



**UNIVERSITI PUTRA MALAYSIA**

***SENSORY CHARACTERISTICS AND FACTORS INFLUENCING  
CONSUMERS' PREFERENCES TOWARDS GOAT MILK IN  
PENINSULAR MALAYSIA***

**ALIA KHALIDAH BINTI ISMAIL**

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CONSUMERS' PREFERENCES TOWARDS GOAT MILK IN PENINSULAR  
MALAYSIA**

**By**

**ALIA KHALIDAH BINTI ISMAIL**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra  
Malaysia, in Fulfilment of the Requirements for the Degree of Master of  
Science**

**January 2021**

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in  
fulfilment of the requirement for the degree of Master of Science

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**January 2021**

**Chairman : Associate Professor Nolila Mohd Nawi, PhD**  
**Faculty : Agriculture**

Goat milk provides a healthy diet, which is essential for the proper development of your body, packaged with calcium, carbohydrates, fats, minerals, and vitamins that contribute to the growing demand for milk and milk products. Furthermore, milk consumption rises year-round due to health claims to prevent any disease. However, Malaysians consume a low amount of milk and milk products for recommended dietary intake, especially from source of goat milk. The situation is due to human attitudes, food neophobia, and poor eating habits among Malaysians. Thus, the general objective of the conducted study was to determine sensory characteristics and factors influencing consumers' preferences towards goat milk in Peninsular Malaysia. Meanwhile, the specific objectives of the study were to determine the sensory characteristics of different samples of goat milk; to determine the association between socio-demographic characteristic and consumer preferences for goat milk; to determine the factor affecting consumer preferences for goat milk; and to identify the most influential factors that influence consumers' preference for goat milk.

Purposive sampling was used to select 649 goat milk consumers to represent Peninsular Malaysia. Primary data was conducted at the Malaysia Agriculture, Horticulture and Agrotourism (MAHA) 2018 as Central Location Test (CLT). The data was gathered using a structured survey. Four samples of goat milk that were purchased from a supermarket and a local farmer was used for sensory evaluation: two samples from the supermarket and two samples from the farmer. Data were analysed using descriptive analysis, analysis of variance (one-way ANOVA), Chi-square analysis, factor analysis and binary logistic regression analysis.

The majority of respondents were female, married, and aged 25-34. The results found that respondents only consumed goat milk when needed and most of the respondents purchased goat milk from the supermarket or a local vendor. The next analysis involved the analysis of variance (one-way ANOVA) to determine consumer preferences for sensory characteristics of goat milk samples by evaluate the sensory attribute towards appearance, odour, texture, taste and flavour. Compared to the other three samples A, C and D, research sample B scored higher, ranging from 5 (like or dislike) to 7 (medium like). The sample B of goat milk was preferred by the majority of respondents (61.5%).

The Chi-square analysis was conducted to determine the association between the respondents' socio-demographic profiles and preferences for goat milk. The results indicated that age, occupation, and marital status were associated with consumers' preference for goat milk. The factor analysis revealed seven factors that influenced consumers' preference towards goat milk consumption. The factors are nutritive value, advertisement, health, availability, socio-cultural, convenience, and price. Finally, a binary logistic regression analysis was conducted to determine the influential factors that affect consumers' preference for goat milk. The results showed that the three influential factors were age, nutritive value, and price. These three factors were found to be significant in consumers' preferences for goat milk.

In this study, the findings are intended to provide valuable information to the goat milk industry by demonstrating that different sources or types of goat milk can produce different levels of goat milk quality. Factors such as food choices and sensory characteristic variables have been identified as the most crucial factors in current research and should be included in the marketing strategy, marketing activities and tools to attract consumers' attention and encourage them to buy goat milk. Furthermore, findings from this research will enable the stakeholders in the goat milk industry to formulate new strategies in increasing consumers' preferences of goat milk consumption in Peninsular Malaysia.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia  
sebagai memenuhi keperluan untuk ijazah Master Sains

**CIRI-CIRI DERIA DAN FAKTOR-FAKTOR YANG MEMPENGARUHI  
KEUTAMAAN PENGGUNA TERHADAP SUSU KAMBING DI SEMENANJUNG  
MALAYSIA**

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Susu kambing merupakan makanan sihat yang penting untuk perkembangan tubuh yang baik, mengandungi kalsium, karbohidrat, lemak, mineral dan vitamin yang telah menyumbang kepada permintaan susu dan produk susu yang semakin meningkat. Tambahan pula, penggunaan susu juga menunjukkan peningkatan sepanjang tahun kerana tuntutan kesihatan untuk mencegah penyakit. Walau bagaimanapun, rakyat Malaysia mengambil jumlah susu dan produk susu yang rendah berbanding kadar pengambilan makanan yang disyorkan, terutama dari sumber susu kambing. Situasi ini disebabkan oleh sikap manusia, neofobia makanan, dan tabiat makan yang buruk di kalangan rakyat Malaysia. Oleh itu, objektif umum kajian ini dibuat adalah untuk menentukan ciri-ciri deria dan faktor yang mempengaruhi keutamaan pengguna terhadap susu kambing di Semenanjung Malaysia. Sementara itu, objektif khusus kajian ini adalah untuk menentukan ciri-ciri deria bagi sampel susu kambing yang berlainan; untuk mengetahui perkaitan antara ciri sosio-demografi dan keutamaan pengguna terhadap susu kambing; untuk menentukan faktor yang mempengaruhi keutamaan pengguna terhadap susu kambing; dan untuk mengenalpasti faktor yang paling mempengaruhi keutamaan pengguna terhadap susu kambing.

