

# Investigating the impact of modernization attributes and knowledge toward sustaining Nyonya cuisines in Malacca

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## Abstract

This study attempts to determine which of the modernization attributes effect on sustaining Nyonya cuisine in Malacca as Malaysian heritage cuisine and furthermore to identify the relationship between knowledge and sustaining Nyonya cuisine in Malacca. A self-administered survey was used to collect data from the respondents. A total of 400 questionnaires were distributed among Baba Nyonya communities in Malacca; 400 valid samples for evaluation representing a response rate of 100%. The results show that changes of production and processing method is the most affected to the sustaining Nyonya cuisine in Malacca. Since the finding shows a positive relationship between modernization attributes, knowledge and sustainability of Nyonya cuisine, Malaysia Department Heritage, Baba Nyonya Peranakan communities and individual need to emphasize these attributes to prevent the extinction of Nyonya cuisine. Hence, this study would be assisting future researchers to gain substantial insight and information in order to market and promote Nyonya cuisine in the industry as well as to sustain it.

## Keywords:

Nyonya cuisine; Baba Nyonya; Peranakan; Heritage Cuisine; Modernization and Knowledge

## 1 Introduction

Malaysia is a multiracial or multi-ethnic country with a diverse cultural mix. There are three primary ethnic groups known as Malay, Chinese, and Indian, as well as many more ethnic groups or races (indigenous people) that live primarily in Sabah and Sarawak (Kuake & Kuake, 2017). Therefore, it makes Malaysia unique with variety of culinary heritages and foodways. According to Muhammad, Zahari, Shariff, and Abdullah (2016), foodway refers to the way how food is prepared, served and consumed by human as well as a key component of culture and sense of identity. For instance, there are many types of laksa in Malaysia with different ingredients, methods of cooking, tastes and eating decorum. The taste of the laksa reflects the ethnicities, states, culture and identity. Known as *laksa utara*, *laksa penang*, *laksa sarawak*, *laksa johor*, *asam laksa* and *laksa terengganu*.

In addition to this, Nyonya cuisine is also identified as one of Malaysia's heritage cuisines. Nyonya cuisine arose from the Peranakan descendants by intermarriages of Chinese male and local women. Baba Nyonya are originated from Malacca. However, in 19th century some of the Baba Nyonya migrates to Penang and Singapore during British colonial expansion. These three main states however have different taste and flavour of food. Penang dishes are influenced by Thai cuisine with annexation of South Indian taste. The foods are tangy and spicy as compared to Nyonya cuisine in Malacca and Singapore. By contrast, Nyonya cuisine in Malacca and Singapore are sweeter and less spicy as it is inspired by Portuguese and Indonesia (Ng & Ab. Karim, 2016)

According to Ng and Abdul Karim (2016), Nyonya cuisines are created through hybridized culture due to existing of local ingredients with Chinese principles of food preparation that merged together. The creation of this cuisine not only for daily consumption but also for ancestral worship and cultural ceremonies. Nyonya cuisine named after Nyonya (women) because they invented the cuisine since 17<sup>th</sup> century.

However, as time has passed, the Baba Nyonya community has reduced in numbers. Due to the waves of modernization, the majority of Nyonya culinary heritage cuisine has undergone various transformations or alterations (Zahari et. al, 2011). In modern technology, there are changes in production and processing method of preparing Nyonya cuisine and knowledge that has been passed down to one generation to one generation. According to Henderson (2014), the taste of heritage cuisine became more westernised as a result of modernization. Modernization has a favourable impact on socioeconomics, education, technology, and lifestyle. On the other hand, it has an impact on ethnic cultures and practises. Furthermore, changes in products, cooking techniques, cooking equipment, and serving styles will have a huge impact on future generations. Even more ironic is the fact that the younger generations, who are supposed to be the successors, are now mainly forsaking their ancestors' habits and cultural legacy. As a result of the waves of modernization, Nyonya cuisine will fade away.

Therefore, it is very important for Baba Nyonya communities to sustain the uniqueness of the customs, culture and heritage food in the future to prevent modernization effect the culture and most importantly the Baba Nyonya cuisines. Although Malaysian Government has encouraging local to sell traditional food but to what extend Baba Nyonya sustain their food legacy from the wave of modernization and at the same time using authentic recipe and technique. The status of Nyonya cuisine as one of Malaysian authentic cuisine still remain questionable.

## **2 Literature Review**

### **2.1 Background of Baba Nyonya in Malacca**

Baba, which signifies master, were male seafarers who went from Southern China to Nusantara (the Malay Archipelago) to conduct trade and business (Kawangit, 2015;Ng & Abdul Karim, 2016). They are mostly of Hokkien, Teochew, or Cantonese descent. They came from Southern Fujian (Min Nan) Province and Guandong (Ng & Abdul Karim, 2016). In the 15<sup>th</sup> century, Malacca was the home and largest Chinese settlement in peninsular Malaysia (Ng and Karim, 2016).

According to Ng and Abdul Karim (2016), when Chinese settlers arrived in Peninsular Malaysia, they married local women so that their wives could run the business while they sailed back to China. There are three types of races who married with Chinese immigrants namely: Siamese, Burmese and indigenous non-Muslim women from Acehnese, Javanese, Balinese and Batak descents. Although, the intermarriages between local women only lasted for one generation, the next generation preferred married exclusively among their own race: endogamous and rejecting others ethnic group. Taoists, Buddhists and Confucianists are three main religious that have been followed by Baba Nyonya.

