

**HALAL SUPPLY CHAIN FRAMEWORK FOCUSED ON HALAL  
MEAT (A SYSTEMATIC LITERATURE REVIEW)**

**THESIS**

**Submitted to International Program Department of Industrial Engineering in  
Partial Fulfillment of the Requirement for the Degree of Sarjana Teknik Industri  
at Universitas Islam Indonesia**



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YOGYAKARTA**

**2016**

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**THESIS**



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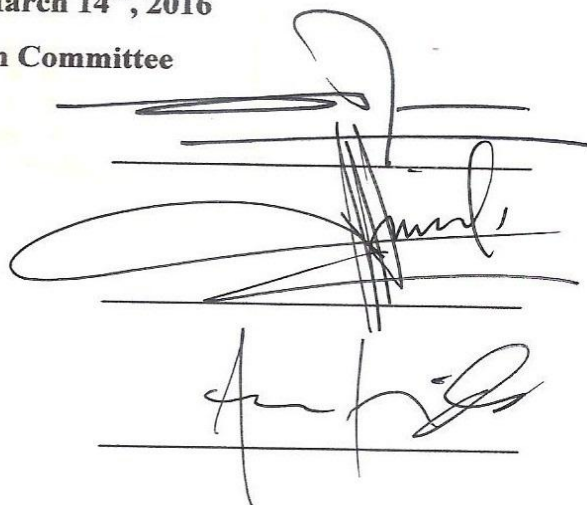
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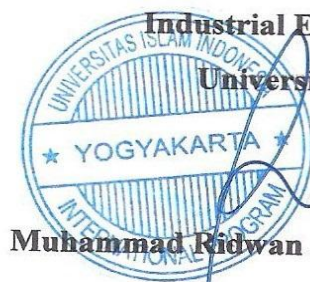


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## ABSTRACT

The growth rate of Muslim population is recorded as 1.84% per year, which is higher if compared with the growth of the Christian population which reaches 1.32% per year. Higher growth rate of Muslim population has become an interesting topic because Muslims are governed by their own set of laws on how to perform their daily activities. Therefore, many researches have been conducted to discuss and explain on certain topic that can be related to Islamic law such as the benefits to health one can get from performing body movements in their daily Sholat. In this report, the authors shall explore and investigate the way on how to maintain the meat *halal* status throughout the supply chain, starting from the meat slaughtering process up to the distribution until it finally consumed by the customer. This study will review the literatures systematically that focused on *halal* meat status, started from the slaughtering process of *halal* meat in the retail throughout the supply chain process such as warehousing, delivery process and transportation, inventory until it is bought and consumed by the consumer. The whole process must be ascertained as *halal*. The study was conducted to create the *halal* meat supply chain framework that focused on *halal* meat for retail business. From the 32 papers reviewed, the result shows that there are several aspects should be put into consideration in creating *halal* supply chain framework for *halal* meat, those are: slaughtering process, delivery process and inventory, *haram* contamination detection, company management, Islamic purchasing and customer behavior and believe toward *halal* product.

**Keyword:** Systematic Literature Review, *Halal* Supply Chain, Sustainability, *Halal* meat and Islamic Purchasing.

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## CHAPTER I

### INTRODUCTION

#### 1.1 Background

Developed and developing countries were participating in global market, in order to produce product and gain the profit, while increasing the countries' public welfare. In their participation, developing countries support Small and Medium-Enterprises (SMEs), which are expected to have the ability to participate in stimulating national economic growth. Greenhalgh and Rogers (2008) studied that SME is relatively more active in trade-marking rather than large-enterprises. According to Kumari et al., (2015) Supply Chain Management (SCM) will help SMEs to take an appropriate decision to mitigate the uncertainty on supply chain, it was supported also by Buchmeister et al., (2014) which stated that supply chain is the best way for the industry to compete in global market. By implementing supply chain, manufacturers, suppliers, distributor, retailers and transportation provider can increase the productivity and obtain the competitive advantage (Buchmeister et al., 2014).

Then the question emerges related to this fact, as the best way to manage the industry, what is supply chain? Supply chain is organization, people, information and resources, which are involved in one system in order to produce product or services, then deliver them from the supplier to the customer (Beamon, 1998). SCM is the key business process which linked all parties from the original supplier of raw material to

the end user of the manufactured product (Yusuf et al., 2014). Theory above shows that the scope of supply chain is wide. Each aspect has its own depth-detail discussion, for example resources as the main factor of supply chain could be defined as the way to extract from nature environment, then the way to transport the resource to the production line, until the way to manufacture the resource. Then, similar as previous, other aspects of supply chain such as, design, planning, inventory, delivery, etc, has their own details to be deeply discussed. Until today, there are millions of researches on supply chain. However, it has already mentioned above that the scope of supply chain is wide and there are many aspects have to be discussed. Thus, supply chain is worth to analyze in many kind of cases by using many kind of methods. Another method that interesting to be studied is by mixing SCM issues with other issues such as SCM and its correlation energy efficiency to become green supply chain. In this research, SCM is combined with current issues, which is the growth of Muslim in the world. Since the growth of Muslim issues become popular many researches have been conducted to discuss and explain on certain topic that can be related with Islamic law such as the benefits to health one can get from performing body movements in their daily Sholat.

