



UNIVERSITI PUTRA MALAYSIA

***AWARENESS AND PERCEPTION ON AGRICULTURE FRESH
PRODUCE TRACEABILITY AMONG PRODUCERS AND WHOLESALERS
IN MALAYSIA***

JULIANA RITONGA SAIPUL JANNAH

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MALAYSIA**

By

JULIANA RITONGA BINTI SAIPUL JANNAH

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

December 2016

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DEDICATION

To

Specially dedicated this Thesis to my lovely husband, my mom, my childs (Alya, Husna, Fatin and Haziq) and my supervisor Associate Prof. Dr. Norsida for their patients and love.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Master of Science

AWARENESS AND PERCEPTION ON AGRICULTURE FRESH PRODUCE TRACEABILITY AMONG PRODUCERS AND WHOLESALERS IN MALAYSIA

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JULIANA RITONGA BINTI SAIPUL JANNAH

December 2016

Chairman : Associate Professor Norsida Man, PhD
Faculty : Agriculture

Agriculture is the third engine of economic growth in Malaysia. Agriculture has been taken seriously by the Malaysian government as they made a National Agriculture Policy and follow by Agro-Food Policy and food safety is one of the eighth (8th) main ideas to perform the Agro-Food Policy. The government emphasized in safety food product especially fresh fruits and vegetables for higher and better quality and to meet the food safety standards, thus allowing access to premium markets in the Middle East and Europe. The traceability can be one of the methods that could trace products from produced stage until market. In order to implement the traceability among the product and wholesaler in Malaysia, the respective department or agencies need to know the level of awareness and knowledge among the implementers. Awareness and knowledge are required for the implementer to make a judgment whether the traceability will be benefited to them and it will result the behaviour. In many agencies, it is still to gather information and strengthen the concept of practicality. However, the responsible department and agencies are working for the implementing food chain traceability in the sector of agriculture. Therefore, this study was conducted to identify the awareness and knowledge of producers and wholesalers in traceability of fresh products. The specific objectives for this study were to describe selected demographic characteristic of the producers and wholesaler, to identify the level of awareness and knowledge of producer and wholesaler in food safety, food supply chain and traceability, to clarify the relationship between socio demographic factors with level of awareness and knowledge of traceability and to examine the factors that influences the producers and wholesalers for accepting concept of traceability. This study was used the Theory of Applied Behaviour and behaviour of human contributors in relation to the behavioural intention. A total of 200 respondent among selected farmers and wholesalers (involve in fresh product) were selected to obtain their opinions towards traceability in fresh fruits and vegetables. The quantitative method was used in this study that was involved for numerical data in which survey method through face to face interview using structure questionnaire. This study was conducted in to two states

which were Johor and Pahang for producers and Selangor for wholesale. In this study, descriptive analysis, Chi-Square, factor analysis methods were applied. From the descriptive analysis, majority of the fresh producers were male with the age between 41 to 50 years old. Most of them were having secondary school. Their annual income was less than RM 100, 000 and has been involved in the farming for about 1 to 10 years. However, for the fresh wholesalers, majority of them were male at the age between 41 to 50 years old and were have secondary school education. In addition, majority of the respondents have annual income less than RM100, 000. Most of them have 21 to 30 years of experience in conducting a business.

The producer and wholesaler mostly were involved as an individual. They also produced and market more in vegetables as compared to fruits. Market area for producer in district and state contributed more than 50% of their marketing strategy. However, for the wholesaler, their marketing area was around Peninsular Malaysia which was contributed more than 50% of their marketing area. In the aspect traceability on their product, only 15% of producer put batch number on their packaging and only 1% have a bar code on their packaging. Moreover, only 27% of the wholesalers put a batch number on their packaging and none of them had bar code on their packaging. It shows that, the availability of tracing their products was very low. Based from the results, the level of awareness and knowledge for food safety and supply chain was high for each group of respondents. It means that the producers and wholesalers know the importance in producing a safe vegetables and fruits for the consumers and they took the responsibilities for producing safe foods. They also know well about supply chain throughout the process, start with food production in farm level until the distribution to the consumer. However the level of awareness and knowledge towards traceability among producer and wholesaler was moderate. It shows that the available information about traceability was low and the government agencies were not taking serious part about tracing back and forward of each product which is available in the market. The Chi-square analysis results showed that in producers' perspectives, income and education level have significant relationships with the producers' intentions to accept the traceability on fresh produce. From the wholesalers' perspective, the result suggests that income in business have significant different relationship with intentions of traceability acceptance. The factor analysis was extracted the factors that influence in attention of traceability producers' perspectives, six (6) factors were extracted namely "business profile", "market channel", "financial", "reputation", "policy" and "infrastructure". On the wholesalers' perspectives, five (5) factors were extracted which are "financial", "business profile", "reputation", "market channel" and "infrastructure". All of these factors were identified as it can create implementation intention amongst producers and wholesalers to perform implementation behaviour towards the traceability. Future research is recommended to conduct study on every stakeholder in supply chain including retailers, exporters and transporters in order to know their attitude, perception, knowledge and awareness of traceability practices on fresh produce so that they can comply with international standards and market requirements.