Persampelan bertujuan digunakan sebagai kaedah persampelan dengan 649 pengguna susu kambing yang dipilih sebagai responden untuk mewakili Semenanjung Malaysia. Pengumpulan data primer diadakan di *Malaysia Agriculture, Horticulture and Agrotourism (MAHA) 2018* sebagai Pusat Lokasi Setempat. Borang soal selidik berstruktur digunakan untuk pengumpulan data. Empat sampel susu kambing telah dibeli dari pasar raya dan petani tempatan yang digunakan untuk penilaian deria: dua sampel dari pasar raya dan dua sampel dari petani. Data dianalisis dengan menggunakan analisis deskriptif,

analisis varians (ANOVA sehalu), analisis Khi-kuasa dua, analisis faktor dan analisis regresi binari logistik. Hasil kajian daripada analisis disskriptif menunjukkan bahawa majoriti responden terdiri dari wanita, berkahwin, dan berumur antara 25-34 tahun.

Hasil kajian mendapati responden hanya mengambil susu kambing apabila diperlukan sahaja dan sebilangan besar responden membeli susu kambing dari pasar raya atau penjual tempatan. Analisis seterusnya melibatkan analisis varians (ANOVA sehalu) untuk menentukan keutamaan pengguna untuk ciri deria susu kambing dengan menilai sifat deria terhadap rupa bentuk, bau, tekstur, rasa dan perisa. Berbanding tiga sampel A, C dan D, purata sampel bagi keutamaan dan tahap penerimaan terhadap sifat susu kambing menunjukkan bahawa sampel kajian B menunjukkan skor yang lebih tinggi, antara 5 (sama ada suka atau tidak suka) hingga 7 (sederhana suka). Susu kambing sampel B juga lebih disukai oleh majoriti responden (61.5%).

Analisis Khi-kuasa dua dilakukan untuk menentukan perkaitan antara profil sosio-demografi responden dan keutamaan responden terhadap susu kambing. Hasil analisis ini menunjukkan bahawa usia, pekerjaan, dan status perkahwinan adalah berkait dengan keutamaan pengguna terhadap susu kambing. Analisis faktor menunjukkan tujuh faktor yang mempengaruhi keutamaan pengguna terhadap penggunaan susu kambing. Faktornya adalah nilai pemakanan, iklan, kesihatan, ketersediaan, sosio-budaya, kemudahan, dan harga. Akhirnya, analisis regresi binari logistik dilakukan untuk menentukan faktor yang paling mempengaruhi keutamaan pengguna terhadap susu kambing. Hasil kajian menunjukkan bahawa tiga faktor yang paling berpengaruh adalah usia, nilai pemakanan, dan harga. Ketiga-tiga faktor ini didapati paling penting dalam mempengaruhi keutamaan pengguna terhadap susu kambing.

Dalam kajian ini, penemuan hasil kajian bertujuan untuk memberi maklumat berharga kepada industri susu kambing dengan menunjukkan bahawa sumber atau jenis susu kambing yang pelbagai akan menghasilkan tahap kualiti susu kambing yang berbeza. Faktor seperti pilihan makanan dan ciri deria telah dikenal pasti sebagai faktor terpenting dalam penyelidikan semasa dan harus dimasukkan dalam strategi pemasaran, aktiviti pemasaran dan alat untuk menarik perhatian pengguna dan mendorong mereka untuk membeli susu kambing. Selain itu, hasil penemuan kajian ini akan membolehkan pihak berkepentingan dalam industri susu kambing merumuskan strategi baharu untuk meningkatkan keutamaan pengguna terhadap penggunaan susu kambing di Semenanjung Malaysia.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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## Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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## LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CLT	Central Location Test
EU-MCCI	EU-Malaysia Chamber of Commerce and Industry
FCQ	Food Choice Questionnaire
GM	Genetic Modified
HSD	Honest Significance Different
JAR	Just-about-right
KMO	Kaiser-Mayer-Olkin
MAHA	Malaysia Agriculture, Horticulture and Agrotourism
MAEPS	Malaysia Agro Exposition Park Serdang
MCC	Milk Collection Centre
mil.	Million
PCA	Principal Component Analysis
RM	Ringgit Malaysia
UHT	Ultra-high Temperature

## CHAPTER 1

### INTRODUCTION

This chapter discusses the introduction of Malaysia dairy market and dietary intake of milk consumption. The background of the research also outlined to provide a better understanding of the Malaysia dairy goat industry and its consumer determinants on goat milk. This chapter consists of the problem statement, research questions, research objectives, significance of the study, and organization of the thesis.