Religious Population Worldwide showed that in 2014, the population of Muslim in the world reached 2.08 billion. It also calculated based on population data from 2011 that the growth of Muslim recorded as the highest if compared with other religions, which is 1.84% per year while Christianity only 1.32% per year. By combining this issue with the SME that implements SCM can produce a business opportunity to compete in global market.

Based on human needs, there are several businesses that can be run for long-last, for example the need for food creates the groceries and restaurant. Then, the business opportunity is combined with the Muslim aspect, for example a Muslim needs specific requirement for food before being consumed. Therefore, the business should be *halal*, which means that the business fulfills the Islamic requirement. *Halal* is normally associated with *haram* which means as ban or forbidden, while *halal* refers to anything that excluded from *haram*/ forbidden. *Haram* could be interpreted as place, thing, people action or anything that is not allowed to be touched. Implementing *halal* in business means that both raw material and the process or supply chain in manufacturing the food should be *halal*. Spiegel (2012) carried out the research framework of *halal* supply chain. It concerned on the standardization of *halal* since there still lacks of standardized *halal* law. Many organizations authorize for *halal* certification and label. Yet, the standards are varied for different countries. Since there are only few of researches about *halal* supply chain thus in this research, the researcher will conduct systematic literature review to identify current and future studies and then review those literatures in detail according to the topics which will create *halal* supply chain framework focused on *halal* meat. Meat is chosen as the material of the food because meat has specific requirement in Islamic law. The problem occurs when there are more aspects which affect *halal* status in *halal* supply chain framework that focused on *halal* meat which will be discussed using systematic literature review in the next chapter.

## 1.2 Problem Formulation

This research aims at systematically collecting and critically analysis the existing contribution *halal* supply chain. Considering this, the main research questions that addressed in this review are:

1. How to conduct systematic literature review and how is the framework of *halal* supply chain of *halal* meat?
2. How is the analysis map on *halal* supply chain for *halal* meat?

## 1.3 Research Objectives

Based on problem formulation above, this research is created to fulfill several objectives as mentioned below:

1. To conduct systematic literature review for *halal* supply chain of *halal* meat and to implement *halal* in business.
2. Analyze the map of *halal* supply chain for *halal* meat.

## 1.4 Research Limitation

Problem limitation is a limitation of problems to make a border in the research in order to keep the research within the scope. Based on the background, there are some scopes to maintain the focus of research, as follows:

1. The research only focuses on *halal* supply chain which starts from slaughtering process for *halal* meat (cow).

2. The research conducts systematic literature review, findings and discussions are derived from papers and articles.
3. The paper only founded in sciencedirect.com (Elsevier).
4. Papers finding are conducted from 2011 – 2015.
5. 32 papers were used to conduct the literature review.

### **1.5 Research Benefit**

It is expected that by conducting this research, some benefits can be earned:

1. Research methodology to conduct systematic literature review.
2. Research question can be used for better future research.

### **1.6 Systematical of Thesis Writing**

Furthermore, this thesis writing will be continued as follows:

## **CHAPTER II LITERATURE REVIEW**

This chapter will explain about the literature studies. The literature review conducted in systematic literature review, derived from the literature of previous researches and papers.

## **CHAPTER III RESEARCH METHODOLOGY**

This chapter will contains steps for conducting the research are applied as a references in order to keep focusing on the primary

goals, which are going to be achieved. It will explain and summary the phases of the systematic literature review undertaken, the method and tools are used to support every stage as well as the section of the article where these are addressed.

#### **CHAPTER IV ANALYSIS AND SYNTHESIS**

This chapter will explain the analysis and synthesis in phase of systematic literature review. It will explain the selection method for synthesis and analysis, and the extraction data of paper.

#### **CHAPTER V FINDING AND DISCUSSION**

This chapter will discuss about the finding papers and literatures, also the frame work of *halal* supply chain for *halal* meat.

#### **CHAPTER VI CONCLUSION**

The final section will describe the overall conclusions from the results of study and the suggestion for the future research.

#### **REFERENCES**

## CHAPTER II

### LITERATURE REVIEW

This chapter will explain about the literature studies. The literature review conducted in systematic literature review, derived from the literature of previous researches and papers.

The literature review presents a review by summarizing the result of current researches systematically to present the fact that more comprehensive and balanced. The review is aimed to systematic literature review on *halal* supply chain. Since the growth of Muslim in the world increasing, so the *halal* topic becomes popular. *Halal* foods are not only consumed by the Muslim but also non-Muslim. Many backgrounds and ethnicities consume *halal* food such as Jews, Asian and even natural organic consumers (Aziza & Sulaliman, 2014). Said et al., (2014) mentioned that non-Muslim awareness of *halal* is growing which indicates the opportunity to the expansion of *halal* brand.

