

HALAL FOOD SUPPLY CHAIN AND HALAL INTEGRITY ASSURANCE  
MODEL

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## **DEDICATION**

*To my beloved:*

*Mother and Father*

*My wife Saharah Othman*

*My Children:*

*Nur Farahin, Nur Liyana, Muhammad Nabil, Hani Sofea*

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## **ABSTRACT**

The halal integrity assurance is one of the major concerns of most Muslim consumers around the world. Halal integrity is regarded as an important issue in halal industry, since without it, the halal market may be jeopardized and halal industry may not be relevant to the consumers. Halal food consumers are now more aware of the authenticity of halal products status. Consumers are keen to know whether all the activities involved along the supply chain for halal products which they purchase are genuinely halal as the products move upstream and downstream of the supply chain. Even though the issue of halal integrity is widely discussed within the halal food industry, the factors assuring the integrity of halal food supply chain are yet to be discussed effectively from the perspectives of both academic and halal industry players. Thus, the primary aim of this study is to examine the existing halal food supply chain model, its influence on halal integrity assurance, and the influence of Halal Assurance and Halal Traceability System. Both quantitative and qualitative research designs were employed in this study. The industry survey and case study were empirically experimented to test concepts and provide practical solutions for halal industry players to optimize their halal food supply chain integrity assurance. The survey questionnaire data was acquired from 121 companies in the halal food industries. The response rate was at 26.5% of the original sample population. Various data analysis tools had been used to analyse the data such as reliability and factor analysis, multiple linear regression, moderated hierarchical regression and test of differences. Both halal food supply chain management and halal integrity assurance form the background against which this study was conducted. It was found that halal supply chain of food and beverages industries have positive effect on halal integrity assurance. Both supply chain business process and network structure dimensions of halal food supply chain had been found to have a significant effect on halal integrity assurance. It was also found that Halal Assurance and Halal Traceability System have moderated halal food supply chain and halal integrity assurance relationships. Halal Assurance System as a moderator was empirically found to influence the relationship between supply chain resources and halal integrity assurance. As a conclusion, Halal Traceability System was found to influence the supply chain logistics control and supply chain resources-halal integrity assurance relationship. The outcome of this study suggests that new focus and solutions are required to reduce the vulnerability in the halal food supply chain to optimize the halal integrity assurance.

## ABSTRAK

Jaminan integriti halal adalah salah satu kebimbangan utama kebanyakan pengguna Muslim di seluruh dunia. Integriti halal dianggap satu isu penting dalam industri halal kerana tanpanya, pasaran halal mungkin terjejas dan industri halal mungkin tidak relevan kepada pengguna. Kini, pengguna makanan halal lebih sedar mengenai status ketulenan produk halal. Pengguna berminat untuk mengetahui semua aktiviti yang terlibat di sepanjang rantai bekalan makanan sama ada produk yang mereka beli adalah benar-benar halal kerana produk bergerak ke hulu dan ke hilir rantai bekalan. Walaupun isu integriti halal dibincangkan secara meluas di dalam industri makanan halal, faktor-faktor yang menjamin integriti rantai bekalan makanan halal masih belum dibincangkan dengan sepenuhnya dari perspektif akademik dan pengamal industri halalnya. Oleh itu, matlamat utama kajian ini adalah untuk menilai model rantai bekalan makanan halal sedia ada, pengaruhnya terhadap jaminan integriti halal, dan pengaruh Sistem Jaminan Halal dan Sistem Pengesanan Halal. Kedua-dua reka bentuk penyelidikan kuantitatif dan kualitatif telah digunakan dalam kajian ini. Tinjauan industri dan kajian kes secara empirikal bereksperimen telah digunakan untuk menguji konsep dan menyediakan penyelesaian praktikal bagi pengamal industri halal untuk mengoptimumkan jaminan integriti rantai bekalan makanan jaminan halal mereka. Data soal selidik tinjauan diperoleh daripada 121 syarikat dalam industri makanan halal. Kadar respons adalah pada 26.5% daripada saiz populasi sampel asal. Pelbagai kaedah analisis data telah digunakan untuk menganalisis data seperti analisis faktor dan kebolehpercayaan, regresi linear berbilang, regresi hierarki sederhana dan ujian perbezaan. Pengurusan rantai bekalan makanan halal dan jaminan integriti halal menjadi latar belakang kajian yang dijalankan ini. Kajian ini mendapati bahawa rantai bekalan makanan halal bagi industri makanan dan minuman telah memberi kesan positif pada jaminan integriti halal. Proses perniagaan rantai bekalan dan dimensi struktur rangkaian bagi rantai bekalan makanan halal didapati mempunyai kesan signifikan terhadap jaminan integriti halal. Kajian juga mendapati bahawa Sistem Jaminan Halal dan Sistem Pengesanan Halal telah menyederhanakan hubungan rantai bekalan makanan halal dan jaminan integriti halal. Sebagai kesimpulan, Sistem Pengesanan Halal didapati mempengaruhi hubungan kawalan logistik rantai bekalan dan jaminan integriti halal-sumber rantai bekalan. Hasil kajian mencadangkan bahawa fokus dan penyelesaian baharu diperlukan untuk mengurangkan kelemahan dalam rantai bekalan makanan halal untuk mengoptimumkan jaminan integriti halal.

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## LIST OF ABBREVIATIONS

AH	-	Authority Hierarchy
ANOVA	-	Analysis of Variance
CLM	-	Council of Logistics Management
CSCMP	-	Council of Supply Chain Management Professionals
DV	-	Dependent Variable
EPU	-	Economic Planning Unit
HIMP	-	Halal Industry Master Plan
IMP2	-	Second Industrial Master Plan
IMP3	-	Third Industrial Master Plan
IV	-	Independent Variable
KMO	-	Kaiser-Meyer-Olkin
MIDA	-	Malaysian Industrial Development Authority
MITI	-	Ministry of International Trade and Industry
MNC	-	Multinational Companies
MSA	-	Measure of Sampling Adequacy
MV	-	Moderating Variable
NAP3	-	Third National Agricultural Policy
NKEA	-	National Key Economic Areas

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Food is one of the most important topics of discussions among scholars because food is a basic necessity of the human well-being. The quality of human life can often be enhanced by the availability of food required for nourishment and sustenance as the food is seen in many beneficial ways to encourage health, nutrition, well-being, and physical fitness (Teng *et al.*, 2013; Zailani *et al.*, 2010a). Food also plays a vital role in social, cultural, and religious life of many communities. There are many sources of food ingredients that have been used in the production of food products. In Islamic perspective, food ingredients are either permitted (*halal*) or prohibited (*haram*). Food which is consumed by Muslims must meet Islamic dietary guidelines which are permitted and allowable or known as halal (Fadzlillah *et al.*, 2011).

All over the world, Muslims are bound by a systematic lifestyle because Islam consists of specific standards, protocols, and guidelines to follow. *Shariah* law (Islamic law) puts particular stress on the importance of permissibility of sources of food and beverages ingredients. The term *halal* originated from the Arabic word meaning lawful, justified, and allowed to be consumed under Islamic law. A popular misconception about halal is that it is only limited to the ingredients of food and beverages, the slaughter of animals, and the use of alcohol. Halal is also concerned about the processes and standards. It is also about food safety, cleanliness, reliability, and quality assurance (Teng *et al.*, 2013).

Halal carefully considers and deliberates all sides of a subject matter; this is inclusive of the economic and scientific angles. Business in halal industries is the world's fastest growing business. It is an emerging market force that attracts Muslims and non-Muslims in the food industries with its healthy, hygienic and contamination-

free principles (Bahrudin *et al.*, 2011). The halal concept has received increasing attention because the demand for halal food is growing every year as a result of increase in Muslim population. Grim and Karim (2011) estimated that by 2030, there would be a 35% increase of Muslim population reaching 2.2 billion from 1.8 billion. The global halal food industry has been valued by the Malaysian Investment Development Authority (MIDA) to be between USD 600 billion to USD 2.3 trillion and forecasted to reach USD 6.4 trillion by the year 2030 (Talib *et al.*, 2015). There is a significantly growing demand for halal products, both from Muslims and non-Muslims from around the world. Presently, the Malaysian halal industry is valued at USD 30 billion and is expected to grow further by 25% by 2022, whereas in the world, the global halal market is estimated to be worth about USD 2.3 trillion and is expected to continue to grow (Shahwahid *et al.*, 2017).