#### 1.1 Introduction of the Malaysia Dairy Market

Along with public demand for sustainable practises, demand for animal products (such as dairy and beef) in tropical regions is expected to rise due to the rising population and climate change (Ribeiro, Salama, Vitor, Arguello, Moncau, Santos, Caja, de Oliveira, Balieiro, Hernández-Castellano, Zachut, Poletif, Castrod, AlvESC, and Almeida, 2020). The need to increase animal production output must be met through improved management and production technologies. Malaysia has developed a favourable dairy market in recent years as indicated by the constant growth rates. Unfortunately, despite the surge in demand for dairy products, the domestic supply of milk has been held to a minimum and therefore, unable to keep up with the growing demand.

In Malaysia, domestic milk production is somewhat slow in its growth while consumption of milk has increased between 2015 and 2019 (Table 1.1). In 2015, milk production was registered at 27.40 million litres and gradually increased to 29.70 million litres, demonstrating an increment of 2.3 million litres in 5 years. Meanwhile, milk consumption increased by 8.2 million litres in the same period; from 45.80 million litres in 2015, which sharply increased to 54.00 million litres in 2019.

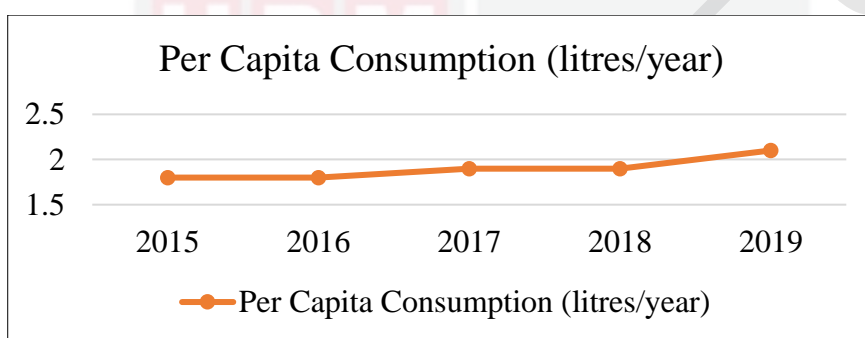
**Table 1.1: Peninsular Malaysia: Dairy Milk Market**

	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Milk Production (mil. litres)</b>	27.40	27.40	25.90	27.60	29.70
<b>Milk Consumption (mil. litres)</b>	45.80	45.00	49.30	49.70	54.00

(Source: Department of Veterinary Services Malaysia, 2019)

The exceeding amount of consumption over the output volume suggests a serious deficiency. One key factor that leads to the reduced domestic supply of milk is the tropical climate in Malaysia, which is not favourable to optimal conditions for rearing dairy ruminants. Land available for ruminant farming is also limited (EU-Malaysia Chamber of Commerce and Industry (EU-MCCI), 2015).

In 2015, an average Malaysian consumed 1.80 litres of milk in a year; by the end of the 5 years, the consumption per capita increased to 2.10 litres/year (Figure 1.1). Rising incomes and increased awareness on the nutritional benefits of milk and milk products, coupled with change of taste-preference among Malaysian consumers, have contributed to the growing demand for milk and milk products (Sim and Suntharalingam, 2015).



**Figure 1.1: Per Capita Consumption of Milk (litres/year)**  
(Source: Department of Veterinary Services Malaysia, 2019)

### 1.1.1 Types of Milk and Milk Products

There are many different types of milk, with the main difference being the process used to produce the final results such as fresh (raw), pasteurised, sterile, and ultra-high temperature (UHT milk), or powder milk (full cream, skimmed, and filled powder) (Malaysia Dietary Guidelines, 2010). According to Suntharalingam (2019), in the Southern Zone of Peninsular Malaysia (Johor, Negeri Sembilan, and Melaka), raw milk has the highest volume sold, while yoghurt has the lowest volume sold (Table 1.2). Flavored milk and yoghurt are popular value-added dairy products in the Southern Zone market. 91% of the milk produced is sold raw or fresh, with no processing. Only 9% of total fresh milk volume is added value to produce three types of dairy products: yoghurt, flavoured milk, and ghee.

