CHAPTER 5

DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

5.1 Introduction

The findings of this research have been documented in Chapter 4 and continuous from the findings, Chapter 5 focuses on the discussion, recommendations for future works, and finally an overall conclusion of the research.

5.2 Mediating Effects of Health Consciousness on Consumer's Goat Milk Consumption Intention

The outcomes on relationships between variables in TPB (Attitude, Social Influence, and Self-efficacy) with health consciousness as mediator variable in the predictive model proposed in this study are discussed in this section. Results from data analysis in Chapter 4 shows that there was direct and positive relationship between attitude, self-efficacy, and health consciousness with goat milk consumption intention among Malaysian consumers. Findings from the data also suggests that social influence does not influence the consumption intention of goat milk among Malaysian consumers.

Following the Theory of Planned Behaviour, attitude in this study is determine by beliefs about the likelihood of goat milk consumption and their importance. It was found

in this study that milk consumption intention among Malaysian consumers is direct and positively influence by attitude towards its consumption. This is in accordance with findings from Kamarubahrin (2019) where the researcher reported attitude has significant effect on positive relationship with Muslim consumer behaviour in Malaysia towards goat milk. Furthermore, this finding is consistent with findings from Kim et al. (2003) where they found intention to consume dairy products among a sample of older adults was significantly related to the 3 variables proposed in the TPB, with attitude showing the highest magnitude of association. Studies with similar findings included Chen, (2007); Hsu et al. (2016); Irianto (2015); Kusumaningsih et al. (2019); Lien et al. (2002); Michaelidou & Hassan (2008); and Povey et al. (2000).

Secondly, the results from this Stage 1 study also show that there was no direct and positive relationship between social influence and goat milk consumption intention among respondents. In this study, social influence was measured by 4 items on the influence of information and another 7 items measured the tendency to conform to the expectations of others. Social influence is a person's perception of social pressure to perform the behaviour (Ajzen, 1991a). Results from Stage 1 shows that goat milk consumption was not as common when compared to cow milk, thus, respondents largely may not feel pressured from their families and people surrounding them to consume goat milk if these people themselves do not practice goat milk. According to Powers et al. (2005) children's health behaviours, particularly eating habits, are influenced by family, classmates, the media, and the environment. Eating habits formed in childhood are carried over into adulthood. This further confirms that social influence to influence goat milk consumption is minimal if social practice is low.

Furthermore, information influence such as goat milk advertisement on local television programmes, and newspapers/magazines are very few. This is noted by (Ardianto et al., 2021) that mentioned goat milk is less popular than cow milk. Hence, the study shows that social influence does not influence the respondents' intention towards goat milk consumption. Interestingly, Kim et al. (2003) showed comparable results in their study in U.S. where the attitude and perceived behavioural control constructs contributed significantly to the model for predicting intention to consume dairy products while subjective norms (social influence) did not.

However, several research that studied the relationship between social influence and intention to perform health behaviours towards popular subjects such as organic foods (Chen, 2007; Irianto, 2015; Kusumaningsih et al., 2019), fruits and vegetables (Lien et al., 2002), dairy products (Kim et al., 2003), and eating healthily (Povey et al., 2000) demonstrated positive and significant relationship of social influence at influencing the behavioural intention. Zahid and Dastane (2016) show that social influence is most influential factor impacting the behavioural intention of young adults towards smartphones (highly popular item).

In short, findings in this study show that social influence is not particularly powerful especially relating to foods that are lesser popular such as goat milk. High social influence does not always translate into higher likelihood and intention to adopt a recommended health behaviour.

Self-efficacy is "an individual's perceived confidence in the capability of performing the behaviour" (Ajzen et al., 2004). It is measured from internal factors

(skills, abilities) and external factors (opportunities, barriers) that either facilitate or inhibit the behaviour (Kim et al., 2003). In this study, it is demonstrated that there was direct and positive relationship between self-efficacy and goat milk consumption intention. In other words, when the respondents think that they had the better abilities, more opportunities and lesser barriers to goat milk, their intention to consume would increase as well. Study of Aertsens et al. (2009) has presented "Indeed recent studies point out that personal norms have a significant influence on their intention". Referring to personal norms, this concept is defined as individual's conviction that acting in a certain way is right or wrong based on own valuations.

This finding is further supported by Kim et al. (2003) where intention to consume dairy products was demonstrated to be influenced by the respondents' self-efficacy. In Malaysia, the current study implies that people may be more willing to practice goat milk consumption if they could comfortably locate and able to purchase goat milk from shops. Internal factors such as increased abilities to locate and purchase goat milk and external factors such as higher opportunities and lesser barriers would significantly influence the respondents' intention to consume goat milk. Other studies that demonstrated similar findings included Chen (2007), Kamarubahrin (2019) and Povey et al. (2000).

In short, this study found that attitudes and self-efficacy are more predictive than social influence in influencing goat milk consumption intention. In other words, when consumers perceive more behavioural control over purchasing food, the intention to consume will increase. Self-efficacy becomes the perception to the extent to which the behaviour is controllable.

5.3 Relationship between health consciousness and goat milk consumption intention among Malaysian consumers

Health consciousness in this study included measurement of items relating the internal focus of health and health behaviours. The study found that there was direct and positive relationship between health consciousness with the respondents' intention to consume goat milk. This suggested that respondents who were more conscious and alert about their health and well-being has higher intention to consume goat milk. In other words, health benefits of goat milk drive the intention to consume goat milk among the health-conscious consumers. Jerop and Kosgey (2014) reported in their study that the main factor motivating consumption of goat milk were health concern. Further, this finding is in accordance with research from Hsu et al. (2016) even though it is in contrast with findings from Michaelidou & Hassan (2008) who observed that other variables (e.g. attitude and ethical self-identity) are stronger influencer towards intention to purchasing organic foods. However, it is in line with research findings.

One of the most important variables in the research of consumer behaviour toward functional foods is health. This is because when consumers have more favourable opinions toward items, especially when the products are promoted as healthy and have good nutritional information, their intention towards its consumption will improve (Kozup et al., 2003). Established consumers of goat's milk in Siaya County "believed that goat milk had therapeutic properties and could cure or prevent some diseases" (Jerop & Kosgey, 2014). Harden and Hepburn (2011) conducted a four-year longitudinal survey of milk users and discovered that 66.8% of those who consumed goat's milk did so for health purposes.