Despite the fact that they consider themselves to be Chinese, the Baba and Nyonya communities are distinct from the Chinese community. Nonetheless, Baba and Nyonya identity is a result of the cultural assimilation process, in which a society adopts new culture while maintaining their own. Food and clothes are two examples of assimilation process of Baba and Nyonya community that is similar with Malay traditions. Nyonya wore Kebayas and Sarungs alike female Malays. Aside utilizing chopsticks like the Chinese community, they are utilizing the use of hands, same as traditionally practiced by Malay community. However, Baba Nyonya community utilizing the use of hands only at home as taking of food using hands in the Chinese and Baba Nyonya community is considered to be rude especially during a function.

The emergences of Nyonya cuisines or Peranakan cuisines are from the intermarriage that came from cultural mixtures of Peranakan who are both Chinese and localized.

## 2.2 The birth and the uniqueness of Nyonya cuisine

The emergence of Nyonya cuisine is the result of two civilizations: Chinese culinary techniques and native spices and flavors like lemongrass, tamarind, and ginger. In addition to that, the cuisine is influenced by Thailand, Indian, Dutch, Portuguese and English techniques. The Chinese immigrants invented fusion food when they discovered that the local cuisine did not suit their tastes. They attempted to make their own food with local products because they were unable to cook the food of their homeland due to a lack of ingredients. Thus, they tried to produce their own food with local ingredients (Ng & Ab. Karim, 2016).

Nyonya cuisine is used to strengthen family bonding during important celebrations, rites, and ancestral worship, as well as for daily consumption. There are three functions for serving food in the Peranakan culture. Foods are prepared for deities and ancestors, to seal vows, and to celebrate social events such as weddings, festivals, and seasons. Although the Peranakans have adopted many elements of local culture into their ways of life, the symbolism of their food namely, color symbolism, symbolism by linguistic association and symbolism by physical association remains Chinese (Ng & Abdul Karim, 2016). According to Ma (2015), in Chinese society, food establishes the relationship between people and their environment, people and what they believe and to express relationship between one another.

In the past, the Peranakans strictly followed Chinese patriarchal practices, whereby women as housewife being responsible in preparing meal for families in the kitchen or known as *perut rumah* or stomach of the house. It was the center of the household's life and activity as they did not enjoy the privilege of getting an education. Traditionally, due to Nyonya cuisine is a complicated meal to prepared, it drove the Nyonya to become perfectionist in every aspect of preparing, cooking and presenting the dishes. Ng and Abdul Karim (2016) added that the cooking capability of a Nyonya could be judged based on the tempo with which she crushed the spices to make sambal belacan with mortar and pestle.

Nyonya foods have a flavour that is generally spicy and peppery. The use of chilli, which is a foreign ingredient in Chinese cuisines, is one of the similarities between Malay and Nyonya cuisines (Kawangit, 2015). The consumption of pork meat in Nyonya dishes is one of the contrasts between Malay and Nyonya cuisines. While Chinese cuisines and Nyonya cuisines can be differentiate based on the usage of local non - Chinese ingredients in its preparation. The local ingredients used to cook Nyonya cuisines are turmeric, galangal, lengkuas (greater galangal), ginger, laksa leaves, wild pepper leaves (daun kaduk), galangal leaves (daun cekok), coriander leaves, kaffir, mint leaves and curry leaves. Nyonya also utilized spices such as cloves, cinnamon, cardamom, cumin, star anise and nutmeg (Ng & Ab. Karim, 2016).

Nyonya cuisine can be divided into three categories namely Chinese Hokkien food, Malay style dishes and the innovated cuisine. Table 1 illustrates the categories of Nyonya cuisines in Malacca. Besides main course, there are taste enhancers from

condiments that eat together with rice namely: chili chukka (chili with vinegar), acar awak (pickled mixed vegetables and meats), sambal belacan and cinalok. In addition, Nyonya are famous for their colorful and delighted kueh (cake and desserts) (Ng & Ab. Karim, 2016). Table 2 illustrates the categories of Nyonya kueh and desserts.

Table 1: Categories of Nyonya cuisines in Malacca

Categories	Name of Food
Chinese Hokkien Food	Ayam Tim (Stewed Chicken)
	Ayam Sio (Roast Chicken)
	Itik Sio (Roast Duck)
	Sek Bak (Braised Pork)
	Jiu Hoo Char (Jicama and Cuttlefish Stir Fry with lettuce wrap)
	Chap Chye (Mixed Vegetable Stew)
	Kiam Chye Ark Th'ng (Salted Mustard Duck Soup)
Malay Style Dishes	Heepeow/Hee Pioh Soup (Fish Bladder Soup)
	Ayam Masak Buah Keluak (Chicken Cooked with Keluak Nuts)
	Ikan Masak Asam (Fish in Tamarind Juice)
	Sambal Udang (Prawn Chilli Paste)
Innovation cuisine by Nyonya womenfolk	Nasi Ulam (Herbal Rice)
	Udang Goreng Asam (Fried Tamarind Prawn)
	Ayam Pongteh (Stewed Chicken)
	Kueh Koci (Glutinous Rice Cake with Coconut Filling)
	Kueh Chang Nyonya (Glutinous Rice Dumpling)

Source: Ng and Abdul Karim (2016).

Table 2: Categories of Nyonya kueh and desserts in Malacca

Categories	Kuehs and Desserts
Chinese Hokkien Food	Kueh Ku or Angku Kueh (Red Tortoise Cake)
	Milled Glutinous Rice Stuffed with Tau Sah or Coconut Fillings
Malay Style Dishes	Kueh Bangkit (Coconut Flavoured Cookies)
	Dodol (Sweet Toffee)
	Kueh Karas (Net Cake)
	Kueh Wajik (Palm Sugar Glutinous Rice Cakes)
Innovation cuisine by Nyonya womenfolk	Pulot Tatai (Steamed Blue Glutinous Rice Cake)
	Kueh Sarlat/ Kuih Seri Muka/ Gadang Galoh
	Kueh Koswee (Steamed Palm Sugar Cake)
	Huat Kueh (Steamed Rice Cake)
	Kow Chan Kueh (Kuih Lapis)
	Pineapple Tarts
	Bubur Cha

Source: Ng and Abdul Karim (2016).