**Table 1.2: Types of Milk and Dairy Products Distributed in the Southern Zone of Peninsular Malaysia (RM/litre)**

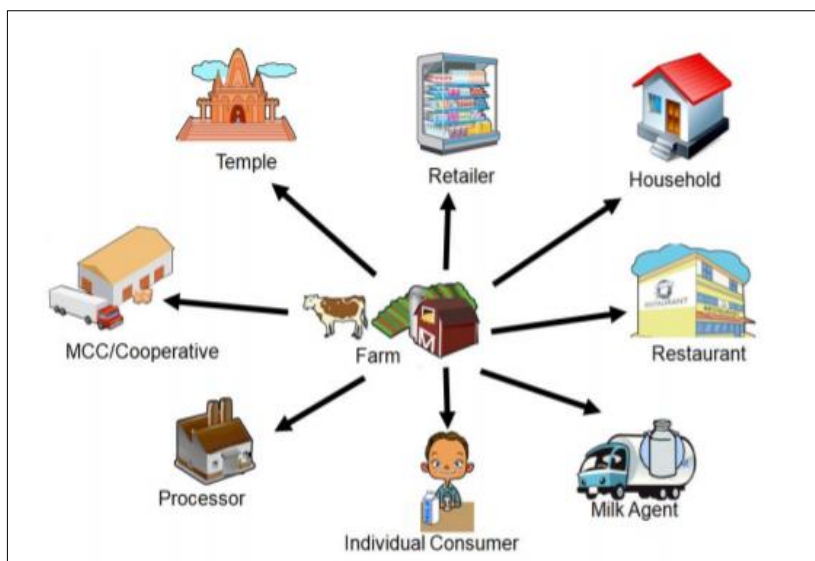
State	Total fresh milk	Raw milk	Flavoured Milk	Yoghurt (in Milk Equivalent)
<b>Johor</b>	7815	7,331	0	484
<b>Negeri Sembilan</b>	3812	3,110	646	52
<b>Melaka</b>	1170	1,145	0	25
<b>Total</b>	<b>12797</b>	<b>11,586</b>	<b>646</b>	<b>561</b>

(Source: Suntharalingam, 2019)

As can be seen in the Table 1.2 above, there is a strong demand for yoghurt in each of the three states. In Negeri Sembilan, the most popular type of milk is flavoured milk. Generally speaking, the amount of processing required to produce these dairy products ranges from minimal to extensive. Processing milk into flavoured milk and yoghurt is relatively simple, which is why farmers in Johor and Negeri Sembilan have successfully commercialised the production of both of these milk products. Farmers in Negeri Sembilan produce most of the flavoured milk, while farmers in Johor produce a significant portion of the yoghurt and act as major producer. Despite this, small-scale farmers in all three states make significant contributions to the production of yoghurt.

Specifically, when it comes to the distribution channel for milk and milk products, they are sourced from small-scale farms and distributed through eight marketing channels such as retail outlets, household restaurants, milk agent offices, individual consumers, processors, cooperatives, and temples, whereas milk sourced from commercial farms is sold primarily to cooperative/milk collection centres (MCCs), processors, restaurants, agents, and retail outlets, among other places as shown in Figure 1.2 below. Individual consumers and households have developed close relationships with and trust in small-scale farmers and their products. Individual consumers are those who live in the immediate vicinity of the farm. They come to the farm on a regular basis to replenish their supplies of milk and dairy products.

During this time, milk and dairy products are delivered directly to consumers' homes and offices. When compared to individual consumers, the demand for milk and milk products is much more stable among households. As a side note, because of the large volume of milk produced on their farm and the high profit margins, commercial farmers prefer to sell their products through the MCC method of distribution. Furthermore, because of the large volume of milk they produce, it is more convenient for them to deliver milk to a single location rather than to a number of different locations. This approach not only results in less time being consumed, which saves them time, but it also assists them in lowering transactional costs (Suntharalingam, 2019).