5.4 Health Consciousness Does Not Mediates the Relationship Between Attitude and Goat Milk Consumption Intention Among Malaysian Consumers

Health consciousness is a new variable extended into the TPB framework in this study to predict the goat milk consumption intention among Malaysian consumers. Even though health consciousness and attitude towards goat milk both has direct and positively related to goat milk consumption intention among Malaysian consumers, health consciousness does not mediate the relationship between attitude and intention.

Results from Stage 2 study show that the respondents are generally agreeable with the idea that goat milk is good, but they are not ready to consume it frequently. Hence, the low attitude level influences the low intention to consume goat milk which explains their relationship. This is in line with study done by Kusumaningsih et al. (2019) where they demonstrated that attitude significantly affects the intention to purchase organic foods. Furthermore, the unreadiness of the respondents could be reflected by their negative impression on goat milk and its poor taste reputation. Bus and Worsley (2003) reasoned that although positive perceptions about goat milk health benefits were common, negative perceptions and misperceptions about its taste and flavour appear to be prevalent. Wham and Worsley (2003) further mentioned that "taste is a major determinant of food choice".

Findings from Stage 2 included unfavourable comments on goat milk are such as dislike the smell of goat milk, goat milk has strange/weird taste, expensive, taste is no good, and very hard to find. On overall, these comments can be group into four factors which are sensory properties such as taste and texture, price, religion, and availability of the goat milk. This study suggests that attitude towards goat milk has better strength than mediator health-consciousness at influencing the consumers intention to practice goat

milk. In situations in which attitudes are strong it may be more predictive than the mediator variable health consciousness (Kim et al., 2003). Thus, this study shows that health consciousness does not influence the strength of attitude towards goat milk consumption.

5.5 Health Consciousness Mediates the Relationship Between Social Influence and Goat Milk Consumption Intention among Malaysian Consumers

Even though there is no direct and positive relationship between social influence and goat milk consumption intention among Malaysian consumers, statistical analysis shows that the relationship between social influence and consumption intention is strongly mediated by health consciousness. There need not be a significant relationship between social influence and consumption intention in order to be mediated by health consciousness (Zhao et al., 2010). In other words, this study is suggesting that, social influence does not direct and significantly influence consumers' intention to consume goat milk, however, health consciousness is significantly influence by social influence; and health consciousness is also significantly influencing consumption intention. Hence, the indirect effect of health consciousness significantly mediates the relationship between social influence and consumption intention. This implies that one's awareness towards health will increase when there is higher social pressure for the individual to know their health status and perform health-improvements related behaviours. And because of this, health consciousness is demonstrated as a significant mediator that motivates higher intention to consume goat milk amongst the respondents. In a focus group study on

intention to purchase goat milk in Malaysia, participants disclosed that their motivations towards goat milk purchase and/or consumption intention include:

> "*Health factor is first pointed out in my mind when I purchase or consumed goat's milk because it contains many nutritious and benefit" (Female, aged 35).*
>
> *"Nutritious contents information stick at the bottle of goat's milk was motivated me toward intent to purchase goat's milk" (Female, aged 27).*
>
> *"I have high blood pressure. Thus, to recover it I choose to purchase and consume goat's milk regularly. Because of it beneficial to my health" (Female, aged 45).*
>
> *"Awareness of health care makes me consume and regularly purchase goat's milk. Because goat's milk is better than other types of milk. And as what I know about goat's milk fact, it is the best after mother's milk" (Female, aged 30)."*

Quotes are adopted from Kamarubahrin et al. (2019). The respondents' comments clearly reflected behaviours of health consciousness. Thus, health is an important factor that influences them they to buy and/or practice goat milk consumption.

5.6 Health Consciousness Mediates the Relationship Between Self-Efficacy and Goat Milk Consumption Intention among Malaysian Consumers

Self-efficacy is an important and significant variable that influences intention to consume goat milk among the respondents in this study. When health consciousness is introduced into the relationship as a mediator, it forms a complementary relationship (also known as Baron and Kenny's partial mediation) with self-efficacy in influencing the goat milk consumption intention. According to Zhao et al. (2010) a significant relationship for the direct path between self-efficacy (independent variable) and consumption intention (dependent variable) as well as significant relationship for the indirect path of self-efficacy towards health consciousness (mediator) to consumption intention resulted in a complementary mediation of health consciousness mediating the influence of self-efficacy towards consumption intention. The mediation analysis following recommendation from Zhao et al. (2010) suggests that health consciousness is identified consistent with the hypothesized theoretical framework.

The current study suggested that consumption intention is direct and significantly influenced by self-efficacy in a way that people may be more willing to practice goat milk consumption if they could comfortably locate and able to purchase goat milk from shops. Similarly, respondents who are more conscious and alert about their health and well-being has higher intention to consume goat milk. Hence, in a complementary relationship, respondents who demonstrated better abilities to easily find and purchase goat milk, and to overcome barriers (such as taste, price, and availability) towards goat milk

consumption, are likely those that have higher awareness of their health as well. In turn, this will increase their goat milk consumption intention.

Thus, in this study it was found that intention to consume goat milk is influenced directly by self-efficacy and indirectly via health consciousness. Health consciousness mediates the influence of self-efficacy on goat milk consumption intention.

5.7 Knowledge of Goat Milk Health Benefits

Knowledge levels on the goat milk health benefits were determined using total mean score. Based on descriptive analysis, 53.0% (N=398) of the respondents were considered to have good knowledge of goat milk health benefits by scoring above the total mean score. Literatures that report on studies pertaining to Malaysian consumers' knowledge on goat milk were little and literatures that discussed knowledge level of goat milk health benefits were even lesser. One finding from Umar (2018) that studied the knowledge of goat milk health benefits among Muslims community in Klang Valley discovered 52.6% (N=462) of the respondents has good level of knowledge on goat milk health benefits.

