

100ml -Oil / Ghee for frying

Method:-

1. Peel banana and add it to blender. Make it into a smooth puree. Put that in a mixing bowl.
2. Heat jaggery and water till it is melted. Sieve it through a strainer. Pour that over the banana and mix well.
3. Add in cardamom and dry ginger powder. Mix this well too
4. Add in the rice flour and mix well so a thick batter is formed. If it is too thick add in some more water. If it is too thin add some flour.
5. Now add in baking soda and mix well. Cover this batter and let it ferment for 3 to 4 hours.
6. Now heat ghee or oil in a frying pan. Drop spoonful of this batter in hot ghee and fry till golden on one side. Flip over and cook for another minutes.
7. Drain and serve unniyappam



Plate 4 - Unniyappam

4. Kesari

Ingredients:-

Semolina- 2 cup

Sugar- 1 1/2 cup

Ghee- 1 cup

Coconut oil - 2 tablespoons

Cashew nut - 125g

Almond - 125g

Saffron- 1/2 tbsp

Cardommon- 1/4 tsp

Water- 4 cup

Method:-

1. Heat 2 table spoons of ghee in a heavy bottom pot. Split open cashew nuts and clean them. Fry them until slightly golden.
2. Add 12 almonds and fry . Remove them to a plate.
3. Next pour the 1 cup rava. Mix well to coat the rava in ghee.
4. Begin to roast the rava well on a low to medium heat until crunchy and slightly aromatic. Do not brown it.
5. While the semolina is getting roasted, bring 2 cups water to a boil in a pot. You can also use milk or a mix of both. Kesari bath is mostly made with water and not milk.
6. When the water comes to a rolling boil, pour it to the rava slowly in a stream. Stirring consistently with the other hand. Make sure the flame is medium at this stage.
7. There should be no lumps.
8. Continue to cook stirring consistently until the water is absorbed completely.
9. Lower the flame and cook covered for 2 to 3 minutes.
10. Add $\frac{3}{4}$ to 1 cup sugar and mix well. I use 1 cup. If you prefer low sweet, then add lesser. Sugar melts and makes the mixture gooey. Then continue to cook until all the moisture evaporates.
11. Sprinkle $\frac{1}{4}$ teaspoon cardamom powder and kesari color. I used 2 pinches of saffron soaked in 2 tbsps hot water. If you do not have the kesari, just skip it.
12. Next add 3 to 4 tbsp ghee. I used 3 tbsp.
13. Mix well and continue to cook until the mixture leaves the pan. Cook covered for 2 minutes.
14. Garnish it with the nuts and serve the kesari



Plate 5- Kesari

3.3.4 To develop a nutritive value of selected traditional foods in Palakkad district

Macronutrients:

Energy

Our bodies need the energy to grow and repair themselves, keep warm and do physical activity. Energy comes from food and drinks, in particular from carbohydrates, protein, fat and alcohol. Carbohydrates, protein and fat are essential **macronutrients** (often called ‘macros’) as we need them in our diet in large amounts (macro=large) to survive and function. Alcohol is non-essential (not needed in our diet). Energy is measured in kilojoules (kJ) or calories (kcal).

$$1 \text{ kcal} = 4.2 \text{ kJ}$$

Carbohydrates

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. Some foods don't have a lot of carbohydrates, such as meat, fish, poultry, some types of cheese, nuts, and oils.

Protein

Protein is found throughout the body—in muscle, bone, skin, hair, and virtually every other body part or tissue. It makes up the enzymes that power many chemical reactions and the haemoglobin that carries oxygen in your blood. At least 10,000 different proteins make you what you are and keep you that way. Protein is made from twenty-plus basic building blocks called amino acids. Because we don't store amino acids, our bodies make them in two different ways: either from scratch, or by modifying others. Nine amino acids—histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine—known as the essential amino acids, must come from food.

Fat

In humans and many animals, fats serve both as energy sources and as stores for energy in excess of what the body needs immediately. Each gram of fat when burned or metabolized releases about 9 food calories ($37 \text{ kJ} = 8.8 \text{ kcal}$).

Fats are also sources of essential fatty acids, an important dietary requirement. Vitamins A, D, E, and K are fat-soluble, meaning they can only be digested, absorbed, and transported in conjunction with fats.