In most circumstances, Nyonya cuisine is time-consuming and complicated. It takes a long time to prepare food because it must be perfectly cooked, precisely prepared, and flavorful. There are numerous steps involved in preparing a single dish. Making Nyonya laksa, for example, required numerous steps and procedures. Firstly, need to make a broth from chicken and prawn. Secondly, to prepare sambal paste that made from dried chili and belacan. Thirdly, in different pot, need to sauté shallots, garlic, turmeric, candlenuts, lemongrass, belacan and lengkuas that already pounded with mortar and pestle. Fourthly, to mix two types of broth to the sauté ingredients and finally mix with coconut milk. That does not include other Nyonya cuisine such as dodol, kueh koswee, ayam pongteh and others. Ng and Abdul Karim (2016) added that, Nyonya womenfolk cooked food 1 to 2 days before the festival or event to allow the ingredients incorporate with other ingredients and thus make it taste better. It shows that preparing Nyonya cuisine are time consuming and required the provision of time.

Due to today lifestyles, womenfolk have limited of time on the kitchen, they use a lot of short cut in the preparation of food whereas the food requires long hours of preparation and a lot of patience in cooking it (Ismail, Karim, Othman, & Halim, 2013). They don't have patience in cooking the traditional food. For them, provided that the dish is nearly similar in taste to the original is enough to complete the cooking.

### **2.3 The Challenges in Sustaining Nyonya Cuisine as Heritage Cuisine**

As children get older, their mothers teach them about the importance and consequences of specific dishes. This has a clear impact on their later acceptance of ancestral foods in their daily lives. Nonetheless, as they progress toward greater independence and autonomy, youth's eating habits reflect the shifting significance of parental influence on food choices, particularly traditional foods. The rise in eating out and ordering takeout meals among teenagers is linked to a loss of food knowledge as well as traditional food quality.

Furthermore, the style of living plays a role in the survival of Nyonya cuisine in Malacca. Families throughout the twentieth century have gone through significant transformations. Family structures have been changed as a result of rising rates of marriage instability, unwed and separated motherhood. Women's participation and employment in the workforce have transformed home roles. The maid now handles the majority of the women's responsibilities in the home. As a result, Baba Nyonya households in the twenty-first century view and use food differently than families in previous generations.

### **2.4 Knowledge**

Knowledge plays a vital role in sustaining Nyonya cuisine as authentic cuisine in Malacca. Traditional food knowledge (TFK) refers to the cultural tradition of passing down food provisioning skills, ingredients, preparations, cooking techniques, the proper equipment to use, and cultural beliefs from generation to generation (Nor, Sharif, Zahari, Salleh, Ishak & Muhammad, 2012) via oral transmission, observation,

and hands-on experience that focuses on the microenvironment in which food is produced (Sharif, Zahari, Nor, & Muhammad, 2013). Furthermore, food knowledge transmission can occur in a variety of situations or occasions such as telephone instruction, festive, holiday season, and family gathering. The transmission of Nyonya cuisine occurs between mothers and daughters. The tradition is oral and repeated, oral transmission is still one of the most preferred and trusted sources of knowledge (Ng & Abdul Karim, 2016).

Oral tradition is valuable learning source about own culture and it helps develop cultures values. This is supported by Dato Fazley Yaakob in his speech in Food Heritage Symposium, he been taught by his mother in preparing *Daging Salai Lemak Cili Api* with 17 local ingredients (Yaakob, 2017). His mother told him that before putting coconut milk in the pan or pot, he must pour the gravy inside coconut endocarp so that coconut milk, coconut flesh and gravy are will mix and its extract the sweetest of coconut flesh into the gravy. This knowledge give value and quality to the authentic food.

As regional systems and cultures change with pressure from global industrialisation, urbanisation, and cultural homogenization, traditional culinary knowledge can vanish within households and communities. There is a gap when traditional food knowledge is not passed down through the generations and young people refuse to use it in their daily lives. A study by Nor et al. (2012) revealed that mothers in the 1990s spend the least amount of time in the kitchen with their daughters, teaching food preparation and cooking methods, whereas mothers in the 1960s spend more time with their daughters. Families with a non-biological mother (a step, adoptive, or foster mother) spend less on food knowledge transmission than families with a biological mother (Nor, et al., 2012).

Indirectly, it diminished Nyonya cooking habits in daily life. In this regard, moms of the older age, in particular, can play an important role in sustaining Nyonya cuisine among the younger generation. As a result, an elderly mother should continue to encourage their young married daughter to practise preparing home cooked meals for their family, particularly during weekends or vacations. It is critical for Baba Nyonya to pass on their dietary traditions to future generations in order to maintain their ethnic culture identity.

## **2.5 The Effects of Modernization on Cuisine**

Modernization are a worldwide phenomenon linked to globalisation, industrialisation, and urbanisation (Zahari, Kamaruddin, & Kutut, 2011). Routines, customs, rituals, norms, ethnic festival foodways, and people's daily activities are the key factors that influence societal transformation (Zahari et. al, 2011). Not only that, but modernization has an impact on the community's socio-demographic, economic, educational, and social life. Henderson (2014) added that modernization resulted alteration in heritage cuisine.