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

**KESEDARAN DAN PERSEPI PENGELUAR DAN PEMBORONG
MENGENAI KEBOLEHKESANAN PRODUK SEGAR DI MALAYSIA**

Oleh

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Pertanian adalah enjin pertumbuhan ketiga di Malaysia. Pertanian telah diambil tindakan yang serius oleh Kerajaan Malaysia dengan membuat Dasar Pertanian Negara diikuti Dasar Agro-Makanan. Keselamatan makanan merupakan salah satu daripada lapan (8) idea utama dalam melaksanakan Dasar Agro-Makanan. Kerajaan memberi penekanan dalam menghasilkan produk makanan yang selamat terutamanya buah-buahan dan sayuran segar yang berkualiti tinggi dan untuk memenuhi piawaian keselamatan makanan, sekaligus dapat memenuhi permintaan market premium di Timur Tengah dan Eropah. Kebolehkesanan boleh menjadi salah satu kaedah yang boleh mengesan produk dari peringkat hasil sehingga ke pasaran. Dalam usaha untuk melaksanakan kebolehkesanan di kalangan pengeluar dan pemborong di Malaysia, jabatan atau agensi yang terlibat perlu tahu tahap kesedaran dan persepsi di kalangan pelaksana. Kesedaran dan persepsi pelaksana diperlukan untuk melihat keberkesanan pelaksanaan samaada ia bermanfaat atau tidak serta tingkah laku mereka terhadap keberkesanan. Kebanyakan agensi masih dalam proses mengumpul maklumat dan berusaha mengukuhkan konsep praktikal. Walau bagaimanapun, jabatan dan agensi-agensi yang bertanggungjawab sedang berusaha ke arah melaksanakan kebolehkesanan dalam rantai makanan bagi sektor pertanian. Oleh itu, kajian ini dijalankan untuk mengenal pasti tahap kesedaran dan persepsi pengeluar dan pemborong terhadap kebolehkesanan produk segar. Objektif khusus kajian ini adalah untuk menggambarkan ciri-ciri demografi terpilih daripada pengeluar dan pemborong, untuk mengenal pasti tahap kesedaran dan pengetahuan pengeluar dan pemborong dalam keselamatan makanan, rantai bekalan makanan dan kebolehkesanan, untuk menjelaskan hubungan antara faktor-faktor demografi sosio dengan tahap kesedaran dan pengetahuan kebolehkesanan dan untuk mengkaji faktor-faktor yang mempengaruhi pengeluar dan pemborong dalam menerima konsep kebolehkesanan. Kajian ini dijalankan berdasarkan kepada Teori Behavior Gunaan dan tingkah laku manusia. Sejumlah 200 responden di kalangan petani dan pemborong dipilih (terlibat dalam produk segar) untuk mendapatkan pendapat mereka terhadap pengesanan dalam buah-buahan dan sayuran segar. Kaedah kuantitatif digunakan di dalam kajian ini

menggunakan data berangka melalui kaedah temuduga bersemuka berpandukan soalan kajiselidik berstruktur. Kajian ini dijalankan di dua negeri untuk pengeluar iaitu Johor dan Pahang serta Selangor bagi pemborong. Jumlah responden dalam setiap kategori adalah seramai 100 orang. Dalam kajian ini, analisis deskriptif, Chi-Square, kaedah analisis faktor telah digunakan. Daripada analisis deskriptif, majoriti pengeluar segar adalah lelaki yang berusia antara 41 hingga 50 tahun. Kebanyakan mereka mendapat pendidikan sehingga sekolah menengah, pendapatan mereka kurang daripada RM 100, 000 setahun dan telah terlibat dalam pertanian selama kira-kira 1 hingga 10 tahun. Manakala bagi pemborong segar, majoriti daripada mereka adalah lelaki yang berumur antara 41 hingga 50 tahun dan tamat pengajian sekolah menengah. Majoriti pendapatan mereka kurang daripada RM100, 000 setahun. Kebanyakan mereka mempunyai 21 hingga 30 tahun pengalaman dalam menjalankan perniagaan.