In other countries outside Malaysia, several studies have examined the consumers' acceptance and purchasing behaviour towards goat milk. A research done in Japan to study the goat milk acceptance by Ozawa et al. (2009) mentioned that a large majority at 87.0% (N=275) of the respondents in their research claimed to have no knowledge on goat milk nutritional benefits which corresponded to the 70% (n=192) of respondent that had no goat milk drinking experience. In Bogor, Indonesia, a research by Santoso et al.

(2012) reported that the 47.8% (N= 150) of the respondents in their study who regularly consume goat milk did so because their families found out about the advantages of goat milk. The importance of knowledge on goat milk health benefits and goat milk consumption was clearly reflected in this study. In Nigeria, goat milk is described as affordable, readily available, highly nutritious, and the knowledge on its nutritional value could enhance the use of goat milk for child nutrition (Belewu & Adewole, 2009).

In this study among the multicultural Malaysian respondents, Malay and Indian were found to have good knowledge level of goat milk health benefits compared to the Chinese and Other ethnics. Goat milk is sunnah food in Muslim (Kamarubahrin et al., 2019) which may lead to better level of knowledge in Malay whereas other ethnics may need to proactively look up for information about goat milk when needed. Another research revealed that Muslim consumers are aware of the health benefits impart by goat milk and are frequently purchasing and consuming it to improve their health (Kamarubahrin, 2019). This may explain for the significantly higher mean score for knowledge on goat milk health benefits of Malay respondents. Besides, goat milk is widely recognized by the Indian community as a food with high medicinal value as documented in Nepalese Ayurveda (Nepalese Traditional Medicine) and Indian Ayurveda (Bhattarai, 2014; Csapo, 2019); which may have contributed to their knowledge in goat milk health benefits.

Score analysis for knowledge of goat milk health benefits shows that among the six items, Item 2 received the lowest mean score at 3.79 (0.727) while highest mean score was obtained by Item 6 at 4.15 (0.786). The low mean score of Item 2 reflected that on

overall the respondents were not very sure whether to agree that goat milk is easier to be digested compared to cow's milk. This may be because the respondents were less expose to specific description of goat milk benefits. In other words, respondent could be aware that generally goat milk is nutritious but are not aware that certain nutrients such as the fatty acids in goat milk are better in digestibility and bioavailability compared to cow's milk. Many studies have discussed the many aspects of goat milk nutrients digestibility and its health benefits to the digestive system (Alférez et al., 2001, 2003; Park, 1994; Slačanac et al., 2010).

On the other hand, the respondents were quite confident to agree to Item 6 that goat milk helps to strengthen the bones. This may be because respondents could have easily associated the general knowledge of cow's milk benefit in strengthening bones as commonly similar to goat milk to be rich in calcium, and hence is able to help strengthen the bones as well. This is evidenced by Nishitani et al. (2008) where it was mentioned in their research that participants who were accustomed to drinking cow milk could have evaluated goat milk by comparing it to cow milk based on their experience. Thus, it is likely that participants felt goat milk has similarity to cow milk. Many studies has indeed documented the nutritional values of goat milk to be a good source of protein and calcium (Chauhan et al., 2018; Haenlein et al., 2007; Jenness, 1980; Slačanac et al., 2010). Four major benefits of goat milk for human health are "similar to human breast milk, high digestibility, high taurine content and high content of minerals and vitamins" (Nishitani et al., 2008).

In a nutshell, 53.0% (N=398) of the respondents were considered to have good knowledge of goat milk health benefits with the Malay and Indian ethnics were found to have better knowledge level of goat milk health benefits compared to the Chinese and Other ethnics. Item 2 on goat milk is easier to be digested compared to cow's milk obtained the lowest mean score, and Item 6 on goat milk helps to strengthen the bones obtained the highest mean score.

5.8 Attitude towards Goat Milk Consumption

The overall mean score for attitude towards goat milk consumption among the respondents was 3.71 (n=180) in which 45.2% of the respondents were considered to have positive attitude towards goat milk consumption while the remaining 54.8% were described as having low attitude towards goat milk consumption intention. Only the Malay ethnic shows higher number of respondents who scored above the mean score while Chinese, Indian and Others ethnic showed either equal or higher number of respondents scoring below the mean score. Goat milk acceptance in Malaysia and has not been extensively studied and has been receiving little attention. This is evidenced by the scarcity of the available literatures. However, based on recent studies there is new awareness especially among health-conscious people that goat milk can be a good source of nutrition (Bhattarai, 2014; Danviriyakul et al., 2011; Ozawa et al., 2009).

Among the multicultural ethnicities, the mean score reflects that Malay respondents has more positive attitude level towards goat milk consumption compared to the rest. There is significant difference (p=0.000) for attitude towards goat milk consumption between different ethnicity of respondents. Religion plays an important part

in moulding the lives, beliefs, and attitudes of people. Furthermore, religion can have an impact on the attitudes of consumers and their behaviours. As influenced by the *Sunnah*, Muslims are encouraged to consume goat milk in their religion (Kamarubahrin et al., 2019). This may have instilled positive attitude among the Malay respondents which explains the significantly higher mean score. This finding is supported by Umar (2018) that reported higher percentage of the Malay respondents in her research showed positive attitude towards goat milk consumption than negative attitude.

In the current study, even though the Malay respondents showed higher positive attitude compared to other ethnics, on overall, the positive attitude level is still low (48.0%). Generally, the attitude towards goat milk consumption is said to be affected by consumers consumption habit and barriers to consumption such as price, taste, and lack of motivation (Umar, 2018). Furthermore, the overall lower attitude level of the non-Malay respondents towards goat milk consumption may be due to the poor reputation of goat milk sensory properties such as goaty odour (Csapo, 2019; Danviriyakul et al., 2011; Nishitani et al., 2008; Slačanac et al., 2010).

Annunziata and Pascale (2011) reported that "health information increases consumer awareness or expectations about the healthiness of a product and produces more positive attitudes towards it" which in this context suggest there is a need for intervention programme to be carried out to increase awareness towards goat milk health benefits.