#### 2.1 Literature Research

In order to become developed country, economic condition as the parameter of public welfare should be improved by developing country. Economic condition itself can be improved by supporting Small and Medium-Enterprises (SME). Small entrepreneurs are expected to have the ability to participate in stimulating national economic growth. SMEs have very meaningful role in national economic growth by creating job

opportunities so that the amount of unemployment can be decreased, in Indonesia as developing country, SMEs contribute 60% from PDB (Product Domestic Bruto) (Eravia et al., 2015). Previous study of Greenhalgh and Rogers (2008) found that relatively SME is more active in trade-marking rather than large-enterprises. To compete in the present market, SMEs focus on core expertise and activities (outsourcing). Based on Kumari et al., (2015) Supply Chain Management (SCM) will help SMEs to take an appropriate decision to mitigate the uncertainty in supply chain, it is also supported by the state of Buchmeister et al., (2014) stated that supply chain is the best way to answer the issues. Therefore, by implementing SCM, the productivity and competitive advantage for manufacturers, suppliers, distributor, retailers and transportation provider can be increased.

Supply chain is organization, people, information and resources, which involved in one system in order to produce product or services than deliver them from the supplier to the costumer (Beamon, 1998). Global Supply Chain Forum mentioned that SCM is the key business process which linked all parties from the original supplier of raw material to the end user of the manufactured product (Yusuf et al., 2014). Supply chain also manages the planning and control of material and information flows from supplier to the costumer (Minner, 2003). Theory above shows that the scope of supply chain is wide. Each aspect has its own depth-detail discussion, for example resources as the main factor of supply chain the discussion is about the way to extract from nature environment, then the way to transport the resource to the production line, until the way to manufacture the resource. Same thing with another aspect of supply chain such as, design, planning, inventory, delivery etc, can deeply discussed. There are millions of research of supply chain, however, above already mention that the scope

of supply chain wide and there are many aspect to be discussed, thus, supply chain worth to analyze in many kind of cases using some kind of methods.

The fact of SCM is interesting topic will be combined with current issues which is the growth of Muslim in the word. Religious Population Worldwide show that in 2014, the population of Muslim in the world is 2.08 billion. Based on population data in 2011, the growth rate of Muslim population is recorded as 1.84% per year, which is higher if compared with the growth of the Christian population which reaches 1.32% per year.\. Pew Research Center and Public Life Project predicts that Muslim will grow more than twice as fast as the overall world population in 2010 until 2050, as the graph shown below:

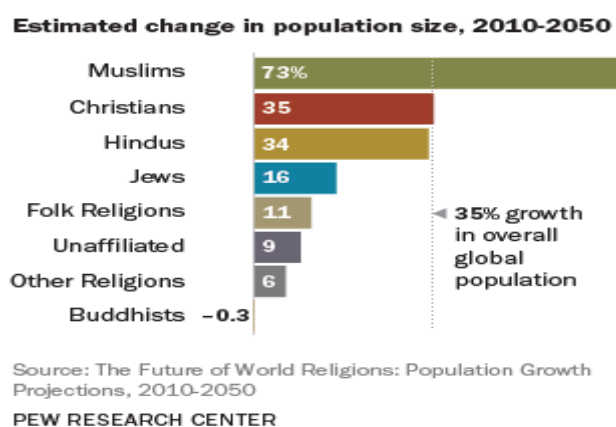


Figure 2.1 Estimated Religion Populations in 2010-2050

(Source :[www.pewresearch.org](http://www.pewresearch.org))

This issue brings the business opportunity. First, the long-last and profitable business field should be determined. Based on human needs, there are some businesses that can be run for long-last. The need of clothes makes the business in

fashion become long-last business the same thing with the need of food makes the groceries and restaurant, as well in business of property and technology also based on human need that make it long-last. Besides to fulfill the human need, the place that serves food as the sustainable (long-last), SME is important implications of industry in order to develop the capital (Lee et al., 2016). Second, determine business field that combines with the issue of the Islamic growth. Thus, the discussion theme will lead to the supply chain of *halal* food.. *Halal* is chosen because in Islam, there are some food requirements that have to be met before it can be consumed, required food called *halal*. *Halal* is not only addressed to the material but also for the process of supply chain.

The requirements of *halal* food was mentioned by Spiegel et al., (2012) where *halal* food must be clean or not contaminated by other *haram* things according to Islamic law during its production, transportation and storage. The process of supply chain and supporting tools must be in *halal* condition as well.

Basically, same with the other religion, Islam also has prohibition especially in food. If Hindu regulates the followers for not consuming beef, in Islam there are some requirements that should be fulfilled before consuming the meat.

From Saddadi Ibnu Aus, Rasulullah saw. said; “Indeed, Allah has given to do good against everything. If you kill, kill well. If you want to slaughter, slaughter well and sharpen the knife and give pleasure to the slaughtered animals (Translation from HR. Muslim).