Pengeluar dan pemborong kebanyakannya terlibat sebagai seorang individu. Mereka juga menghasil dan memasarkan lebih sayur-sayuran berbanding dengan buah-buahan. Kawasan pasaran bagi pengeluar kebanyakannya di kawasan daerah dan negeri yang menyumbang lebih daripada 50% daripada strategi pemasaran mereka. Walau bagaimanapun, bagi pemborong, kawasan pemasaran mereka adalah sekitar semenanjung Malaysia yang ia menyumbang lebih daripada 50% daripada kawasan pemasaran mereka. Dalam kebolehsesan aspek pada produk mereka, hanya 15% daripada pengeluar meletakkan nombor kelompok pada bungkusan mereka dan hanya 1% mempunyai kod bar pada bungkusan mereka. Sehubungan dengan itu, hanya 27% pemborong, meletakkan nombor kelompok pada bungkusan mereka dan tiada seorang pun daripada mereka mempunyai kod bar pada bungkusan mereka. Ini menunjukkan bahawa, pengesanan produk mereka adalah sangat rendah. Berdasarkan daripada hasil kajian, ia menunjukkan bahawa tahap kesedaran dan pengetahuan untuk keselamatan makanan dan rantai bekalan yang tinggi bagi setiap kumpulan responden. Ini bermakna bahawa pengeluar dan pemborong tahu bahawa ia adalah penting dalam menghasilkan sayur-sayuran dan buah-buahan yang selamat kepada pengguna. Mereka bertanggungjawab dalam menghasilkan makanan yang selamat. Mereka juga mengetahui mengenai rantai bekalan sepanjang proses tersebut bermula dengan pengeluaran makanan di peringkat ladang hingga kepada peringkat pengguna. Walau bagaimanapun tahap kesedaran dan pengetahuan ke arah kebolehsesan antara pengeluar dan pemborong adalah sederhana. Ia menunjukkan bahawa maklumat yang boleh didapati mengenai pengesanan adalah minimum dan agensi-agensi kerajaan tidak mengambil serius mengenai kebolehsesan setiap produk yang terdapat di pasaran. Dapatan analisis Chi-Square kajian mendapati pendapatan dan tahap pendidikan mempunyai hubungan yang signifikan dengan niat penerimaan pengeluar terhadap kebolehsesan pada produk segar. Dari perspektif pemborong, hasil kajian menunjukkan bahawa pendapatan dalam perniagaan mempunyai hubungan yang signifikan yang berbeza dengan niat penerimaan kebolehsesan. Analisis faktor telah mengekstrak faktor-faktor yang mempengaruhi dalam perhatian pengeluar terhadap kebolehsesan, enam (6) faktor telah diambil iaitu "profil perniagaan", "saluran pasaran", "kewangan", "reputasi", "dasar" dan "infrastruktur". Pada perspektif pemborong, lima (5) faktor telah diekstrak iaitu "kewangan", "Profil perniagaan", reputasi, 'saluran pasaran' dan "infrastruktur". Semua faktor-faktor ini telah dikenal pasti kerana ia boleh menjadi faktor mendorong pengeluar dan pemborong sayur dan buah-buahan segar ke arah mengamal dan melaksanakan pengesanan. Kajian akan datang

adalah disyorkan untuk menjalankan kajian ke atas setiap pemain dalam rantai bekalan termasuk peruncit, pengeksport dan pengangkut untuk mengetahui sikap, persepsi, pengetahuan dan kesedaran mengenai amalan kebolehhesanan mereka terhadap produk segar supaya mereka dapat mematuhi piawaian antarabangsa dan keperluan pasaran.



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I certify that a Thesis Examination Committee has met on 1 December 2016 to conduct the final examination of Juliana Ritonga binti Saipul Jannah on her thesis entitled "Awareness and Perception on Agriculture Fresh Produce Traceability among Producers and Wholesalers in Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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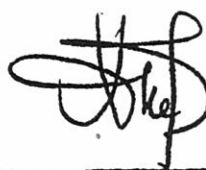
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Declaration by graduate student

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	vi
APPROVAL	vii
DECLARATION	ix
LIST OF TABLES	xiv
LIST OF FIGURES	xvii
CHAPTER	
1 INTRODUCTION	1
1.1 Agriculture Sector in Malaysia	1
1.2 Policies and National Agenda Focusing on Fresh Fruit and Vegetable	1
1.2.1 Agriculture National Key Economic Area (NKEA)	1
1.2.2 National Agrofood Policy (2011-2020)	2
1.3 Overview of Fresh Fruits and Vegetable Sector in Malaysia	3
1.4 Food Safety and Standard	4
1.5 Food Traceability	5
1.6 Knowledge and Awareness	6
1.7 Problem Statement	6
1.8 Objective of the Study	7
1.8.1 General Objectives	7
1.8.2 Specific Objectives	7
1.9 Significance of the Study	7
1.10 Thesis Organization	8
2 LITERATURE RIVIEW	9
2.1 Food Safety	9
2.2 Food Safety and Regulations Relating to Agriculture Sector in Malaysia	10
2.2.1 Malaysian Good Agricultural Practices (myGAP)	10
2.2.2 Organic Certification in Malaysia (myOrganic)	11
2.2.3 Good Agricultural Practice (GAP)	12
2.3 Traceability of Fresh Produces	13
2.4 Factors Influenced the Intention of Traceability Concept in Fresh Produce	16
2.4.1 Business Background	16
2.4.2 Financial	17
2.4.3 Infrastructure	17
2.4.4 Reputation	17
2.4.5 Policy	18
2.4.6 Market Channel	19
2.5 Knowledge in Food Safety, Traceability and Supply Chain	19
2.6 Awareness in Food Safety, Traceability and Supply Chain	20
2.7 Theory of Planned Behaviour	21