Score analysis for attitude towards goat milk consumption intention shows that Item 3 received the lowest mean score at 3.52 (0.871) while highest mean score was obtained by Item 1 at 3.98 (0.662). This statistic reflects that most respondents thought it is a wise idea to consume goat milk (as in Item 1) but do not think that they like to

consume it frequently (as in Item 3). This shows that respondents do not reject the idea that consuming goat milk is a sensible behaviour. However, results from Item 3 reveals that the respondents may not be ready to adopt the behaviour as the mean score was lowest. According to Rani et al. (2016), majority of the respondents in their survey (85.2%, n=162) knew about the health benefits of goat milk such as able to cure heart burn and ease indigestion problems. The goat milk reputation as a healthful food may explain the findings of Item 1. On the contrary, respondents may dislike or find it difficult to frequently consume goat milk due to factors such as availability of goat milk, price, and its taste. Umar (2018) summarized the barriers to frequent consumption of goat milk as price, taste, lack of motivation, difficult to find, and quality and freshness issues.

In summary, lesser than half of the respondents in this study were considered to have good attitude towards goat milk consumption intention. Among different ethnicities, the Malay shows highest level of attitude, followed by the Indian and Chinese. Others ethnics obtained the lowest total mean score for attitude towards goat milk consumption. Findings from this study also discovered that majority of the respondents thought it is a wise idea to consume goat milk, but they may not be ready yet to consume goat milk frequently.

5.9 Practice of Goat Milk Consumption

While the findings on knowledge of goat milk health benefits and attitude towards goat milk consumption did not appear very encouraging, the practice towards goat milk consumption shows similar trend.

In this study, it was found that slightly more than half (53.8%) of the respondents had tried goat milk before. It was found that percentage of Malay (54.3%) and Chinese (54.8%) respondents who consumed goat milk were just slightly higher than those who had not tried goat milk. However, for 'Other' ethnic, majority of the respondents (70.0%) had not tried goat milk. This is in accordance with another study in Langkawi, Malaysia by Umar et al. (2017) found that nearly half of the residents never or rarely consumed goat's milk in their lifetime. The main reasons reported for the low consumption among the Langkawi respondents were lack of interested to consume goat's milk, unpleasant taste, and non-staple food. Hendijani and Karim (2010), explained that "since milk is seldom practiced as a healthy food among Malaysians, its consumption is low. In addition, the low milk consumption was due to the existence of competing drinks, effect of packaging, sensory properties, belief to health benefits, effects of family members and friends, availability at home and advertising".

Santoso et al. (2012) also reported similar consumption pattern in Bogor, Indonesia where 52.2% customers did not regularly buy goat milk and only 47.8% of the respondents regularly consumed goat milk. The reason reported for irregular consumption was because the respondents just wanted to try and to "know the reaction and its effect" of consuming goat milk. In Thailand, Danviriyakul et al. (2011) reported only 60% of the

respondents have previously consumed goat milk and related products in their study. The researcher reported thar despite the survey reported moderate consumption percentage, that the respondents rated highly for the desire to consume goat milk for its various nourishing benefits.

Additionally, when compared among ethnics, the mean score in this current study shows higher consumption of goat milk among the Malay respondents even though there was no statistical mean difference among different ethnics. This finding is in accordance with another study by Lim et al. (2016) found that there is significant correlation between consumer attitude and goat milk consumption. Umar et al. (2017) also reported knowledge and attitude are positively correlated with goat's milk consumption. These discoveries help to explain the higher practice among Malay respondents towards goat milk consumption. This finding is further backed by research done by Rani et al. (2016) in Negeri Sembilan, Malaysia where the study reported that about moderately high percentage at 76.5% (n=124) of the Muslim respondents had experience in goat milk consumption.

Overall, for all ethnics, the practice of goat milk consumption is considered low among the respondents. Current study reported that only 5.5% of the respondent drink goat milk almost every day. Similarly, a study among local Muslim residents in Langkawi Island, Malaysia found only 11.8% of the residents consumed goat's milk daily (Umar et al., 2017). Goat milk is not considered a reputable drink in many regions around the world (Mowlem, 2005). Although the study from Rani et al. showed that moderate consumption experience, the amount of goat milk consumed were low. Reasons

documented for the low amount consumed include low availability of fresh goat milk and powdered-goat milk compared to cow milk, and the unpleasant goaty smell. Similarly, the current study also noted that from the group of respondents that consume goat milk, majority of them (26.6%, n=106) consume only less than 1 cup (240 ml) of goat milk per serving. According to Malaysian Dietary Guidelines (2020), Ministry of Health Malaysia recommends taking 1 to 2 servings of dairy each day. Only 2.0% (n=8) of the respondents who consume goat milk takes more than 1.5 cup (355 ml) per serving. Rani et al. also concluded that there was no association between socio-demographic profiles and practice scores of the respondents.

In short, to conclude practice towards goat milk consumption in this study, it was found that 53.8% (n=214) of the respondents had experienced drinking goat milk. The mean score was significantly higher for Malay, follow by Indian, Chinese, and Others. The consumption rate and consumption volume of goat milk among respondents was low and did not meet the recommendation of the Malaysian Dietary Guidelines.

5.10 Impression on Goat milk

Although goat milk has received poor reputation of its sensory properties such as goaty odour, it is important to note that this study revealed that 66.8% of the respondents who consume goat milk actually has positive impression on goat milk such as good taste, sweet and thick taste (creamy) while the remaining described negative impression on goat milk such as dislike the smell of goat milk, strange taste and do not remember.

Ozawa and his team who did a survey on the impression of goat milk among Japanese household reported similar findings in which positive impression were evaluated higher than negative impression (Ozawa et al., 2009). In Thailand, a research found that after having experienced drinking goat milk, the consumers were likely to buy it for their own use and household consumption, and most of them (>75%) intended to introduce it to other consumers (Danviriyakul et al., 2011). This shows that having experienced with goat milk consumption may improve impression of goat milk.

On the other hands, negative impressions of respondents were largely due to its sensory properties (taste, odour, flavour), availability of other choices such as cow's milk, and price factor. Comparable to similar research in Thailand that reported the inconvenient access to the products is the main reason to deny goat milk as well as its strong smell and dislike of flavour (Danviriyakul et al., 2011). Chamboko et al. (2014) mentioned that goat milk's strong flavour and tastes may limit the consumption and market opportunities of goat milk. Yangilar (2013) explained that this misconception can be traced back to poor sanitary conditions in which goats are milked and poor handling of the goat milk and milk products. Zhao et al. (2017) noted that people could learn to accept foods by physiological and social associative conditioning. For example, young children learned to accept new foods that are repeatedly offered by family, which often reflect cultural preference.

