Consumer Acceptance towards Plant-based Meat as Meat Alternative in Kelantan

Nur Auni Binti Wahabi
F18A0264

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UNIVERSITI MALAYSIA KELANTAN

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DECLARATION

I hereby declare that the work embodied in this report is the result of the original research except for the excerpts as cited in the references.

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Signature

Student's name : Nur Auni Binti Wahabi

Matric number : F18A0264

Date :

Approved by :

_____

Supervisor signature

Supervisor's name : Dr. Liew Jeng Young

Stamp :

Date :

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Penerimaan Pengguna terhadap daging berasaskan tumbuhan sebagai Alternatif Daging di Kelantan

ABSTRAK

Selama bertahun-tahun, pengambilan daging telah menjejaskan penternakan haiwan, alam sekitar dan kesihatan awam secara negatif. Oleh itu, untuk mengurangkan perkara ini, salah satu caranya ialah dengan menggantikan penggunaan daging dengan daging berasaskan tumbuhan. Alternatif ini juga hanyalah satu strategi untuk memastikan bekalan protein kekal mampan tanpa terlalu bergantung kepada sumber haiwan, tetapi ia juga merupakan salah satu strategi untuk memastikan pengguna mengamalkan diet mampan dalam kehidupan seharian mereka. Oleh itu, penggunaan daging dalam kalangan pengguna di Kelantan adalah sangat tinggi kerana pengguna di sana adalah penyokong makan daging. Objektif kajian ini adalah untuk menentukan (i) tahap penerimaan pengguna terhadap daging berasaskan tumbuhan sebagai alternatif daging, (ii) faktor terpenting penerimaan pengguna dari aspek pengetahuan, sikap dan amalan dengan menggunakan Indeks Kepentingan Relatif, dan (iii) hubungan antara pengetahuan, sikap, dan amalan penerimaan pengguna terhadap daging berasaskan tumbuhan. Soal selidik telah diedarkan kepada 251 responden di Kelantan dengan menggunakan teknik persampelan rawak mudah. Soal selidik juga dibangunkan berdasarkan model tinjauan pengetahuan, sikap, dan amalan (KAP). Statistical Package for the Social Sciences (SPSS) dan Microsoft Excel 2010 telah digunakan untuk menganalisis dapatan. Daripada kajian ini, dapatan kajian menunjukkan bahawa pengguna di Kelantan mempunyai kadar penerimaan yang tinggi terhadap daging berasaskan tumbuhan ini, dan faktor terpenting menunjukkan sikap, dengan jumlah nilai Indeks Kepentingan Relatif ialah 0.842. Oleh itu, hubungan antara pengetahuan, sikap dan amalan penerimaan pengguna terhadap daging berasaskan tumbuhan sebagai alternatif daging didapati positif. Kesimpulannya, daging berasaskan tumbuhan sebagai alternatif daging boleh diterima.

Kata kunci: Kesihatan awam, Pemakanan mampan, Penerimaan, Indeks Penting Relatif, Persampelan rawak mudah

Consumer Acceptance towards Plant-based Meat as Meat Alternative in Kelantan

ABSTRACT

Over the years, consumption of meat has negatively affected animal husbandry, environment, and public health. Therefore, to reduce this, one of the ways is by replacing meat consumption with plant-based meat. This alternative is also simply one strategy to ensure that protein supply remains sustainable without heavily relying on animal resources, but it is also one of the strategies to ensure that consumers practise sustainable diets in their daily lives. Hence, the consumption of meat among consumers in Kelantan is very high since the consumers there are proponents of eating meat. The objectives of this study were to determine (i) the level of consumers' acceptance toward plant-based meat as meat alternative, (ii) the most important factor of consumer's acceptance from aspects of knowledge, attitude, and practise by using the Relative Importance Index, and (iii) the relationship between knowledge, attitude, and practise of a consumer's acceptance towards plant-based meat. The questionnaire was distributed to 251 respondents in Kelantan by using simple random sampling techniques.The questionnaire was also developed based on the knowledge, attitude, and practise (KAP) survey model. The Statistical Package for the Social Sciences (SPSS) and Microsoft Excel 2010 were used to analyse the findings. From this study, the result shows that the consumers in Kelantan have high acceptance rate for this plant-based meat, and the most important factors indicate attitude, with the total value of the Relative Importance Index being 0.842. Hence, the relationship between knowledge, attitude, and practise of consumer acceptance towards plant-based meat as meat alternative was found to be positive. In conclusion, plant-based meat as meat alternative can be accepted.

Keywords: Public health, Sustainable diet, Acceptance, Relative Important Index, Simple random sampling

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LIST OF ABBREVIATIONS AND SYMBOLS

FAO	Food and Agricultural Organization
SSL	Self Suffiency Level
SSR	Self Suffiency Ratio
TVP	Textured Vegetable Protein
RII	Relative Importance Index
KAP	Knowledge, Attitude, Practise theory
WCRF	World Cancer Research Fund
AICR	American Institute for Cancer Research
SMMI	Swedish Food and Environment Information
GHG	Global Greenhouse Gas
SPSS	Statistical Package for the Social Sciences
α	Cronbach's Alpha
r_s	Spearman correlation coefficient
N	Population size
S	Sample size
%	Percentage

CHAPTER 1

INTRODUCTION

1.1 Research Background

The meat beef and veal per capita consumption in Malaysia approximately 5.41 kilograms in 2020 and it will rise to 5.91 kilograms per person by 2025 (Statista, 2021). This number of meat consumption will definitely keep arising because according to the prediction of Food and Agricultural Organization of the United Nation (FAO, 2019) in World Population Prospects that by 2050 the world population will reach 9 billion of people. This situation will encourage the increasing of demand for meat consumption. Then, report by Steinfeld et al. (2006) also stated that the meat consumption will double from 229 millions ton in 1999 to 465 millions by 2050. However, in the long run, this might cause food scarce particularly in the consumption of animal-based meat.

According to Steinfeld et al. (2006), livestock has now dominated 30% of the earth's total land area, encompassing mainly permanent pasture. A total of 33% of global arable land is used to produce feed for livestock. Deforestation is a major threat to agriculture as forests are cleared to make way for new pastures, especially in Latin America, where 70% of former forest in Amazon has been converted to grazing in order to support the growth of livestock. At the same time, livestock activity seems to have effect on global water supply, as more than 8% of human water usage is used to irrigate feed crops.

All these factors showed that the livestock industry may not be able to cater to the world's food needs in future. Therefore, another alternative is needed in order to make

sure the food security of meat for the source of protein will be enough for everyone. However, according to Deputy Agriculture and Agro-based Industry, Minister Datuk Seri Tajuudin Abdul Rahman (Daim, 2017) Malaysia will face a beef local shortage, pushing this country to import more livestock products from Thailand and Australia. Datuk Seri Tajuudin also mentioned that in order to satisfy local demand for livestock products, Malaysia currently produces 52,000 tons of beef worth RM169 million and imports worth RM1.14 billion per year. This circumstance revealed that livestock self-sufficiency levels (SSL) in Malaysia are still below 100% and have yet to met up with demand.

According to the Department of Statistics Malaysia (2020), the ratio of self-suffiency ratio (SSR) of beef and mutton in supply and utilization accounts selected agricultural commodities, Malaysia 2015-2019 are 23.7% and 12.1% respectively. In order to overcome all these problem, another alternatives is needed to ensure the consumer are able to consume meat as protein source in their daily lives.

Plant-based meat is the replacement of meat by other food and generally it is made from vegetarian ingredients and does not contain any products or dairy that provides the same nutrient for human (Joshi & Kumar, 2015). It also can be defined as a meat analog, meat alternative or vegan meat. It can be made from tofu or tempeh, which are both-soy based. It can be made from pea protein and textured vegetable protein (TVP), with flavouring applied to make it taste meats (Bakhsh et al., 2021). TVP is commonly use to provide desired quality, texture, binding and desired amount of chewiness or to make product firmer or softer. Then, there is the issue that meat has a slew of health issues that can degrade the health of those who consume it. It is because the presence of saturated fats in most meat in one factors that lead to obesity and cardiovascular disease. However, the existence of plant-based is not widely known among the consumers even the people is starting to healthy food and environmentally friendly lifestyle (Mousel & Tang, 2016).

1.2 Problem Statement

The consumption of meat among consumers in Kelantan is very high since the consumers there, are proponents of eating meat and this makes consumers always reliant on animal meat, particularly beef (Malaysia Dateline, 2021). At the same time, there is a lack of knowledge about over-consuming animal meat which might also influence consumers' health problem among consumers in Kelantan. Then, it is because the meat demand is quite high and exceeds with the beef production in Kelantan.

The high amount of saturated fat in most meat can lead to obesity and the over-consumption of meat can give a negative effect on human health, especially colon cancer (D'Silva & Webster, 2010). Plant-based meats are created to suit customer demand and ensure the food chain's long-term sustainability, and many food companies have succeeded in producing these plant-based meat products (Sha & Xiong, 2020). Alternative meat options, such as legume-based burgers, patties, and fried balls, have been around for decades, and they are still considered a niche segment of the food industry.

Entrepreneurial partnerships and collaboration with venture capital funds have been important to the market's exponential growth (Sha & Xiong, 2020). According to Wong (2021), it is reported that in order to raise awareness on climate issues, Green Monday encourage people to do their part for the planet by skipping meat for at least one day weekly and introducing plant-based product that developed by OmniFoods which is Omnimeat. Green Monday is an award-winning activist platform known for transforming the meat industry and promoting sustainability through plant-based food options. Malaysians may expect to see Green Monday's OmniMeat products on the shelves of AEON supermarkets, Jaya Grocer, and Village Grocer. In these plant-based substitutes,

the plant-based proteins from peas, soy, shiitake mushrooms and rice are blended together to form a meat-like appearance (Wong, 2021). By introducing this alternative it will allow Malaysians to eat healthily without sacrificing their meat intake. Not only that, KFC also had launched their Zero Chicken Burger which is a plant-based and meatless burger that coated with KFC's recipe by combining 11 herbs and spices (Berkhout, 2021).