2.8	Summary	23
3	METODOLOGY	24
3.1	Conceptual Framework	24
3.2	Sampling Techniques	26
3.3	Respondents Selection	27
3.4	Study Location	27
3.5	Questionnaire Design	28
3.6	Pilot Test	28
3.7	Reliability Test	29
3.8	Data Analysis Techniques	32
	3.8.1 Descriptive Analysis	32
	3.8.2 Chi Square Analysis	32
	3.8.3 Factor Analysis	33
3.9	Summary	34
4	RESULT AND DISCUSSION	35
4.1	Descriptive Analysis result	35
	4.1.1 Profile of Fresh Producers' Respondents	35
	4.1.2 Profile of Fresh Wholesalers' Respondents	37
	4.1.3 Farm Profile for Fresh Producers' Respondents	39
	4.1.4 Company Profile for Fresh Wholesaler' Respondents	45
4.2	Knowledge and Awareness of Fresh Producers' Respondents towards Food Safety, Supply Chain and Traceability	50
	4.2.1 Knowledge of Fresh Producer Respondents about Food Safety	50
	4.2.2 Awareness of Fresh Producers' Respondents about Food Safety	51
	4.2.3 Knowledge of Fresh Producers' Respondents towards Traceability	52
	4.2.4 Awareness of Fresh Producers' Respondents towards Traceability	54
	4.2.5 Knowledge of Fresh Producers' Respondents towards Supply Chain	55
	4.2.6 Awareness of Fresh Producers' Respondents about Supply Chain	57
4.3	Knowledge and Awareness of Wholesalers towards Food Safety, Supply Chain and Traceability	58
	4.3.1 Knowledge of Wholesalers' Respondents about Food Safety	58
	4.3.2 Awareness of Wholesalers' Respondents towards Food Safety	60
	4.3.3 Knowledge of Wholesalers' Respondents towards Traceability	61
	4.3.4 Awareness of Wholesalers' Respondents towards Traceability	63
	4.3.5 Knowledge of Wholesalers' Respondents towards Supply Chain	64
	4.3.6 Awareness of Wholesalers' Respondents towards Supply Chain	66

4.4	Mean Ranking Analysis on Respondents' Perception towards Factors Contribute in the Intention Acceptance of Traceability among Fresh Producers	68
4.4.1	Business Profile	68
4.4.2	Market Channel	70
4.4.3	Financial	71
4.4.4	Reputation	73
4.4.5	Policy	74
4.4.6	Infrastructure	75
4.5	Mean Ranking Analysis on Respondents' Perception towards Factors Contribute in the Intention Acceptance of Traceability among Fresh Wholesalers	76
4.5.1	Business Profile	77
4.5.2	Market Channel	78
4.5.3	Financial	79
4.5.4	Reputation	80
4.5.5	Policy	82
4.5.6	Infrastructure	83
4.6	Chi square Analysis Results	84
4.6.1	Testing Relationship between Respondents' Demographic Profiles with Perception Level towards Traceability (Producer)	85
4.6.2	Testing Relationship between Respondents' Demographic Profiles with Perception Level towards Traceability (Wholesaler)	85
4.7	Factor Analysis Results	86
4.7.1	Reliability Analysis	86
4.7.2	Measure of sampling Adequacy	87
4.7.3	Communality	88
4.7.4	Varimax Normalization	92
4.7.5	Eigenvalue Criteria	93
4.7.6	Factors contributes in the intention acceptance in Traceability	94
4.7.7	Variance Explained	106
4.7.8	Internal Reliability Analysis on Factor Scores	107
4.8	Summary	108
5	CONCLUSION AND RECCOMENDATION	109
5.1	Summary	109
5.2	Conclusion	111
5.3	Recommendation	111
5.4	Marketing Implications	112
5.5	Food Safety Implications	113
5.6	Limitation of the Study	113
5.7	Recommendations for Future Study	114
	REFERRENCES	115
	BIODATA OF STUDENT	125
	PUBLICATION	126

LIST OF TABLES

Table		Page
1.1	Production and Planted Area for Fruits and Vegetables in Malaysia 2013	3
1.2	The Amount Per Capita Consumption of Fresh Fruits and Vegetable among Malaysian	4
3.1	Analysis of Reliability	31
4.1	Demographic Profile of Fresh Vegetables Producers	36
4.2	Demographic Profile of Fresh Wholesalers	38
4.3	Farm Profile of Fresh Producer	40
4.4	Market Area Coverage of Fresh Producer	42
4.5	Record Keeping of Fresh Producer	43
4.6	Product Tracking Practices of Fresh Producer	44
4.7	Product History Withdrawn of Fresh Producer	45
4.8	Company Profile of Fresh Wholesaler	46
4.9	Market Area Coverage of Fresh Wholesaler	47
4.10	Record Keeping of Fresh Wholesaler	48
4.11	Product Tracking Practices of Fresh Wholesaler	49
4.12	Product Withdrawn of Fresh Wholesaler	49
4.13(a)	Knowledge of Fresh Producers' Perceptions towards Food Safety	50
4.13(b)	Knowledge of Fresh Producers' Perceptions Level toward Food Safety	51
4.14(a)	Awareness of Fresh Producers' Perceptions towards Food Safety	51
4.14(b)	Awareness of Fresh Producers' Perceptions Level towards Food Safety	52
4.15(a)	Knowledge of Fresh Producers' Perceptions towards Traceability	53
4.15(b)	Knowledge of Fresh Producers' Perceptions Level on Traceability	53