The importance of traditional cooking equipment and tools in producing the perfect blend of texture, appearance, colour, and flavour has been highlighted in real culinary literature. According to Ng and Abdul (2016), every kitchen in a Baba Nyonya family must contain a *batu lesong/tumbok* (mortar and pestle), which is the most important piece of equipment for producing high-quality food. The batu lesong was originally an indispensable Peranakan cooking tool for crushing, pounding, grinding, or pulverising chillies, garlic, shallots, herbs, and spices to extract their essence and make pastes (rempah), which are key ingredients in Nyonya cuisine.

It is believed that utilising a stone mortar and pestle releases the food's particular flavour more effectively than using modern kitchen equipment like a blender or food processor (Ismail et. al, 2013). Lye (2013 as cited in Ng & Abdul Karim, 2016) remarked that after blending, the juice from the chillies does not come out. As a result, the sambal made this way will be considerably different from those made by pounding, when the juice is naturally released. While Langgat et. al, (2011) discovered that changing the food preparation, cooking style and time of a authentic food will produce a quite different taste.

In line with that, some Nyonya womenfolk still prefer to grind wet and dry ingredients like chillies, onion, garlic, ginger and other local dried ingredients with a stone mortar and pestle. This is because combining the ingredients would make food even more delectable. Aside from that, Nyonya authentic cuisine is synonymous with the use of firewood in the kitchen. Others who adhere to modernism, on the other hand, consider grinding ingredients with a stone mortar and pestle and cooking with a firewood stove to be insignificant, requiring additional preparation and cooking time.

The image of modern lifestyles and the introduction to quick and easy method of cooking have impacted the Nyonya cuisines. For example, the Nyonya womenflok used banana leaves to cover grilled fish on top of the ember of a wood fire so that the aroma and flavour from banana leaves would incorporate into the fish. But, with the introduction of modern techniques nowadays, they tend to replace it with aluminium foil and roast it in the oven as an alternative to the traditional way. The results of the two technique and two different equipment gave different taste. However, these technique help majority working wife in preparing food. A study by Zahari et al. (2011) explained that modern cooking technology has given the food industry a new dimension. Modern equipment has been cited as a catalyst for improved preparation and cooking, as well as a reduction in cooking time. However, due to the arrival of new devices and technological appliances in the food sector, cultural practises in authentic Nyonya cuisine are progressively disappearing (Ismail et al., 2015).

Furthermore, continuous and inescapable modernization allows for the invention of new technologies to continue (Ismail et. al. 2013; Ng and Abdul Karim, 2016). Food preparations that save time and energy in everyday life. As a result, traditional and inconvenient cooking utensils are phased out in favour of modern kitchen tools. The



batu lesung is replaced by grinders, electric blenders and chopper which match the demand for speed.

## **2.6 The Effects of Modernization on Food Preparation**

Modernization also includes food modification or alteration that has inspired new consumption trends. Modernization has had a significant impact on food production, processing, and delivery (Sobal et al.1998 and Sobal, 1999). Business leaders and policymakers support this. As a result, this situation has influenced and manipulated the development of regional and global food production systems, which are used not only to improve nutritional well-being but also to promote economic growth by increasing consumer demand. As a result, ready-made items (instant packets) are available all over the world.

Ready-made products are an example of industrialization innovation to meet global market demand because they can stay fresh for a longer period of time. However, it has also influenced womenfolk and chefs in restaurants and hotels today. Because it reduces both food preparation and cooking time. As a result, there is a behavioural deviation when preparing food. In fact, this has been supported by Ismail et. al. (2013) on his study about *The Values of The Traditional Culinary Practices Towards the Modernization as Perceived by the Malay Chefs in the Klang Valley*, "Previously in the Malay kitchen, we do all the preparation from scratch, on our own. But now, we have a lot of instant paste, premix items and instant coconut milk. So which part do we call traditional?!". Furthermore, the curry paste and chilli paste are no longer made from scratch. Curry paste and chilli paste have been transformed into dried powders as a result of industrialization. Everything is supplied by the supplier, along with additional preservatives and additives. As a result, the flavour cannot be described as authentic.

According to Mohammad and Chan (2011) in the study, an interesting results emerged that "*most customers never experience the authenticity of a cuisine. They may not know the difference between what is authentic and what blended*". This is happened to Nyonya cuisine image whereby Malaysian citizen and non Malaysian citizen eat the food and cannot differentiate the authentic taste of Nyonya cuisine and alteration of Nyonya cuisine that has adjust due to modernization factors.

The food convenience concept, which consists of three components such as time, physical energy, and mental energy, significantly contributes to the alteration or changes to authentic cuisine (Buckley et. al., 2007 as cited in Zahari et. al., 2011). While Sheely (2008) in Zahari, Kamaruddin, & Kutut (2011) identified ten lifestyle issues which drive the demand for convenience foods. They are the (1) aging population, the (2) changing of household structures, (3) higher females participation in labor force and longer working hours, (4) consumer prosperity and technology ownership, a move toward (5) healthier eating, a desire for (6) new experiences, (7) individualism, (8) declining cooking skills, (9) breakdown of traditional meal times and (10) value for the money.

Modernization of Nyonya cuisines occurs when women are forced to work to support their families due to rising living costs. As a result, they will be too preoccupied to learn the time-consuming Nyonya art of cooking (Ng and Abdul Karim, 2016). Furthermore, the “trial and error” method used in Peranakan kitchens in previous years is unsuitable for the expansion of commercial businesses that require standardization and speed.

### **3 Methodology**

#### **3.1 Research Paradigm and Approach**

A descriptive research design using a quantitative approach through cross sectional research approach is considered as the most appropriate method to be used as the aim of this study as it is to investigate the relationship of modernization attributes toward the sustainability of Nyonya cuisines. The dimensions of modernization attributes consist of modern technology, changes in production and processing method and knowledge.