Fats play a vital role in maintaining healthy skin and hair, insulating body organs against shock, maintaining body temperature, and promoting healthy cell function. Fat also serves as a useful buffer against a host of diseases. When a particular substance, whether chemical or biotic, reaches unsafe levels in the bloodstream, the body can effectively dilute—or at least maintain equilibrium of—the offending substances by storing it in new fat tissue. This helps to protect vital organs, until such time as the offending substances can be metabolized or removed from the body by such means as excretion, urination, accidental or intentional bloodletting, sebum excretion, and hair growth.

Micronutrients :

Vitamin A

Beta-carotene belongs to a group of coloured pigments called carotenoids. It's converted to vitamin A in the body and found in many fruits and vegetables.

Beta-carotene and other red, orange, and yellow pigments called carotenoids are considered antioxidants. They provide about 50% of the vitamin A needed in the diet. Vitamin A is an essential nutrient. Its antioxidant and anti-inflammatory effects help to protect cells from damage. People use beta-carotene for an inherited disorder marked by sensitivity to light. It is also used to prevent certain cancers, heart disease, cataracts, aging skin, and many other purposes, but there is no good scientific evidence to support most of these uses.

Many global health authorities recommend getting beta-carotene and other antioxidants from food instead of supplements.

Vitamin B12

Vitamin B₁₂, also known as cobalamin, is a water-soluble vitamin involved in metabolism. It is one of eight B vitamins. It is required by animals, which use it as a cofactor in DNA synthesis, and in both fatty acid and amino acid metabolism. It is important in the normal functioning of the nervous system via its role in the synthesis of myelin, and in the circulatory system in the maturation of red blood cells in the bone marrow. Plants do not need cobalamin and carry out the reactions with enzymes that are not dependent on it. Vitamin B₁₂ is the most chemically complex of all vitamins, and for humans, the only vitamin that must be sourced from animal-derived foods or from supplements.

4. RESULTS AND DISCUSSIONS

Results of the present study on “Documentation and nutritive evaluation of traditional foods of Kerala - Palakkad 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 by 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 of traditional foods and beverage

4.2.1 Nutritive value of traditional foods products

4.2.2 Nutritive value of traditional Beverages

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, and details of traditional kitchen utensils and equipments used.

4.1.1 Preference of traditional foods by different communities

The details regarding the preference for traditional foods among different communities are given in Table 4

Table 4. Preference for traditional foods

Communities (n)	Preference for traditional foods	
	Preferred	Not preferred
Hindu (8)	8 (100.00)	-
Muslim (7)	5 (71.42)	2 (28.57)
Christian (5)	3 (60.00)	2 (40.00)
Total (20)	16 (80.00)	4 (20.00)

Numbers in parenthesis are percentage

It was found that all respondents from Hindus preferred traditional foods. Majority of the respondents from Muslim(71.42%) and Christian(60.00%) communities also preferred traditional foods.

In a study conducted by Shyna (2001), it was seen that more than 70 per cent of respondents preferred traditional foods due to their variety, purity and palatability. In a study conducted by Aneena (2009), it was seen that majority of respondents of Kerala preferred traditional foods

4.1.2. Reasons for preference of traditional foods

The reasons indicated by the respondents for the preference given for traditional foods are presented in Table 5

Table 5. Reasons for preference of traditional foods

Reasons	HI (n=8)	MU (n=5)	CH (n=3)	TOTAL (n= 16)
Healthy	2 (25.00)	5 (100.00)	1 (33.33)	8 (50.00)
Tasty	3 (37.50)	2 (28.57)	3 (100.00)	8 (50.00)
No adulteration	8 (100.00)	1 (14.28)	1 (33.33)	10 (62.5)
Less expensive	-		-	-
Ingredients are locally produced	2 (25.00)	1 (14.28)	-	3 (18.75)

Numbers in parenthesis are percentage

All respondents belonging to the Muslim community who gave preference to traditional foods indicated that they preferred traditional foods because of their health benefits, the Christians preferred traditional foods since they are very tasty and the Hindus preferred traditional foods since they are not adulterated.