This scenario shown that plant-based meat is readily applicable in Malaysia but not widely known. The lack awareness of this existence alternative might give some barriers for consumers to accept with new alternatives because different people has different acceptance towards what they are consuming in their daily lives. So, this research was performed to evaluate the consumers acceptance towards plant-based meat as meat alternative which is in Kelantan.

1.3 Hypothesis

$H_{0:}$ There is no significant value between the relationship of knowledge, attitude, and practise of consumer's acceptance towards plant-based meat as a meat alternative in Kelantan.

$H_{1:}$ There is significant value between the relationship of knowledge, attitude, and practise of consumer's acceptance towards plant-based meat as meat alternative in Kelantan.

1.4 Objectives

The objectives of this study were:

I. To determine the level of consumer 's acceptance towards plant-based meat as meat alternative in Kelantan.

II. To determine the most important factor of consumer's acceptance towards plant-based meat from aspects of knowledge, attitude, and practise by using the Relative Importance Index (RII).

III. To determine the relationship of knowledge, attitude and practise of consumer's acceptance towards plant-based meat as meat alternative in Kelantan.

1.5 Scope of Study

This study focused on acceptance of consumer's towards plant-based meat as meat alternative. The survey questionaire was distribute and conducted in Kelantan by using simple random sampling where there was respondents from various districts involved. The target samples were ranging from 13 years old and above. The respondents were not necessarily working but they can be either a student, housewife or retired. In other words, this survey was distributed to people with different education level in Kelantan since they might have different opinion and knowledge on meat alternative as their protein source.

1.6 Significance of Study

The significance of this research was to raise consumer awareness about the existence of plant-based meat and to educate them on the importance of consuming plant-based meat, including how it may help to reducing negative impacts towards environment such as land degradation, global warming, and pollution. However, there are some of people who know about this since they do not get proper education and information that exposing them to this issues. So, health institution should provide more campaigns to educate consumers about the disadvantages of eating meat excessively.

Then, the importance of this study was to encourage Malaysia's food sector to produce more plant-based meat in order to ensure that the protein supply chain would be sustainable in the future and also that the self-sufficiency level (SSL) for meat would be more than 100%.

Next, the significance of this study was to encourage academic sectors to expand their scope of learning to include aspects of these meat alternatives, so that the students can share their knowledge with their parents and people around them to ensure that many people are aware of the existence and benefits of plant-based meat.

1.7 Limitation of Study

The study's limitation is that it is limited to Kelantan, with no respondents from other states. At the same time, only 251 respondents took part in this study, therefore more accurate outcomes might be produced if there were more than 251 respondents who took part. Then, one of the study's constraints is time availability.

CHAPTER 2

LITERATURE REVIEW

2.1 Concepts of Consumers' Acceptance

Generally, one of the elements influencing consumer acceptability of plant-based meat is the ability of customers to distinguish between plant-based and animal meat. This indicates that plant-based meat should take the same shape and function as animal meat (Elzerman et al., 2011). The sensory aspects of items, such as appearance, taste, and texture, are also vital for consumers' acceptance of a product by meat eaters, although taste and texture of meat are the most important (Hoek et al., 2004).

According to European consumer research, there are four main types of customers who embrace plant-based meat, the first of which are customers who are reducing their meat consumption and preferring a healthy balanced diet. Secondly, consumers who are passionate about animal care, environmental sustainability, and ethical issues. Consumers that value convenience and are cost conscious are the third group. Lastly, consumers who are enjoy excess and are willing to try new things (Sun et al., 2021).

2.2 Plant-based Meat Definition

Meat analogue or meat substitutes is another name for plant-based meat. Plant-based meat are made-up from non-animal protein but the appearance and smell are pretty similar to animal meat (Kumar et al., 2017). However, the characteristics of this plant-based meat reveals depends on the texture, flavour and colour on the ingredients used (Kyriapkopolou et al., 2019). The typically ingredient, composition and functions for each ingredients used in plant-based meat are presented in Table 2.1. Then, the production of plant-based also can be from protein-rich precursor. For example, cereal grain gluten (wheat, rice or maize), defatted oil seed and bean flour. Hence, soya protein, mushroom, wheat gluten, egg albumen, carbohydrates and gum, and flavouring compounds are key ingredients that are needed during preparation of plant-based meat (Kumar et al., 2017).

Table 2.1 : Typical plant-based meat ingredients and functions (Bakhsh et al., 2021).

Ingredients	**Functions**	**Usage level (%)**
Water	Ingredients distribution, emulsification, juiciness	50-80
Textured vegetable proteins: textured soy flour, textured soy concentrate, textured wheat gluten, textured protein combinations such as soy and wheat	Water binding, texture, and mouthfeel, Appearance, protein fortification/nutrition Source of insoluble fiber	10-25
Non-textured proteins: isolated soy proteins, functional soy concentrate, wheat gluten, egg whites, whey proteins	Water binding, emulsification Texture/mouthfeel Protein fortification/nutrition	4 to 20
Flavors/spices	Flavor, savory, meaty, roasted, fatty, serumy, Flavor enhancement (for example, salt) Mask cereal notes	3 to 10
Fat/ oil flavor	Textured/mouthfeel, Succulence, Maillard reaction/browning	10-15
Binding agents: wheat gluten, egg whites, gums and hydrocolloids, enzymes, starches	Texture for bite, water binding, may contribute to fiber content, can determine production processing conditions	1-5
Colouring agents: Caramel colours, malts extracts, beet powder,FD&C colours	Appearance/eye appeal, Natural or artificial	0 to 0.5

2.3 Nutritional and Health Benefits of Plant-based Meat

The purpose of consuming meat is because the meat providing high quality of protein which is the same aspects that need to maintain by plant-based meat if meat is fully replaced by plant-based meat products. Researchers has found that plant-based meat that containing protein content of up to 30% with a low fat/lipid level can be a good alternative to meat from a nutritional prospective (Kyriapkopolou et al., 2019). Moreover, the diet pattern that based on plant-based meat have a lot of benefits. For example, reducing cardiovascular disease, increasing obesity-induced metabolic activity (Wanezaki et al., 2015). Hence, plant-based meat also can increase the effect on weight loss and improve weight loss (Kumar et al., 2017).

According to Kumar et al. (2006), the pottassium concentration in plant-based meat is higher compared to animal meat. Hence, plant-based meat also has higher proportion of polyunsaturated fatty acids, calcium and phosphorus than animal meat which is good for human health. Then, plant-based meat consumption has many significant advantage, which is not only significant environmental benefits but it also has low-risk intervention that addresses a variety of chronic illness (McMacken & Shah, 2017).

Consuming plant-based protein as diets with no intake of refined foods or animal products are highly beneficial for preventing and treating type 2 diabetes. The World Cancer Research Fund (WCRF) and the American Institute for Cancer Research (AICR) recommended eating only-plant-based foods, avoiding both processed meats and sugary drinks, limiting intake of red meats and high energy-foods, salt, and alcohol able to reduce the risk of cancer, which is second leading cause of death in the United States (McMacken & Shah, 2017). At the same time, meat substitutes can be a good replacement to meat

when meat substitutes consisting of 30% protein with lower quantity of fat. Consuming plant-based meat also will reducing cardiovascular disease and retaining anti cancer (Bakhsh et al., 2021). Phytochemicals and fibre, which are important in the diet, are also found in plant-based meat. Saponins, isoflavones, and protease inhibitors are active components of plant protein that can increase LDL-cholesterol oxidation, reduce lipid effects, and lower blood pressure (Kumar et al., 2017).

2.4 Environmental Benefits of Plant-based Meat

Food production is the most environmentally damaging activity, accounting for 30% of global greenhouse gas (GHG) emissions and 70-85% of global water footprint. Since consumers' understanding of environmental and socioenomic issues (food security, animal welfare, and pollution) has grown, they have begun to seek for sustainable foods that are also environmentally friendly, and they have begun to cut their meat consumption (Moberg et al., 2019).

People who switch to a plant-based diet have a lower environmental effect than those who consume animal products. Plant-based meat made from soymeal, for example, has been shown to be more environmentally sustainable than chicken and lab-grown meat. There was also the reality that animal-based goods have a higher carbon emissions than plant-based alternatives, which is why food commodity carbon taxes are always advised as one of the best ways to reduce animal-based protein consumption (Moberg et al., 2019).

Meat replacement, on the other hand, could lessen the environmental impact of meat consumption by replacing meat that requires a lot of resources to produce. Some approaches will be taken, such as replacing beef or pig with edible insects, with the goal of reducing the impact of animal food production on climate change (Hartmann & Siegrist, 2017).

2.5 Market Prospects of Plant-based Meat

Plant-based foods are being developed not merely to satisfy vegetarians, but also to ensure the nutritional security of the whole population. Simultaneously, these solutions can aid in the reduction of animal welfare, health, and environmental concerns. Germany, France, the Netherlands, the United States, Italy, and Sweden are among the major countries participating in plant-based meat innovation and research, accounting for roughly 40% of global plant-based meat production (Kyriapkopolou et al., 2019). The market for plant-based meat production in the United Kingdom is considered to be the most developed, with a 15% annual growth rate. In the United States, frozen plant-based meat sales totaled 267 million dollars in 2010, compared to 74 billion dollars for beef sales. However, most of plant-based products are based on soy which are Tofu,Tempeh and Textured Vegetable Protein (TVP). This scenario demonstrated that plant-based meat products have a higher demand than animal meat products (Kumar et al., 2017). The rising popularity of plant-based meat is driven by consumers' desire for a healthier and more sustainable protein source (Kyriapkopolou et al., 2019).

This market prospects is not only in Western countries where this alternative also applicable in Malaysia. Phuture Daging company is a pioneer in Malaysia’s plant-based meat industry that offerring 100% of plant-based products where the mission of this company to tackle food sustainability and food security concern.