#### **3.2 Sampling Method and Population Size**

Malacca was selected as the area of the study because Malacca is the origin place of Baba Nyonya communities live and where Baba Nyonya first exists in Malaysia. This study was conducted in the context of heritage cuisine, which needs to preserve and sustain for future. According to Department of Statistics Malaysia (2017), there are 8,000 to 10,000 Baba Nyonya in Malacca.

Based on Krejcie and Morgan’s sample size calculation which is the same as using the Krejcie and Morgan’s sample size determination table, the sample size representative of the Baba Nyonya or Peranakan in this study was 370.

The method for data collection process will be using the self-administered questionnaire survey as it is believed that this approach will give a significant yet meaningful result on the issue that will be investigated. Thus, this approach is chosen to ensure that the research would be based upon actual respondents’ opinion.

This study will be using a non-probability sampling technique. Non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected (Kakinami & Conner, 2010). A purposive sample is selected based on characteristics of a population and the objective of the study that met the research study. The data collected was recorded and keyed in for analysis. The details of sampling techniques are presented in Table 3.

Table 3: Summary of Sampling Design

Items	Description
Instruments	Self-administrated questionnaire
Population	Baba Nyonya communities
Sampling method	Purposive sampling
Sample size	370 respondents
Duration	4 weeks

### 3.3 Research Instruments

Questionnaires are adapted from previous studies which are Langgat et. al. (2011), Ismail et. al. (2013) and Hamzah et. al. (2015). Taking into account in differences of ethnic group's profile and educational level, the questionnaires will be developed was simple and easy to understand with minimum reading and writing. To reduce any possible uncertainty in the questionnaire, bilingual languages are used as language of the instrument as Baba Nyonya communities understand this national language. Questionnaires are designed closed ended questions and divided into three major sections. First is Section A; the questions will be focusing on modernization attributes and this section will be applied using 5-points Likert scale (5: strongly satisfied, 4: satisfied, 3: neutral, 2: dissatisfied and 1: strongly dissatisfied) to obtain more accurate information and result. Second is Section B which will be focusing on the sustainability of Nyonya cuisine in Malacca and this section will be using 5-point Likert scale. Section C will be the last part of the questionnaire section which focusing on the socio – demographic factors or profile of the respondent. In this section, the researcher will assess the characteristics of the respondent: gender, age, level of education, profession and annual income.

## 4 Result and Discussion

### 4.1 Response Rate

This study targeted to collect data a minimum of 370 samples based on (Krejcie & Morgan, 1970) sampling theory and the questionnaires were answered by Baba Nyonya communities in Malacca. A total of 400 survey questionnaires were successfully collected. By using Google Forms, all questions are mandatory to answer before proceeding to submit the questionnaire. Therefore, this study managed to collect a total of 400 valid samples for evaluation without rejecting any of the questionnaires. Thus, the response rate of this study is 100 percent.

### 4.2 Profile of The Respondents

The demographic information described the gender, nationality and marital status of respondents that have been obtained from Section D in the questionnaire. Table 4 below displayed the data obtained from Section D in the questionnaire.

Table 4: Demographic Profile

	Frequency	Percent
<b>Gender</b>		
1 Male	144	36.0
2 Female	256	64.0
<b>Age</b>		
1 18 - 24	62	15.5
2 25 - 34	132	33.0
3 35 - 44	86	21.5
4 45 - 55	62	15.5
5 56 - 65	48	12.0
6 66 and above	10	2.5
<b>Marital Status</b>		
1 Single	144	36.0
2 Married	242	60.5
3 Divorced	14	3.5
<b>Highest Education Level</b>		
1 Secondary	86	21.5
2 Certificate	15	3.8
3 Diploma	35	8.8
4 Bachelor's Degree	194	48.5
5 Master Degree	61	15.3
6 PhD	9	2.3
<b>Occupation</b>		
1 Private sector	153	38.3
2 Government sector	52	13.0
3 Self - employed	58	14.5
4 Student	87	21.8
5 Unemployed	50	12.5
<b>Income Level</b>		
1 Less than RM 2,500	152	38.0
2 RM 2,500 – RM 5,000	122	30.5
3 RM 5,001 – RM7, 500	88	22.0
4 RM 7,501 – RM 10,000	14	3.5
5 RM 10,000 and above	16	4.0

Note: 400 respondents

Table 4 shows the demographic profile of 400 respondents of Baba Nyonya communities in Malacca. It was found that female was the majority of the respondents with 64.0 percent (N=256) while 36.0 percent (N=144) of them are male. This can be stated that female is more towards of answering questionnaire than male.

The findings also indicate information about the age of the respondents. Table 4 shows the age of the respondent where the youngest group of age is between 18 – 24 years old and eldest group is 66 and above. Based on finding, respondents aged 25

until 34 are the highest percentage with 33.0 percent (N=132) followed by 21.5 (N=86) from age 35 until 44 years old. While aged between 18 until 24 and 45 until 55 are third highest percentage with 15.5 percent (N=62). Last but not least, aged between 56 until 65 with 12.0 percent (N=48) and the lowest percentage are those ages above 66 years old with 2.5 percent (N=10).

On marital status, married respondents were the majority with 60.5 percent (N=242) followed by single with 36.0 percent (N=144) whilst 3.5 percent (N=14) are divorced.

According to highest education level, the highest percentage group were nominated by 48.5 (N=194) degree holder and 21.5 percent (N=86) secondary education. The trend were followed with master holder with 15.3 percent (N=61), diploma holder with 8.8 percent (N=35) and certificate holder with 3.8 percent (N=15). Last but not least, only 2.3 percent (N=9) from the total respondents were PhD holders.