The trend has therefore caught all countries' attention in generating more halal producers. The trend of people choosing a healthy lifestyle has put halal food products known as clean and harmless products under the spotlight, particularly with regard to food. Halal food product has the potential to reach wider world population markets, which is not just limited to Muslim consumers (Zulfakar *et al.*, 2012). Products consisting of meat and poultry, food and pharmaceutical generated much demand not only in Islamic countries but also in non-Islamic populated regions, where the Muslims may constitute the majority or minority portion of the population, such as Europe and South America. In fact, the demand for halal food products from non-Muslims has also increased (Bruil, 2010; Golnaz *et al.*, 2010; Melatu Samsi *et al.*, 2011). The main reasons contributing to this market growth lies in the increase of Muslim population, a better level of awareness and higher purchasing power among Muslim consumers (Kamaruddin *et al.*, 2012; Omar, 2013).

Malaysia is already well known as a successful halal hub since 1997, when the *Codex Alimentarius Commission* chose Malaysia as a model for the development of the halal food industry when adopting the *Codex General Guidelines* for the use of the term *halal* in Geneva. Malaysia is seen as one of the world's most successful examples where there is a single halal standard ruling across the country (Bahrudin *et al.*, 2011). The Halal Industry Development Corporation (HDC) was established by the

Malaysian government as an agency under the Ministry of International Trade and Industry (MITI). The role of the agency is to create awareness and understanding of halal concept through various events that introduce halal practice to not only food-producing companies, but to pharmaceuticals, cosmetics, and finance. Halal product has expanded its reach through creation of specific areas called Halal Industrial Park in each state in Malaysia

Given the present global food trade scale and volume, the advances in science and technology and ongoing initiatives to improve life of communities, it is crucial that both halal producers and customers fully understand the halal concept. It is essential to appreciate how the concept of halal will affect societal changes toward a better quality of life. It has been shared that the quality of life is affected by variety of dimensions including food, education, employment, energy, environment, health, human rights, income, infrastructure, national security, public safety, recreation, and residence (Henderson, 2001).

However, food safety and its quality assurance are among the concerned issues to many people around the world. Several past decades have shown that people are more concerned about such issues than anything else because of changes in beliefs, values, and eating habits (Muhammad *et al.*, 2009; Zailani *et al.*, 2010a). According to Beulens *et al.* (2005) and Heiman *et al.* (2019), the issue of food integrity is equivalent to the issue of food safety, as food safety is considered to be an important issue for all stakeholders in food production, food quality, food integrity, and food-related services. In short, the issues of food integrity are considered to include food safety, healthy, nutritious, and quality (Bahrudin *et al.*, 2011).

In May 2014, New Straits Times reported that two brands of Cadbury chocolate products, Cadbury Dairy Milk Hazelnut, and Cadbury Dairy Milk Roasted Almond, were suspected containing pig DNA known as porcine following random testing made by the Ministry of Health (MoH) taken off the shelves in Perlis and Kedah (Lai and Nawawi, 2014). The shocking revelation of contaminated chocolate samples has angered Muslim customers who said that suspension of halal certificate alone was not enough for the two products and insisted that the authorities take stronger action. This



event has led the consumers questioning the integrity assurance of halal food produced in Malaysia. In similar cases, a butter manufacturer was also tainted with cross-contamination issue where pig DNA was found in their products where the cross-contamination occurred during the repackaging process (Ling, 2011), premises serving bubble tea drinks that are not certified halal detected by Selangor Islamic Religious Department (JAIS), and a container carrying a load of lard (pork fat) which did not comply with the import requirements was detained at North Butterworth Container Terminal (NBCT), Malaysia (Mohamad, 2020). In a recent issue, a cartel has been importing non-halal certified meat and selling them as halal meat throughout Malaysia. The cartel has imported meat from non-halal certified slaughterhouses in Brazil, Bolivia, Colombia, Spain and Mexico. The meat would be taken to warehouses where it would be mixed with halal-certified meat, repacked, relabeled with fake halal logos and then sold in the halal market throughout Malaysia (Hammim, 2020). Investigations into the manufacturing processes and procedures revealed weaknesses in sustaining halal food integrity assurance for halal food products. As a response, the Department of Islamic Development Malaysia (JAKIM) proposed the need for critical monitoring of every halal food product as well as random inspections to ensure halal compliance.

With the increasingly available brands and varieties of food in the market, the authenticity of halal food has raised concerns among Muslim consumers around the world (Fadzlillah *et al.*, 2011). The status of halal food has also become doubtful with the growing numbers of non-Muslims producers and foreign multinationals dominating the halal food industry. It seems that the suppliers and producers do not understand the specialty in handlings halal food products (Arif and Sidek, 2015). Food products are produced and originated from all corners of the world. Food products travel a greater distance and involve a lot of handlings along the food supply chain before they reach the consumers; thus the integrity assurance of halal food must therefore be controlled and monitored in order to satisfy consumers with the authentic halal food products. Muslims consumers are aware that the halal concept is not only restricted to the sources of food ingredients, but also includes processing, food handling, packaging, storing and delivering (Alam and Sayuti, 2011). In other words, it could not be considered as halal in the event that the food product was not handled or stored correctly. Consumers will not only ask for halal products, they will also ask

about the halal process (Bonne and Verbeke, 2008). Consumers, therefore, choose to purchase halal food products mainly due to the halal process.

The improvements in the processing methods of food and agribusiness sectors has resulted in the growing interest in the supply chain for halal food products. The halal food supply chain works towards embedding the halal concept to the food chain so as to meet up with the needs of the consumer by integrating and coordinating the efforts of all parties involved in production and delivery (Riaz and Chaudry, 2004). However, the production of halal food requires a thorough understanding of the supply chain processes, especially when a specific halal food product involves many sources of food ingredients and processing stages (Al-Mazeedi *et al.*, 2013).

Factors influencing agribusiness at the consumer level are consumer concerns over the quality, safety, health, and nutrition of food products. The place of origin of food products is also a concern. It covers the production of non-food features used such as environmental sustainability and animal welfare. With the consideration of consumer views, the concept of halal acts as a catalyst that not only changes the way of life but people's ideas and understanding of quality, safety, health, and environment (Zailani *et al.*, 2010a).

Halal food consumers are now having higher levels of awareness and have better education on their daily food consumption they purchase. They are not only concerned about the sources of food ingredients, whether they are halal or not, but they are also concerned about all activities in the supply chain, whether the products they purchase are genuinely halal along the food supply chain (Jaafar *et al.*, 2011; Che Man *et al.*, 2007). Their concerns are valid as the majority of food products now come from different parts of the world. Not only because of the distance, and the number of food handlers should go for such ingredients, but also because of the validity of the halal status of the original products themselves is sometimes questionable (Zulfakar *et al.*, 2014).

The question is whether halal integrity of food products can be assured and the food status can remain halal in the current food trade scenario throughout the food supply chain processes. This has further triggered a growing interest in managing the halal food supply chain from both academic and industries perspectives.

## **1.2 Problem Statement**

Regardless of types of halal products, the primary indicator of a successful halal industry is the assurance of halal integrity; without the halal integrity assurance, halal market existence may be meaningless, and there shall exist no halal industry (Evans, 2007). Ensuring the halal integrity is the biggest challenge in the halal industry. The halal integrity offers assurance and creates more demand for authentic halal products. As the integrity assurance of halal products is the result of various processes along a supply chain, the supply chain approach is important to guarantee the assurance of halal integrity from the point of origin to the consumers. It is essential to ensure that the integrity assurance of halal products will not be compromised along the entire upstream to downstream supply chain processes, down to the point of consumption (Tieman, 2011).