Rasulullah saw said: Anything that can draw blood and called the name of God, thus you can eat, not the teeth, and nails and I'll tell you about it, while teeth are bones, and nails is the weapon of Habsy (Translation from HR. Al Bukhari from Raft' bin Khadis : 5074)

In Al-Qur'an Surah An'amayat 121 explain that :

وَلَا تَأْكُلُوا مِمَّا لَمْ يُذْكَرِ اسْمُ اللَّهِ عَلَيْهِ وَإِنَّهُ لَفِسْقٌ وَإِنَّ  
 الشَّيَاطِينَ لَيُوحُونَ إِلَىٰ أَوْلِيَآئِهِمْ لِيُجَدِّدُوا لَكُمْ وَإِنْ أَطَعْتُمُوهُمْ  
 إِنَّكُمْ لَمُشْرِكُونَ ﴿١٢١﴾

And do not eat of that upon which the name of Allah has not been mentioned, for indeed, it is grave disobedience. And indeed do the devils inspire their allies [among men] to dispute with you. And if you were to obey them, indeed, you would be associators [of others with Him].

Based on the reference above, *halal* meat should be slaughtered according to Islamic law, which is starting with *basmalah* (the name of Allah), and then inscribe the knife (made from metal, stones or bamboo) on the neck of slaughtered animal until the vessel of eating, drinking, breathing, right and left jugular vein break.

## 2.2 Systematic Literature Review

There are some phases in conducting systematic literature review, Garza-reyes (2015) explained there are 5 phases in reviewing the literature systematically, those are : a)

question formulation, which is formulation of research question that will guide the process of research, b) locating study and c) study selection and evaluation that inform the source (the publisher), research period, criteria of the paper of the study, d) analyzing and synthesizing the selected papers, and the last phase is e) recapitulating and using the reports which inform the findings of the report. In this research, those phases will be explained briefly in two separated chapters.

### **2.2.1 Location of studies and selection**

The process of studies' search for this research is conducted by using electronic database which is taken from Elsevier Publisher (sciencedirect.com). In order to find more valid information accordance with current issues, this research employs papers from the last five years, papers that were published from 2011-2015 including the papers in 2015 "in press" which will be published in 2016. Search result includes peer-reviewed article, published in academic journals and the proceedings of international conferences only. Mendeley Desktop will be used to help process analyzing.

According to the objectives of this research, the references that are reviewed focused on paper of supply chain management especially *halal* supply chain of *halal* meat. The keywords which are set on the *halal* meat supply chain search in electronic database, include supply chain, *halal* supply chain, and *halal* meat. Thus, based on the focus of the research there are two kinds of papers that will be reviewed; the paper of *halal* meat that related to the *halal* process in order to get *halal* meat and paper related to *halal* supply chain.

### **2.2.2 Analysis and Synthesis**

Garza-Reyes, (2015) stated various methods can be included to perform systematic literature review, thematic analysis/synthesis, qualitative comparative analysis, qualitative meta-summary, meta ethnography, qualitative meta-analysis, grounded theory and content analysis can be considered for the synthesis of qualitative research. Thematic synthesis was considered the most appropriate method to obtain from the systematic review of the literature.

The research will be divided into several groups related to *halal* supply chain which focused on *halal* meat. The groups will explain how is *halal* according their type of study.

### **2.2.3 Descriptive Analysis and Findings**

Total numbers of 32 papers are complied with selection criteria. The papers are referred to *halal* supply chain which focused on *halal* meat.