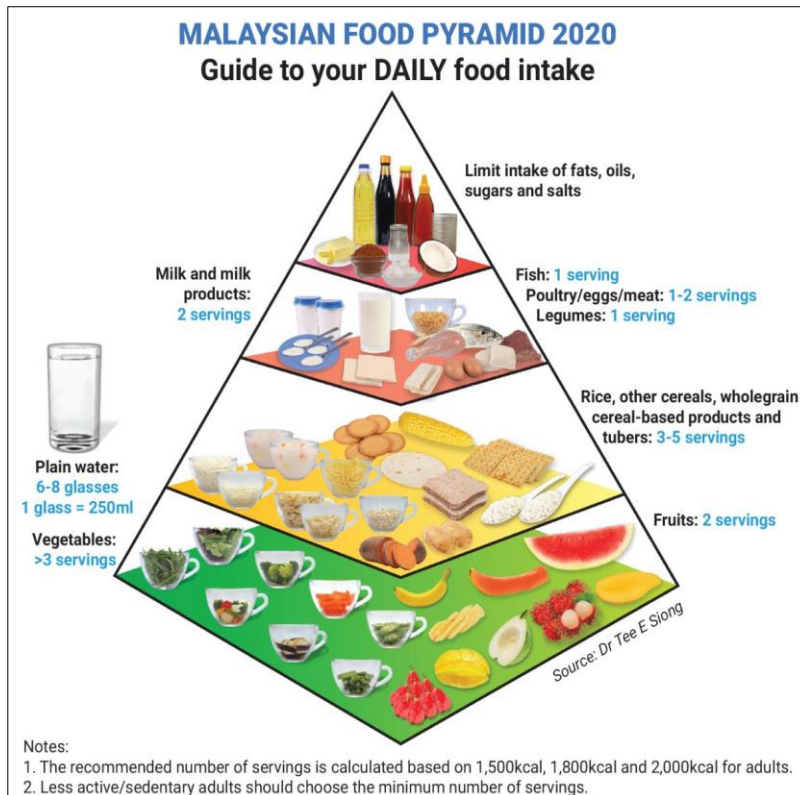


**Figure 1.2: Marketing Channel of Raw Milk in the Southern Zone**  
(Source: Suntharalingam, 2019)

## 1.2 Dietary Intake of Milk Consumption

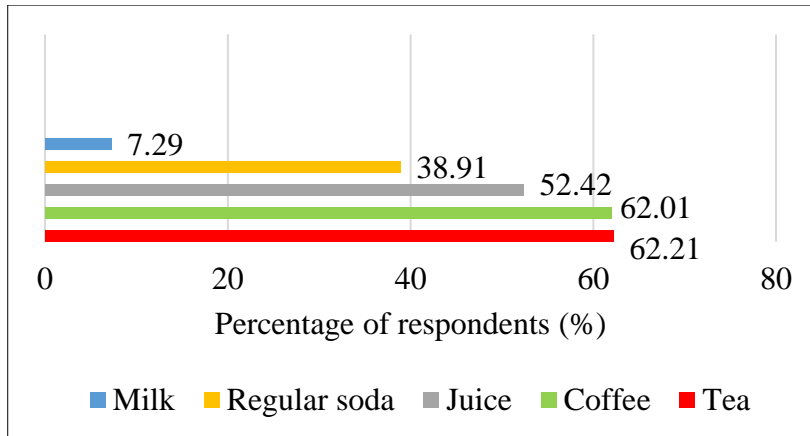
It is essential for a living person to incorporate a well-balanced diet into their daily routine in order to maintain a healthy lifestyle. In order to achieve this, it is necessary to obtain appropriate foods that incorporate the principles of good nutrition such as variety, balanced intake of nutrients, and moderation in consumption. Different foods contain different proportions of energy and nutrients than others. The most effective way to meet daily requirements is to eat a nutritious diet that includes cereals, fruits and vegetables, meat, fish, poultry, legumes, and milk and milk products. When it comes to the food group of milk and milk products, Malaysians consume them because they are a rich source of essential nutrients, such as protein, retinol, riboflavin, vitamin D, vitamin B12, zinc, magnesium, and potassium. There are several important implications of this, one of which is that milk and milk products are also excellent sources of calcium (Malaysia Dietary Guidelines, 2010).

Malaysian Dietary Guidelines (2010) encouraged the consumption of milk in order to obtain all of the essential nutrients for the healthier body. The Malaysian Food Pyramid 2020 is depicted in Figure 1.3, the food group of milk and milk products should be consumed in moderation, with 2 servings per day. The most important recommendations for milk are as follows: 1) consume milk and milk products everyday and 2) replace sweetened condensed milk and sweetened condensed filled milk with unsweetened liquid or powdered milk.



**Figure 1.3: Malaysian Food Pyramid 2020**  
(Source: Ministry of Health Malaysia, 2020)

Interestingly, based on Figure 1.4 it showed that there are slight increase in milk consumption from 2017 to 2018. It can be associated with the consumers' interest in drinking tea and coffee instead of milk (Statista Research Department, 2018). As a matter of fact, a survey conducted by Cint Group (the world's largest data exchange platform) indeed revealed that 62.21% of respondents in Malaysia drink tea regularly, while 62.01% indicated they would drink coffee (Figure 1.4). Milk, however, was consumed significantly less, that is among 7.29% of the Malaysian (Statista Research Department, 2018). As it happens, Malaysia imports most of the milk and its products primarily from Australia and New Zealand (EU-MCCI, 2015).



**Figure 1.4: Percentage of Malaysian Consuming Beverages (%)**  
(Source: Statista Research Department, 2018)

Nonetheless, several Malaysians are still unaware of the numerous health benefits of drinking milk and milk products in their diet. According to Leiu, Chin, Mohd Shariff, Arumugam, and Chan (2020) that there was a high body fat percentage and low consumption of milk and milk products connected with low vitamin D levels in postmenopausal Chinese women. Another study from Von Goh, Azam-Ali, McCullough, and Mitra (2020) stated that the food habit pattern (surveyed by Malaysian Adult Nutrition Survey 2003 and 2014) for milk and milk products showed that they are not widely consumed by Malaysians. Same as study by Norimah, Safiah, Jamal, Haslinda, Zuhaida, Rohida, Fatimah, Norazlin, Poh, Kandiah, Zalilah, Wan Manan, Fatimah, and Azmi (2008), milk and milk products were not consumed in sufficient quantities to meet the Food Pyramid recommendation by Malaysian adults, which is 1-3 servings per day, but they consumed 0.14 servings per day.

Moreover, the consumption of milk and milk products was lower than the recommended number of servings for a healthy diet due to the fact that Malaysians consumed only 0.1 to 0.2 servings of milk, yoghurt, and cheese per day on average when compared to the consumption of the other food groups. This contributed to the low calcium intake among Malaysians (Lee and Muda, 2019). Khor, Shariff, and Sariman, Huang, Mohamad, Chan, Chin, and Yusof (2015) found that less than 10% of children aged 7-12 years met the Malaysian Dietary Guidelines recommended intake of milk, indicating that children have an unhealthy diet pattern that is caused by a low intake of milk (Koo, Poh, Lee, Chong, Bragt, and Abd Talib, 2016). This is due to the fact that milk and milk products are not a staple food for the majority of the population, particularly among children and adolescents (Elwood, Pickering, Givens, and Gallanher, 2010).