2.6 Policy and Regulations of Plant-based Meat

One of the most crucial aspects of the growth of plant-based products and the consumer movement toward plant-based is policy and laws. This issue has been discussed in several nations, with the suggestion that official nutritional guidelines be modified to include environmental concerns. Sweden is one of the countries that implemented a modification in rules known as the double pyramid in 2015, which encourages people to focus on plant-based diets and minimise their consumption of meat and dairy. Consumer demand may be affected as a result of this (Witzel et al., 2020). At the same time, Sweden is another country that uses rules and regulations to help its consumers change to plant-based meat as their primary protein source, with the Swedish Food and Environment Information (SMMI) charging a meat tax on its consumers. This country's aim is to convince people to consume food in a more sustainable and environmentally sustainable manner. Denmark had imposed a similar tax on fat in meat and dairy products, as well as cooking oils, but due to high administrative costs and negative effects on local businesses, it only lasted for a few years (Mousel & Tang, 2016).

However, there is a debate over the naming of meat substitutes. This is because meat manufacturers want to make sure that terms like meat, sausages, and burgers are only used for animal-based products, whereas meat alternatives need to make sure that the word "alternative" appears on the product package to let consumers know that their products are an alternative (Mousel & Tang, 2016).

2.7 Alternative to Change

Alternatives to improve sustainable and healthy diets should try to overcome current hurdles to increasing use of plant-based protein. Ten potential motivations for changing meat intake have been identified in the Eating Better study (2014). The ten potentials are (i) behaviours; (ii) the cultural significance of meat eating; (iii) cost; (iv) accessibility; (v) health; (vi) consciousness of the impact on the environment of meat consumption; (vii) concern for animal rights; (viii) concern for provenance and track - and - trace of meat-based foods; (ix) awareness about alternative meat; and (x) consumer reactions to food safety issues (Stubbes, Scott & Duarte, 2018).

According to De Bakker and Dagevos (2012), three alternate solution approaches for influencing consumer behaviour in connection to meat consumption have been identified which are (i) achieving low-fat and healthful diets; (ii) active consumer participation in moderate meat reduction (portion size, meat-free days); and (iii) wide-scale cultural change that alters consumption patterns.

2.8 Theoretical Framework

Theoretical framework is made up of theories expressed by researchers in the field that are used to analyse data and interpret results in the research process (Kivunja, 2018). Then, this theoretical framework is a structure that summarises concepts and theories that are derived from published knowledge and have been previously evaluated in order to help in the development of a theoretical background based on research data (Kivunja, 2018). According to Osanloo and Grant (2006) the theoretical framework is taken from an existing theory (or theories) in the literature that has been tested and validated by others and is widely accepted in the scholarly literature. Theoretical framework is important for topic selection, forming of research questions, focus of literature review, design approach and analysis design for research study (Osanloo & Grant, 2016). Then, this theoretical framework also increases the confirmability of the findings in qualitative data or objective of findings in quantitive data (Osanloo & Grant, 2016). In this study, the theoretical framework that have been used was Knowledge, Attitude, Practise (KAP) Theory. It is this because to identify the relationship of knowlegde, attitude and practise of consumer's acceptance towards plant-based meat.

2.9 Knowledge, Attitude, Practise (KAP) Theory

KAP is a theory that is used to research a specific population in order to get data about their knowledge, beliefs, and behaviour in relation to a specific topic. This theory will be differentiate among the population group because it is related to their cultural and socioenomic, age and religious groups. By using KAP surveys, it can help to identify knowledge gaps based on their level, behavioural patterns and cultural beliefs (Gumucio, 2011). This theory is meant to be a representative survey of a target population and aims to elicit what is known (knowledge), believed (attitude) and done (practise) in the context of the topic of research study. The advantage of this KAP model is easy to conduct (Gumucio, 2011).

Consumers' understanding of any information regarding a connected topic is referred to as knowledge. Knowledge is essential for determining the level of education and information that consumers have about the survey topics. Attitude is the intermediate between the stimulus and the response to the stimulus. Consumers' practise is the activity they perform after making multiple observations about a particular topic (Gumucio, 2011).

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The objective of this study was to analyse the level of consumers' acceptance towards plant-based meat. It was also intended to determine the most important factor of consumer's acceptance towards plant-based meat from aspects of knowledge, attitude and practise by using Relative Importance Index (RII). Then, this study research was to determine the relationship of knowledge, attitude and practise of consumer's acceptance towards plant-based meat as meat alternative in Kelantan. Different people would have different food preferences so it would give impact to the acceptance of meat alternatives. The research design and method used in this study were discussed in this chapter.

In this chapter, the research methodology was separated into conceptual framework, sampling method, data collection method, research instrument development and data procesing. The software that was used in this study were Statistical Package for the Social Sciences (SPSS) and Microsoft Excel 2010. The research methodology was importance in order to make sure the correct prosedures are used so it can obtain the good outcomes at the end of the study.

3.2 Conceptual Framework

The KAP survey was created in 1950 (Gumucio, 2011). The three components of this survey model are knowledge, attitude, and practise. Each of the components has different functions in the research study. This survey model can be used in research to determine the level of knowledge, attitude, and practise of a specific topic. It is also a representative study of a specific population with the goal of gathering data on what is perceived to be the case on a specific topic (Rui et al., 2015). The KAP survey has the advantages of being simple to construct, calculate data, understand, and generalise small sample results to a larger population (Launiala, 2009).

Knowledge is refer to consumers' understanding of any information regarding a connected topic. Knowledge is essential for determining the level of education and information that consumers have about the survey topics. It is typically utilised to gain access the community health information (Launiala, 2009). Knowledge is based on scientific facts and different with beliefs (Pelto & Pelto, 1997).

The term "attitude" refers to a person's positive or negative assessment of a behaviour (Maichum et al., 2017). It can be thought of as the total of thoughts about a specific behaviour that are evaluated by these beliefs (Rui et al., 2015).

Practise is refers to the way of which individual express their knowledge and attitude though the action. It also indicate how individual attitude on a particular topic is discussed (Gumocio, 2011).

Figure 3.1 shows the conceptual framework used of this study based on KAP survey model. Figure 3.1 indicates two variables which are independent and dependent that used in this research. The independent variables include knowledge, attitude and practise of consumers' acceptance toward plant-based meat while dependent variables are consumer's acceptance towards plant-based meat as meat alternative in Kelantan.

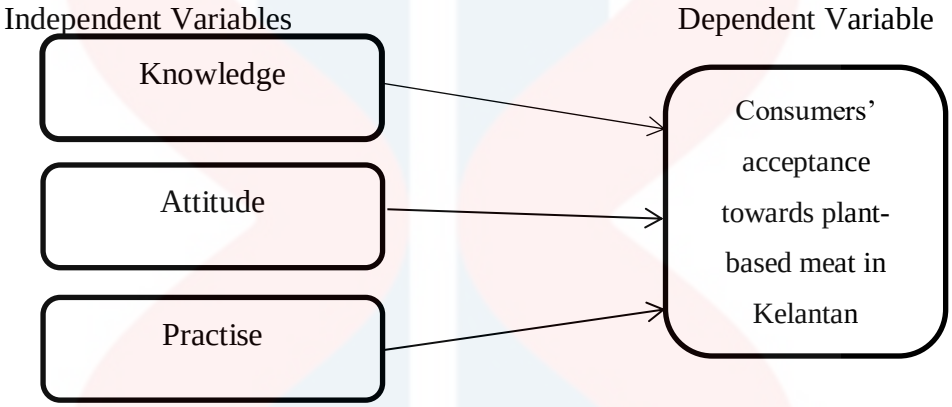

Figure 3.1: Conceptual Framework based on KAP Survey Model

3.3 Sampling Methods

This research study was contruct to the consumers in Kelantan which the main target was consumers that has power of buying. This study do not have maximum of age because everyone can involve in this study. The questionnaires were distributed in two different ways which by face to face and through the use of Google Forms on various internet platforms. Due to the Covid19 outbreak, this survey cannot be conducted fully face to face. However, the face to face method was only used in the Jeli in a small range. This survey technique used simple random sampling, also known as probability sampling, in which each individual in the population has an equal chance of being included in the sample (Taherdoost, 2016). The benefits of utilising this sampling technique also are it is the simplest of all probability sampling plans to implement, and that it may be used in connection with any other probability sampling plan (Jawale, 2012).

3.4 Population and Sample

In 2021, population in Kelantan was 1,923,000 (Population of Cities in Malaysia, 2021). Kelantan was chosen because it is one of the states that has a high population in meat consumption. Based on the population of Kelantan, questionaire were distributed to 251 respondents. The survey questionaire focussed on consumer that has power of buying either vegetarian or not-vegetarian.

3.4.1 Sample Size

Sample is a set of respondents that have being selected from a larger population for the purpose of study (Chuan, 2006). There are a few factors that need to consider in determine the sample size which are how much sampling error can be allowed, population size, how variable the population is in terms of the characteristics of interest, and the smallest subgroup within the sample for which estimates are needed are all considerations to consider when determining the sample size (Chuan, 2006).

The sample of this study was determind by using Morgan method Table 3.1. According to Morgan method, the number of sample size, that was needed in this study was (S=384) because the population size (N=1000000) and the population size in this was 1,923,000. However, this study only can collect 251 respondents and this number of respondents was acceptable. The number of sample sizes that were above 200 was large and below 50 was small, but the samples sizes in the range of 200-250 were acceptable for research study (de Winter, Wieringa & Dudou, 2009).

Table 3.1 shows the number of sample size based on size that should be studied based on choosen area. The sample size increases as the population increases (Krejcie & Morgan, 1970).

Table 3.1: Sample size with respective population size given by Krejcie & Morgan (1970)

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note- N is population size and S is sample size

3.4.2 Data Collection Method

The information utilised in this study come from two main different sources which were primary data and secondary data. The primary data pertains to information gathered from respondents in Kelantan using various techniques such as Whatsapp, Facebook, and face to face distribution of Google forms. The questionaire was constructed based on data gathered from prior studies that were discussed in the literature review. Secondary data was acquired from a variety of sources. Journals, articles, websites, and newpapers, for example, that have been analysed by the researcher as part of the literature review references. Additionally, statistical data was gathered from the official department's portal for pertinent research information. For instance, the number of population size.

3.5 Research Instrument Development

This survey question was designed for Kelantan consumers. The questionnaire was created based on past research that were similar to or related to the current topic. The questionaire also was developed based on KAP survey model.