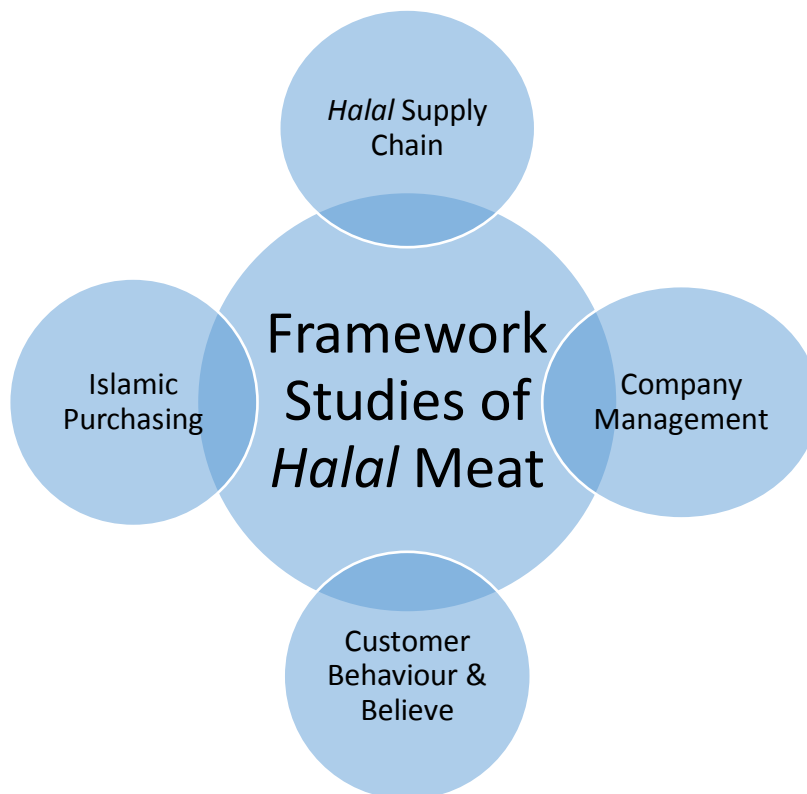


Figure 2.2 Framework Studies of *Halal* Meat Map

The figure 2.1 shows the framework studies of *halal* meat map, this research will review some literatures, which will show the supply chain framework of the *halal* meat. Some literatures that related to the supply chain of *halal* meat will be grouped based on sub-studies that concern in specific topic. Later, a framework is created from those topics. There are four groups of studies that establish the supply chain framework of *halal* meat; *halal* supply chain, the company management, Islamic purchasing, and the costumer behavioral and believe toward *halal* meat. Study of *halal* supply chain is important because in the supply chain activity, there is possibility of outside contamination that makes *halal* meat becomes *haram* (forbidden). Based on that, company as the subject which runs the supply chain must have the ability to maintain the *halal* meat in order to avoid the possibilities of unexpected outside contamination which makes *halal* become *haram*, so company

management is needed to be reviewed. In Islamic law, *halal* not only based on the process but also the way to get things, that is why Islamic purchasing also reviewed to make complete framework because *halal* product must be bought in *halal* way as well. Then customer behavioral and believe toward *halal* meat also needed to reviewed to know the feedback from the customers on *halal* meat. (Khalid et al., 2015; Farouk et al., 2015; Mustafa M. Farouk, 2013; Lever & Miele, 2012; Nakyinsige et al., 2012; Velarde et al., 2014; Kassim et al., 2014; Ngah et al., 2014; Spiegel et al., 2012; Tieman & Ghazali, 2014; Wright & Annes, 2013 and Yunus et al., 2014) in *halal* supply chain management. (Ibrahim, 2014; Mochtar et al., 2014; Ratanamaneichat & Rakkarn, 2013; Tarmizi et al., 2014; Yunus et al., 2014 and Zulfakar et al., 2014) in management of company. (Pepinsky, 2013 and Puspitasari, 2015) in Islamic purchasing. (Ahmad et al., 2014; Alqudsi, 2014; Aziza & Sulaliman, 2014; Ismoyowati, 2015; Kamaruddin et al., 2012; Khalek, 2014; Said et al., 2014; Verbeke et al., 2013; Yusof & Shutto, 2014) in customer behavior and believe.

Focusing on *halal* supply chain management, there are some sub-topics that have to be discussed. Discussion of *halal* supply chain management is divided into, slaughtering process, delivery process and inventory and the last the *haram* contamination detection.

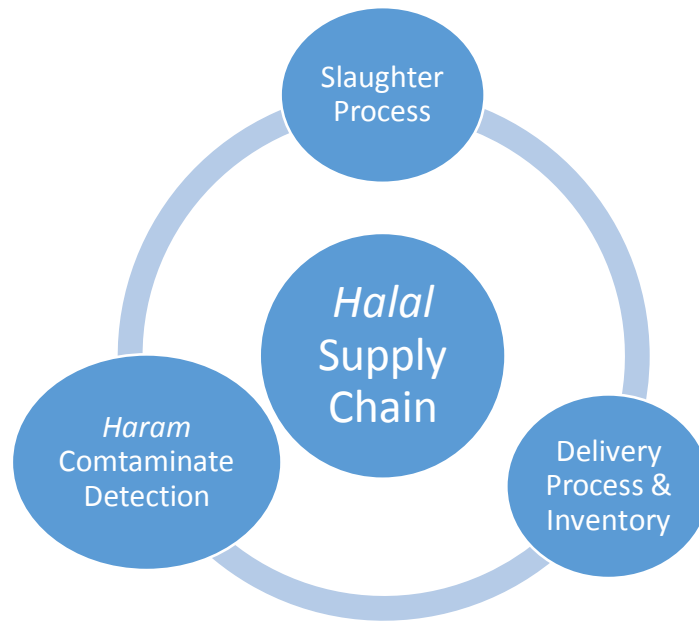


Figure 2.3 Sub-Topic of *Halal* Supply Chain

*Halal* is determined from the early process, focuses in meat thus the first step is by choosing the animal. Not all (Khalid et al., 2015; Farouk et al., 2015; Mustafa M. Farouk, 2013; Lever & Miele, 2012; Nakyinsige et al., 2012 and Velarde et al., 2014) in slaughter process. (Kassim et al., 2014; Ngah et al., 2014; Spiegel et al., 2012; Tieman & Ghazali, 2014; Wright & Annes, 2013 and Yunus et al., 2014) in delivery process and inventory. (Nakyinsige et al., 2012; Ali et al., 2015; Ali et al., 2015 and Demirhan et al., 2012) in *haram* contamination detection.