However, it is a great challenge to sustain the halal integrity along the supply chain when there is the possibility of cross-contamination or when there is the tendency of halal products on the part of the producer to jointly process halal with non-halal products, the probability of which is quite high throughout the entire supply chain processes. The possibility of product cross-contamination can occur at various stages of the supply chain activities, particularly during the sourcing, processing, handling, packaging, storing, and delivering (Tieman, 2008). Since the main processes engaged in the halal food supply chain start with the origin of the ingredient, followed by manufacturing, primary processing, final processing, distribution, retail, food service sector, ending with domestic consumption, maintaining the halal integrity needs a full knowledge and understanding of the entire halal food supply chain (Soon *et al.*, 2017).

According to Zulfakar *et al.* (2014), there is a limited number of studies discussing in the area of a halal food supply chain in relation to halal integrity assurance despite an increase in other related knowledge areas for the past few years. He recognized that there was a significantly huge gap in the body of knowledge on issues related to halal food supply chain integrity assurance from “farm-to-fork” despite the fact that the issue of halal integrity is widely discussed within the halal food industry. However, until to date there is still less research being conducted in the area of halal food supply chain especially related to the factors that affect the integrity assurance of halal food supply chain (Zulfakar *et al.*, 2012). Prior studies indicated that there are several factors that best explained halal food supply chain integrity assurance. However, the factors that constitute the halal food supply chain integrity assurance are still unclear. Various researchers have different views of what determine the integrity assurance of halal food supply chain (Talib *et al.*, 2015). The factors strengthening the integrity assurance of a halal food supply chain is also yet to be discussed well within the halal food industry, even though the issue of halal integrity has been widely highlighted from the perspective of academic and industries (Zulfakar *et al.*, 2014).

Lodhi (2009) recognized the critical aspects of the modern halal food supply chain including halal certification, halal control, and halal monitoring system. The quality control and monitoring process in the halal food supply chain are highly sought by producers and consumers as the key components towards assuring halal integrity of the halal food supply chain (Tiemann, 2007c). The industry players are pushing for the needs to have a higher quality assurance mean and better traceability process. The quality assurance and traceability process will help to ensure the integrity status of the halal food supply chain is always at its utmost level. In order to develop and sustain a clean and reliable halal food supply chain in a complex and competitive environment, Lodhi (2009) proposed that a full understanding of the halal food supply chain was crucial. His view was shared by Khan (2009), which posted that every party in the halal food supply chain needs to be well-versed in sustaining the integrity of halal food products. To achieve untainted halal integrity of the halal food supply chain, there is a need to monitor every party of the supply chain (supplier, manufacturer, logistics provider, and end-user) to ensure customer satisfaction with the integrity and authenticity of the halal food products (Bahrudin *et al.*, 2011). It is, therefore,

imperative to develop a model that is capable of describing and optimizing the existing halal food supply chain management, where its sustainability could be robust enough seeking lower exposure of halal cross-contamination and thereby ensuring the authenticity and integrity of halal food products.

In summary, the problem statement are as follows: in halal food industry context, this research attempts to examine to what extent does halal food supply chain have an impact on halal integrity assurance? Meanwhile, in order to help bridge the literature gap, this study evaluates the important roles that the halal control and halal monitoring system plays in the halal food supply chain and its relationship with halal integrity assurance.

### **1.3 Research Questions**

This research attempts to answer the following questions:

- a) Does any significant relationship exist between halal food supply chain and halal integrity assurance?
- b) Does halal assurance system and halal traceability system moderate the halal food supply chain and halal integrity assurance relationship?
- c) To what extent does the present halal food supply chain management has been effective in ensuring food safety and quality assurance of halal food products?

### **1.4 Research Objectives**

In line with the problem explained above, the objective of this research is to examine the relationship between halal food supply chain, halal integrity assurance, halal assurance, and halal traceability system. Within the context of the problem statement, this research is aimed as the following:

- a) To examine the relationship between halal food supply chain and halal integrity assurance.
- b) To evaluate the moderating effect of halal assurance system and halal traceability system on the relationship between halal food supply chain and halal integrity assurance.
- c) To determine the extent to which the halal food supply chain management has been effective in ensuring food safety and quality assurance of the halal food products.

### **1.5 Significant of the Research**

One of the objectives of this research is to evaluate the moderating roles of halal assurance system and halal traceability system in enhancing halal integrity assurance of halal food supply chain management. Therefore, this research is expected to provide the following contributions:

- i. The findings of this research will provide practical implication on the approach to manage a halal food supply chain that has an impact on halal integrity assurance in the halal food industry.
- ii. The findings will determine the significant dimensions to strengthen the halal food supply chain management against halal integrity assurance in the halal food industry.
- iii. The findings will also identify the right approaches which will contribute towards the sustainability of halal food supply chain management.
- iv. This research will provide insight into the moderating roles of halal assurance and halal traceability system in moderating the relationship between halal food supply chain and halal integrity assurance.
- v. The practical significance lies in the attempt of this research to provide an operational model to enhance halal integrity assurance by managing the halal food supply chain.

## **1.6 Research Scope**

This research is based on data collected both quantitatively and qualitatively within halal food industry to allow for a comprehensive coverage for data analysis.

- i. The quantitative data are obtained through survey questionnaires from selected respondents in the halal food industry which practice halal food supply chain activities.
- ii. The qualitative data are collected primarily through semi-structured face-to-face interviews with halal personnel from selected halal food producers.
- iii. The respondents came from halal food and beverages industry in Pulau Pinang, Selangor, Kuala Lumpur, Melaka, and Johor.
- iv. The quantitative data are complemented by semi-structured qualitative interview data obtained through case studies.
- v. The respondents selected to answer the survey questionnaires in this research are assumed to have knowledge in the halal food industry, while the interviewees must be experienced and knowledgeable in the area of halal food supply chain integrity assurance.
- vi. The study has selected three (3) halal personnel from different industries, namely food & beverages industries and logistics services forwarding company.

The combination of the survey questionnaires with qualitative interviews will enhance the outcome of the research from using multiple sources of data collection approaches. The primary source of this research was generated through quantitative data via survey questionnaires distributed to 475 companies in the halal food industry extracted from Malaysia halal industry directory.

## **1.7 Variables Definition**

This section gives a brief definition of the principal variables to ensure a common understanding of the terms as they are used for the study. Detailed descriptions will be provided in the literature review chapter.

### **1.7.1 Halal**

*Halal* originates from the Arabic word namely *halla*, *yahillu*, *hillan*, *wahalalan* which means allowed or permissible by the *Shariah* law (JAKIM, 2015). *Halal* is defined as things or actions permitted by *Shariah* law without punishment imposed on the doer (Department of Standards Malaysia, 2009).

### **1.7.2 Halal Integrity**

Integrity is defined in the *Webster's New World Dictionary* (3rd College Edition, 1994), as the quality or state of being complete; entirety, perfect; and wholeness. Halal integrity in this context means that the product remains halal from the upstream to the downstream supply chain, free from any activity that might infringe the halal status, either intentionally or unintentionally (Zulfakar *et al.*, 2012)

Ethical aspects are referred to the proper conducts including processing, handling, packaging, labeling, warehousing, transporting, distributing, financing, marketing and selling (Mohamad and Hassan, 2011).

Physical aspects of halal product demand the basic requirements of halal and *toyyib* concepts are met which includes the aspects of halal, cleanliness, safe, healthy, and nutritious (Mohamad and Hassan, 2011).



### **1.7.3 Halal Integrity Assurance (HIA)**

Halal Integrity Assurance (HIA) is a holistic concept that relates to the procurement, production, packaging, labelling, logistics, retailing and consumption of goods and services, thus maintaining halal integrity is crucial to the success of the emerging halal market (Khan *et al.*, 2018).

### **1.7.4 Halal Assurance System (HAS)**

This is a system set up by a producer to guarantee that all food products are halal. The halal assurance system is developed based on three zeros concept which is zero limits (excluding every *haram* material during production), zero defect (no *haram* products produced), and zero risks (manufacturers took no detrimental risk) (Chaudry *et al.*, 1997).