The questionaire was divided into 5 sections. The first section was section A which was demographic profile. In this part, the questions were constructed in multiple choice questions. For next section which was section B until section E, the questions were constructed in likert scale. In the section B until section E, the respondent were required to answer the questions provided based on five-point Likert scale from scale 1=Strongly disagree to scale 5=Strongly agree. However, for section C, the Likert scale from scale 1 =Don't know until scale 3=Know. This section was designed for evaluating the respondent's knowledge.

3.6 Procedures for Data Analysis

Data analysis is the process of analysing, collecting, manipulating, and modelling data with the objective of identifying usable information, informing conclusions, and assisting decision-making. The evaluation of the data can be done by using analytical and statistical tools to analyse and prove the accuracy of the data. Statistical package for Social Science Software (SPSS) for example can be used to analyse the descriptive statistics of frequency. In this study, inferential statistical analysis used were reability test, normality tests and Spearman correlation analysis. Then, the Relative Importance Index also considered in this study.

3.6.1 Reliability Test

The acceptablity of the questionaire for the pilot test before the actual questionaire distributed was test by using Cronbach's alpha test. The range of the test must be in the range of 0.7 to 0.95 (Taber, 2018). The procedure of reliability test that commonly used for measuring of scale reliability and provide information between individual items of that scale Cronbach's alpha (Kraisuth & Pabjakajornsak, 2018) shown in Table 3.2.

Table 3.2: Cronbach's Alpha Scale of Acceptability of Kraisuth & Pabjakajornsak (2018)

Coefficient of Cronbach's Alpha (α)	Reability Level
$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

3.6.2 Descriptive Statistical Test

In this study, descriptive analysis was utilised to describe the data's basic features that can be measured quantitatively. It provides basic summaries of data that are straightforward to analyse and understand. The descriptive data was required to calculate the mean of the nomial data collected in this study. It's utilised to calcuate the frequency and percentage of demographic background of consumers in Kelantan and summary of consumers acceptance towards plant-based meat as meat alternative.

3.6.3 Relative Importance Index (RII)

The calculating of RII is important since the value of the index will specify ranked degree of importance. This calculation is useful for questionaire that use a Likert scale. The RII formula was introduced into Microsoft Excel 2010 in order to determine the index for sets of objects (Tholibon et al., 2021). The equations shows in Equation 1 below.

$$\text{Relative Importance Index (RII)} = \frac{\sum \omega}{AN} = \frac{5n5+4n4+3n3+2n2+1n1}{5N} \quad \text{Equation 1}$$

where ω is the respondents's weighting of each factor, which can range from 1 to 5. For example, n1 represents the number of respondents who opted for strongly disagree option, n2 represents the number of who opted for disagree option, n3 represents the number of respondents whose are neutral, n4 and n5 represent the number of respondents who voted options that are agree and strongly agree, respectively. Thus, the highest weight (in this study, 5) is *A*. The total number of people labelled as *N*. The RII ranges from 0 to 1.

3.6.4 Normality Test

In this study, normality test was used to identify whether the data set was well modelled by normal distribution or non-normal distribution (Kim & Park, 2019). Kolmogorov-Smirnov test was used in this study because the sample size were more than 50 respondents which were 251 respondents. Kolmogrov-Smirnov test was used in this study because the normality test showed the p-value for the data was 0.000. According to Godina et al. (2018), if the p-value greater than 0.05 it was normal distribution but if the p-value lower than 0.05 it is was non-normal distribution.

3.6.5 Spearman Correlation Analysis

Spearman correlation analysis was used in this study because the normality test shows non-normal distribution. Spearman correlation coefficent (r_s) was used in order to measure of the strength and direction of monotonic relationship between two variables (Schosler, Boer & Schwarte, 2018). In this study, Spearman correlation analysis was used to measure the monotonic relationship between variables that influence the consumer's acceptance towards plant-based meat as meat alternatives.

Table 3.3: Strength of the correlation between two variables using the Spearman correlation coefficient (r_s)

No	Spearman correlation coefficient (r_s)	Relationship
1	.00-.19	Very weak
2.	.20-.39	Weak
3.	.40-.59	Moderate
4.	.60-.79	Strong
5.	.80-1.0	Very Strong

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

This chapter was designed to discuss the results obtained in detail by using the method that was explained in Chapter 3. The purpose of the study was to determine the level of consumers' acceptance toward plant-based meat as a meat alternative. Then, to determine the most important factor of the consumer's acceptance towards plant-based meat from aspects of knowledge, attitude, and practice by using the Relative Importance Index. Next, this study was also to determine the relationship between knowledge, attitude, and practise of a consumer's acceptance towards plant-based meat as a meat alternative. SPSS and Microsoft Excel 2010 were used to analyse the data.

4.2 Internal Reliability Test

According to Heffner (2016), the reliability test is survey, observation and other measuring device that used to determine the proportion of systematic variation in scale. Reliability is not a continuous quality of a test but it is preferable to think of it as distinct sorts of reability for different populations and levels of construction being measured (Franzen, 2011). The Cronbach's alpha was used in this study in order to validate the questionaire before distributed the actual questionaire and the acceptable values of Cronbach 'alpha should be in range 0.70 to 0.95 (Tavakol & Dennick, 2011).

However, a low alpha value might be due to a small number of questions and insufficient interdependence between variables. A high alpha number may indicate that some elements are unnecessary, hence the alpha value with 0.95 is recommended (Tavakol & Dennick, 2011).

Table 4.1: Reliability test of variables

Variable	Cronbach 's Alpha	Number of item
Consumer's acceptance	0.823	7
Knowledge	0.825	7
Attitude	0.804	7
Practise	0.776	7

(Source: Survey, 2021)

According to the reliability test in Table 4.1, all Cronbach's alpha value the in this study was in the range of 0.7-0.8 which above the acceptable value. So, the questionnaire was approved for proceeding analysis. So, the questionanaires were confirmed to be proceeded to the next analysis.

4.3 Descriptive Analysis

4.3.1 Demographic Profile of Respondents

In this study, the descriptive analysis was used to analyse the demographic profile of consumers in Kelantan in order to collect the data of their socio-demographic information. The example of information was gender, education level, household income, occupation, living situation at home, living area and identification as vegetarian or not.

Table 4.2 : Frequency and percentage of respondent gender

Gender	Frequency (n=251)	Percentage (%)
Male	54	21.5
Female	197	78.5

Table 4.2 shows the gender of respondents for this survey. There were 251 respondents, 54 male and 197 female were involved in this survey. The percentage were 21.5% and 78.5%, respectively.

Table 4.3 : Frequency and percentage of respondent age

Age	Frequency (n=251)	Percentage (%)
13-20 years old	36	14.3
21-30 years old	182	72.5
31-40 years old	12	4.8
41-50 years old	15	6.0
More than 50 years old	6	2.4

Table 4.3 shows the age group of respondents for this survey. The age of respondents in Kelantan was mostly between 21-30 years old, which was 182 respondents (72.5%). Then, the age of groups of 13–20 years old was 36 respondents (14.3%). Next, the age group of more than 50 years old had the least number of respondents, which was 6 respondents, which constituted 2.4%.

Table 4.4: Frequency and percentage of respondent education level

Education level	Frequency (n=251)	Percentage (%)
SPM	14	5.6
STPM / Matriculation	8	3.2
Diploma	27	10.8
Technical certificate	3	1.2
Degree	192	76.5
Master degree or Phd	7	2.8

Table 4.4 shows the education level of respondents in this study. The respondents mostly came from degree backgrounds, with 192 respondents that contributed to 76.5%. Then, followed by diploma background with 27 respondents, which contributed to 10.8%, and technical certificate with 3 respondents, which constituted 1.2% of the samples. There were 14 respondents (5.6%) with an SPM background, 8 respondents (3.2%) with an STPM/Matriculation degree, and lastly, 7 respondents (2.8%) with a Master's degree or PhD background.

Table 4.5: Frequency and percentage of respondent occupation

Occupation	Frequency (n=251)	Percentage (%)
Student	200	79.7
Working full time	44	17.5
Housewife	5	2.0
Retired	2	0.8

Table 4.5 illustrates the occupations of respondents who had taken part in this study. Students were the highest number of respondents, which was 200, and contributed to 79.7% of the total percentage. The second highest group was those working full time, with 44 respondents contributing 17.5%. There were two groups, which were retired and housewives, that contributed 0.8% and 2.0%, respectively.

Table 4.6: Frequency and percentage of respondents household income

Household income	Frequency (n=251)	Percentage (%)
Less than RM4,850	168	66.9
RM4,850 – RM 10,959	65	25.9
More than RM10,959	18	7.2

Table 4.6 represents the household income of respondents who have taken part in this study. Most of the respondents, which was 168 respondents (66.9%), were from the B40 group, which was less than RM4,850. Respondents with an income of between RM4,850-RM10,959 were 65 respondents (25.9%) and the remaining more than RM10,959 were 18 respondents (7.2%).

Table 4.7: Frequency and percentage of respondents living area

Living area	Frequency (n=251)	Percentage (%)
Urban area	113	45
Rural area	138	55

Table 4.7 display the living area of respondents living area who had answered this questionaires. The highest number of respondents were in rural area which was 138 and contributed to 55%. The least group were in urban area which was 113 respondents that contributed to 45%.

Table 4.8: Frequency and percentage of respondents living situation at home

Living situation at home	Frequency (n=251)	Percentage (%)
Alone	15	6.0
With spouse	15	6.0
With spouse and children	21	8.4
With parents	198	78.9
Others	2	0.8

Table 4.8 illustrates the respondents' living situations at home who have taken part in this study. The respondents who participated in this research study mostly stayed with their parents, 198 respondents (78.9%). Then, respondents who live alone and with their spouse are 15 respondents (6.0%), and respondents who live with their spouse and children are 21 respondents (8.4%). The remaining are those who stay at hostels, for example, 2 respondents (0.8%).

Table 4.9: Frequency and percentage of respondents' status of vegetarian

Are you vegetarian	Frequency (n=251)	Percentage (%)
Yes	34	13.5
No	217	86.5

Table 4.9 shows the status of vegetarians as reported by respondents who participated in this study. The number of respondents who were vegetarian was 34, and they contributed to 13.5% of the total percentage, while the remaining 217 respondents were not vegetarian and contributed to 86.5% of the total percentage.