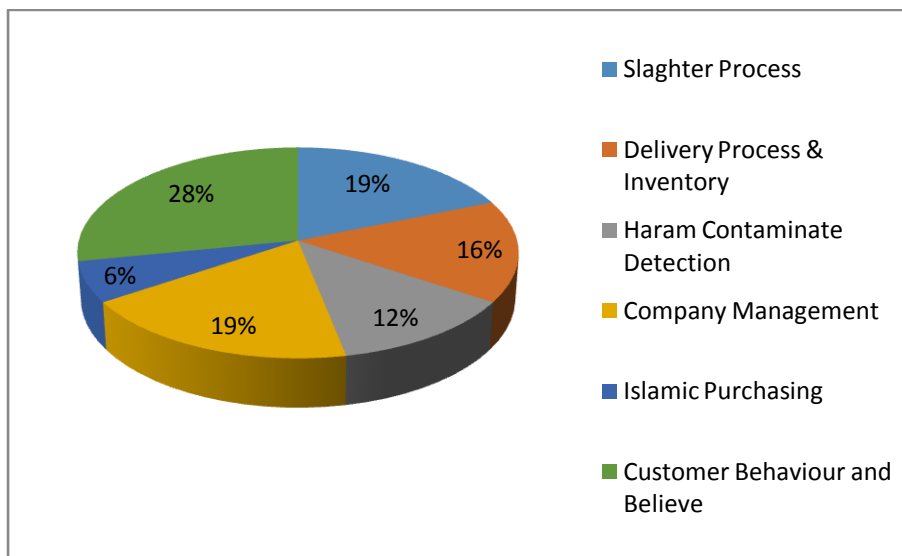


Figure 2.4 *Halal* supply chain focus on *halal* meat Journal

The figure above shows the percentage of the studies of supply chain framework focused on *halal* meat from the total paper ( $n = 32$ ). It shows the percentage of each sub-topic contribution which creates a framework of *halal* supply chain focuses on *halal* meat. The most interesting issues is customer behavioral and believe which explain the willingness of customer to buy *halal* meat because of the logo, certification, believe, behavior and ethnic, the customer not only comes from Muslim but also non-Muslim, it contributes 28% followed by Slaughtering process with 19%, which explains about the way to produce *halal* meat since the growth of technology makes the slaughtering process can be carried out massively by using high technology. And the same contribute by company management with 19%, explains that manage the company included in organizational and employee skill in order to handle the *halal* product is becomes important because *halal* meat should be support with *halal* process and maintain in *halal* way as well. In order to produce *halal* meat, all the processes must be *halal* as well, 16% for delivery process and inventory, which mention some activities that need to be considered in delivery and storage of *halal*

meat, it is followed by *haram* contamination detection which contributes 12% and the last is Islamic purchasing which contributes 6%. This study is also supported by Al-Quran and Hadiths as the guidance to determine whether the process is *halal* or not because the guidance and the steps of *halal* processes to produce *halal* meat have already been explained in Al-Quran, but with the growth of technology many shortages in processing the *halal* product are found, thus the journal is used as the reference to make a framework of *halal* process to produce *halal* meat but still the framework parameters that must be met the rules from Al-Quran and Hadith.

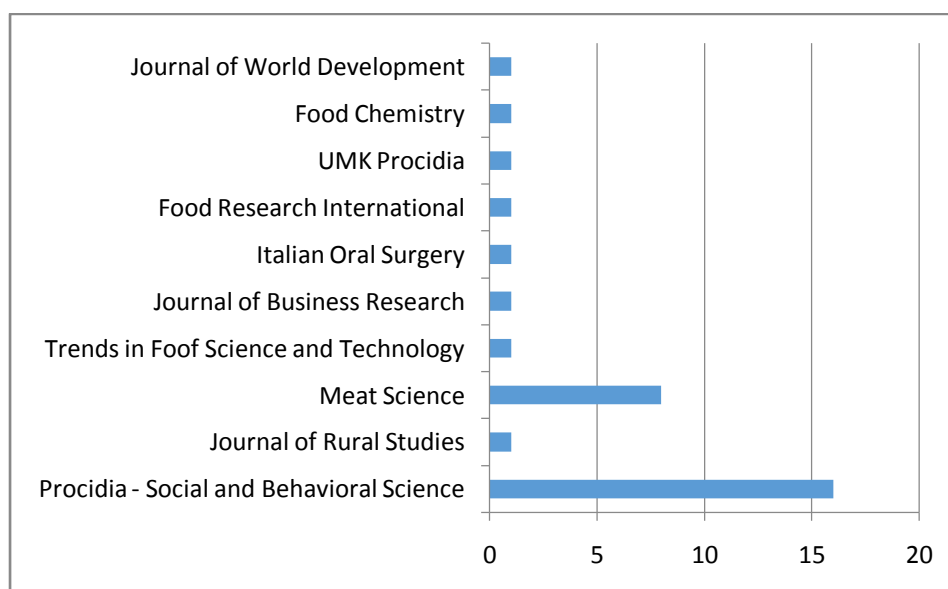


Figure 2.5 Publication Journal

Figure 2.5 shows the publisher of selected papers that employed to conduct the research. In terms of number of publication papers, Procedia – Social and Behavioral Science contributes with 16 papers of journal followed by International Journal of Meat Science with 8 papers, also followed by another publication with only contribute a paper each.