4.16(a)	Awareness of Fresh Producers' Perceptions on Traceability	54
4.16(b)	Awareness of Fresh Producers' Perceptions Level on Traceability	55
4.17(a)	Knowledge of Fresh Producers' Perceptions towards Supply Chain	56
4.17(b)	Knowledge of Fresh Producers' Perceptions Level towards Supply Chain	57
4.18(a)	Awareness of Fresh Producers' Perceptions toward Supply Chain	57
4.18(b)	Awareness of Fresh Producers' Perceptions Level towards Supply Chain	58
4.19(a)	Knowledge of Wholesalers' Perceptions towards Food Safety	59
4.19(b)	Knowledge of Wholesalers' Perceptions Level towards Food Safety	59
4.20(a)	Awareness of Wholesalers' Perceptions towards Food Safety	60
4.20(b)	Awareness of Wholesalers' Perceptions Level towards Food Safety	61
4.21(a)	Knowledge of Wholesalers' Perceptions towards Traceability	62
4.21(b)	Knowledge of Wholesalers' Perceptions Level towards Traceability	62
4.22(a)	Awareness of Wholesalers' Perceptions about Traceability	63
4.22(b)	Awareness of Wholesalers' Perceptions Level on Traceability	64
4.23(a)	Knowledge of Wholesalers' Perceptions towards Supply Chain	65
4.23(b)	Knowledge of Wholesalers' Perceptions Level towards Supply Chain	66
4.24(a)	Awareness of Wholesalers' Perceptions about Supply Chain	67
4.24(b)	Awareness of Wholesalers' Perceptions Level on Supply Chain	68
4.25	Business Profile as factors among Producers	69
4.26	Marketing Channel as a factor among Producers	70
4.27	Financial as a factor among Producers	72
4.28	Reputation as a factor among Producers	73

4.29	Policy as a Factor among Producers	75
4.30	Infrastructure as a factor among Producers	76
4.31	Business Profile as a Factor among Producers	78
4.32	Market Channel as a Factor among Wholesalers	79
4.33	Business Profile as a Factor among Wholesalers	80
4.34	Reputation as a Factor among Wholesalers	81
4.35	Policy as a Factor among Wholesalers	82
4.36	Infrastructure as a Factor among Wholesalers	84
4.37	Testing Relationship between Socio Demographic Factors and Perception Level towards Traceability (Producer)	85
4.38	Testing Relationship between Socio Demographic Factors and Perception Level towards Traceability (Wholesaler)	86
4.39	Cronbach's Alpha for Producers	87
4.40	Cronbach's Alpha of Wholesaler	87
4.41	KMO and Bartlett's Test for Producers	87
4.42	KMO and Bartlett's Test for Wholesalers	88
4.43	Communalities for Producers	89
4.44	Communalities for Wholesalers	91
4.45	Summary of Factor Analysis Result for Producers	95
4.46	Summary of Factor Analysis Result for Wholesalers	101
4.47	Result of Variance Explained for Producers	107
4.48	Result of Variance Explained for Wholesaler	107
4.49	The Reliability Test for Producers	108
4.50	The Reliability Test for Producers	108

LIST OF FIGURES

Figure		Page
2.1	Conceptual representation of material and traceability information flow Malaysia 2013	15
2.2	Core relationship between the primary determinants of behavioral intention, behavioral intention and behavior in the theory of planned behavior	22
2.3	The adopted Theoretical Framework TPB	23
3.1	Conceptual Framework	25
3.2	Map of Study Location	27

CHAPTER 1

INTRODUCTION

This chapter covers introduction on agriculture sector in Malaysia, government policy on agriculture sector in Malaysia, problem statement, research questions, objectives and significant of the study. An introduction about agriculture sector in Malaysia, national policy on agriculture sector, overview of fresh fruits and vegetables in Malaysia and food traceability are briefly discussed in this section. The problem in traceability awareness and knowledge among producer and wholesaler is explained in the problem statement. The research questions become guideline for developing the objectives of this study. The significance of the study is discussed to express the impact of the study to all respective parties.

1.1 Agriculture Sector in Malaysia

Agriculture is an important sector in Malaysia. Development in agriculture contributes significantly to the economic development of the country. As agriculture included Agro-Food sector, the government has formulated a special policy for this industry to ensure the industry remains significant as one of the important sectors in the economy. The government aims to transform the occurrence of the food industry to be more challenging and competitive, a more modern and dynamic with the objective to ensure food supply. In addition, agriculture is the third economic engine growth in Malaysia and it contributes 7.3% of Gross Domestic Income in 2010 and it is been expected that agriculture will contribute RM 49.1 billion in GDI of Malaysia (MOA, 2010). Agriculture also been taken seriously by the Malaysian Government as they made a policy for agriculture started with through their four (4) policies; 1st, 2nd and 3rd National Agriculture Policy and National Agro-Food Policy and practically done by all the related department and agency in Malaysia.