4.4 Analysis of the level of consumer's acceptance towards plant-based meat as meat alternative.

Table 4.10: Analysis of the level of consumer's acceptance towards plant-based meat as meat alternative

Statement	Percentage (%)					RII	Rank	Mean
	1*	2*	3*	4*	5*			
I can accept plant-based as meat alternative.	1.6	4.8	17.5	42.6	33.5	0.803	6	4.02
In my opinion, plant-based meat will be more sustainable than animal meat.	1.6	3.6	33.1	39.0	22.7	0.755	7	3.78
I will consume the plant-based meat if the taste of plant-based meat is similar to animal meat (eg. Beef, mutton and etc).	0	2.4	15.1	43.0	39.4	0.839	4	4.20
I will buy the plant-based meat if the price of plant-based meat is cheaper than the animal meat (eg. Beef, mutton and etc).	0.8	1.2	16.7	35.5	45.8	0.849	2	4.24
The existence of animal meat does not prevent me from accepting plant-based meat as my daily meat.	0.8	2.8	17.9	43.4	35.1	0.818	5	4.09
In my opinion, this alternative needs to be commercialized more widely to give awareness to consumers about the existence of this plant-based meat.	0	0.8	12.4	32.3	54.6	0.881	1	4.41
I think the plant-based meat production is indeed good for reducing environmental problems such as degradation and water pollution.	0.4	2.0	17.9	32.7	47.0	0.848	3	4.24
Total score						0.827	-	4.138

*Indicator: 1. Strongly disagree; 2.Disagree; 3.Neutral; 4.Agree; 5.Strongly Agree

(Source: Survey, 2021)

Table 4.11: Level indicator of mean score by Wahab et al., (2013)

Mean value	Level indicator
1.0-2.33	Low
2.34-3.66	Moderate
3.67-5.00	High

The first objective of this study was to determine the level of consumer's acceptance towards plant-based meat as a meat alternative in Kelantan. Table 4.10 shows the percentage, mean, RII value and the ranks for each question.

First, it shows that a majority of consumers agree that this meat alternative needs to be commercialised more widely to give consumers awareness about the existence of this plant-based meat. This reveals that their awareness of meat substitutes is still inadequate, and they require additional awareness regarding plant-based meat as one of their acceptance criteria. Study also stated that consumers are not always aware of which alternative proteins offer specific benefits because they are unaware of the possible health and environmental benefits (Onwezen, Bouwman, Reinders, and Dagevos, 2021).

Then, the acceptance of consumers towards food choices also depends on factors such as health, price, and sensory appeal of the foods (Hoek et al., 2011). This statement is parallel with the respondents' responses to the statement "I will buy the plant-based meat if the price of plant-based meat is cheaper than animal meat (eg. Beef, mutton and etc)". This statement is ranked number 2 with the RII value of 0.849 and mean score 4.24. This statement was agreed upon by the majority of B40 respondents, who stated that the cost of food also influenced their willingness to accept new alternatives in their daily lives.

The second last rank, with RII value of 0.803 and mean score 4.02, shows that the majority of respondents accept this plant -based meat as a meat alternative. It shows that this alternative will allow consumers in Kelantan to eat healthily without sacrificing their meat intake. Next, with RII value of 0.755 and mean score 3.78, the statement "In my opinion, plant-based meat will be more sustainable than animal-meat" was ranked lowest. This statement indicates that respondents also agree that this option has more advantages than animal meat. According to other findings, plant-based meat is a trend toward lowering meat consumption, and a more plant-based diet is supported to increase sustainability and animal suffering (Graca, Oliveira & Calheiros, 2015).

Based on Table 4.10, the data shows the total mean score was 4.138 and the total score of the RII value was 0.827. The total mean score of 4.138, indicates as high mean score according to Table 4.11. The high mean score value and total score of RII value have proved that the consumers accept this plant-based meat, and the objective for this study was achieved.

4.5 Analysis the most important factor of consumer's acceptance towards plant-based meat from aspects knowledge, attitude and practise.

Table 4.12: Ranking of knowledge of consumer's acceptance towards plant-based meat as meat alternative in Kelantan

Statement	Percentage (%)			RII	Rank
	1*	2*	3*		
I know about the existence of plant-based meat	23.9	25.1	51.0	0.766	4
I know about the resources used in producing plant-based meat	31.1	36.3	32.7	0.672	6
I know about companies that manufacture and sell plant-based meat	51.8	27.5	20.7	0.563	7
I know why plant-based meat was created	23.5	27.5	49.0	0.752	5
I know that plant-based meat are good for health	10.8	21.9	67.3	0.855	1
I know about the environmental impact of extensive animal farming	11.6	25.9	62.5	0.837	2
I know that the existence of this plant-based meat is vey good to ensure food security	9.6	32.7	57.8	0.827	3

*Indicator: 1. Don't know; 2. Not Sure; 3. Know

(Source: Survey, 2021)

Table 4.12 shows the ranking of knowledge of consumer's acceptance toward plant-based meat. First, it shows that the majority of consumers know that plant-based meat is good for their health. This may be agreed upon by consumers who have an education level of a degree or above. This is because the majority of consumers involved in this study are those who have a degree-level education, which means they have more knowledge of this alternative meat. It was also stated by Corrin and Papadopoulus (2017) that those with higher education were the most willing to consume a plant-based or vegan diet.

Next, it shows that they know about the environmental impact of extensive animal farming and that they know that the existence of this plant-based is very good to ensure food security. This statement was ranked as number 2 and the RII value was 0.837. It also proves that people realise that this alternative will ensure that the source of protein can be maintained in the future as the population and per capita income continues to grow at this rate. It is estimated that by 2050, the demand for livestock will increase by 70%, which will be harmful to population health, food availability, and the environment (Corrin & Papadopoulus, 2017).

However, the statement that they know about the companies that manufacture and sell plant-based meat is the least important, with an RII value of 0.563. This indicates most consumers that participated in this study do not know about the companies that manufacture the plant-based meat. Demographic factors can also influence this factor since 55% of respondents live in rural areas, making the availability of plant-based meat hard to purchase. According to a publication by Corrin and Papadopoulus (2017), one of the factors contributing to the unavailability of plant-based meat is demographics. Simultaneously, the alternatives to serving more plant-based meat in restaurants and food service companies must be convenient in order to attract more consumers to become aware of this alternative (Corrin & Papadopoulus, 2017).

Table 4.13: Ranking of attitude of consumer's acceptance towards plant-based meat as meat alternative

Statement	Percentage (%)					RII	Rank
	1*	2*	3*	4*	5*		
In my opinion, the nutritional content and health facts about plant-based are very important for consumer acceptance.	0	2.4	10.4	38.2	49.0	0.868	1
I think that consuming plant-based meat is environmentally friendly.	0	2.0	18.7	42.6	36.7	0.828	5
In my opinion, consumers will be willing to consume plant-based meat of the products are labelled with safety information.	0	0.8	17.5	33.1	48.6	0.859	3
I cannot distinguish between animal meat and plant-based if there is no information on plant-based products sold in supermarkets.	1.2	4.4	17.9	33.5	43.0	0.825	6
In my opinion, this alternative also is means to encourage vegans to eat meat.	3.2	4.8	15.9	35.5	40.6	0.811	7
In my opinion, the existence of this plant-based meat can be accepted by all groups if it able to provide benefits to food security.	0.8	2.4	11.6	36.3	49.0	0.861	2
In my opinion, this meat alternative is also good option for addresing animal welfare issues.	1.6	1.6	16.3	34.3	46.2	0.844	4

*Indicator: 1. Strongly disagree; 2.Disagree; 3.Neutral; 4.Agree; 5.Strongly Agree

(Source: Survey, 2021)

Table 4.13 shows the attitude of consumer's acceptance toward plant-based meat ranking. Firstly, the statement "In my opinion, the nutritional content and health facts of plant-based meat are very important" was ranked as number 1 with an RII value of 0.868. This indicates that the respondents were concerned with the health facts and nutritional content of their food intake where the sources used in the preparation of plant-based meat also consist of soy, which some people would be allergic to. Hence, health promotion and resources are necessary for their acceptance in order to increase and individual's confidence and trust in changing their diet pattern by accepting plant-based meat as meat alternative (Corrin & Papadopoulus, 2017).

Then, consumers will also be willing to consume plant-based meat if the product is labelled with safety information. This statement was ranked third with an RII value of 0.859. This indicates that safety information is very important since the perceived level of safety can drop rapidly when new information is revealed, even without medical or scientific support (Issanchou, 1996).

Next, the statement "In my opinion, this meat alternative is a good option for addressing animal welfare issues" has been ranked number 4 with an RII value of 0.844. This indicates that consumer attitudes toward accepting plant-based meat are influenced by a higher concern for animal welfare and the environment (Hoek et al., 2004). This indicates that in order to become a plant-based meat eater, factors such as health, animal welfare, and environmental issues will also be considered (Hoek et al., 2011).

Then, the statement "I think that consuming plant-based is environmentally friendly" has been ranked number 5 with an RII value of 0.828 and the statement "I cannot distinguish between animal meat and plant-based if there is no information on plant-based products sold in supermarkets" has been ranked number 6 with an RII value of 0.825. Lastly, with an RII value of 0.811, the statement "In my opinion, this alternative also encourages vegans to eat meat" was ranked as the least important.