### **1.7.5 Halal Traceability System (HTS)**

This is the tracking and tracing of halal product flow from production to the distribution chain. Traceability refers to the ability to identify every halal product at critical stages of production and distribution. It involves the logging of product flow, and the systematic collection, management, and storage of information (Meuwissen *et al.*, 2003).

**Halal Tracking:** This is the trailing of halal products in real-time. During product distribution, information on the exact location of a halal product may be required (Meuwissen *et al.*, 2003).

**Halal Tracing:** This is identifying the flow history of a halal product from the records. This is done by analyzing the registration and production records in the database. There are two ways to trace halal product history:

- a) Upstream tracing: The history of a halal product is reconstructed from the final destination of a product back to its origin.
- b) Downstream tracing: Raw material is taken as a starting point, and the halal products that contain that raw material is identified (Meuwissen *et al.*, 2003).

### **1.7.6 Halal Traceability and Tracking Systems**

A traceability system offers a set of information related to where (place) and when (time) the food and food ingredients are located along the production chain (Gellynck and Verbeke, 2001).

### **1.7.7 Halal Food Supply Chain (HFSC) Management**

This is the managing of procurement, production, transportation, and storage process of halal food products. Its primary focus is on the way food products are handled through the supply chain according to the principles of *Shariah* law (Tieman, 2011).

### **1.7.8 Supply Chain Objective (SC Objective)**

The supply chain objective refers to the right intention of the organization to conduct supply chain management (Alserhan, 2010).

### **1.7.9 Supply Chain Logistics Control (SC Logistics Control)**

The supply chain logistics control is the control point of the halal supply chain model, which provides the foundation for effective decision-making and management of a supply chain (Damme, 2000).

### **1.7.10 Supply Chain Resources (SC Resources)**

The supply chain resources describe the organization and its information management (Tieman *et al.*, 2012).

### **1.7.11 Supply Chain Business Process (SC Business Process)**

The supply chain business process refers to customer order fulfillment, manufacturing flow management, and procurement, which are of particular importance (Tieman *et al.*, 2012).

### **1.7.12 Supply Chain Network Structure (SC Network Structure)**

This is a network comprised of organizations that are linked and interdependent, working together mutually and cooperatively to control, manage, and enhance the materials and information flow (Aitken, 1998).

## **1.8 Structure of Thesis**

The thesis consists of seven chapters and is organized as follows:

Chapter 1 provides the background of the research, problem statement, research questions, and research objectives. It also includes research scope and significance of the research and definition of operational terms used in this thesis.

Chapter 2 reviews the related literature on halal industry overview, halal food, halal certification and standards, halal integrity, halal supply chain, halal assurance and halal traceability system. Conceptual framework and past research have also been included.

Chapter 3 covers research methodology used in this study. It starts with a discussion on the overall structure of research methodology, i.e., research design and approach, research instruments, method of data analysis and case study.

Chapter 4 analyzes the data collected from the survey questionnaire using statistical analysis. The analysis begins with the response rate of a survey questionnaire followed by the descriptive statistic of the responding industries and respondents. Next is the analysis of the reliability study followed by Exploratory Factor Analysis (EFA) and hypotheses testing using multiple linear regression and moderated hierarchical regression analysis.

Chapter 5 analyzes the case study method using interviews with halal personnel from three selected halal companies. This case study was analyzed to provide qualitative data to support an in-depth understanding of the conceptual framework.

Chapter 6 discusses the research findings which begins with a summary of the overall study. Then, it continues with the discussion of results of analysis obtained from previous chapters. The discussion was based on the hypotheses which supported/ not supported the research objectives and research questions.

Chapter 7 draws conclusions from the research; highlights contributions to the knowledge from a theoretical perspective and practical implications; as well as a statement on the limitations of the study and recommendations for future research.

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## APPENDIX

### Appendix A Survey Questionnaire



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

#### **HALAL FOOD SUPPLY CHAIN AND HALAL INTEGRITY ASSURANCE (RANTAIAN BEKALAN MAKANAN HALAL DAN JAMINAN INTEGRITI HALAL)**

**HIGHLY CONFIDENTIAL**

Dear respective respondent/ *Responden yang dihormati,*

**A study of the relationship between Halal Food Supply Chain and Halal Integrity Assurance: The moderating Effect of Halal Assurance and Halal Traceability System.**

*Satu Kajian mengenai hubungan di antara Rangkaian Bekalan Makanan Halal dan Integriti Halal: Kesan Jaminan Halal dan Pengesanan Halal Sistem*

This is purely academic research to study the relationship between Halal Food Supply Chain and Halal Integrity Assurance: The moderating effect of Halal Assurance and Halal Traceability System. I would like to seek your kind assistance and valuable time in completing this questionnaire and return it directly to me using the enclosed postage-paid envelope. If you are interested to know the result of the research, we will please to send you a complimentary copy of the research report, highlighting the survey result, as soon as it is ready. This research report will be provided at no cost to you.

*Ini adalah penyelidikan akademik untuk mengkaji hubungan antara Rangkaian Bekalan Makanan Halal dan Integriti Halal: Kesan Jaminan Halal dan Pengesanan Halal Sistem. Saya ingin mendapatkan bantuan dan masa anda yang berharga dalam melengkapkan soal selidik ini dan mengembalikannya kepada saya menggunakan sampul surat pos berbayar yang disertakan. Jika anda berminat untuk mengetahui hasil kajian ini, kami akan hantar satu salinan percuma laporan penyelidikan yang akan menonjolkan hasil kaji selidik sebaik sahaja ianya siap. Laporan penyelidikan akan disediakan tanpa sebarang kos kepada anda.*

**There is no right or wrong answer, but is only your honest and frank opinion that matters. Your response will be treated with utmost confidentiality and no names of firm or individual shall be revealed. The information collected will be used for research purpose only. Please select Halal program that has been implemented within the last 3 years whether it is successful or unsuccessful.**

*Tidak ada jawapan yang betul atau salah, tetapi yang penting hanya pendapat jujur dan berterus-terang anda. Respon anda akan disimpan dengan penuh kerahsiaan dan tiada nama-nama firma atau individu yang akan dinyatakan. Maklumat yang dikumpul akan digunakan untuk tujuan penyelidikan sahaja. Sila pilih program Halal yang telah dilaksanakan dalam tempoh 3 tahun yang lepas sama ada yang berjaya atau yang tidak berjaya.*

Thank you in advance for your valuable time spent in completing this questionnaire and should you have any queries, please do not hesitate to contact me or my supervisor.

*Sekiranya anda mempunyai sebarang pertanyaan, jangan teragak-agak untuk menghubungi saya atau penyelia saya.*

**THANK YOU FOR YOUR TIME AND COOPERATION  
TERIMA KASIH UNTUK MASA DAN KERJASAMA YANG ANDA  
SUMBANGKAN**

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Dear respondent/ Responden yang dihormati,

Please read the following before proceeding to answer the questionnaire/ *Sila baca maklumat yang berikut sebelum menjawab soal selidik di bawah;*

1. This study intends to further explore the relationship between Halal Food Supply Chain and Halal Integrity Assurance, and the influence of Halal Traceability and Halal Assurance System on the said relationship.  
*Kajian ini bertujuan untuk meneroka hubungan antara Rangkaian Bekalan Makanan Halal dan Integriti Halal, dan pengaruh Kebolehkesanan Halal dan Jaminan Halal Sistem dalam hubungan tersebut.*
2. Select Halal program that has been implemented during the last 3 years.  
*Pilih program Halal yang telah dilaksanakan dalam tempoh 3 tahun lepas.*

**Halal Food Supply Chain Management** will be defined as the process of managing the procurement, movement, storage and handling food products through the company and supply chain in compliance with general principles of Sharia law .

*Pengurusan Rangkaian Bekalan Makanan Halal ditakrifkan sebagai proses menguruskan perolehan, pergerakan, penyimpanan dan pengendalian produk makanan melalui syarikat dan bekalan rantaian serta mematuhi prinsip-prinsip am undang-undang syariah.*

**Halal Integrity** means that the product remains Halal from the upstream to downstream supply chain, free from any activities that might breach the Halal status, intentionally or unintentionally.