Table 4 indicate that private sector are the highest percentage of respondents' occupation with 38.3 percent (N=153), followed by 21.8 percent (N=87) are students. A number of 58 self-employed were reported which represent 14.5 percent. Following 13.0 percent (N=52) respondents are working with government and unemployed respondents with 12.5 percent (N= 50).

According to respondents' income level, it is said that the highest income level with 38.0 percent (N=152) are less than RM 2,500 followed by RM 2,501 to RM 5,000 with 30.5 percent (N=122). The third highest is RM 5,001 to RM 7,500 income level with 22.0 percent (N=88). While fourth highest is RM 7,501 to RM 10,000 with 3.5 percent (N=14). The least percentage recorded was RM 10,000 and above with 4.0 percent (N=16).

### **4.3 Descriptive Statistics Analysis**

The descriptive analysis was undertaken by looking at the mean scores and standard deviation rated by the respondents. Responses to all items to the study variables were made on a Five-point Likert scales (1=Strongly Disagree to 5=Strongly Agree). Mean score is identified as the sum of all the data entries divided by the number of entries while standard deviation measures variability and consistency of the sample or population.

#### **4.3.1 Modernization attributes**

The summary of the mean and standard deviation for all items in modernization attributes dimension illustrated in table 4.12. There are thirteen items that measured as modernization attributes: Factor 1: (Changes of production and processing method); Factor 2: (Modern Technology) and Factor 3 (Equipment Influential). Table 5 indicates

the five items of Factor 1. The highest ranking with highest mean of 4.94 is scored by SA\_PRO6 with standard deviation 0.242. The lowest mean is scored by SA\_PRO4 in which the mean is 4.90 with standard deviation 0.323.

By looking at Table 4.2 below, it shows the magnitude of the mean scores range for five items ranging from 4.90 to 4.94 indicating that majority of the respondents highly agreed with most of the items in this section analysis.

Table 5: Descriptive Statistics of Change of Production and Processing Method

Code	Items	Mean ( $\mu$ )	Std. Deviation ( $\sigma$ )	Rank
SA_PRO1	Industrialization resulting in changes of production and processing method of my heritage food	4.93	.264	3
SA_PRO2	Industrialization alters the originality, uniqueness and identity of Nyonya cuisine	4.93	.255	2
SA_PRO4	The availability of convenience foods (instant packet) requires less commitment and time consume	4.90	.323	5
SA_PRO5	Ready-made and instant product affect the taste and the quality of my heritage food	4.91	.348	4
SA_PRO6	The usage of instant paste makes young generation do not know about their food legacy	4.94	.242	1

Note:  $N=400$

*Cronbach's Alpha ( $\alpha$ ): 0.903, Mean ( $\mu$ ):4.92*

*Mean  $\mu$ : Score (>4.00 – High, 2.00 to 3.99 – Moderate, <1.99 – Low)*

Table 6 reported the summary of the mean and standard deviations for four items of modern technology. The mean for all items were ranged from 4.75 to 4.87 and standard deviation ranged from 0.370 to 0.591. The highest ranking with highest mean of 4.87 is scored by SA\_MT09 with standard deviation 0.370. The lowest mean is scored by SA\_MT05 in which the mean is 4.75 with standard deviation 0.591. This result suggests that majority of the respondents tend to satisfy with the measured items statement made in measuring traditionalism.

Table 6: Descriptive Statistics of Modern Technology

Code	Items	Mean ( $\mu$ )	Std. Deviation ( $\sigma$ )	Rank
SA_MT01	Modern technologies influence the alteration of my heritage food	4.81	.454	3
SA_MT04	The applications of modern equipment can speed up the time of cooking	4.84	.385	2
SA_MT05	The use of modern equipment are more efficient than traditional equipment	4.75	.591	4
SA_MT09	Modern equipment makes the cooking process of my heritage food easier	4.87	.370	1

Table 7 reported the summary of the mean and standard deviations for four items of equipment influential. The mean for all items were ranged from 4.77 to 4.88 and standard deviation ranged from 0.429 to 0.608. The highest ranking with highest mean

of 4.88 is scored by SA\_Pro3 with standard deviation 0.429. The lowest mean is scored by SA\_MTO7 in which the mean is 4.77 with standard deviation 0.608. This result suggests that majority of the respondents tend to satisfy with the measured items statement made in measuring equipment influential.

Table 7: Descriptive Statistics of Equipment Influential

Code	Items	Mean ( $\mu$ )	Std. Deviation ( $\sigma$ )	Rank
SA_MT03	Modern cooking equipment influence the way of cooking my heritage food	4.80	.492	3
SA_MT06	The use of traditional equipment in some of the Nyonya cuisine truly portrays Nyonya culture	4.85	.498	2
SA_MT07	Modern serving equipment influence the style of serving my heritage food	4.77	.608	4
SA_PRO3	Changing the original recipes of my heritage food to suit industrialization criteria affect the textures of my heritage food	4.88	.429	1

Table 8 reported the summary of the mean and standard deviations for ten items of Knowledge. The mean for all items were ranged from 4.86 to 4.96 and standard deviation ranged from 0.196 to 0.450. The highest ranking with highest mean of 4.96 is scored by SA\_KNO7 with standard deviation 0.196. The lowest mean are scored by SA\_KNO3 and SA\_KNO11 in which the mean is 34.86 with standard deviation 0.391 and 0.450 respectively.