Among 16 respondents who preferred traditional foods 50.00 and 50.00 per cent of respondents considered that they are healthy and tasty and 62.50 and 18.75 per cent preferred traditional foods due to their purity without any adulteration and the ingredients were locally produced.

In a study conducted by Aneena (2009) it was seen that among 227 respondents who preferred traditional foods 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 are given in Table 6.

Table 6. Frequency of preparation of traditional food items

Frequency	HI (n=8)	MU (n=5)	CH (n=3)	TOTAL (n=16)
Daily	5 (62.5)	5 (100.00)	1 (33.33)	11 (68.75)
Weekly twice	3 (37.50)	-	-	3 (18.75)
Weekly thrice	-	-	2 (66.66)	2 (12.5)

Numbers in parenthesis are percentage

From table 6 it is clear that all respondents from Muslim community prepared traditional food items daily. Among 16 respondents who preferred traditional foods 68.75 per cent of respondents preferred consumption of traditional foods on daily basis, 18.75 per cent of respondents preferred consumption weekly twice and 12.5 per cent of respondents preferred consumption weekly thrice.

In a study conducted by Aneena (2009) it was seen that only 47.22 per cent of respondents belonging to Muslim community prepared traditional food items daily. Altogether it was found that 81.78 per cent of respondents prepared traditional food items daily

4.1.4 Frequency of preparation of traditional health foods

The frequency of preparation of different traditional health foods by the different communities are given in Table 7.

Table 7. Frequency of preparation of traditional health foods

Frequency	HI (n=8)	MU (n=5)	CH (n=3)	Total (n=16)
Occasionally	5 (62.5)	-	1 (33.33)	6 (37.5)
Never	3 (37.5)	5 (100.00)	2 (66.66)	10 (62.5)

Numbers in parenthesis are percentage

Details of frequency of preparation of different health foods by different communities (Table 7) indicated that none of the respondents of Muslim community prepared traditional health foods at home. Majority of the Christian community also did not prepare traditional health foods at home. Among 16 respondents who preferred traditional foods 37.5 per cent prepared traditional health foods at home and 62.5 per cent of respondents did not prepare traditional health foods at home.

In a study conducted by Aneena (2009) it was seen that majority of Christian (80%) respondents did not prepare traditional health foods at home. About, 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 Table 8 to 10.

4.1.5.1 Hindu

Traditional foods prepared in connection with special occasions of the Hindu community are presented in Table 8

Table 8. Traditional food items prepared by Hindus on special occasions

Occasion	Items
Annaprasam	Ada appam, aval and malar in jaggery syrup, sadya
Birthday	Ada, appam, sadya
Marriage Namakaranam Upanayam	Sadya
Death	Adiyanthira sadya
Shradham	Shradha sadya

Traditional Kerala sadya, the legendary vegetarian feast was served during marriage, namakarana (naming ceremony), upanayanam (sacred thread ceremony), annaprasam (giving solid food to the infant for the first time) and for birthday.

For shradha sadya, Hindus insisted on serving raw white rice called kavyam. Injithairu without adding chillies and pazham nurukku, banana chips, bread fruit chips and colocasia chips were also served. All items were prepared in brass or wooden vessels using ghee. Ada pradhama with jaggery and coconut milk was a compulsory item for shradha sadya. It was found that appam and ada were served in almost all special occasions of Hindus.

4.1.5.2 Muslim

Traditional foods prepared in connection with special occasions of the Muslim community are presented in Table 9

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

Occasion	Items
Marriage	Pathiri, neichoru, biriyani, meat preparations
5 th and 7 th day of demise	Kurry kurukkal
40 th day of demise	Ghee rice and beef curry
Birthday	Meals with non vegetarian items

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 bride's house after marriage, 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 puthiyapla (bride groom).

On the 40th day of the birth of a child, Muslim community removed baby's hair completely and on this day, raw meat was distributed to close relatives. Birthdays were celebrated only in high income families during which time, meat preparations were included along with the major meals of the day. During 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 40th day, ghee rice and beef curry were prepared and distributed to close relatives and family members.