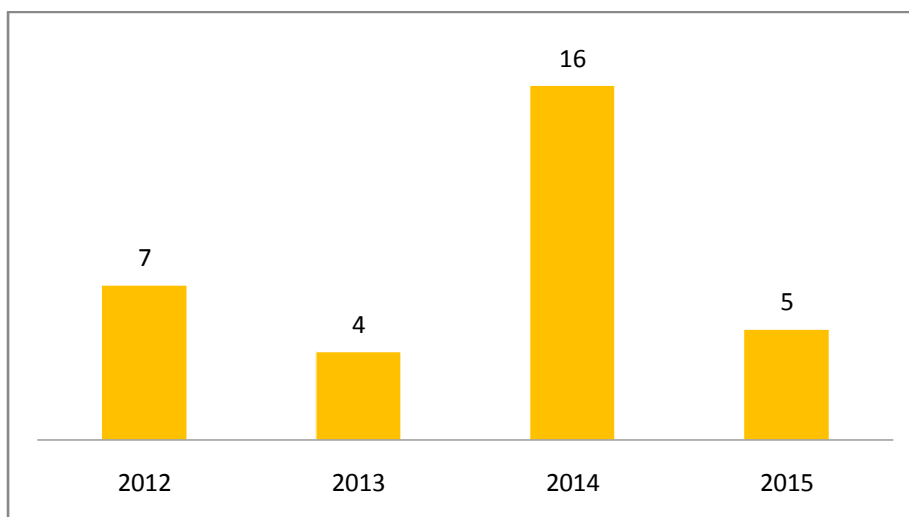


Figure 2.6 Publication Year

Figure 2.6 shows the publication year, it shows the publication year of selected papers for this research, the papers are taken from 2012 until 2015. In 2012, 7 selected papers are created, 4 papers from 2013, 16 papers from 2014, and 2015 contributes 5 papers.

Table 2.1 Supply Chain Framework of *Halal* Meat Paper Included in Systematic Literature Review

NO	AUTHOR	YEAR	TITLE
1	Syed Ghazaly Alqudsi	2013	Awareness and Demand for 100% <i>Halal</i> Supply Chain Meat Products
2	Mustafa M. Farouk	2013	Advances in the industrial production of <i>halal</i> and kosher red meat
3	John Lever, Mara Miele	2012	The growth of <i>halal</i> meat markets in Europe: An exploration of the supply side theory of religion
4	Khadijah Nakyinsige, Yaakob Bin Che Man, Awis Qurni Sazili	2012	<i>Halal</i> authenticity issues in meat and meat products
5	Abdul Hafaz Ngaha,	2014	Adoption of <i>Halal</i> Supply Chain among Malaysian <i>Halal</i>

NO	AUTHOR	YEAR	TITLE
	Yuserri Zainuddinb, Ramayah Thurasamy		Manufacturers : An exploratory Study
6	Marco Tieman, Maznah Che Ghazali	2014	<i>Halal</i> control activities and assurance activities in <i>halal</i> food logistics
7	Wim Verbeke, Pieter Rutsaert, Karijn Bonne, Iris Vermeir	2013	Credence quality coordination and consumers' willingness-to-pay for certified <i>halal</i> labeled meat
8	Mohd Hafiz Zulfakara, Marhani Mohamed Anuarb, Mohamed Syazwan Ab Talib	2014	Conceptual Framework on <i>Halal</i> Food Supply Chain Integrity Enhancement
9	Ahmad Jamal, Juwaidah Sharifuddin	2014	Perceived value and perceived usefulness of <i>halal</i> labeling: The role of religion and culture
10	Norazlina Abdul Aziza, Siti Sarah Sulaiman	2014	Role of the Local Authority in Issuing License for <i>Halal</i> Certified Premise in the City of Shah Alam
11	Hazwani Ahmad Tarmizia, Nitty Hirawaty Kamarulzamana, Ismail Abd Latiffa, Azmawani Abd Rahman	2014	Factors influencing readiness towards <i>halal</i> logistics among food-based logistics players in Malaysia
12	M.M. Farouk, J.M. Regenstein, M.R. Pirie, R. Najm, A.E.D. Bekhit, S.O. Knowles	2015	Spiritual aspects of meat and nutritional security: Perspectives and responsibilities of the Abrahamic faiths
13	Rohana Kamaruddin, Hadijah Iberahim	2012	Willingness to Pay for <i>Halal</i> Logistics: The lifestyle choice