Table 4.14: Ranking of practise of consumer's acceptance towards plant-based meat as meat alternative in Kelantan

Statement	Percentage (%)					RII	Rank
	1*	2*	3*	4*	5*		
I can consume new types of food and adapt to it easily.	2.0	6.0	27.5	36.3	28.3	0.766	3
For me, the information on plant-based meat is not difficult to access.	2.0	4.8	30.7	39.0	23.5	0.755	4
I am willing to buy plant-based meat if the tastes better than the animal meat even though it is more expensive.	4.0	6.8	27.9	31.9	29.5	0.752	5
I cannot decide freely over what I consume in my household, therefore puchase of plant-based meat is unlikely for me.	4.0	14.7	35.1	27.9	18.3	0.684	6
Plant-based meat is not easy to find in the store I usually buy and making my purchase of plant-based meat is not possible.	1.2	5.6	25.9	40.6	26.7	0.829	2
If plant-based meat is delicious and healthy, I would encourage others who live with me to consume it.	1.2	1.2	16.7	35.1	45.8	0.846	1
People around me love to try new foods so it is not a barrier for me to try it once and accept this plant-based as meat alternative	2.4	6.4	25.9	36.7.	28.7	0.766	3

*Indicator: 1. Strongly disagree; 2.Disagree; 3.Neutral; 4.Agree; 5.Strongly Agree

(Source: Survey, 2021)

Table 4.14 shows the ranking of consumer's practise towards plant-based meat acceptance. Firstly, it shows that the majority of respondents would encourage others who live with them to consume plant-based meat if the plant-based meat was delicious and healthy. This demonstrates that the benefits and risks of consumption are now part of the decision-making process in order to avoid something harmful to one's health (Ueland et al., 2012). While taste is one factor for people to adapt to new foods,

Secondly, the majority of respondents who participated in this study agreed that plant-based meat is not easy to find in the store that they usually buy it from, making their purchase of plant-based meat not possible. This indicates that the availability of plant-based alternatives also influenced consumer acceptance. This statement was ranked second with an RII value of 0.829.

Then, the statement "people around me love to try new foods, so it is not a barrier for me to try it once and accept this plant-based meat as a meat alternative" was ranked as number 3 with an RII value of 0.766. This proves that the majority of respondents eating habits that participated in this study are impacted by people around them. Other studies have found that people are likely to adapt their eating habits to those of their peers (Michel et al., 2021).

Next, the statement "For me, the information on plant-based is not difficult to access" has been ranked as number 4 with an RII value of 0.755. This statement shows that respondents can access this information through the internet in order to get more information about plant-based meat. Then, the statement that stated, "I am willing to buy plant-based meat if it tastes better than animal meat, even though it is more expensive," was ranked as number 5 with an RII value of 0.752. This means that respondents are willing to pay more for their food as long as it is delicious, even if they need to pay more.

According to other research, meat alternatives that are created to mimic the flavour and texture of meat and are reasonably priced have the best chance of being successful in replacing meat (Michel et al., 2021). Finally, with an RII value of 0.684, respondents ranked the ability to consume new types of food and adapt to them as the least important.

4.5.1 Group Ranking

Figure 4.1 shows the group ranking between the aspects of knowledge, attitude, and practise. It indicates the most important factor was attitude, with a total value of RII of 0.842, which was higher than practise (0.771) and knowledge (0.753).

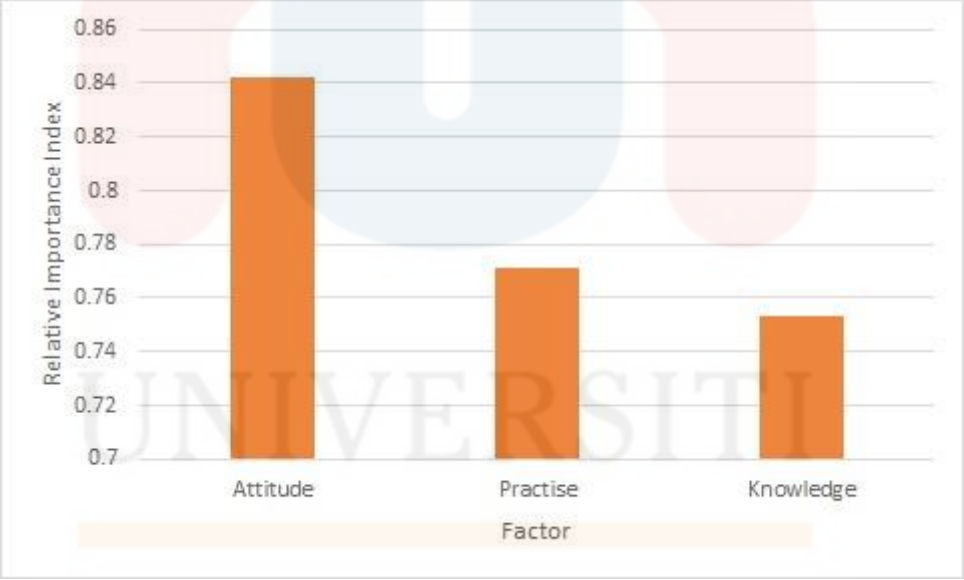

Figure 4.1: Group ranking between the aspects of knowledge, attitude and practise

4.6 Normality Test

Normality test was used in this study in order to identify whetever the data set in this study was well modelled by normal distribution or non-distribution (Kim & Park, 2019). Kolmogrov-Smirnov test was used in this study because the sample size is more than 50 respondents (Kim & Park, 2019). The respondents in this study were 251 respondents.

Table 4.15: Kolmogorov-Smirnov test

	Statistics	df	Sig (p)
Consumer acceptance of plant-based meat as meat alternative	0.491	251	0.000
Knowledge of consumers	0.498	251	0.000
Attitude of consumers	0.383	251	0.000
Practise of consumers	0.422	251	0.000

Based on Table 4.15, the normality test showed the p-value for the all data was 0.000. According to Godina, Rodrigues, & Matias (2018) if the p-value greater than 0.05 it indicates the normality test was a normal distribution. However, if the p-value lower than 0.05 it determines that the normality test was non-normal distribution. So, all the data in this study were 0.000 which means that these data was non-normal distribution by using Kolmogrov-Smirnov.

4.7 The relationship of Knowledge, Attitude and Practise of consumer's acceptance towards plant-based meat as meat alternative

Table 4.16: Result of Spearman correlation analysis

		Knowledge	Attitude	Practise
Consumer acceptance of plant-based meat as meat alternative	Spearman Correlation	0.151*	0.570**	0.399**
	Sig. (2-tailed)	0.017	0.000	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

This section was to analyse the hypothesis of the relationship of knowledge, attitude and practise of consumer's acceptance towards plant-based meat as meat alternative in Kelantan. The H_0 stated that was no significant value between the relationship of knowledge, attitude and practise of consumer's acceptance toward plant-based meat in Kelantan whereas the H_1 stated that there was significant value between the relationship of knowledge, attitude and practise of consumer's acceptance towards plant-based meat in Kelantan. The strength of the correlation between the variables can be determined based on Table 4.16.

According to Table 4.16, the relationship between knowledge and consumers acceptance shows a very weak relationship at a value of $r_s = 0.151$. This relationship was between two variables at a significant 0.05 level (2-tailed) (p=0.017). However, even the relationship in this study shows very weak relationship but other research stated that knowledge also one of the factor of acceptability of food choices and has strong relationship towards consumer's acceptance. Knowledge and experience with plant-based meat alternatives are also demonstrated to be linked with acceptance (Onwezen et al., 2021).

The attitude relationship of consumer's acceptance towards plant-based meat indicates a moderate relationship at the value of $r_s = 0.570$ and significant at 0.01 level (2-tailed). This indicates that attitude has positive relationship on consumer acceptance. The study from other researcher also stated that attitude has positive towards consumer's acceptance and makes their chance of buying increase. The variables that contained within the attitude factor like health benefit, environmental issues and food security concerns has a positive feeling that lead to influence their acceptance of plant-based meat (Mousel & Tang, 2016).

Then, the practise relationship of consumer's acceptance towards plant-based meat shows a weak relationship at the value of $r_s = 0.399$. This relationship between two variables and the significant at level 0.01 level (2-tailed). Hence, even the relationship of consumer's practise towards accepting of plant-based meat in this study shows weak relationship but others findings of practise shows a positive relationship in accepting of plant-based meat. Consumers' acceptance of plant-based meat or meat alternatives is influenced by other people's purchases or consumption, which is one of the variables in practise (Mousel & Tang, 2016).

For this study, the relationship of knowledge, attitude and pactise of consumer acceptance towards plant-based as meat alternative has a positive relationship. Hence, H_1 is accepted while H_0 rejected in this study.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

As a conclusion, demographic profiles of 251 respondents were obtained which 78.5% female and 21.5% male were contributed to this study. Majority of respondents that contributed in this study was student that has degree as the highest education level which constituted to 76.5%. At the same time, there were also 0.8% of retired that contributed in this study. Then, for monthly income, 66.9% was the highest percentage which was less than RM4,850 that indicates as B40 group. Next, the respondents that contribute in this study were mostly stay with their parents at home and which constituted to 78.9%. Lastly, 86.5% of respondents that participate in this study were not-vegetarian.

Based on Figure 4.1, attitude was indicated as the most important factor that influences consumers' acceptance of plant-based meat as meat alternative, whose total of RII value constituted 0.842. Next, the relationship between knowledge, attitude, and practise of consumers' acceptance of plant-based meat as meat alternative also shows a positive correlation. Then, high mean score value and total score of RII value in Table 4.10 has proved that the consumers accept this plant-based meat, and the objective to determine the level of consumer acceptance toward plant-based meat for this study was achieved.

The findings gained from this study was to help more people aware about the existence of plant-based meat especially youths who have the power to encourage parents and children to understand and about the benefits and existence of meat alternatives. This

study also proves that animals meat also has pros and does not give disadvantages entirely but other alternatives are also needed in ensuring that the supply of protein will be adequate for all humans in the future.

5.2 Recommendations

The recommendation that could be done for future research that can be done is identifying the most influenctial factors on the consumers acceptance towards plant-based meat in every state in Malaysia and other researchers can be done by using other statistical analysis which is regression or ANOVA. Futhermore, this research also should be done by physically which are the researchers should provide 2 types of meat which are plant-based meat and animal meat for consumers sensory evaluation. This methods would give more accurate results about their acceptance of plant-based meat.