4.1.5.3 Christian

Traditional foods prepared in connection with special occasions of the Christian community are presented in Table 10

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

Occasion	Items
Betrothal, Marriage, birthday, baptism, Holy communion	Traditional Christian non vegetarian sadya
Death	Kanji
7 th day after demise	Vegetarian meals
40 th day after demise Annual remembrance day	Non vegetarian meals

For betrothal function, paachoru was served first followed by appam and stew. Later, regular Christian sadya with all non vegetarian dishes was served. On the previous day of marriage, a dinner with rice and botti (curry made up of intestine of cattle) varutharacha curry, puzhukku with plantain, yam and kavath was a usual practice. On 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 ularthu. Serving avilosu podi, achappam and kuzhalappam along with paachoru were also common among Christian community on marriage day.

After marriage, a sadya was served with non vegetarian items. Traditionally, the first item served was either paachoru or venpaachoru for marriage sadya. After that rice was

served with chicken curry to which ash gourd pieces were added, along with pork ularthiyathu, fish peerai, beef fry and morucurry. Along with this, there was a custom of serving different types of plantains also. Christian community also served a dessert called panambani prepared from fermented jaggery syrup, plantain and sugar. Kozhimbidi was also prepared as a special non vegetarian item for functions related to betrothal and marriage. 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 along with cowpea thoran and uppilittathu as the side dishes, after cremation. On the 7th day of demise, a mediocre vegetarian sadya was served for the close relatives. Christian communities prepared only vegetarian dishes until 40th day of demise and they avoided curd, ghee, milk, egg, butter milk and liquor till 40th day. On the 40th 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.

In a study conducted by Aneena (2009) it was seen that Muslim community gave prime importance for hospitality and prepared numerous delicious food items on all occasions and distributed to friends and relatives. Rajashekhar (2005) reported that Muslim food habits have been influenced very much by Islam and Arab traders and they used milk, nuts, dry fruits and juices abundantly in their preparations.

On the occasion of marriage, neichoru along with meat preparations were the major items served. Shyna (2001) also observed that Muslims prepared neichoru for their marriage feast.

Christian food habits are influenced by the Portuguese, Dutch and British food habits (Rajashekhar, 2005). Abraham (2007) reported similar pattern of Sadya in Syrian Christians of Kerala. Jacob (2004) reported that chicken curry added with fried grated coconut paste, beef ularthu added with coconut pieces, fish curry added with kudampuli preserved by smoking and garlic, ginger and curry leaves were the major items of Christian marriage sadya.

4.1.6 Traditional kitchen utensils and equipments

The traditional kitchen utensils and equipments used by different communities are given in table 11

Table 11. List of traditional kitchen utensils and equipment

SL.No	UTENSILS AND EQUIPMENTS	USES
1.	Ada palaka	For straining water from cooked rice
2.	Cheena chatti	Cooking and frying
3.	Kalchatti	Preparing curries
4.	Ammi	Mashing and grinding
5.	Chirava	For scraping coconut
6.	Manchatti	Cooking
7.	Ural and ulakka	Pounding



PLATE 6

In a study conducted by Aneena (2009) it was seen that different traditional kitchen utensils like chottu kotta, ada palaka, arivetti, korika, neyyuruli, pancha paathram, mara pathi, marika, gomukhi etc. were used by the families. Majority of the respondents also indicated that they are still using kuzhi uruli(66.4%), manchatti(64.37%) and nazhi(60.73%).

4.2 Nutritive value of traditional foods and beverage

The nutritive value of different traditional food and beverages are presented in the table 12 and table 13

4.2.1 Nutritive value of traditional foods products

The nutritive value of different traditional food products are given in the table 12

Table 12. Nutritive value of selected traditional food products (1 serving)

Sl no.	Name of food	Energy (Kcal)	Carbohydrates (g)	Protein(g)	Fat(g)	Beta carotene (IU)	Vitamin B12 (IU)
1.	Areerappam	1554.89	123.08	21.08	109.45	-	-
2.	muttayappam	1110.54	64.69	19.61	87.12	24.25	0.36
3.	unniyappam	1351.85	128.79	19.26	85.16	25.04	-
4.	kesari	1809.73	102.51	103.47	28.1	168.75	-

4.2.2 Nutritive value of traditional Beverages

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

SL no.	Name of beverage	Energy (kcal)	Carbohydrates (g)	Protein(g)	Fat(g)	Beta carotene	Vitamin B12
1.	Nannari sarbath	72	18	-	-	-	-

From the above tables it is evident that kesari has highest calories(1809.73kcal), protein(103.47g) compared to other traditional foods and nannari sarbath with 72kcal energy is the least. Unniyappam has higher carbohydrate content, areerappam has higher fat content.