*Integriti Halal bermakna produk itu kekal Halal dari hulu ke hilir rantaian bekalan, bebas daripada apa-apa aktiviti yang mungkin melanggar status Halal, dengan sengaja atau tidak sengaja.*

3. The types of Halal Integrity will refer to Ethical and Physical Integrity of the products produced by company  
*Jenis-jenis Integriti Halal akan merujuk kepada Etika dan Integriti fizikal daripada produk yang dikeluarkan oleh syarikat*
4. All questions must be answer by focusing on the implementation of Halal food supply chain  
*Semua soalan mesti dijawab dengan memberi tumpuan kepada pelaksanaan rantaian bekalan makanan Halal*

**Physical Integrity** of halal product demands the basic requirements of halal and tayyib; the aspects of halalness, cleanliness, safe, healthy and nutritious.

*Integriti fizikal produk halal menuntut keperluan asas Tayyib halal dan; aspek halal, kebersihan, selamat, sihat dan berkhasiat.*

**Ethical Integrity** of halal product demands the aspects of processing, handling, packaging, labeling, warehousing, transporting, distributing, financing, marketing, and selling

*Integriti etika produk halal menuntut aspek pemrosesan, pengendalian, pembungkusan, pelabelan, pergudangan, pengangkutan, pengedaran, kewangan, pemasaran, dan penjualan*

**Halal Assurance System** is a system implemented by a producer or company to assure that the products produced are halal.

*Sistem Jaminan Halal merupakan sistem yang dilaksanakan oleh pengeluar atau syarikat yang memberi jaminan bahawa produk yang dihasilkan adalah halal.*

**Halal Traceability** implies that products are uniquely identifiable at critical points in the production and distribution processes, the identity of product flows are logged and that the information is systematically collected, processed and stored.

*Kebolehkesanan Halal membayangkan bahawa produk yang boleh dikenal pasti secara unik pada titik kritikal dalam proses pengeluaran dan pengedaran, identiti aliran produk log dan maklumat secara sistematik yang dikumpul, diproses dan disimpan.*

5. Completed questionnaire can be returned using self-addressed stamped envelope.

*Soal selidik yang telah lengkap boleh dipulangkan semula menggunakan sampul surat berbayar yang disertakan*

**Thank you** for your great participation and valuable time to complete the questionnaire of this study.

*Terima kasih atas penglibatan anda dan masa yang berharga untuk melengkapkan soal selidik kajian ini.*

## SECTION 1: COMPANY PROFILE/ PROFIL SYARIKAT

Please tick appropriate answer/ Tandakan jawapan yang sesuai

- 1 What is approximate number of employees in company?  
*Berapakah bilangan pekerja sepenuh masa dalam syarikat?*

<input type="checkbox"/>	Less than 50/ kurang dari 50
<input type="checkbox"/>	50 – 150
<input type="checkbox"/>	151 – 250
<input type="checkbox"/>	251 – 500
<input type="checkbox"/>	More than 500/ lebih dari 500

- 2 What is major type of product produced by the company?  
*Apakah jenis produk utama yang dihasilkan oleh syarikat?*

<input type="checkbox"/>	Food Products/ <i>Produk Makanan</i>
<input type="checkbox"/>	Beverage Products/ <i>Produk Minuman</i>
<input type="checkbox"/>	Seafood/ <i>Makanan Laut</i>
<input type="checkbox"/>	Ingredients/ <i>Ramuan</i>
<input type="checkbox"/>	Livestock & Meat Products/ <i>Produk Daging Ternakan</i>
<input type="checkbox"/>	Others/ <i>Lain-lain. Please mention/ Sila nyatakan</i> _____

- 3 What is the ownership status of your company?  
*Apakah status pemilikan syarikat?*

<input type="checkbox"/>	Family Business/ <i>Perniagaan Keluarga</i>
<input type="checkbox"/>	Local/ <i>Tempatan</i>
<input type="checkbox"/>	Foreign/ <i>Luar Negara</i>
<input type="checkbox"/>	Joint Venture/ <i>Usahasama</i>
<input type="checkbox"/>	Other ownership/ <i>Lain. Please specify/ Sila nyatakan:</i> _____

- 4 Has your company/ industry been certified Halal by JAKIM/ JAIN?  
*Adakah syarikat anda telah disahkan oleh JAKIM/JAIN?*

<input type="checkbox"/>	Yes, by JAKIM/ JAIN
<input type="checkbox"/>	No. In progress/ <i>Dalam proses</i>

- 5 Is your company implementing Halal Food Supply Chain (HFSC)?  
*Adakah syarikat anda melaksanakan Rantaian Bekalan Makanan Halal (HFSC)?*

<input type="checkbox"/>	Yes/ <i>Ya</i>
<input type="checkbox"/>	No/ <i>Tidak</i>



6. What quality systems have your organization implemented?  
*Apakah system quality yang telah dilaksanakan oleh syarikat anda?*

<input type="checkbox"/>	GMP
<input type="checkbox"/>	HACCP
<input type="checkbox"/>	MS1500:2009
<input type="checkbox"/>	MS1900:2005
<input type="checkbox"/>	ISO9001

**SECTION 2: ASSESSMENT OF HALAL FOOD SUPPLY CHAIN MANAGEMENT/ PENILAIAN PENGURUSAN RANTAIAN BEKALAN MAKANAN HALAL**

Please tick appropriate box according to the best of your knowledge, using scale below.

*Sila tandakan kotak yang sesuai mengikut pengetahuan anda dengan menggunakan skala di bawah.*

Strongly Agree <i>Sangat Setuju</i>	Agree <i>Setuju</i>	Neutral <i>Neutral</i>	Disagree <i>Tidak Setuju</i>	Strongly Disagree <i>Sangat Tidak Setuju</i>
1	2	3	4	5

**1. Supply Chain Objectives/ Objektif Rantaian Bekalan**

No.		1	2	3	4	5
1	Top Management aware on the importance of Halal concept/ <i>Pengurusan Tertinggi sedar tentang kepentingan konsep Halal</i>					
2	Top Management give full support and commitment on Halal implementation/ <i>Pengurusan Tertinggi memberikan sokongan penuh dan komitmen dalam pelaksanaan Halal</i>					
3	Top Management understand Supply Chain (SC) Objectives/ <i>Pengurusan Tertinggi memahami Objektif rantaian bekalan</i>					
4	Top Management aware on the importance of Halal Integrity along the SC/ <i>Pengurusan Tertinggi sedar tentang kepentingan Integriti Halal berserta rantaian bekalan makanan Halal</i>					
5	Middle management and employees aware of Halal SC objectives to protect the Halal Integrity of products/ <i>Pengurusan pertengahan dan pekerja sedar akan matlamat SC Halal untuk melindungi Integriti Halal produk</i>					

2. SC Logistics Control/ Kawalan Logistik Rantaian Bekalan

No.		1	2	3	4	5
1	This company implement planning & control of products flow when manufacture products/ <i>Syarikat ini membuat perancangan &amp; kawalan aliran produk apabila mengeluarkan produk</i>					
2	This company control flow of material/ products from purchasing to the end consumers/ <i>Syarikat ini mengawal aliran bahan/ produk daripada pembekal kepada pengguna yang terakhir</i>					
3	This company employed logistics services to ship in their raw material and ship out finished products/ <i>Syarikat ini menggunakan perkhidmatan logistik untuk mendapatkan bahan mentah dan menghantar produk yang telah siap.</i>					
4	This company has appropriate storage, transit and equipment at their warehouse/ <i>Syarikat ini mempunyai tempat simpanan yang sesuai, transit dan peralatan di gudang</i>					
5	Dedicated infrastructure e.g. transportation fleet, warehouse and storage places being used to avoid mixed of Halal products/ <i>Infrastruktur khas cth. pengangkutan, gudang dan tempat penyimpanan digunakan untuk mengelakkan campuran produk Halal</i>					