5.11 Predictors towards Practice of Goat Milk Consumption

Based on logistic regression analysis, knowledge, attitude, and age of respondents added significantly to the prediction model, but gender, ethnicity, education level, and total income did not add significantly to the model. As the respondent's knowledge of goat milk health benefits increases by 1 unit, the odds of goat milk consumption are increased by 1.6 times when the other independent variables are controlled. This result implied that someone who knew more about benefits of goat milk will have higher odds to consume goat milk. This is supported by findings from Boniface and Umberger (2012) who found that "consumers who believe fluid milk is a good source of nutrition" is more likely to consume milk. Likewise, in this study respondents who knew more about the nutritional benefits of goat milk are more likely to consume goat milk. Besides, "Knowledge", more importantly is the respondents' attitude towards goat milk. In this study, findings show that when the respondent's attitude increased by 1 unit, the odds of goat milk consumption are increased by 6.5 times when the other independent variables are controlled. In other words, respondents who believed that goat milk is good for them will be more ready and showed higher tendency to consume goat milk. This finding is consistent with the study on goat consumption among Muslim residents in Pulau Langkawi, Malaysia where the researcher reported that their knowledge and attitude are positively correlated with goat's milk consumption.

Another significant predictor to goat milk consumption is "Age" where in this study reports that when the respondent's age increased by 1 unit, the odds of goat milk consumption are increased by 1.5 times. Literatures on goat milk consumption trend

among Malaysians were few. However, this finding is interesting as it show similar findings to the research done by Boniface and Umberger (2012). The team of researchers studied on factors influencing consumption of dairy products in Malaysia and found that age of respondents too, was a significant contributing factor to predict the consumption of dairy products. The research concluded that "older consumers in their study tend to be more likely than young consumers to increase their consumption of dairy products" (Boniface & Umberger, 2012). In a separate research conducted by Bus and Worsley (2003) among 361 randomly selected shoppers in two shopping centres in Melbourne, Australia found that milk consumption was higher among elderly adults in age group 51 – 65 years old.

5.12 Health Education Intervention Programme to Increase Knowledge, Attitude, and Consumption of Goat Milk

This section discussed the findings from Stage 3 which was the health education intervention programme. As narrated in Chapter 8, the health education intervention programme coincided with the onset of Covid-19 pandemic, thereby making an on-ground physical intervention programme inappropriate. According to Goni et al. (2020) the use of technology to communicate such as through smartphones are heavily associated with our everyday routines and are a vital part of modern life. This trend provides an opportunity to a viable option of providing health education interventions and conducting prospective surveys online. Furthermore, the use of smartphone apps to deliver health education interventions is vastly more efficient in terms of reaching a bigger audience and providing immediate feedback (Goni et al., 2020). Nikniaz et al. reported approximately

70% (18 out of 25) of the health education intervention programmes in their systematic review successfully increased dairy consumption when activities such as telephone calls, the use of the web and technology tools among others were included.

Research that specifically focused on intervention programme to increase goat milk consumption as the targeted outcome is scarce. Hence, discussion in this section is mainly based on relevant literatures that include interventions on dairy products and dairy consumption as the main focus. In this study, the health intervention programme targeting the knowledge, attitude, and practice constructs, show promising success as results show that there was significant improvement of mean score in knowledge, attitude, and practice in for the intervention group pre and post intervention. In other words, the intervention programme has successfully increased the level of goat milk health benefits with improved attitude level that leads to higher consumption of goat milk which is the primary goal. This outcome is supported by review done by Nikniaz et al. (2020) where the researchers reported educational intervention programme were effective in increasing dairy consumption. Furthermore, the researchers also found that interventions in young adults as target groups were more effective than children, middle-aged people, and the elderly. In community-based interventions, altering food habits and behaviours of the elderly is a really challenging task (Nikniaz et al., 2020). This helps to justify the decision of selecting undergraduates as targeted intervention programme participants in the current study. Although an eight-week intervention is effective as shown in the current study, Nikniaz et al. has reported that interventions longer than 24 weeks were more effective than shorter interventions below six weeks.

The findings in this current intervention which is guided by the KAP theory is in line with Watson et al. (2009). Their study evaluated the effectiveness of the education intervention programme at improving general nutrition knowledge level, attitudes, and food consumption practices. Similarly, they reported that only the "intervention group significantly improved in nutrition knowledge, some attitude scores, and milk and breakfast consumption behaviours". It was suggested that nutrition education can have a positive impact on high school students' knowledge, attitudes, and eating habits (Watson et al., 2009). Moreover, systematic review from Shapu et al. (2020) reported 87.5% (7 out of 8) of the KAP-guided intervention programme showed statistically significant improvement in knowledge, attitude, and practices towards health issues such as malnutrition.

In other words, the findings in this current study is in accordance with the findings from various KAP-guided, community-based intervention programme, hence, supported the choice of using KAP theory in the intervention programme to increase the knowledge, attitude, and eventually the consumption of goat milk in intervention group. Using of theory in developing health education modules effectively improved KAP (Shapu et al., 2020).

5.12.1 Evaluation on Pre and Post Intervention among Control and Intervention Group for Goat Milk Consumption

Research that specifically focused on goat milk consumption as the targeted outcome is scarce. Hence, discussion in this chapter is mainly based on relevant literatures that include interventions on dairy products and dairy consumption as the main focus.

5.12.2 Knowledge of goat milk health benefits

Outcomes from the intervention programme show that there is no significant mean difference for knowledge score among participants in control group pre and post intervention. However, there is significant mean difference for knowledge score on goat milk health benefits in intervention group pre- and post-intervention. Cohen's d value obtained was 1.1 which is interpreted as large effect size.

Nishitani et al. (2008) who studied the acceptance of goat milk among young Japanese adults found that "the promotion of the health benefits of goat milk to participants via written and verbal information significantly increased the amount of goat milk consumed. In this trial, the participants recognized and consumed goat milk as a "healthy drink" even though the taste itself was only moderately pleasant to them". This is an encouraging research to increase goat milk consumption in Malaysia as well.