1.2 Policies and National Agenda focusing on Fresh Fruit and Vegetable Sector

Malaysian government has outlined several policies for the development of fruit and vegetable industries including the National Agro-food Policy NAP (2011-2020) and Agriculture National Key Economic Area (NKEA).

1.2.1 Agriculture National Key Economic Area (NKEA)

Malaysian government has launched National Key Economic Area (NKEA) in 2010 to boost the growth of Malaysia's economy. NKEA is defined as a driver to potential economic activities that will directly and significantly contribute to Malaysia's economic growth. There are twelve elements in NKEAs which are the core of ETP, and one of them is the Agriculture NKEA. The agriculture sector still plays an

important role for the development of Malaysia's economy as the sector provides job opportunities, increases rural income and ensuring sufficient national food supply.

Agriculture NKEA focuses on sub-sectors that have high potential of growth including aquaculture, seaweed farming, edible swiftlet nests, herbal products, fruits and vegetable and premium processed food. There is an increase demand for these high value products which provides opportunities for farmers to increase their income. This will enable Malaysia to penetrate the high-value global market which is growing rapidly. A total of 16 Entry Point Projects (EPP) and 11 business opportunities have been identified to catalyze the business driven by market demand, of industrial scale and characterized by integrated agriculture.

One of the 16 EPPs is EEP 7 where the government wants to upgrade capabilities to produce fruit and vegetable for premium markets. In order to tap premium market, we have to produce high quality of fresh fruits and vegetables to be exported by performing appropriate postharvest handling practices. Malaysian government is taking seriously in the development of vegetables industry as there is an increasing demand from local market and because of their importance as the sources of vitamins and provides fiber for digestion.

The Government intends to increase the production of fruits and vegetables for higher quality, better and meet the food safety standards, thus allowing access to premium markets in the Middle East and Europe. Various tropical fruits such as papaya exotic premium, MD2 pineapple, KR1 rock melon, star fruit B10, J32 jackfruit, banana Cavendish and three (3) types of highland vegetables which are tomato, capsicum and lettuce are the main agricultural products. Department of Agriculture (DOA) is the trusted department under the Ministry of Agriculture and Agro-Based Industry in implementing the EPP7.

1.2.2 National Agro-food Policy (2011-2020)

Food safety one of the main agenda that been focusing in National Agro-Food Policy (2011-2020) (MOA, 2011). The reason for including food safety is one of the main agendas in this policy because it became a crucial to produce safe food for the consumers. It also because of the increasing number of food safety problems occurring worldwide in recent years and heightened consumers' food safety awareness and has caused public distrust of the increasingly complex and globalized food production and trading system (Setboonsarng et. al,2009).

Food safety is a responsible for the both individuals and government side. As individuals we need to store, prepare and cook food in a hygienic manner. However, the food supply chain has become more complicated and difficult to handle. It is the government responsibility to ensure the supply chain operates in a manner which does not put health of the ultimate consumer at risk (WHO). The establishment of an effective food control system is the key element in the system. Therefore, government

plays their role by creating a policy that includes food safety element. Increasing consumer awareness towards health care are expected to provide opportunities for the increasing in fresh vegetable production and product development based on minimally processed products including vegetable juice, functional foods, frozen vegetables, high-fiber vegetables and pickled vegetables.

To strengthen the vegetables industry, the policy outlines four (4) strategies to ensure adequate food supply, increase the value-add of the agro-food sector, compliment and strengthen the supply chain as well as provide trained labor for the agriculture sector. Throughout this policy, the government has outlined several strategies for the development of vegetable industry in reducing dependency on imported vegetables including: (i) increase the productivity and expansion area of vegetables production; (ii) improve the method of postharvest handling and marketing logistic facilities; and (iii) strengthen organic vegetables market.

1.3 Overview of Fresh Fruits and Vegetables Sector in Malaysia

Fresh fruit and vegetable is the main intake for the most Malaysian nowadays. It contains an important source of minerals, vitamins and fibers in the daily diet. Based on Department of Agriculture (DOA) 2014 statistic, there are about 48 types of vegetables and more than 50 types of fruits that available and planted in Malaysia. The fruits are being categorized based on season and non-season fruits, while vegetables are categorized either as leafy, fruit, root and others or groups of commodities under cash crops (maize, groundnuts, cassava, yam and sweet potatoes) and spices (hot chili, ginger and lemon grass).

The prospects for Malaysia vegetable industry is bright and a comparatively profitable sub-sector in Malaysia. Most of the vegetables are grown by small farmers who live in the edge of densely populated town. Temperate vegetables with higher values such as tomatoes, carrot, cabbage, cauliflower and broccoli are grown on the high land such as Cameron Highland, Pahang and Lojing, Kelantan. The plantation areas of vegetable at Malaysia show an increasing rate over the years with the opening of new lands and the development of existing areas of vegetable crops plantation. The production of vegetables also keeps increasing every year in tandem with the planted area. Table 1.2 presents the total production and planted area of vegetable from 2007 to 2011.