3. SC Resources/ Sumber Rantaian Bekalan

No.		1	2	3	4	5
1	This company setup Halal division to be responsible on Halal issues/ <i>Syarikat ini menubuhkan bahagian Halal yang bertanggungjawab mengenai isu-isu Halal</i>					
2	The company appoints Halal committee to guide management to make decision on Halal issues/ <i>Syarikat ini melantik jawatankuasa Halal untuk membimbing pihak pengurusan membuat keputusan mengenai isu-isu Halal</i>					
3	The Halal committee responsible for the compliance of the management and practices according to Halal standards/ <i>Jawatankuasa Halal bertanggungjawab bagi memastikan pematuhan pihak pengurusan dan amalan mengikut piawaian Halal</i>					
4	The Halal committee drafts halal policy to be endorsed by the MD/ CEO of the company/ <i>Jawatankuasa Halal draf polisi halal yang disahkan oleh Pengarah Urusan / Ketua Pegawai Eksekutif syarikat itu</i>					
5	Halal committee appoints halal compliance officer that acts as an internal auditor/ <i>Jawatankuasa Halal melantik pegawai pematuhan halal yang bertindak sebagai juruaudit dalaman</i>					



#### 4. SC Business Process/ Bisnes Proses Rantaian Bekalan

No.		1	2	3	4	5
1	Business processes division of this company processes customer order fulfilment, doing manufacturing flow management and procurement/ <i>Bahagian proses perniagaan syarikat ini memproses pesanan pelanggan, melakukan pengurusan aliran pengeluaran dan perolehan</i>					
2	The customer order fulfilment process carries the segregation requirements of customers according to market destination/ <i>Perintah pelanggan proses pemenuhan membawa keperluan pengasingan pelanggan mengikut destinasi pasaran</i>					
3	The manufacturing flow management formulated halal control and assurance activities from source to point of consumer purchase/ <i>Pengurusan aliran pembuatan merumuskan kawalan dan jaminan aktiviti halal dari sumber ke masa pembelian pengguna</i>					
4	The procurement division managing the upstream supply chain to ensure the raw material purchased is halal compliant/ <i>Bahagian perolehan menguruskan rantaian bekalan hulu untuk memastikan bahan mentah yang dibeli mematuhi piawaian halal</i>					
5	Middle management and employees understand the SC Business processes in this company/ <i>Pihak Pengurusan pertengahan dan pekerja memahami proses Rantaian Bekalan perniagaan dalam syarikat ini</i>					

#### 5. SC Network Structure/ Struktur Rangkaian Rantaian Bekalan

No.		1	2	3	4	5
1	This company has network of connected and interdependent companies which mutually and cooperatively working together to manage and control the flow of materials/ <i>Syarikat ini mempunyai rangkaian syarikat-syarikat yang berkaitan dan saling bergantung dan bekerjasama untuk mengurus dan mengawal aliran bahan</i>					
2	This network structure understands and comply with the requirements of halal SC/ <i>Struktur rangkaian memahami dan mematuhi keperluan Rantaian Bekalan halal</i>					
3	This company understand the halal integrity is a function of integrity of SC partners/ <i>Syarikat ini memahami integriti halal adalah fungsi integriti rakan-rakan rantaian bekalan</i>					
4	The company chooses SC partners when designing their SC network structure/ <i>Syarikat itu memilih rakan kongsi rantaian bekalan apabila mereka membentuk struktur rangkaian</i>					

**SECTION 3: ASSESSMENT OF HALAL ASSURANCE SYSTEM/  
PENILAIAN SISTEM JAMINAN HALAL**

In this section we assess the extent of halal assurance system in your firm. Please tick appropriate box according to the best of your knowledge, using the scale below/  
*Dalam seksyen ini, kita menilai sejauh mana sistem jaminan halal dalam syarikat anda. Sila tandakan kotak yang sesuai mengikut pengetahuan anda, dengan menggunakan skala di bawah.*

Strongly Agree <i>Sangat Setuju</i>	Agree <i>Setuju</i>	Neutral <i>Neutral</i>	Disagree <i>Tidak Setuju</i>	Strongly Disagree <i>Sangat Tidak Setuju</i>
1	2	3	4	5

No.		1	2	3	4	5
1	Company is JAKIM Halal certified/ <i>Syarikat telah mendapat pengesahan Halal dari JAKIM</i>					
2	Standard of halal management and halal system is available in the company/ <i>Standard pengurusan halal dan sistem halal boleh didapati di dalam syarikat</i>					
3	Standard audits procedure of halal system is available/ <i>Prosedur audit standard sistem halal boleh didapati di syarikat</i>					
4	There is Haram Analysis Critical Control Point (HrACCP)/ <i>Terdapat Haram Analisis Titik Kawalan Kritikal (HrACCP)</i>					
5	Halal guidelines is in existence and documented in the company/ <i>Garis panduan halal wujud dan didokumenkan dalam syarikat</i>					
6	The general guidelines of the components above is written and documented in a halal manual/ <i>Garis panduan am komponen di atas ditulis dan didokumenkan dalam manual halal</i>					
7	The halal manual includes halal policy and objective of the system/ <i>Manual halal termasuk dasar halal dan objektif sistem</i>					
8	The commitment of the company on Halal Assurance System (HAS) is reflected from this manual/ <i>Komitmen syarikat pada Sistem Jaminan Halal dapat disemak dari manual ini</i>					
9	Top management understand effective HAS can create competitive advantage for the company/ <i>Pengurusan tertinggi memahami kebersanan HAS yang boleh mewujudkan kelebihan daya saing bagi syarikat</i>					
10	Internal halal committee (IHC) identified halal critical points which can lead to non-compliance to halal standard requirement/ <i>Jawatankuasa halal</i>					

<i>Dalam (IHC) mengenal pasti titik kritikal halal yang boleh membawa kepada ketidakpatuhan pada piawaian standard halal</i>					
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**SECTION 4: ASSESSMENT OF HALAL TRACEABILITY/ PENILAIAN PENGESANAN HALAL**

In this section we assess the extent of halal traceability being implement in your company. Please tick appropriate box according to the best of your knowledge, using the scale below/ *Dalam seksyen ini kita menilai sejauh mana pengesanan halal dilaksanakan dalam syarikat anda. Sila tandakan kotak yang sesuai mengikut pengetahuan anda, dengan menggunakan skala di bawah.*

1. **Do your company know about the Halal Traceability system of food products?**

*Adakah syarikat anda tahu tentang sistem Kebolehkesanan Halal produk makanan?*

Yes/ Ya

No/ Tidak

2. **Is it necessary to implement Halal Traceability system?**

*Adakah perlu untuk melaksanakan sistem Kebolehkesanan Halal?*

Yes/ Ya

No/ Tidak

3. **Are you interested in carrying out Halal Traceability system to ensure your company to deliver Halal product with integrity?**

*Adakah anda berminat untuk menjalankan sistem Kebolehkesanan Halal untuk memastikan syarikat anda menghasilkan produk yang berintegriti Halal?*

Yes/ Ya

No/ Tidak

4. At current time, have your company implemented or plan to implement a system on Halal product traceability in the company?