### 1.3 Malaysia Dairy Goat Industry

The milk market in Malaysia can be divided into three categories: cow milk, sheep milk, and goat milk (Malaysia Dietary Guidelines, 2010). However, their gross chemical composition of milk differs with each other. Goat milk is a niche market for drinking milk products that exists in addition to the cow milk market. Goat milk is primarily consumed for health reasons and is found primarily in Malaysian Indian communities, which account for approximately 7.3 % of Malaysia's total population (EU-MCCI, 2015). According to Kapadiya, Prajapati, Jain, Mehta, Darji, and Aparnathi (2016), goat milk is characterized by having lower fat, total solids, lactose, protein content, total nitrogen and non-protein nitrogen compared to cow milk and buffalo milk. It also contains higher ash and non-casein nitrogen contents relative to other milk. Although goat milk has lower mineral contents such as calcium and phosphorus relative to cow milk, it has higher levels of magnesium and chloride compared to cow milk and buffalo milk. This shows the potential development of goat milk, especially in developing tropical countries, as a milk substitute (Shahudin, Ghani, Zamri-Saad, Zuki, Abdullah, Wahid, and Hashim, 2018).

As part of the inclusive dairy industry, the dairy goat faces a stiff competition with other milk products from cow, sheep and buffalo (Shahudin et al, 2018). The fact is goat milk is rarely sold widely even though it is consumed locally (Shahudin et al., 2018). As far as it is concerned, by having lower allergen and more nutritional properties compared to cow milk, have sparked a strong interest in goat milk as an alternative food and currently an emerging trend in healthy eating option in developed countries (Lima, Teixeira-Lemos, Oliveira, Teixeira-Lemos, Monteiro, and Costa, 2018). The specific composition of nutrition such as fats, proteins, amino and fatty acids as well as the unique characteristic of flavour, taste, aroma, and fatness of goat milk appeal most to the traditional consumers in certain region across the globe (Boyazoglu and Morand-Ferh, 2001).

The dairy goat farming in Malaysia began in 1950 when the country imported breeds such as Saanen, Aglo, Nubian, British, Alpine, and Jamnapari (Shahudin et al., 2018). Liang and Paengkoum (2019) reported that the key driving force in Malaysia's recent revival of dairy goat production is the high price of goat milk, an average of RM 15.43 per litre (former farm price) compared to RM 2.88 per litre for cow milk. Additionally, the growing demand is also attributed to the medicinal properties of the goat milk as it is sold at 2-3 times higher compared to cow milk, particularly in countries of Eastern and Southeast Asia. Although some goat milk is processed prior to the distribution to the local town and Singapore supermarkets, farmers typically sell fresh goat milk directly to individual and frequent customers. However, despite the impressive properties possessed by the goat milk, there is no official data recorded of goat milk production and its consumption in Malaysia up until now (Shahudin et al., 2018).

### 1.3.1 Issues and Challenges Facing Dairy Goat Industry in Malaysia

Given the fact that Malaysia is an Asian country, it is imperative that the knowledge gap regarding Malaysia's dairy goat market be addressed. Asia is home to approximately 60% of the total world goat population and has the largest goat breed share, accounting for 26% of the total goat population. Among Asian agriculture's most important socio-economic roles is the goat, which is especially important for resource-poor people who live in harsh environments. Asia accounts for approximately 59 % of global goat milk production, and the region's demand for animal products is increasing at a rapid pace, driven by rising populations and rising disposable incomes.

Goat milk has been produced in Malaysia for a long period of time. Since goat milk has a significant niche market, there has been a dramatic increase in the development of dairy goat farming in this country, which has resulted in a large influx of dairy goat from various countries. According to Shahudin et al. (2018), there is very little information available about dairy goat farming in Malaysia. Farmers must deal with a number of issues and challenges related to the development and improvement of the dairy goat industry in order to succeed. Despite recent improvements, goat milk yields are still low and poorly managed by small community farmers who lack access to modern technologies and innovations (Nasir, Abdullah, and Embong, 2018). Furthermore, dairy goat farmers in Malaysia face a number of challenges, including a reliance on imported breeding stock, the ability of farmers to apply the concept of comparative advantage, animal health and disease, and, finally, marketing and local consumption patterns (Jamaluddin, Idris, and Roslaini, 2012).

The demand for dairy goat products in Malaysia is steadily increasing, thanks to increased marketing efforts and changes in local consumption patterns. A supply chain in the marketing of goat milk in Malaysia from farm gate to consumer should be developed by engaging wholesalers, retailers, and customers (Jamaluddin et al., 2012). Grading of goat milk should be implemented in order to eventually deliver milk of a high enough quality to satisfy customers. When viewed through the lens of Malaysian cultural perspectives, Islamic values have a direct and indirect impact on Malaysian lifestyles and food choices. Goat milk is a traditional Sunnah food that is highly regarded for its nutritional value. Sunnah food products have traditionally been regarded as universally acceptable by both Muslim and non-Muslim communities alike. However, one of the primary reasons for the low consumption of goat milk is the significant lack of demand from consumers. The low consumption scenario prompts us to consider the role played by the market and the consumer, particularly in terms of goat milk purchases.