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APPENDICES

APPENDIX A

Table A.1: Responses Rate of Questionnaire

Case Prosessing Summary

		N	%
Case	Valid	251	100.0
	Excluded[a]	0	0.0
	Total	251	100.0

a. Listwise delection based on all variables in the procedure

Table A.2: Cronbach 's Alpha Test for 30 respondents

Reability test

Cronbach's Alpha	N of Items
.823	7
.825	7
.804	7
.776	7

Table A.3: Descriptive for Gender of Respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	54	21,5	21,5	21,5
	Female	197	78,5	78,5	100,0
	Total	251	100,0	100,0	

Table A.4: Descriptive for Age of Respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	13-20 years old	36	14,3	14,3	14,3
	21-30 years old	182	72,5	72,5	86,9
	31-40 years old	12	4,8	4,8	91,6
	41-50 years old	15	6,0	6,0	97,6
	More than 50 years old	6	2,4	2,4	100,0
	Total	251	100,0	100,0	

Table A.5: Descriptive for Education level of Respondents

Education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SPM	14	5,6	5,6	5,6
	STPM / MATRICULATION	8	3,2	3,2	8,8
	Diploma	27	10,8	10,8	19,5
	Technical certificate	3	1,2	1,2	20,7
	Degree	192	76,5	76,5	97,2
	Master degree or Phd	7	2,8	2,8	100,0
	Total	251	100,0	100,0	

Table A.6: Descriptive for Occupation of Respondents

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	200	79,7	79,7	79,7
	Working full time	44	17,5	17,5	97,2
	Housewife	5	2,0	2,0	99,2
	Retired	2	,8	,8	100,0
	Total	251	100,0	100,0	

Table A.7: Descriptive for Household income of Respondents

Household income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than RM4,850 (B40)	168	66,9	66,9	66,9
	RM4,850 – RM10,959 (M40)	65	25,9	25,9	92,8
	More than RM10,959 (T20)	18	7,2	7,2	100,0
	Total	251	100,0	100,0	

Table A.8: Descriptive for Living area of Respondents

Living area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban area	113	45,0	45,0	45,0
	Rural area	138	55,0	55,0	100,0
	Total	251	100,0	100,0	

Table A.9: Descriptive of Living situation at home of respondents

Living situation at home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alone	15	6,0	6,0	6,0
	With spouse	15	6,0	6,0	12,0
	With spouse and children	21	8,4	8,4	20,3
	With parents	198	78,9	78,9	99,2
	Others	2	,8	,8	100,0
	Total	251	100,0	100,0	

Table A.10: Descriptive of vegetarian declaration of respondents

Are you a vegetarian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	13,5	13,5	13,5
	No	217	86,5	86,5	100,0
	Total	251	100,0	100,0	

Table A.11: Descriptive for Consumer acceptance towards plant-based meat (Statement 1)

I can accept plant-based meat as meat alternative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1,6	1,6	1,6
	Disagree	12	4,8	4,8	6,4
	Neutral	44	17,5	17,5	23,9
	Agree	107	42,6	42,6	66,5
	Strongly agree	84	33,5	33,5	100,0
	Total	251	100,0	100,0	

Table A.12: Descriptive for Consumer acceptance towards plant-based meat (Statement 2)

In my opinon, plant-based meat will be more sustainable than animal meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1,6	1,6	1,6
	Disagree	9	3,6	3,6	5,2
	Neutral	83	33,1	33,1	38,2
	Agree	98	39,0	39,0	77,3
	Strongly agree	57	22,7	22,7	100,0
	Total	251	100,0	100,0	

Table A.13: Descriptive for Consumer acceptance towards plant-based meat (Statement 3)

I will consume the plant-based meat if the taste of plant-based meat is similar to animal meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	2,4	2,4	2,4
	Neutral	38	15,1	15,1	17,5
	Agree	108	43,0	43,0	60,6
	Strongly agree	99	39,4	39,4	100,0
	Total	251	100,0	100,0	

Table A.14: Descriptive for Consumer acceptance towards plant-based meat (Statement 4)

I will buy plant-based meat if the price of plant-based is cheaper than the animal meat (eg. Beef, mutton and etc)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	,8	,8	,8
	Disagree	3	1,2	1,2	2,0
	Neutral	42	16,7	16,7	18,7
	Agree	89	35,5	35,5	54,2
	Strongly agree	115	45,8	45,8	100,0
	Total	251	100,0	100,0	

Table A.15: Descriptive for Consumer acceptance towards plant-based meat (Statement 5)

The existence of animal-meat does not prevent me from accepting plant-based meat as my daily diet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	,8	,8	,8
	Disagree	7	2,8	2,8	3,6
	Neutral	45	17,9	17,9	21,5
	Agree	109	43,4	43,4	64,9
	Strongly agree	88	35,1	35,1	100,0
	Total	251	100,0	100,0	

Table A.16: Descriptive for Consumer acceptance towards plant-based meat (Statement 6)

In my opinion, this alternative needs to be commercialized more widely to give awareness to consumers about the existence of this plant-based meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	,8	,8	,8
	Neutral	31	12,4	12,4	13,1
	Agree	81	32,3	32,3	45,4
	Strongly agree	137	54,6	54,6	100,0
	Total	251	100,0	100,0	

Table A.17: Descriptive for Consumer acceptance towards plant-based meat (Statement 7)

I think the plant-based meat production is indeed good for reducing environmental problems such as degradation and water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	,4	,4	,4
	Disagree	5	2,0	2,0	2,4
	Neutral	45	17,9	17,9	20,3
	Agree	82	32,7	32,7	53,0
	Strongly agree	118	47,0	47,0	100,0
	Total	251	100,0	100,0	

Table A.18: Descriptive for knowledge of consumer acceptance towards plant based meat (Statement 8)

I know about the existence of plant-based meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know	60	23,9	23,9	23,9
	Not sure	63	25,1	25,1	49,0
	Know	128	51,0	51,0	100,0
	Total	251	100,0	100,0	

Table A.19: Descriptive for knowledge of consumer acceptance towards plant based meat (Statement 9)

I know about the resources used in producing plant-based meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know	78	31,1	31,1	31,1
	Not sure	91	36,3	36,3	67,3
	Know	82	32,7	32,7	100,0
	Total	251	100,0	100,0	

Table A.20: Descriptive for knowledge of consumer acceptance towards plant based meat (Statement 10)

I know about companies that manufacturer and sell plant-based meats

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know	130	51,8	51,8	51,8
	Not sure	69	27,5	27,5	79,3
	Know	52	20,7	20,7	100,0
	Total	251	100,0	100,0	

Table A.21: Descriptive for knowledge of consumer acceptance towards plant based meat (Statement 11)

I know why plant-based meat was created

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know	59	23,5	23,5	23,5
	Not sure	69	27,5	27,5	51,0
	Know	123	49,0	49,0	100,0
	Total	251	100,0	100,0	

Table A.22: Descriptive for knowledge of consumer acceptance towards plant based meat (Statement 12)

I know that plant-based meat are good for health

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know	27	10,8	10,8	10,8
	Not sure	55	21,9	21,9	32,7
	Know	169	67,3	67,3	100,0
	Total	251	100,0	100,0	

Table A.23: Descriptive for knowledge of consumer acceptance towards plant based meat (Statement 13)

I know about the environmental impacts of existensive animal farming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know	29	11,6	11,6	11,6
	Not sure	65	25,9	25,9	37,5
	Know	157	62,5	62,5	100,0
	Total	251	100,0	100,0	

Table A.24: Descriptive for knowledge of consumer acceptance towards plant based meat (Statement 14)

I know the existence of this plant-based meat is very good to ensure food security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't know	24	9,6	9,6	9,6
	Not sure	82	32,7	32,7	42,2
	Know	145	57,8	57,8	100,0
	Total	251	100,0	100,0	

Table A.25: Descriptive for attitude of consumer acceptance towards plant based meat (Statement 15)

In opinion, the nutritional content and health facts about plant-based meat are very important for consumers acceptance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	2,4	2,4	2,4
	Neutral	26	10,4	10,4	12,7
	Agree	96	38,2	38,2	51,0
	Strongly agree	123	49,0	49,0	100,0
	Total	251	100,0	100,0	

Table A.26: Descriptive for attitude of consumer acceptance towards plant based meat (Statement 16)

I think that consuming plant-based meat is environmentally friendly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	2,0	2,0	2,0
	Neutral	47	18,7	18,7	20,7
	Agree	107	42,6	42,6	63,3
	Strongly agree	92	36,7	36,7	100,0
	Total	251	100,0	100,0	

Table A.27: Descriptive for attitude of consumer acceptance towards plant based meat (Statement 17)

In my opinion, consumers will be willing to consume plant-based meat if the products are labelled with safety information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	,8	,8	,8
	Neutral	44	17,5	17,5	18,3
	Agree	83	33,1	33,1	51,4
	Strongly agree	122	48,6	48,6	100,0
	Total	251	100,0	100,0	

Table A.28: Descriptive for attitude of consumer acceptance towards plant based meat (Statement 18)

I cannot distinguish between animal meat and plant-based meat if there is no information about it on plant-based meat products sold in the supermarkets.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	1,2	1,2	1,2
	Disagree	11	4,4	4,4	5,6
	Neutral	45	17,9	17,9	23,5
	Agree	84	33,5	33,5	57,0
	Strongly agree	108	43,0	43,0	100,0
	Total	251	100,0	100,0	

Table A.29: Descriptive for attitude of consumer acceptance towards plant based meat (Statement 19)

In my opinion, this alternative also is means to encourage vegans to eat meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	8	3,2	3,2	3,2
	Disagree	12	4,8	4,8	8,0
	Neutral	40	15,9	15,9	23,9
	Agree	89	35,5	35,5	59,4
	Strongly agree	102	40,6	40,6	100,0
	Total	251	100,0	100,0	

Table A.30: Descriptive for attitude of consumer acceptance towards plant based meat (Statement 20)

In my opinion, the existence of this plant-based meat can be accepted by all groups if it is able to provide benefits to food security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	,8	,8	,8
	Disagree	6	2,4	2,4	3,2
	Neutral	29	11,6	11,6	14,7
	Agree	91	36,3	36,3	51,0
	Strongly agree	123	49,0	49,0	100,0
	Total	251	100,0	100,0	

Table A.31: Descriptive for attitude of consumer acceptance towards plant based meat (Statement 21)