*Pada masa sekarang, adakah syarikat anda telah melaksanakan atau merancang untuk melaksanakan sistem kebolehhesanan produk Halal?*

Yes/ Ya

No/ Tidak

Strongly Agree <i>Sangat Setuju</i>	Agree <i>Setuju</i>	Neutral <i>Neutral</i>	Disagree <i>Tidak Setuju</i>	Strongly Disagree <i>Sangat Tidak Setuju</i>
1	2	3	4	5

No.		1	2	3	4	5
1	Company implement Halal product traceability <i>Syarikat melaksanakan sistem pengesanan produk halal</i>					
2	Company implement Halal process traceability <i>Syarikat melaksanakan proses pengesanan halal</i>					
3	Company implement input traceability e.g. raw material <i>Syarikat melaksanakan pengesanan input cth bahan mentah</i>					
4	Company has Halal product recall capability <i>Syarikat mempunyai keupayaan penarikan balik produk Halal</i>					
5	Company has Halal tracking capability (downstream tracking) <i>Syarikat mempunyai keupayaan pengesanan Halal (pengesanan hiliran)</i>					
6	Company has Halal tracing capability (upstream tracking) <i>Syarikat mempunyai keupayaan mengesan Halal (pengesanan hulu)</i>					

**SECTION 5: ASSESSMENT OF HALAL INTEGRITY/ PENILAIAN INTEGRITI HALAL**

In this section we assess the impact on halal integrity. Please tick appropriate box according to the best of your knowledge, using the scale below/ Dalam seksyen ini kita menilai kesan ke atas integriti halal. Sila tandakan kotak yang sesuai mengikut pengetahuan anda, dengan menggunakan skala di bawah

1. To what degree are the impact on halal integrity were successful:  
Tahap impak Integriti Halal:

	1	2	3	4	5
	Very positive result/ Hasil yang sangat positif	Somewhat positive result/ Hasil yang agak positif	No result/ Tiada Hasil	Somewhat negative result/ Hasil yang agak negatif	Very negative result/ Hasil yang sangat negatif
Improved physical halal/ <i>Peningkatan Halal fizikal produk</i>					
Improved ethical value/ <i>Peningkatan nilai etika produk</i>					
Better halal toyyiban/ <i>Halalan Toyyiban yang lebih baik</i>					
Higher quality product/ <i>Kualiti produk yang lebih tinggi</i>					
Better physical product core (design, quality, color, style) <i>Teras produk lebih baik (rekabentuk, kualiti, warna, gaya)</i>					
Better product package (branding, label, trademarks) <i>Pakej produk yang lebih baik (penjenamaan, label, tanda dagangan)</i>					
Improved Auxiliary services (warranties, delivery) <i>Peningkatan perkhidmatan sokongan(waranti, penghantaran)</i>					
Reduced cost of product recall/ <i>Kos dikurangkan daripada penarikan balik produk</i>					
Reduced number of product recall/ <i>Penurunan jumlah penarikan balik produk</i>					
Ability to meet regulatory requirement/ <i>Keupayaan untuk memenuhi keperluan kawal selia</i>					
Ability to meet customer requirement/ <i>Keupayaan untuk memenuhi keperluan pelanggan</i>					
Ability to access new markets/ <i>Keupayaan untuk mengakses pasaran baru</i>					
Ease new product introduction/ <i>Kemudahan pengenalan produk baru</i>					
Ease product distribution/ <i>Kemudahan pengedaran produk</i>					
Ease product development/ <i>Kemudahan pembangunan produk</i>					
Improve delivery/ <i>Penambahbaikan penghantaran produk</i>					

Improve customer perception/ <i>Memperbaiki persepsi pelanggan</i>				
Serving existing market/ <i>Melayani pasaran sedia ada</i>				
Maintain competitive pricing/ <i>Mengekalkan harga yang kompetitif</i>				
Increase customer satisfaction/ <i>Menambah kepuasan pelanggan</i>				
Increase customer trust/ <i>Menambah kepercayaan pelanggan</i>				

**SECTION 6: GENERAL PROFILE OF RESPONDENT/ PROFIL AM RESPONDEN**

Please provide some information about yourself. The information is not mandatory, but it will help us in our survey/ *Sila berikan maklumat mengenai diri anda. Maklumat ini tidak wajib, tetapi ia akan membantu dalam kajian kami.*

What is your job title/ *Pangkat anda:* \_\_\_\_\_

Department attached to/ *Jabatan anda:* \_\_\_\_\_

Numbers of years with the industries/ *Bilangan tahun bekerja dengan syarikat:* \_\_\_\_\_

Sex/ *Jantina:* \_\_\_\_\_ Age/ *Umur:* \_\_\_\_\_

What is your highest qualification/ *Kelulusan akademik tertinggi anda:* \_\_\_\_\_

I would like to share the findings of this study. Please provide us the following/ *Saya ingin berkongsi dapatan dari kajian ini. Sila lengkapkan ruang di bawah:*

Nama/ *Name:* \_\_\_\_\_ Email: \_\_\_\_\_

Address/ *Alamat:* \_\_\_\_\_

State/ *Negeri:* \_\_\_\_\_

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**THANK YOU FOR COMPLETING THIS QUESTIONNAIRE  
TERIMA KASIH KERANA TELAH MELUANGKAN MASA MELENGKAPKAN  
SOAL SELIDIK INI**



## Appendix B Interview Questionnaire



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

### **HALAL FOOD SUPPLY CHAIN AND HALAL INTEGRITY ASSURANCE (RANTAIAN BEKALAN MAKANAN HALAL DAN JAMINAN INTEGRITI HALAL)**

**HIGHLY CONFIDENTIAL**

Dear respective respondent/ *Responden yang dihormati,*

**A study of the relationship between Halal Food Supply Chain and Halal Integrity Assurance: The moderating Effect of Halal Assurance and Halal Traceability System.**

*Satu Kajian mengenai hubungan di antara Rangkaian Bekalan Makanan Halal dan Integriti Halal: Kesan Jaminan Halal dan Pengesanan Halal Sistem.*

This is purely academic research to study the relationship between Halal Food Supply Chain and Halal Integrity Assurance: The moderating effect of Halal Assurance and Halal Traceability System. I would like to seek your kind assistance and valuable time in completing this interview session. If you are interested to know the result of the interview, I will please to send you a complimentary copy of the research report, highlighting the survey result, as soon as it is ready. This research report will be provided at no cost to you.

*Ini adalah penyelidikan akademik untuk mengkaji hubungan antara Rangkaian Bekalan Makanan Halal dan Integriti Halal: Kesan Jaminan Halal dan Pengesanan Halal Sistem. Saya ingin mendapatkan bantuan dan masa anda yang berharga dalam melengkapkan soal selidik ini. Jika anda berminat untuk mengetahui hasil kajian ini, kami akan hantar satu salinan percuma laporan penyelidikan yang akan menonjolkan hasil kajiselidik sebaik sahaja ianya siap. Laporan penyelidikan akan disediakan tanpa sebarang kos kepada anda.*

**There is no right or wrong answer, but is only your honest and frank opinion that matters. Your response will be treated with utmost confidentiality and no names of firm or individual shall be revealed. The information collected will be used for research purpose only. Please select Halal program that has been implemented within the last 3 years whether it is successful or unsuccessful.**

*Tidak ada jawapan yang betul atau salah, tetapi yang penting hanya pendapat jujur dan berterus-terang anda. Respon anda akan disimpan dengan penuh kerahsiaan dan tiada nama-nama firma atau individu yang akan dinyatakan. Maklumat yang dikumpul akan digunakan untuk tujuan penyelidikan sahaja. Sila pilih program Halal yang telah dilaksanakan dalam tempoh 3 tahun yang lepas sama ada yang berjaya atau yang tidak berjaya.*

Thank you in advance for your valuable time spent in completing this interview session and should you have any queries, please do not hesitate to contact me or my supervisor.

*Sekiranya anda mempunyai sebarang pertanyaan, jangan teragak-agak untuk menghubungi saya atau penyelia saya.*

**THANK YOU FOR YOUR TIME AND COOPERATION  
TERIMA KASIH UNTUK MASA DAN KERJASAMA YANG ANDA  
SUMBANGKAN**

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Dear respondent/ Responden yang dihormati,

Please read the following before proceeding to answer the interview questions/ *Sila baca maklumat yang berikut sebelum menjawab soal selidik di bawah;*

1. This study intends to further explore the relationship between Halal Food Supply Chain and Halal Integrity, and the influence of Halal Traceability and Halal Assurance and on the said relationship.

*Kajian ini bertujuan untuk meneroka hubungan antara Rangkaian Bekalan Makanan Halal dan Integriti Halal, dan pengaruh Kebolehhesanan Halal dan Jaminan Halal dalam hubungan tersebut.*

2. Select Halal program that has been implemented during the last 3 years.

*Pilih program Halal yang telah dilaksanakan dalam tempoh 3 tahun lepas.*

**Halal Food Supply Chain Management** will be defined as the process of managing the procurement, movement, storage and handling food products through the company and supply chain in compliance with general principles of Shariah law .