Low goat milk consumption in Malaysia is attributed to a variety of factors including human behaviour (Kok-Siew, Rahman, Rahman, Haris, Mohd, and Rani, 2016; Lee-Chang, Rahman, Rahman, Shamsir, Aris, Kok-Siew, and Rani, 2016), food neophobia (Kok-Siew et al., 2016), and poor eating habits (Lee-Chang et al., 2016, Lee and Muda, 2019). Purchasing goat milk is based on consumer behaviour, which includes attitudes towards the product. This demonstrates that Malaysian consumers believe that using goat milk is a good and wise idea, and that they would consume goat milk more frequently if they were better informed and aware of the nutritional contents. Malaysians drank goat milk regardless of the cost of the milk; the sale price of goat milk in many Asian countries is 2 to 4 times higher than the price of cow milk (Abdullah, Omar, Makkar, Otte, Rajion, Alimon, Boo, Kam, and Li, 2012), possibly due to the additional health benefits provided by goat milk. The increasing prevalence of human health problems such as obesity, heart disease, lactose intolerance towards cow's milk products, and other chronic diseases may be one of the primary reasons why people are switching to goat milk (Lad, Aparnathi, Mehta, and Vepula, 2017). As a result, attitudes play a role in determining final decisions regarding consumer consumption behaviour (Lee-Chang et al., 2016).

The desire to act in accordance with the expectations of friends, family, and social groups is another issue that arises when considering human behaviour in terms of subjective norms. The genuine purchasing decisions of Malaysian customers were directly influenced by the group and significant others to which they belonged at the time of purchase. Malaysians' factual purchasing is directly influenced by cultural and social factors that act as social pressure, whether they purchase goat milk or not (Kok-Siew et al., 2016). As a result, cultural variation and social influence factors play a significant role in determining whether or not goat milk should be consumed in everyday life in Malaysia. Malaysia is a multicultural country that is home to people of many different races, including Malay, Bumiputra, Chinese, Indian, and others. As a result, cultural variation and social influence factors play a significant role in determining whether or not to consume goat milk in one's daily life (Lee-Chang et al., 2016). Therefore, it has been demonstrated that cultural variation and social influence have an impact on the consumption of goat milk by Malaysian consumers.

According to Kok-Siew et al. (2016), food neophobia is a persistent issue that affects Malaysians' willingness to consume goat milk on a regular basis. It is a complication associated with a person's reluctance to experiment with new foods that are unfamiliar to their eating habits. Consumers are extremely concerned about the safety and security of the product they are consuming. In the context of food selection, neophobia is a concept that is specifically associated with food-related personality traits (Eertmans et al., 2005). Food neophobia is a protective mechanism that protects humans from potential physical harm, but it also limits the development of new food products and flavours (Altisent, Jaeger, Johnston, and Harker, 2013); additionally, the goaty odour is a barrier to the development of new food products and flavours (Jamaluddin et al., 2012; Kamarubahrin, 2019). The

presence of neophobia among goat milk consumers in Malaysia has been demonstrated to have a partial impact on their purchasing intentions. From the findings, it can be inferred that the expected consequences of consuming a food are related to the beneficial or harmful effects of consuming the food, beyond social the intention to purchase, lowering predictability of the social influence, particularly into goat milk consumption among Malaysian consumers (Kok-Siew et al., 2016). As a result, evaluation of goat milk characteristics should be implemented in order to eventually deliver milk of high quality that meets customer needs and wants.

During the last few decades, Malaysia has seen an increase in the prevalence of overweight and obesity, which is endangering Malaysians' overall health. One of the most important contributors to the development of obesity and many non-communicable diseases is a poor dietary intake. While at the same time, people's food environment today frequently provides them with numerous opportunities to make unhealthy food choices (Mancino, Tod, and Lin, 2009). According to Lee and Muda (2019), the study participants had high proportions of overweight and obesity, which was associated with their dietary intake. The protein intake exceeded the acceptable amounts, despite the fact that the total energy intake was within the recommended limits. The intake of fruits and vegetables as sources of dietary fibre was below the recommendations, and the intake of sugars and fats was significantly higher than the recommendations among the participants, whereas the intake of milk and milk products was significantly lower.

As a result, there is a need to consider the goat milk and its products as a part of the health consciousness in order to overcome the problem of dietary intake of milk. Malaysians' health consciousness is associated with the perceived use of goat milk in the form of medicinal values and nutritional contents, which prompts them to purchase the product in the first place (Kok-Siew et al., 2016). When it comes to maintaining their interest and motivation to purchase a healthy product, it is the customer's initiation, effort, and perseverance that is most important in determining their final decision to purchase goat milk. In order to maintain a healthy balanced diet, milk has long been and will continue to be consumed because it contains an impressive array of nutrients. A steady stream of scientific data is being published, documenting both previously known information about nutrient content and new information about health and disease prevention and mitigation. However, less information about goat milk consumption among Malaysian in order to fulfill their dietary intake for health purposes.