Table 8: Descriptive Statistics of Transmission of Knowledge

Code	Items	Mean ( $\mu$ )	Std. Deviation ( $\sigma$ )	Rank
SA_KNO2	In preparing Nyonya cuisine, there are certain technique from ancestors and generations beliefs that need to follow to ensure that the food are properly cook and up to Baba Nyonya standards	4.91	.341	4
SA_KNO3	Generations food beliefs are passed to the young generations by oral transmission and practices	4.86	.391	7
SA_KNO4	Oral traditions and food belief are important factors that influence traditional food consumption	4.89	.326	5
SA_KNO6	The identity of Nyonya cuisine can be seen through the ingredients, cooking technique and serving styles	4.92	.297	3
SA_KNO7	Nyonya cuisines has its own unique identity as other ethnic cuisine	4.96	.196	1
SA_KNO8	Baba Nyonya is rich in traditional eating manners	4.87	.389	6



SA_KNO9	Knowledge of the communities influence in sustaining Nyonya cuisine	4.92	.275	3
SA_KNO11	Time constraint are the reason working wife has no time to teach young generations about food belief and cooking techniques as what ancestors did before	4.86	.450	7
SA_KNO12	Due to existent of instant product mix in the market, it helps working wives to use it and forget knowledge that has been passed by ancestors and eldest generations	4.89	.427	5
SA_KNO13	Lack of exposure and family support are the reasons young generations did not practice and cook Nyonya cuisine	4.93	.282	2

#### 4.3.2 Sustainability of Nyonya cuisine

Table 9 reported the summary of the mean and standard deviations for seven items of sustainability of Nyonya cuisine. The mean for all items were ranged from 4.92 to 4.96 and standard deviation ranged from 0.225 to 0.422. The highest rankings with highest mean of 4.96 are scored by SB\_SUST3, SB\_SUST4 and SB\_SUST5 with standard deviation 0.225. The lowest mean is scored by SB\_SUST1 in which the mean is 4.92 with standard deviation 0.422. This result suggests that majority of the respondents were tend to satisfied with the measured items statement made in measuring sustainability of Nyonya cuisine.

Table 9: Descriptive Statistics of Sustainability of Nyonya cuisine

Code	Items	Mean ( $\mu$ )	Std. Deviation ( $\sigma$ )	Rank
SB_SUST1	It is my responsibility to sustain Nyonya cuisine as a heritage food	4.92	.422	5
SB_SUST2	I believe that transmission of knowledge are important to sustain the heritage food	4.95	.245	2
SB_SUST3	It is important for me and my generation to sustain our heritage food	4.96	.225	1
SB_SUST4	The sustainability of the heritage food will avoid it from deteriorated and disappeared	4.96	.225	1
SB_SUST5	Family was a major influence in sustaining Nyonya cuisine	4.96	.225	1
SB_SUST6	Changing of the food habits had arisen from declining family heritage meals, the erosion of heritage cuisine and the growth of convenient and fast food makes it hard to sustain Nyonya cuisine	4.94	.291	3
SB_SUST7	Modern lifestyles influence the alteration of my heritage food	4.93	.397	4

Note: N=400

Cronbach's Alpha ( $\alpha$ ): 0.888  
 Mean  $\mu$ : Score (>4.00 – High, 2.00 to 3.99 – Moderate, <1.99 – Low)

#### 4.4 Correlation Analysis

Pearson's correlation is used to investigate the relationship between the two interested variables because the normality assumption of the variable met (Pallant, 2011). This analysis can take a value between ranging -1.00 to +1.00. The sign out the front indicates the direction of the correlation whether positive or negative (Pallant, 2011). Based on strength of correlation in Table 10 below by Evans (1996), the coefficient correlation more than 0.80 to 1.00 indicate as very strong, the coefficient between 0.60 to 0.79 indicate as strong, coefficient between 0.40 to 0.59 indicates a moderate strength, the coefficient between 0.20 to 0.39 measure a weak strength correlation, whereas the correlation coefficient less than 0.20 indicating a very weak correlation.

Table 10: Pearson Correlation Coefficient Index

R Value	Strength of Correlation
0.00 – 0.19	Very Weak
0.20 – 0.39	Weak
0.40 – 0.59	Moderate
0.60 – 0.79	Strong
0.80 – 1.00	Very Strong

Source: Evans (1996)

Table 11 below shows the correlation analysis result for all variables in this study. It indicates that all the variables have the significant weak to very strong effect on each other variables. This implies that if one of the variables increased in the average opinion then the effect of other variables will towards positive direction either.

Table 11: Pearson Correlations Among Study Variables

	1	2	3	4	5
Changes of Production and Processing Method	-				
Modern Technology	.546**				
Equipment Influential	.556**	.601**			
Knowledge	.885**	.584**	.552**		
Sustainability of Nyonya Cuisine	.642**	.387**	.590**	.677**	-

Note: N=400, \* $p < .05$ ; \*\* $p < .01$

From Table 11, all inter-correlations were statistically significant. Correlations among proposed variables were statistically significant ranging from  $r = .546^{**}$  ( $p < .01$ ) to  $r = .885^{**}$  ( $p < .01$ ). The correlations between variables proposed and sustainability of Nyonya cuisine were significant ranged from  $r = .387^{**}$  to  $r = .677^{**}$ .

The direction of the correlation analysis was shifting to the right direction therefore it is a positive and significantly correlated. Besides, from this analysis most of

the variables have significant correlations and there is no multicollinearity detected since all the correlations were below 0.85 (Chinna, 2015).