Sharon et al.(2006) also reported high carbohydrate content in traditional foods of Kerala which varied from 24 to 79 per cent. Nagaraja (2006) indicated 40 per cent carbohydrate in Halu bayi,a Karnataka traditional food based on peanut and ground coconut. Sharon et al(2006) indicated protein content in the range of 2.36 to 9.41 per cent in traditional Kerala foods.

High fat content was observed in niracha pathiri which is a deep fried non vegetarian item followed by kala kala another fried snack. In a study on math i,a traditional fat fried food, Kalra et al.(1996) observed a fat content in the range of 30 to 45 per cent.

In a study conducted by Aneena (2009) it was seen that he lime based beverage cherunaranga then vellam had vitamin C and jaggery added beverage paanakamhad more iron also. These beverages contained minor amounts of sodium, calcium and iron.

The present study entitled on “Documentation and nutritive evaluation of traditional foods of Kerala - Palakkad district” was undertaken with the aim of identifying and collecting information on the various traditional foods of Kerala - Palakkad district and to document their nutritive value. The respondents were categorised into different communities, Hindus, Muslims and Christians. As traditional food habits were highly diversified and these items have strong link with religious and cultural practices.

5. SUMMARY AND CONCLUSION

The study entitled “documentation and nutritive evaluation of traditional foods of Kerala -Palakkad district” was taken up with the objectives of identifying and collecting information on various traditional foods of Palakkad and documenting their mode of processing for and nutritive values of the same. Traditional foods are foods and dishes that are passed on through generations or which have been consumed for many generations. Elderly citizens above 60 years of age who possess the details of traditional food items and preparations of Palakkad were selected as respondents. The respondents were categorized based on the communities they represent. Thus three communities namely Hindu community, Muslim (MU) and Christian (CH) with distinct regional and religious diversified culinary culture were selected purposefully. A total of 5 elderly persons were selected as the sample for the study.

Traditional food habits of respondents, their preference, reasons for their preference for traditional foods, frequency of preparation of traditional foods, traditional foods prepared during special occasions, and details of traditional kitchen utensils and equipments used were collected. The nutritive value for each selected traditional food were also found out.

It was found that majority of respondents from all three communities i.e.Hindu, Muslim and Christian preferred traditional foods due to their tastiness, purity of not having any adulteration and health benefits. it is also clear that all respondents from Muslim community prepared traditional food items daily. Among 16 respondents who preferred traditional foods 68.75 per cent of respondents preferred consumption of traditional foods on daily basis, 18.75 per cent of respondents preferred consumption weekly twice and 12.5 per cent of respondents preferred consumption weekly thrice. Details of frequency of preparation of different health foods by different communities also indicated that none of the respondents of Muslim community prepared traditional health foods at home. Majority of the Christian community also did not prepare traditional health foods at home. Respondents belonging to different communities prepared various traditional foods during special festivals such as sadhyas, marriages and betrothal functions etc. From the selected food products kesari had the highest calorie and protein content. Unniyappam had higher carbohydrate content.

Changes were observed in the traditional food pattern and foods over different years with respect to change in ingredients, chemical composition and utensils used for preparation.

This was due to the introduction of new utensils that require less labour compared to the traditional utensils and purchase of instant mixes.

From the collected traditional food recipes such as areerappam, muttayappam, unniyappam, kala kala, murukku, neyappam, koova pasayam, kesari, nannari sarbath and uralappam 5 were selected for preparation and further evaluations.

Nutritive evaluation has also shown changes as most of them were rich in either macro or micro nutrients. Results indicated that most of the traditional foods are acceptable to younger generation.

From the present study, it was found that the selected traditional food items could be replicated under the prevailing conditions without much change in their quality aspects. Hence, these technologies should be popularised as an attempt to conserve the traditional cuisines of Palakkad .