In addition, a study in Iran by Vakili et al. (2008). There is a significant increase in scores of knowledge after the KAP-guided intervention programme was conducted on middle school girls to increase intake of milk and dairy products. Naghashpour et al.

(2014) reported similar findings in their study to improve dietary calcium intake among female students at junior high schools. The study found significant increase in nutritional knowledge in the intervention group post intervention compared to pre intervention. The researcher mentioned that through the nutritional education, the knowledge on benefits of consumption has increased, perceived barriers was decreased, and dairy consumption increased. There was no significant different in knowledge score pre and post intervention in the control group (Naghashpour et al., 2014). Similarly Watson et al. (2009) reported that the results of paired sample t tests that the participants in the intervention group demonstrated a significant increase in attitude in nutrition at the post-test, whereas the control group did not. In short, the findings support the effectiveness of nutrition education intervention to increase health and benefits knowledge. In China, Zhao et al. (2017) reported that weak nutritional knowledge is associated with inappropriate dietary behaviour. In their study, the researchers found that participants with poor dairy knowledge were more likely to have a lower dairy product intake. Hence, as an outcome of nutritional education, dietary behaviours can be changed.

5.12.3 Attitude towards Goat Milk Consumption

Outcomes from the current intervention programme show that there is no significant mean difference for attitude score among participants in control group pre and post intervention. Yet, there is significant mean difference for attitude score towards goat milk consumption in intervention group pre- and post-intervention. Cohen's d value obtained was similar to knowledge's effect size at 1.1 which is interpreted as large effect size.

This result is in accordance with study by Vakili et al. (2008) that reported is a significant increase in scores of attitude after the KAP-guided intervention programme was conducted on middle school girls to increase intake of milk and dairy products. Like the knowledge attribute, Watson et al. (2009) reported that the intervention programme significantly increased the attitude of participants in intervention group by effectively increasing their interest in nutrition after the intervention. Naghashpour et al. (2014) likewise found significant increase in attitude level in the intervention group post intervention compared to pre intervention. There was no significant different in attitude score pre and post intervention in the control group. Although educational interventions enhance nutritional knowledge, there is often a large disparity between information and practices. Thus, in the KAP theory, attitude is always essential in influencing nutritional behaviours (Zhao et al., 2017).

In this study, intervention activities such as Quiz competition, Selfie competition, and free goat milk sample testing synergized by increased knowledge on goat milk health benefits provided in pamphlet and videos have instilled positive attitudes towards goat milk consumption among participants in the intervention group.

Hendijani & Karim (2010) found that milk is not a preferred choice of beverage among Malaysian young school children. Instead, mineral water, Milo, fruit juice, flavoured milk, yoghurt, Ribena, tea and soft drinks received better acceptance than plain milk. The researchers suggested attitude to its sensory properties was among reason affecting consumption of milk. Nishitani et al. (2008) suggested familiarizing school children with goat milk since young will cultivate a better attitude towards goat milk.

In addition, previous research showed that prior experience plays an essential role to determine consumer attitude since the more experienced (organic food) consumers have, the more positive attitude they would have (Aertsens et al., 2009). Thus, creating opportunities for people to try goat milk could help instil positive attitudes towards goat milk consumption especially in overcoming sensory barriers.

In a nutshell, intervention programme carefully designed following the KAP theory can proved to be effective at increasing attitude of participants post intervention.

5.12.4 Practice of Goat milk Consumption

For knowledge and attitude, intervention results showed results of no significant mean difference for knowledge and attitude among the participants in control group pre and post intervention and significant mean difference among the participants in intervention group pre and post intervention. However, for practice, there is significant mean difference in practice of goat milk among the participants in control as well as intervention group pre and post intervention. Cohen's d value for intervention group was 0.5 which is interpreted as medium effect size.

In control group, there was a significant decrease in mean score pre and post intervention probably due to lack of interest in goat milk consumption and for not having involved in the intervention activities. As mentioned, for this group of participants, statistically analysis show that there was no significant mean difference for knowledge

and attitude which implies that the knowledge on goat milk health benefits level and participants' attitude towards its consumption post intervention remained unchanged compared to pre intervention. This supports the KAP theory where it explained the "progressive relationship of acquisition of knowledge, the generation of attitudes and the formation of behaviour" (Fan et al., 2018).

The current findings is also found to be consistent with research by Naghashpour et al. (2014) who reported significant increase in practice level towards intake of dietary calcium in the intervention group post intervention compared to pre intervention. Findings from the intervention programme in this study is in accordance with a study by Powers et al. (2005) who reported a successful nutrition education programme that focused on changing dietary behaviour and increasing nutrition knowledge. Knowledge showed significant positive score changes in the treatment group and for dietary behavior changes, the researchers reported dairy consumption improved significantly in treatment group compared to a decline in control group. The research concluded a correlation between overall dietary behaviour and nutrition knowledge.

In Thailand, School Milk Programme not only aimed to increase nutritional status of school children but at the same time helps to support the dairy industry by providing milk from local producers. "This will hopefully develop a taste for milk and hence a market for the future. Milk drinking habits of Thai children will eventually lead to positive consequences for dairy goat milk production in terms of demand and technology development" (Anothaisinthawee et al., 2012).

5.12.5 The Effect Size

Effect size is usually reported in intervention studies to measure the extend of the intervention effect on the participants. According to Kotrlik and Williams (2003), effect size measures the magnitude of a treatment effect and the meaningfulness of the results. Following Cohen's d statistics, the intervention results in this study show that knowledge and attitude constructs have large effect size in influencing the practice to consume goat milk. This agrees with the finding in Stage 2 where there is direct and positive relationship between attitude and goat milk consumption intention.

5.12.6 Evaluation on Mean differences between Control and Intervention Group after Eight-Week Goat Milk Intervention Programme

Results of independent t-test to compare the mean differences between control group and intervention group after eight-weeks intervention programme show that there is significant mean difference for all constructs of knowledge, attitude, and practice. This shows that providing accurate knowledge on goat milk health benefits is important as a strong foundation to form positive attitude towards goat milk that will actually transform into practice of goat milk consumption.