Table 1.1 : Production and Planted Area for Fruits and Vegetables in Malaysia 2015

Year	Production (tonnes)	Planted area ('000 hectares)
Fruits	17.50 mt/ha	203,122
Vegetable	15.86 mt/ha	80,707

Source: Crop Statistic (Crop Sub-sector) 2015, Department of Agriculture

Table 1.2 shows the production of fresh fruits and vegetables in Malaysia are increasing every year. It shows that the transaction involving fresh product in market increasing with a large amount of fresh produce. Based from Table 1.2, it also shows the increasing consumption per capita of fresh fruits and vegetables among Malaysian in 2010.

Table 1.2 : The Amount Per Capita Consumption of Fresh Fruits and Vegetables among Malaysian

Commodities	Capita Consumption (kg)			
	2011	2012	2013	2014
Vegetables	55.30	56.20	57.30	58.5
Fruits	93.20	93.40	93.6	93.8

Source: Crop Statistic (Crop Sub-sector) 2015, Department of Agriculture

1.4 Food Safety and Standard

Today, almost 1 billion people in the world are hungry or undernourished, while a growing 1.5 billion are overweight or obese (FAO, 2012). In developing countries, often more than half of the households' income is spent on food, making poor people highly vulnerable to sudden price fluctuations (Cranfield et. al, 2007; Ivanic and Martin, 2008) which may drive people into poverty and/or impede efforts of poverty alleviation. Food systems are increasingly exposed to multiple internal and external drivers of change, ranging from sudden shocks to long-term stressors, which in turn increase the systems' vulnerability to shocks (Wisner et.al, 2003). Various slow but major shifts such as climate change, soil degradation, pest outbreaks, economic and political crises, and population growth are adding pressure to the global food system (Rockstrom et.al, 2009; Godfray et.al, 2010; Pretty et.al, 2010). Changes in food consumption patterns, such as rising demand for meat in emerging countries (FAO, 2009) and for organic food (Falguera et.al, 2012) pose further challenges.

The basic food safety concept is that, the food will not harm the consumer so long as intended use guidelines are followed when it is prepared or eaten. Conversely, food is potentially harmful whenever it has been exposed to hazardous agents and intended use guidelines have not been followed (Ioannis, 2009).

Agriculture sector in Malaysia, in order to produce a safety food product, food producers and manufacturers are expected to comply with the relevant food safety measures such as Good Agricultural Practice (GAP), Good Animal Husbandry Practice (GAHP), Good Hygiene Practice (GHP), Good manufacturing Practice (GMP), Good Aquaculture Practice (GAP), Hazard Analysis Critical Control Point System (HACCP) etc. (Ministry of Agro-based and Agriculture, 2014). Although compliance with the practices is voluntary, it is identified that the programs were able to help reduce the occurrence of potential food related outbreaks. However to make

sure the product in market are safe, traceability is one of the method how we can trace the product upward and backward.

1.5 Food Traceability

Traceability as define by Codex Allimentarius Commission (CAC) as: “the ability to follow the movement of a food through specified stage (s) of production, processing and distribution”. However, Dimara and Skuras (2003) define traceability as extrinsic quality evidence. The authors demonstrate that traceability and the use of certificates of origin influence consumer evaluation. Food traceability has become an important concept, system and practices especially in Europe, America, Australia, Canada, Japan and Korea as they made a special policy and regulation in practicing of traceability system. Traceability has become one of the important agenda because it contributes in producing safe food. Food safety has been worldwide attention and it also become an importance thing in Malaysia and one of the main agenda which is also been highlighted in Agro-food Policy.

The demand from the consumer to have a verifiable evidence for food a product which is refers to the traceability. Consumers demand is a greater transparency on food safety and that they are willing to pay for it. Traceability may enhance credibility of product information, more useful for food business, prevents food frauds, environmentally friendly, more informative label, product information can be more comprehensive; can directly communicate product information (Chrysochou, 2009). Therefore, the benefits of a system should be considered in cases where food crises may result in loss of consumer confidence (Tunkel et. al,2004). On the other hand, the implementation of a traceability system requires standards that are able to store the necessary information. In this sense, global standards are developed in the market, allowing item identification for global tracking and tracing of food products (Cheek, 2006).

As traceability gradually becomes compulsory in the supply chain, the food industry is called to implement traceability systems. In order to practice the traceability, records keeping through food supply chain from farm to customers are needed to be gathered in one system. Producer, processor, marketer, distributor and consumer can access all the available data in order to make sure the products are safe to consume (Food Standards Agency, 2002). The basic characteristics of traceability systems (i.e. identification, information and the links between) are common in all systems, independently of the type of product, production and control systems that are served. In their simplest form, traceability systems are paper-based, while more advanced ones are computer-based. However, a good traceability system does not necessarily relate to advanced technological solutions. Information technology (IT) has a complementary but rather important role that enhances the effectiveness of record keeping and data access. The increased efficiency, effectiveness and security of IT-enabled systems are recognized and gradually being rolled out throughout the food supply chain (Chrysochou, 2009). The main objective of traceability is the identification and isolation of any potential contamination source that will enable the return and withdrawal of such products from the market (Peter, et. al, 2011). Problems

are relatively rare, but when they occur, health and lives are at stake as well as the livelihoods of the companies industries, and employees (Welt and McEntire, 2011).