In my opinion, this meat alternative is also good option for addressing animal welfare issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1,6	1,6	1,6
	Disagree	4	1,6	1,6	3,2
	Neutral	41	16,3	16,3	19,5
	Agree	86	34,3	34,3	53,8
	Strongly agree	116	46,2	46,2	100,0
	Total	251	100,0	100,0	

Table A.32: Descriptive for practise of consumer acceptance towards plant based meat (Statement 22)

I can consume new types of food and adapt to it easily

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	2,0	2,0	2,0
	Disagree	15	6,0	6,0	8,0
	Neutral	69	27,5	27,5	35,5
	Agree	91	36,3	36,3	71,7
	Strongly agree	71	28,3	28,3	100,0
	Total	251	100,0	100,0	

Table A.33: Descriptive for practise of consumer acceptance towards plant based meat (Statement 23)

For me, the information on plant-based meats is not difficult to access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	2,0	2,0	2,0
	Disagree	12	4,8	4,8	6,8
	Neutral	77	30,7	30,7	37,5
	Agree	98	39,0	39,0	76,5
	Strongly agree	59	23,5	23,5	100,0
	Total	251	100,0	100,0	

Table A.34: Descriptive for practise of consumer acceptance towards plant based meat (Statement 24)

I am willing to buy plant-based meat if it tastes better than animal meat eventhough it is more expensive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	10	4,0	4,0	4,0
	Disagree	17	6,8	6,8	10,8
	Neutral	70	27,9	27,9	38,6
	Agree	80	31,9	31,9	70,5
	Strongly agree	74	29,5	29,5	100,0
	Total	251	100,0	100,0	

Table A.35: Descriptive for practise of consumer acceptance towards plant based meat (Statement 25)

I cannot decide freely over what I consume in my household, therefore purchase of plant-based meat is unlikely for me

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	10	4,0	4,0	4,0
	Disagree	37	14,7	14,7	18,7
	Neutral	88	35,1	35,1	53,8
	Agree	70	27,9	27,9	81,7
	Strongly agree	46	18,3	18,3	100,0
	Total	251	100,0	100,0	

Table A.36: Descriptive for practise of consumer acceptance towards plant based meat (Statement 26)

Plant-based meat is not easy to find in the store I usually buy and making my purchase of plant-based meat is not possible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	1,2	1,2	1,2
	Disagree	14	5,6	5,6	6,8
	Neutral	65	25,9	25,9	32,7
	Agree	102	40,6	40,6	73,3
	Strongly agree	67	26,7	26,7	100,0
	Total	251	100,0	100,0	

Table A.37: Descriptive for practise of consumer acceptance towards plant based meat (Statement 27)

If plant-based meat is delicious and healthy, I would encourage others who live with me to consume it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	1,2	1,2	1,2
	Disagree	3	1,2	1,2	2,4
	Neutral	42	16,7	16,7	19,1
	Agree	88	35,1	35,1	54,2
	Strongly agree	115	45,8	45,8	100,0
	Total	251	100,0	100,0	

Table A.38: Descriptive for practise of consumer acceptance towards plant based meat (Statement 28)

People around me love to try new foods so it is not a barrier for me to try it once and accept this plant-based meat as an alternative to animal meat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	2,4	2,4	2,4
	Disagree	16	6,4	6,4	8,8
	Neutral	65	25,9	25,9	34,7
	Agree	92	36,7	36,7	71,3
	Strongly agree	72	28,7	28,7	100,0
	Total	251	100,0	100,0	

Table A.39: Result test of Normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Compute_DV	,491	251	,000	,495	251	,000
Compute_attitude	,498	251	,000	,474	251	,000
Compute_practise	,383	251	,000	,642	251	,000
Compute_knowledge	,422	251	,000	,599	251	,000

a. Lilliefors Significance Correction

Table A.40: Result of correlation between variables

Correlations

			Compute_DV	Compute_attitude	Compute_practise	Compute_knowledge
Spearman's rho	Compute_DV	Correlation Coefficient	1,000	,570**	,399**	,151*
		Sig. (2-tailed)	.	,000	,000	,017
		N	251	251	251	251
	Compute_attitude	Correlation Coefficient	,570**	1,000	,342**	,179**
		Sig. (2-tailed)	,000	.	,000	,005
		N	251	251	251	251
	Compute_practise	Correlation Coefficient	,399**	,342**	1,000	,197**
		Sig. (2-tailed)	,000	,000	.	,002
		N	251	251	251	251
	Compute_knowledge	Correlation Coefficient	,151*	,179**	,197**	1,000
		Sig. (2-tailed)	,017	,005	,002	.
		N	251	251	251	251

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX B

Questionnaire: English version

Dear respondents,

I am Nur Auni Binti Wahabi, a bachelor student in Universiti Malaysia Kelantan. I am currently doing my Final Year Project entittled:

Consumer Acceptance towards Plant-Based Meat as Meat Alternative in Kelantan.

This study focuses on analyzing the consumer acceptance towards plant-based meat in Kelantan in order to ensure the protein source in Malaysia are sustainable without highly relying on animal resources only. Furthermore, plant-based meat is a good diet alternative to prevent and treat type 2 diabetes patients. Then, this study also focuses to identify the relationship between knowledge, attitude and practice of consumer acceptance toward plant-based meat as meat alternative in Kelantan.

Your participation in this survey is entirely voluntary. You have the right to refuse to participate in this study or to withdraw from it at any moment without incurring any consequences.

Please be assured that all information will be treated with strict confidential and used solely for academic purposes.

Thank you very much for your cooperation.

Sincerely ,

.....

Nur Auni Binti Wahabi

Faculty of Agro Based Industry,

Universiti Malaysia Kelantan,

17600 Jeli, Kelantan

email: nurauni0202@gmail.com

SECTION A: DEMOGRAPHIC INFORMATION

Please tick (/) in the appropriate box to indicate your answer

1	Gender	□ Male □ Female
2	Age	□ 13- 20 years old □ 21-30 years old □ 31-40 years old □ 41-50 years old □ More than 50 years old
3	Education Level	□ SPM □ STPM / MATRICULATION □ Diploma □ Technical certificate □ Degree □ Master degree/ PhD
4	Occupation	□ Student □ Working full time □ Retired □ Housewife
5	Describe your household income	□ Less than RM 4,850 □ RM4,850 – RM10,959 (M40) □ More than RM10,959 (T20)
6	Living area	□ Urban area □ Rural area
7	Living situation at home	□ Alone □ With spouse □ With spouse and children □ With parents □ Others
8	Are you vegetarian	□ Yes □ No

Instructions: For the questions on Section B please read each questions and give your answers by tick (/) the answer option that is appropriate to the scale of 1 (strongly disagree) to scale 5 (strongly agree).

SECTION B: EVALUTION IN CONSUMER ACCEPTANCE TOWARDS PLANT-BASED MEAT AS MEAT ALTERNATIVE

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Statements	1	2	3	4	5
I can accept plant-based meat as meat alternative.					
In my opinion, plant-based meat will be more sustainable than animal meat.					
I will consume the plant-based meat if the taste of plant-based is similar to animal meat (eg. Beef, mutton and etc).					
I will buy the plant-based meat if the price of plant-based meat is cheaper than the animal meat (eg. Beef, mutton, and etc).					
The existence of animal meat does not prevent me from accepting plant-based meat as my daily diet.					
In my opinion, this alternative needs to be commercialied more widely to give awareness to consumers about the existence of this plant-based meat.					
I think the plant-based meat production is indeed good for reducing environmental problem such as degradation and water pollution.					

Instructions: For the questions on Section C please read each questions and give your answers by tick (/) the answer option that is appropriate to the scale of 1 (Don't know) to scale 3 (Know).

SECTION C: EVALUTION THE KNOWLEDGE OF CONSUMER ACCEPTANCE TOWARDS PLANT-BASED MEAT AS MEAT ALTERNATIVE

1	2	3
Don't know	Not Sure	Know

Statements	1	2	3
I know about the existence of plant-based meat			
I know about the resources used in producing plant-based meat			
I know about companies that manufacture and sell plant-based meat			
I know why plant-based meat was created			
I know that plant-based meat are good for health			
I know about the environmental impact of extensive animal farming			
I know that the existence of this plant-based meat is vey good to ensure food security			

Instructions: For the questions on Section D please read each questions and give your answers by tick (/) the answer option that is appropriate to the scale of 1 (strongly disagree) to scale 5 (strongly agree).

SECTION D: EVALUTION THE ATTITUDE OF CONSUMER ACCEPTANCE TOWARDS PLANT-BASED MEAT AS MEAT ALTERNATIVE

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Statements	1	2	3	4	5
In my opinion, the nutritional content and health facts about plant-based are very important for consumer acceptance.					
I think that consuming plant-based meat is environmentally friendly.					
In my opinion, consumers will be willing to consume plant-based meat of the products are labelled with safety information.					
I cannot distinguish between animal meat and plant-based if there is no information on plant-based products sold in supermarkets.					
In my opinion, this alternative also is means to encourage vegans to eat meat.					
In my opinion, the existence of this plant-based meat can be accepted by all groups if it able to provide benefits to food security.					
In my opinion, this meat alternative is also good option for addresing animal welfare issues.					

Instructions: For the questions on Section E please read each questions and give your answers by tick (/) the answer option that is appropriate to the scale of 1 (strongly disagree) to scale 5 (strongly agree).

SECTION E: EVALUTION PRACTISE OF CONSUMER ACCEPTANCE TOWARDS PLANT-BASED MEAT AS MEAT ALTERNATIVE

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Statements	1	2	3	4	5
I can consume new types of food and adapt to it easily.					
For me, the information on plant-based meat is not difficult to access.					
I am willing to buy plant-based meat if the tastes better than the animal meat even though it is more expensive.					
I cannot decide freely over what I consume in my household, therefore purchase of plant-based meat is unlikely for me.					
Plant-based meat is not easy to find in the store I usually buy and making my purchase of plant-based meat is not possible					
If plant-based meat is delicious and healthy, I would encourage others who live with me to consume it.					
People around me love to try new foods so it is not a barrier for me to try it once and accept this plant-based as meat alternative					