5.13 Implications of the Study

In general, this thesis has made contributions and implications to research by further explaining the KAP characteristics of goat milk consumptions among multicultural Malaysians and the determinants of its consumption intention based on the Theory of Planned Behaviour extended with health consciousness as a new mediator variable. The following sections discuss the practical, theoretical, and policy implications. All research works, data, and findings from this thesis are made possible by the Niche Research Grant Scheme funded by the Ministry of Education.

5.13.1 Practical Implications

As practical implications, this thesis has made contributions to research by providing new data on the consumption of goat milk among multicultural Malaysians. The data may be useful to different parties from farmers to the entrepreneurs to get an insight on the consumption status among the locals. The findings are useful in shedding light on the Malaysians intention to consume goat milk, in order to help predict goat milk demand and consumption trends in the future. Furthermore, the knowledge disseminated to the participants will guide them to make informed decisions to choose dairy products most suitable to their family needs towards a healthier community. Furthermore, farmers may be keener and more motivated to be involved in goat farming knowing that there is trend of growing demand for good quality goat milk and goat milk products.

Next, findings from this study closes the gaps in understanding dairy goat industry from the Malaysian consumers' perspective by providing analytical data and descriptive

information. Following this, the Ministry of Agriculture, marketers, and farmers will be better guided towards mitigating challenges and improving the local goat milk industry. Based on this study, future campaigns by the government (such as Ministry of Health), or media advertisements by the commercial sectors should target on consumers' knowledge on health benefits, attitude, age, self-efficacy, and health consciousness to increase goat milk consumption.

On the other hand, this study found that in the consumers opinion, the availability of goat milk and its products are few compared to cow milk. This opens new opportunities to academia and food sector to develop odourless, affordable, and nutrient-dense goat milk-based dairy products knowing that this are the future demands of our consumers.

5.13.2 Theoretical implications

The findings in Stage 1 Mediating effects of health consciousness on consumer's goat milk consumption intention show that the Theory of Planned Behaviour (TPB) is useful in predicting the behavioural intention to consume goat milk. The theory applied in Stage 1 carries a predictive model with the introduction of health consciousness (HC) as a mediator. Results from SmartPLS show that HC is a significant mediator that mediate the influence of self-efficacy and social influence towards consumption intention in the context of goat milk. Conventionally, the TPB consists of three independent variables i.e. attitude, social influence (subjective norms), and self-efficacy (perceived control). Findings from this study highlighted that with less popular foods (such as goat milk),

social influence may not be a powerful predictor to predict the consumption intention. In such context, attitude show a higher predictive power on the intention. To the author's best knowledge, there has not been a study that incorporated health consciousness into the TPB in predicting goat milk consumption intention. Future research could further expand the model or apply it in new environment.

On the other hand, the influence of attitude is clearly seen in the KAP model in Stage 2 and Stage 3 of the study where knowledge and attitude were identified as significant factors to affect the consumption of goat milk. Nutrition intervention based on KAP findings in Stage 2 has successfully increased the knowledge and attitude towards goat milk consumption. This implies that the government organizations, healthcare, and marketing sector could adopt similar approach to promote goat milk. Secondly, this study also show that online intervention programme is suitable when targeted at young adults such as university students.

In short, the application of the extended TPB theory incorporated with KAP-based intervention programme show promising success at understanding the intention and increasing the consumption of goat milk. This model can be used or modified by in future research to predict behavioural intention.

5.13.3 Policy Implications

The Twelfth Malaysia Plans, RMK-12 (2021-2025) continues to see the government's efforts in promoting the development of innovative value-added products, boost the income of agropreneurs and farmers, and reduce the reliance on imported dairy

products. According to the National Agrofood Policy 2021-2030 (DAN 2.0) the increase in fresh milk demand way surpasses its production especially when relying on small scale farmers.

Finding from this research show that consumers clearly have the intention to consume goat milk for its health benefits if it is easily available and affordable. Hence, increasing goat milk production could provide a solution in meeting the demand for fresh milk and offering alternatives at the same time. Furthermore, goat is considered an easier ruminant to keep compared to cow (Jamaluddin, 2012). This implication could be useful to the Ministry of Agriculture and Agrobased Industry in achieving the National Agrofood Policy in strengthening the country's food security. Furthermore, the 2021-2025 National Food Security Policy Action Plan (DSMN) emphasizes on efforts to ensure availability of safe, nutritious, and affordable food supply in the country especially rural areas.

In this study, findings show that that self-efficacy and health consciousness are indeed a significant factor influencing the intention to consume goat milk. With advanced farming and processing technology, goat milk can be made easily available and affordable (increase consumer's self-efficacy), safe and nutritious (for health-conscious consumers) to mitigate food security issues in the country. Furthermore, previous studies showed that goat farming has high potential to increase livelihood of people (Devendra, 1999), especially with the use of dual-purpose goat breeds (Liang & Paengkoum, 2019).

On the other hand, findings from the intervention programme in this study show that exposure to experience of goat milk could significantly increase its consumption. This finding can be adopted by the Ministry of Education in expanding the School Milk

Programme with provision of not only cow milk, but also goat milk to selected school children. This will cultivate their habits towards goat milk consumption and providing balanced nutrition to children as well.

5.14 Research Limitations

This section discusses the theoretical and practical limitations of this study. Based on the discussions, some directions for future research are proposed. One of the research limitations was lack of continuation between the stages of the study in which participants in the Stage 3 intervention programme were not able to be sampled from the pool of Stage 2 respondents (KAP study) due to movement restriction order and Covid-19 pandemic. During the MCO, teaching and learning activities in higher institution were conducted online. Thus, only homogenous group of undergraduates aged 18-24 years old were included in the Stage 3 intervention programme as they are the most suitable group for online intervention. It was recommended that for future research, there should be a clear continuation between the stages of study.

Next, the limitation of the study also included lack of follow up after the intervention programme. Long term follow-up is important to see the real change and consistency of behaviour.