#### 4.5 Regression Analysis

The purpose of this analysis is to help the researcher to understand the association between more than two quantitative variables. Multiple regression analysis is a realistic procedure for measuring the connections among variables. According to Pallant (2011), multiple regressions are a family of techniques which can be used in order to examine the relationship between one continuous dependent variable and a number of independent variables or predictors. Moreover, multiple regression is a realistic procedure in measuring the connections among the variables and it helps inscribing a variety of research questions as it facilitates the researcher to examine on how the variables able to predict a particular outcome. To validate the hypotheses formulated, a linear regression was conducted on modernization attributes and sustainability of Nyonya cuisine. The hypotheses formulated as below:

**H1: There is a significant and positive relationship between modernization attributes and sustainability of Nyonya cuisine.**

Table 12: Results of Multiple Regressions of modernization attributes and sustainability of Nyonya cuisine

Predictor	Std. $\beta$	t	Sig
MODERNIZATION ATTRIBUTES			
Change of Production and Processing Method	.489	10.809	.000
Modern Technology	-.111	-2.371	.018
Equipment Influential	.385	8.129	.000
$R^2$	.706 <sup>a</sup>		
Adj. $R^2$	.494		
F-Change	130.843		

a. *Dependent Variable: Sustainability of Nyonya Cuisine*

Note: **N=400**, \* $p < 0.05$ , \*\* $p < 0.01$

Based on Table 12, modernization attributes was able to explain with 70.6 percent ( $R^2=0.706$ ,  $F=187.772$ ,  $p<0.05$ ) of relationship with the sustainability of Nyonya cuisine. Of the three items, only two items were significantly and positively predicting sustainability of Nyonya cuisine. Change of production and processing method had the most significant predictor on sustainability of Nyonya cuisine in Malacca ( $\beta=0.489$ ,  $p<0.001$ ) followed by equipment influential ( $\beta=0.385$ ,  $p<0.001$ ). Meanwhile, from the regression analysis conducted, the contribution from modernization attributes was  $R^2=0.706$  which represent 70.6%. It can be confirmed that the modernization attributes has contributed to the sustainability of Nyonya cuisine. The variance might be explained by other predictors. The hypotheses formulated (H1) is accepted.

**H2: There is negative relationship between knowledge and sustainability of Nyonya cuisine.**

Table 13: Results of Multiple Regressions of knowledge and sustainability of Nyonya cuisine

Predictor	Std. $\beta$	t	Sig
KNOWLEDGE	.677	18.362	.000
$R^2$	.677 <sup>a</sup>		
Adj. $R^2$	.457		
F-Change	337.146		

a. Dependent Variable: Sustainability of Nyonya Cuisine

Note:  $N=400$ , \* $p < 0.05$ , \*\* $p < 0.01$

As shown in Table 13, the model of knowledge was accounted to 67.7% from variance on sustainability of Nyonya cuisine ( $R^2=0.677$ ,  $F=337.146$ ,  $p<0.01$ ). It can be seen that knowledge had positive impact on sustainability of Nyonya cuisine. Therefore, H2 is fully supported.

## 5 Conclusion

In this study, modernization consists of three dimensions; namely changes of production and processing method, modern technology and equipment influential. From the regression analysis conducted, the contribution from modernization attributes was  $R^2=0.706$  which represent 70.6%. It can be confirmed that the modernization attributes have contribute to the sustainability of Nyonya cuisine in Malacca, thus H1 was supported. It means that modernization attributes will lead to the challenges in sustaining of Nyonya cuisine in Malacca. These findings are all in line with the previous study (Mohd Zahari et al. 2011; Mohd Zahari et al. 2011; Ismail et al. 2013; Muhammad et al. 2013; Ismail et al. 2015).

Research objective 1 which is to identify the most important attributes of modernization was achieved through research question 1 and answered by total mean score for each dimension. The results showed that the highly agreed attribute of modernization is Change in production and processing method attribute scoring at 4.92. Therefore, change in production and processing method positively impact sustainability of Nyonya cuisine in Malacca. Followed by the second most important attributes of modernization is equipment influential attribute scoring at 4.82. Meanwhile, modern technology places at third most important attribute scoring at 4.81. It shows that these three attributes play significant role and positively influence sustainability of Nyonya cuisine in Malacca.

Change in production and processing method attribute is the key points that significantly and positively influence challenges in sustaining Nyonya cuisine in Malacca. The waves of modernization gave impact to the growth of processed and

prepared food and directly alter the originality, uniqueness, and identity of Nyonya cuisine as heritage cuisine. Ismail et al. (2013) agreed that production and processing method is one of the most critical determinants in sustaining heritage cuisine because of modernization. Due to the availability of instant paste, it makes young generations do not know about their food legacy.

Second point pertaining to the attribute is that modern equipment makes the cooking process easier as it reduces time of cooking and more efficient. Thus, the existent of modern technology positively and significantly give impact in sustaining Nyonya cuisine in Malacca. For Equipment Influential, the key points that significantly and positively influence the sustainability of Nyonya cuisine in Malacca is the equipment availability that affect the textures of processed and prepared food due to customer demand. Therefore, industrial change original recipe to suits industrial criteria and nutrition value in the product. These findings were all in line with the previous studies (Ismail et al. 2013; Muhammad et al. 2013; Ismail et al 2015).

Research objective 2 which is to investigate the relationship of knowledge toward sustainability of Nyonya cuisine in Malacca achieved through research question 2 and answered by new hypotheses that has developed which is there is a significant and positive relationship between knowledge and sustainability of Nyonya cuisine as H2.

Thus, findings from this study suggest that knowledge is an important for sustaining Nyonya cuisine in Malacca. Food knowledge is inherited from earlier generations and transferred to the young generations through informal learning. Food knowledge is pass from mother to daughter where communication take place between different generations and ages and the history of food is passed verbally and practically.

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