REFERENCES

- Abraham, C. 2007. *Suriyani christianikalude paarambarya bhakshanangal*. In: Rajagopalan, C. R. and Leena, M. A. (eds.), *Naatubakshanam* (4* ed.). D.CBooks, Kottayam, pp. 111-120.
- Achaya, K.T. 1998. *Indian Food - A Historical Companion*. Oxford University Press, New Delhi. p. 322
- Aneena E.R. 2009. Documentation and quality evaluation of selected traditional foods of central zone of Kerala. Kerala Agricultural University, Thrissur
- Bedekar, B.R. 2006. Heritage or traditional processed foods-where is the technology. *Indian Fd Ind.* 25: 46-47.
- Chaudhry, P. 2006. Heritage foods-opportunities and challenges. *Indian Fd Ind.* 25: 83-84.
- Chopra, S.L. and Kanwar, J.S. 1978. *Analytical Agricultural Chemistry*. Kalyani Publishers, Ludhiyana, 110 p
- Diaz, E.C. 2005. Food sovereignty and traditional knowledge. In: *International workshop on traditional knowledge*; 21-23, September, 2005, Panama City. International Indian Treaty Council., USA. pp.1-10
- Dwivedi, S. 2000. April 30. Culinary customs. *The Hindu. Folio*.p. 14.
- Everett, S. and Aitchison, C. 2008. The role of food tourism in sustaining regional identity: a case study of Cornwall, South West England. *J. Sustain. Tourism*16(2): 150-167
- Hollingsworth. 2000. Marketing trends futuring healthful foods success. *Fd Technol.* 54(10): 58

- Holt, G. and Amilien, V. 2007. Introduction: from local food to localised food. *Anthrop. Fd* 2: 64-67.
- Kalra, C.L., Sehgal, R.C., Nayender, A. and Berry, S.K. 1998. Preparation, packaging and quality standards of *mongra* -A traditional savoury product. *J. Fd Sci. Technol.* 35(5): 414-418
- Kuhnlein, H.V. and Receveur, O. 1996. Dietary change and traditional food systems of indigenous people. *Ann. Rev. Nutr.* 16: 417-442.
- Lang, T. 1999. Diet, health and globalization: Five key questions. *Proc. Nut. Soc.* 58(2): 335-343..
- Mendez, M.A., Du, S.F. and Popkin, B.M. 2004. *Urbanization, Income and the Nutrition Transition in China: A Case Study*. FAO Food and Nutrition Paper, Food and Agricultural Organisation, Rome 193p
- Nagaraja, L.R. 2006. Processes and nutritionally improved *Halu bayi* (a traditional food) [abstract]. In: *Eighteenth Indian Convention of Food Scientists and Technologists*; 16-17, November, 2006, Hyderabad. Central Food Technological and Research Institute, Mysore. p.98. Abstract No.TC-29.
- Oniang'o, R.K., Mutuku, J.M. and Malaba S.J. 2003. Contemporary African food habits and their nutritional and health implications. *Asia Pac J. Clin. Nutr.* 12(3): 331-336.
- Pratima, R. 2000. Traditional foods. *Nutrition.* 34(3): 3-6
- Rao, P.H. and Srivastava, A.K. 1998. Global prospects for traditional baked products. *IFCON-98. Fourth International Food Convention, Mysore, Nov. 23-26. Proceedings of Technical Session*, p. 1058

Rajashekhar, K. 2005. Nov-Dec. Gourmand's own country. *Kerala Calling*. 26(2): 42-43

Sharma, R. and Lai, D. 1999. Changes in some water soluble vitamins during preparation and storage of *khoa*. *J. Fd Sci. Technol.* 36(4):349-351

Sharon, C.L., Aneena, E.R. and Indira, V. 2006. Nutritional significance of selected traditional breakfast foods of Kerala [abstract]. In: *18th Indian Convention of Food Scientists and Technologists*; 16-17, November, 2006, Hyderabad. Central Food Technological and Research Institute, Mysore. p.94. Abstract No.TC-10.

Shyna. K.P. 2001. Traditional food habits of different communities in Thrissur district. MSc (Home Science) thesis, Kerala Agricultural University, Thrissur, 128p

APPENDIX

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 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