Lastly, the respondents in this study are Malaysian adults randomly sampled from customer-intercepts at hypermarkets. Hence, this study is not able to describe goat milk consumption based on life stages such as pregnant and lactating women, children, adolescents, and older adults. This is because nutrition needs are different at different life stages. For example, goat milk used as a base for formulated milk targeting aging

population should have different nutritional composition compared to goat milk for teenagers.

5.15 Recommendations for Future Research

Recommendation from this study was to improve awareness of goat milk and its products through promotion and educational programme. More efforts should be in place to promote goat milk such as in food exhibitions, nutrition awareness programmes, and health promotion programmes organized by various stakeholders including schools, universities, government organizations, industries, and farmers. At a smaller scale, goat milk posters and recipe collections can be displayed at strategic locations such as the grocery stores and healthcare centres. Also, sensitization programmes highlighting the nutritional values of goat milk should be regularly aired through social platforms and mass media to reach out to the community.

Secondly. findings from this study show that consumption level among Malaysian adults are borderline satisfactory, future research focus on specific life stages such as practice of goat milk among pregnant and breastfeeding women would complement the current research for a more complete picture of overall goat milk consumptions in Malaysia.

For researchers and academicians, this study contributed to the understanding of goat milk consumption intention within the scopes of Theory of Planned Behaviour with the introduction of health consciousness. Other factors influencing food choice such as convenience, quality, safety, and ethics in farming were not included. With the successful introduction of health consciousness, future study could consider including new factors in

expanding the TPB framework to explain goat milk consumption intention from a different perspective.

Next, in this study goat milk are in the form of liquid milk and dry milk which are the most common form of available goat milk. For the health and food industries, the variety, availability, and affordability of goat milk and goat milk-based products in the local market are not known. Research and surveys covering these scopes will provide useful information to food industries in developing new goat milk-based food products, in accordance with the Twelfth Malaysia Plans in boosting innovative development of value-added products.

In the education and research field, government and universities could start up research centres for goat research such as to developed new methods for goat farming, goat milking and collection techniques as well as processing, packaging, and marketing the goat milk. This will create new markets for innovative goat milk and goat milk products.

Apart from that, the online intervention programme lacks real human interactions, a conventional intervention programme may produce longer-lasting impact on the participants. Hence, future research could aim at implementing a hybrid education intervention to get optimum benefits. Besides, intervention programmes also carve deeper impact if the programmes are implemented frequently. Thus, well-organized, targeted intervention programmes offered at fixed interval (such as once a month) will increase the intention and goat milk consumption.

In addition, from this study, it is further recommended that changing the environment to increase availability and accessibility of goat milk are important to

promote the nutrition behaviours in young adults. Schools and worksites are proposed as good opportunities to improve availability of healthful foods including goat milk. Homes, schools, workplaces, and restaurants provide opportunity for direct mutual influence between individuals and the environment. These are seen as prospective targets for health and nutrition intervention programmes. For example, Hendijani and Karim (2010) suggested, "to increase milk intake among children, marketers need to focus and strengthen the acceptability of milk and increase consumption by altering perception of milk advertisements. Marketers need to focus and strengthen the social acceptability of milk as replacement beverages for soft drinks and position themselves as beverages consumed while in the company of friends and social gatherings."

The Ministry of Agriculture and Food Industries could also focus on how goat milk and its products are marketed, taxed, and distributed; and influence of the media in promoting goat milk to the community that may support or hinder health behaviours. In short, future research could undertake the new perspective of environmental influence as a determinant towards goat milk consumption.

Lastly, with the promising success of the nutrition intervention programme in this study, it is recommended to the government, industry, and academia could form a meaningful collaboration to consider adopting schools for "School Goat Milk" programmes, in which, goat milk can be provided free for children from low-income families or with a subsidized price for the other children for a certain period of time. Data pertaining to acceptance and practice of goat milk from school children can be obtained to evaluate its efficacy and cost-effectiveness. Children will also benefit from the goat milk nutrition.

5.16 Conclusion

This study determines the levels of knowledge, attitude, and practice (KAP) towards goat milk, identifies and evaluates the determinant factors that influence the intention to consume goat milk guided by the Theory of Planned Behaviour. A nutrition intervention programme was conducted to enhance the KAP levels of goat milk consumption. To achieve these objectives, cross sectional quantitative survey was adopted to gather information from multicultural adult consumers in Malaysia. Based on literature reviews; four research questions were derived, four research objectives were generated, and a research model was developed.

In conclusion, 53.0% of the respondents were considered to have good knowledge of goat milk health benefits, 45.2% showed positive attitude towards goat milk consumption, and 53.8% had experienced drinking goat milk in the past one year. Among the multicultural respondents, the mean score for knowledge of goat milk health benefits and attitude were significantly higher for Malay, followed by Indians, Chinese and "Others". This could be partially due to the background of the religion that emphasizes on the way of the Prophet Muhammad in daily life including food choices. Hence, it is recommended that goat milk should be widely promoted to other ethnics as well for its superior health benefits. Government and the private sectors should come together to assist goat farmers to increase production of goat milk and provide better channels in marketing the goat milk, including development of new products by the food industry. In terms of the practice of goat milk consumption, there was no statistically significant mean difference among the ethnics.

In this study, it was also concluded that attitude and self-efficacy were identified as determinant factors that influence the intention to consume goat milk. Social influence was found not influencing the intention, mainly due to consumption of goat milk is not widely practice among Malaysians. Furthermore, commercial information and advertisements on goat milk benefits are few too. The findings concluded that in lesser popular foods, attitude was a stronger influence than self-efficacy and social influence in predicting the consumption intention.

As a newly introduced mediating variable, health consciousness shows evidence of direct and positive relationship with consumption intention. This implies that a person who is more health conscious has higher intention to consume goat milk. This is because other than being known as prophetic food, goat milk is also known for being highly nutritious. Health consciousness showed to fully mediate influence of social influence towards consumption, and complementarily mediates the influence of self-efficacy towards consumption intention. These findings showed that health consciousness was a significant mediator in the extended TPB framework.

An online nutrition intervention programme targeted to enhance knowledge, attitude, and practice of goat milk among respondents show promising success. The study showed significant increase in level of goat milk health benefits, attitude, and practice of goat milk post intervention. This implied that the materials, methods, platforms were suitable and can be adopted by future research in similar context.