1.6 Knowledge and Awareness

Knowledge and awareness can be affected by the habits and other perceptions that result from social, cultural, and economic influences (Rozin & Fallon, 1980). These may develop at an early age and become deeply ingrained. This can sometimes be due to the stereotype behavior, where attitudes are developed without direct experience with the food in question (Cardello et. al, 1996). Farmers, postharvest handling operators, marketers, research practitioners and policy makers need good understanding of the concepts and implications of supply chain traceability to assist in developing and implementing appropriate technological interventions to meet consumer demands for traceable agricultural supply chains. An individual, they may aware of traceability but may not know much the true concept and how it can lead in producing safe food. Further, an individual may have reasonably sound knowledge of the advantage and the contribution of traceability but they not aware the impact of unsafe food.

Organization awareness is one very important factor. The choice whether or not to adopt traceability is made in the organization. If this organization is not aware of the concept, they will never adopt traceability. Producers and wholesalers are part of the main player that will complete the chain of traceability from farm to fork. This is justified why we should know the level of awareness and knowledge among producers and wholesalers before the practicality of traceability are fully applied in Malaysia fresh produce industry.

1.7 Problem Statement

National Agro-Food Policy has eight (8) main ideas and food safety is one of the agenda. The government emphasized in produces safety food product whether it is a fresh produce or process product. Food safety is a major concern for consumers, food producers, manufacturers and regulatory authorities. In Malaysia, food safety is one the increasingly and important issue. Based from the Yearly Report of Food Safety and Quality Division (FSQD) 2011, Ministry of Health (MOH), there are incidents of food safety happen in Malaysia, such as food poisoning from the consumption of Ultra High Temperature (UHT) Milk, Pesticide Residues, Drug Residues and etc. The government through their agencies is intensifying their efforts to improve food safety. Therefore, to ensure food safety it requires more effort than mere enforcement. Besides of the existing legal provisions to provide safe food products to consumers, traceability is also important to be emphasized.

Traceability plays an important role because it enhances the transparency and safety of the food system (Opara and Mazaud, 2001). The globalization of world trade, the North American Free Trade Agreement (NAFTA), food safety in the fresh produce industry, and political and commercial realities have put the traceability regulation on

the radar screen (Fonsah, 2006). Canada and Australia among the develop country that implementing the fresh produce traceability. (Fonsah, 2006). However, in Malaysia, there is Food Safety Legislation, but there is no proper guideline, standard and policy regarding traceability in food produces focusing on fresh produce. The implementers may be not aware and have no knowledge about traceability and its benefit. Therefore we need to know the perception level of awareness and knowledge towards traceability concept and factors that influences the respondents' intention towards the concept of traceability.

The research questions in this study are:

- 1) What is the perception level of awareness and knowledge of respondents toward fresh produce traceability?
- 2) What is the relationship between socio demographic factors and the producers and wholesalers' perception of awareness and knowledge toward fresh produce traceability?
- 3) What are the factors that influence the producers and wholesalers in accepting the concept of traceability?

1.8 Objective of the Study

1.8.1 General Objectives

The general objective of this study is to identify the awareness and perception among the producers and wholesalers on agriculture fresh produce traceability.

1.8.2 Specific Objectives

The specific objectives for this study are:-

- 1) To identify the level of awareness of respondents towards fresh produce traceability.
- 2) To determine the relationship between socio demographic factors and the respondents' level toward fresh produce traceability.
- 3) To identify the factors that influences the respondents in accepting the concept of traceability.

1.9 Significance of the Study

The findings from this study will help the related agency to realize the actual level of awareness and knowledge among fresh producers and wholesalers in Malaysia. With this information it can be a guideline to the government agencies in order to plan a suitable program with a right focus group to make sure the information success reached to the target group. Indirectly, it will attract them to know more about traceability and encourage them to accept this concept and apply it in their business process. The result of this study will help the policy maker and other players in this

industry to build a plan and decision regarding the acceptance of traceability concept and make it happen in the future. From the point of germination and improvement of knowledge, this study would be the basis for research on the level of awareness and knowledge toward traceability concept, not only for fresh produce industry but also in the other industry that involving food production.

1.10 Thesis Organization

This section covers the organization of this study. This study consists of five (5) chapters covering different areas of the study. The introduction in Chapter 1, gives wider knowledge of Agriculture in Malaysia, recent status of fruit and vegetable sector, food safety in Malaysia and also some policy and legislation that involved in agriculture and food safety. It contains the introduction, problems statement, objectives, research questions and significance of the study.

Chapter 2 summarizes previous literatures and finding related to the food safety, food traceability and its benefit, traceability chain and what is Theory of Planned Behavior.

Chapter 3 discusses the methodology adopted in this study. It is presented in details about the research design including questionnaire as the instrument of study, details about the location of study, population and sample method, data collecting technique and analysis conducted for the study.

Chapter 4 summarizes the results and analysis of this study and Chapter 5 discusses the conclusion and provides recommendations for future study in this field.

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