#### 1.4 Problem Statement

Milk is the perfect food for all the young and old people diet plan. It is necessary for the human's proper development. Goat milk provides a healthy diet packed with calcium, carbohydrates, fats, minerals and vitamins, that is essential for proper development of the body. That is why it is best suited for babies and the sick because it contains calcium that helps to promote growth and bones formation. In addition to mother's milk, a variety of milk can be obtain from sheep, cow and goat. The progressive introduction of dairy goat in Malaysia has since focused on the development of its products on the consumer-driven market. Goat milk is one of the products that can determines the success of the dairy goat market.

In Malaysia, scientifically-based information on dairy goat farming is very limited (Shahudin et al., 2018). Despite the fact that several research scholars have pointed out the benefits of milk and milk products, the data collected so far has revealed a low level of consumption of milk and milk products, particularly goat milk in Peninsular Malaysia. The demand for dairy products in general is increasing steadily in Malaysia, but the demand for goat milk products is extremely limited. So it's important to study the factors that stimulate and influence consumers when they consume goat milk in order to understand their preferences and acceptance, as well as factors that consumers prefer in their consumption so that we can deal with them and turn barriers to goat milk consumption into enablers.

The controversies sparked by fundamental questions about Malaysians' attitudes towards goat milk, as well as the impact of these attitudes for consumer consumption of goat milk. It is common for Malaysians to find the taste of goat milk to be bizarre because goat milk in Malaysia is a new food that is unfamiliar to their eating habits (food nephobia). A poor eating habit of milk contributed to the low calcium intake among Malaysians, particularly among children and adolescents. These issues mentioned above are facing Malaysian to consume goat milk that caused low consumption of milk than the recommended number of servings.

Limited knowledge about the specific factors that influence Malaysian preferences and acceptance for quality milk, as well as information about the opportunities and markets for goat milk in Penisular Malaysia. Due to the issues surrounding goat milk among Malaysians in previous studies, such as human behaviour, food nephobia, and unhealthy diet, the current study was inspired to fill this void by conducting a study to assess consumers' preference and acceptance towards consuming goat milk in Peninsular Malaysia where goat milk sensory attributes should be investigated, as well as the factors that influence their preferences.

## **1.5 Research Questions**

- i. Are there any differences in sensory characteristics among different samples of goat milk?
- ii. What is the association between consumers' socio-demographic characteristics and consumer preferences for goat milk?
- iii. What are the factors affecting consumer preferences for goat milk?
- iv. What are the most influential factors that can lead to consumer preferences for goat milk?

## **1.6 Research Objectives**

Generally, the objective of this study was to determine sensory characteristics and factors influencing consumers' preferences towards goat milk in Peninsular Malaysia. The specific objectives of the study were as follows:

- i. To determine the sensory characteristics of different samples of goat milk.
- ii. To determine the association between socio-demographic characteristic and consumer preferences for goat milk.
- iii. To determine the factor affecting consumer preferences for goat milk.
- iv. To identify the most influential factors that influence consumers' preference for goat milk.

## **1.7 Significance of the Study**

There is an increasing numbers of dairy goat in Malaysia and the number is expected to increase further. The growing number is primarily designed to produce milk in order to fulfil the increasing demand. Therefore, this research is performed in order to seek new strategies and overcome some of the problems that prevail in the goat milk industry.

Sensory findings provide solid foundations for the understanding of the sensory characteristic of goat milk associated with the common unfamiliar perception about goat milk that need to be changed, which professionals can use to create internal protocols for quality control and product development applications. Moreover, it is critical to obtain insights on customer behaviour towards a goat milk product for successful marketing, helping managers to recognize the right people for targeting and creating appealing goods.

By considering consumer choice for goat milk, especially in Peninsular Malaysia, producers would be equipped with adequate knowledge to understand the inherent factors that influence goat milk consumption in order to enhance

consumer preferences and enhancing the effort to encourage increased consumption of goat milk. Additionally, the study would help players in the goat milk sector to accurately assess and understand consumers' preferences. In terms of marketing purposes, the study will allow marketers to be able to identify the factors that affect consumers' expectation of goat milk quality and the critical factors.

Therefore, it is hoped that this study would bridge the gap in consumer needs and wants for high-quality goat milk and encourage farmers and other organizations to participate in the production of high-quality milk. The findings from identifying the demand and market potential for goat milk in Malaysia would further benefit the dairy goat farmers, food processors, and food marketers.

### **1.8 Organization of the Thesis**

This thesis is organized into five (5) chapters. The first (1) chapter begins with the introduction that includes the introduction of Malaysia's dairy market, dairy goat industry, problem statement, research questions, objectives of the study and significance of the study. The second (2) chapter consists of the literature reviews of past studies and information relevant to the study. The third (3) chapter includes an explanation of the research methodology, including sampling techniques, data collection methods, study area descriptions, and statistical data analysis. The fourth (4) chapter provides results of the descriptive analysis, analysis of variance (one-way ANOVA), Chi-square, factor analysis and binary regression. An in-depth discussion of the findings is also discussed in this chapter. The last chapter, chapter five (5), consists of a summary of the study, recommendations, study limitations, suggestions for further study, and the overall conclusion of the study.

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