*Pengurusan Rantaian Bekalan Makanan Halal ditakrifkan sebagai proses menguruskan perolehan, pergerakan, penyimpanan dan pengendalian produk makanan melalui syarikat dan bekalan rantaian serta mematuhi prinsip-prinsip am undang-undang syariah.*

**Halal Integrity** means that the product remains Halal from the upstream to downstream supply chain, free from any activities that might breach the Halal status, intentionally or unintentionally.

*Integriti Halal bermakna produk itu kekal Halal dari hulu ke hilir rantaian bekalan, bebas daripada apa-apa aktiviti yang mungkin melanggar status Halal, dengan sengaja atau tidak sengaja.*

3. The types of Halal Integrity will refer to Ethical and Physical Integrity of the products produced by company

*Jenis-jenis Integriti Halal akan merujuk kepada Etika dan Integriti fizikal daripada produk yang dikeluarkan oleh syarikat*

4. All questions must be answer by focusing on the implementation of Halal food supply chain

*Semua soalan mesti dijawab dengan memberi tumpuan kepada pelaksanaan rantaian bekalan makanan Halal*

**Physical Integrity** of halal product demands the basic requirements of halal and tayyib; the aspects of halalness, cleanliness, safe, healthy and nutritious.

*Integriti fizikal produk halal menuntut keperluan asas Tayyib halal dan; aspek halal, kebersihan, selamat, sihat dan berkhasiat.*

**Ethical Integrity** of halal product demands the aspects of processing, handling, packaging, labeling, warehousing, transporting, distributing, financing, marketing, and selling

*Integriti etika produk halal menuntut aspek pemrosesan, pengendalian, pembungkusan, pelabelan, pergudangan, pengangkutan, pengedaran, kewangan, pemasaran, dan penjualan*

**Halal Assurance System (HAS)** is a system implemented by a producer or company to assure that the products produced are halal.

*Sistem Jaminan Halal merupakan sistem yang dilaksanakan oleh pengeluar atau syarikat yang memberi jaminan bahawa produk yang dihasilkan adalah halal.*

**Halal Traceability** implies that products are uniquely identifiable at critical points in the production and distribution processes, the identity of product flows are logged and that the information is systematically collected, processed and stored.

*Kebolehkesanan Halal membayangkan bahawa produk yang boleh dikenal pasti secara unik pada titik kritikal dalam proses pengeluaran dan pengedaran, identiti aliran produk log dan maklumat secara sistematik yang dikumpul, diproses dan disimpan.*

**Thank you for your great participation and valuable time to complete the interview session of this study.**

*Terima kasih atas penglibatan anda dan masa yang berharga untuk melengkapkan soal selidik kajian ini.*

## Part I: Knowledge & Awareness on Halal Traceability System

Main questions	Additional questions	Clarifying questions
<ul style="list-style-type: none"> <li>• What do you know about Halal Traceability system for food products?</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Can you tell me about Halal Traceability system for food products?</li> </ul>	<ul style="list-style-type: none"> <li>• How do you explain the importance of Halal Traceability system?</li> <li>• Why is it considered importance?</li> <li>• Under what reasons does it importance?</li> <li>• How Halal traceability system relate to Halal Integrity of food products?</li> <li>• What do you think? Because of the relation, is it necessary to implement Halal Traceability in your company?</li> <li>• What types of Halal traceability system practised by your company?</li> <li>• Have you noticed any benefits of the implementation of Halal traceability system on your food products?</li> <li>• How do you explain issues and challenges during the implementation?</li> </ul>	<ul style="list-style-type: none"> <li>• Can you expand a little on this?</li> <li>• Can you tell me anything else?</li> <li>• Can you give me some examples?</li> </ul>

## Part I: Knowledge & Awareness on Halal Traceability System

Main questions	Additional questions	Clarifying questions
<ul style="list-style-type: none"> <li>• What do you know about Halal Traceability system for food products?</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Can you tell me about Halal Traceability system for food products?</li> </ul>	<ul style="list-style-type: none"> <li>• How do you explain the importance of Halal Traceability system?</li> <li>• Why is it considered importance?</li> <li>• Under what reasons does it importance?</li> <li>• How Halal traceability system relate to Halal Integrity of food products?</li> <li>• What do you think? Because of the relation, is it necessary to implement Halal Traceability in your company?</li> <li>• What types of Halal traceability system practised by your company?</li> <li>• Have you noticed any benefits of the implementation of Halal traceability system on your food products?</li> <li>• How do you explain issues and challenges during the implementation?</li> </ul>	<ul style="list-style-type: none"> <li>• Can you expand a little on this?</li> <li>• Can you tell me anything else?</li> <li>• Can you give me some examples?</li> </ul>

## Part II: Current view on Halal Assurance System

Main questions	Additional questions	Clarifying questions
<p>What do you know about Halal Assurance system for food products?</p> <p>OR</p> <p>Can you tell me about Halal Assurance System (HAS) for food products?</p>	<ul style="list-style-type: none"> <li>• How do you explain the importance of Halal Assurance System (HAS)?</li> <li>• Why Halal Assurance System is considered importance?</li> <li>• Under what reasons does it importance?</li> <li>• How Halal Assurance system relate to Halal Integrity of food products?</li> <li>• What do you think? Because of the relation, is it necessary to implement Halal Assurance system in your company?</li> <li>• How Halal Assurance system is being practised by your company?</li> <li>• Have you noticed any benefits of instilling Halal Assurance System on your food products?</li> <li>• How do you explain issues and challenges when instilling HAS?</li> </ul>	<ul style="list-style-type: none"> <li>• Can you expand a little on this?</li> <li>• Can you tell me anything else?</li> <li>• Can you give me some examples?</li> </ul>

- End of Interview Question -

**GENERAL PROFILE OF RESPONDENT/ PROFIL AM RESPONDEN**

Please provide some information about yourself. The information is not mandatory, but it will help us in our survey/ *Sila berikan maklumat mengenai diri anda. Maklumat ini tidak wajib, tetapi ia akan membantu dalam kajian kami.*

What is your job title/ *Pangkat anda:* \_\_\_\_\_

Department attached to/ *Jabatan anda:* \_\_\_\_\_

Numbers of years with the industries/ *Bilangan tahun bekerja dengan syarikat:* \_\_\_\_\_

Sex/ *Jantina:* \_\_\_\_\_ Age/ *Umur:* \_\_\_\_\_

What is your highest qualification/ *Kelulusan akademik tertinggi anda:*  
\_\_\_\_\_

I would like to share the findings of this study. Please provide us the following/ *Saya ingin berkongsi dapatan dari kajian ini. Sila lengkapkan ruang di bawah:*

Nama/ *Name:* \_\_\_\_\_ Email: \_\_\_\_\_

Address/ *Alamat:* \_\_\_\_\_

State/ *Negeri:* \_\_\_\_\_

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**THANK YOU FOR COMPLETING THIS INTERVIEW**  
**TERIMA KASIH KERANA TELAH MELUANGKAN MASA MELENGKAPKAN**  
**SOAL SELIDIK INI**

## LIST OF PUBLICATIONS

### Journal with Impact Factor

1. **Mohamed, Y. H.**, Rahim, A. R. A., Ma'aram, A. B., & Hamza, M. G. (2016). Halal traceability in enhancing halal integrity for food industry in Malaysia—a review. *International Research Journal of Engineering and Technology*, 3(3), 69-74.
2. **Mohamed, Y. H.**, Rahim, A. R. A., Ma'aram, A.B. (2017). Halal assurance system for halal food integrity assurance over the supply chain. *Journal of Advance Research in Applied Sciences and Engineering Technology*, 2(1), 1-12.
3. **Mohamed, Y. H.**, Rahim, A. R. A., Ma'aram, A.B. (2017). The effect of halal food supply chain on halal integrity assurance. *Journal of Islamic Marketing (JIMA)*, already published on-line.