NO	AUTHOR	YEAR	TITLE
	Alwi Shabudin		
14	Nor Marini Mohtara, Nur Alia Amirnordin, Dr. Hazliza Haron	2014	Ayamas Food Corporation Sdn. Bhd: A Study on the Factors of Consumer Behaviour towards <i>Halal</i> Product Selection
15	Rahimah Mohamed Yunos, Che Faridah Che Mahmood, Nor Hafizah Abd Mansora	2014	Understanding Mechanisms to Promote <i>Halal</i> Industry- The Stakeholders' Views
16	Mahiah Saida, Faridah Hassan, Rosidah Musa Rahman, N.A.	2014	Assessing Consumers' Perception, Knowledge and Religiosity on Malaysia's <i>Halal</i> Food Products
17	Shazlinda Md Yusof, Noriyuki Shutto	2014	The Development of <i>Halal</i> Food Market in Japan : An Exploratory Study
18	Aiedah Abdul Khalek	2014	Young consumers' attitude towards <i>halal</i> food outlets and JAKIM's <i>halal</i> certification in Malaysia
19	Ibrahim S. Othman, M	2014	Malaysian Diaspora strategies in a globalized Muslim market
20	Dyah Ismoyowati	2015	<i>Halal</i> Food Marketing: A Case Study on Consumer Behavior of Chicken- based Processed Food Consumption in Central Part of Java, Indonesia
21	Norrahimah Kassima, Puziah Hashima, Dzulkifly Mat Hashima, Hamdan Jol	2014	New Approach of <i>Samak</i> Clay Usage for <i>Halal</i> Industry Requirement
22	Chiratus Ratanamaneichat, Sakchai Rakkarn	2013	Quality Assurance Development of <i>Halal</i> Food Products for Export to Indonesia
23	Nor Sara Nadia Muhamad Yunus, Wan Edura Wan Rashid,	2014	Muslim's Purchase Intention towards Non-Muslim's <i>Halal</i> Packaged Food Manufacturer

NO	AUTHOR	YEAR	TITLE
	Norafifa Mohd Ariffina, Norhidayah Mohd Rashid		
24	M. van der Spiegel, H.J. van der Fels-Klerx, P. Sterrenburg, S.M. van Ruth, I.M.J. Scholtens-Tomz, E.J. Kok	2012	<i>Halal</i> assurance in food supply chains: Verification of <i>halal</i> certificates using audits and laboratory analysis
25	A. Velarde a,P. Rodriguez, A. Dalmau, C. Fuentes, P. Llonch, K.V. von Holleben, M.H. Anil, J.B. Lambooi, H. Pleiter, T. Yesildere, B.T. Cenci-Goga	2014	Religious slaughter: Evaluation of current practices in selected countries
26	Rizvan Khalid, Toby G. Knowles Steve B. Wotton	2015	A Comparison of Blood Loss during the <i>Halal</i> slaughter of Lambs following Traditional Religious Slaughter without Stunning, Electric Head-Only Stunning and Post-Cut Electric Head-Only Stunning
27	Zainor Nasrah Abdul Rahmana, Siti Khadijah Ab Manan	2014	<i>Tawarruq</i> as a Useful Instrument to Finance Retail the <i>Halal</i> Way.
28	Novi Puspitasari	2015	Hybrid Contract And Funds Efficiency Management Of Islamic General Insurance Company (Study In Indonesia)
29	Khadijah Nakyinsige, Yaakob Bin Che Man,	2012	<i>Halal</i> authenticity issues in meat and meat products

NO	AUTHOR	YEAR	TITLE
	Awis Qurni Sazili		
30	Md. Eaqub Ali, Md. AbdurRazzak , Sharifah Bee AbdHamida, Md. MahfujurRahmana, Md. Al Amina, NurRaifanaAbd Rashid, Asing	2015	Multiplex PCR assay for the detection of five meat species forbidden in Islamic foods
31	M.E. Ali, U. Hashim, S. Mustafa, Y.B. Che Man, Th.S. Dhahi, M. Kashif, Md. Kamal Uddin, S.B. Abd Hamid	2012	Analysis of pork adulteration in commercial meatballs targeting porcine-specific mitochondrial cytochrome b gene by TaqMan probe real-time polymerase chain reaction
32	Yasemin Demirhan, Pelin Ulca, Hamide Z. Senyuva	2012	Detection of porcine DNA in gelatin and gelatin-containing processed food products— <i>Halal/Kosher</i> authentication

#### 2.2.4 Supply Chain Framework Focus on *Halal* Meat Analysis

From total number of 32 papers that complied with selection criteria, it is selected which correlated with *halal* supply chain especially for *halal* meat which is slaughtering process, *halal* supply chain management, *haram* contamination detection, company management in order to maintain *halal* meat, Islamic purchasing and customer behavioral and believe toward *halal* meat. The following section will explain different study of *halal* supply chain focused on *halal* meat.

#### 2.2.4.1 Slaughtering Process

Slaughtering process is the basic but very important part to produce *halal* meat. The predicate of *halal* certification, label and logo are given to meat based on this slaughtering process. By the increasing of demand and the improvement of technology, the stunning of animal is conducting in the substantial amount of animal by employing machines both mechanical and electrical (Mustafa M. Farouk, 2013). But the way to slaughter in order to produce *halal* meat must be fulfilled under the Islamic Law requirement.

Some method was derived by following researcher, (Farouk et al., 2015; Mustafa M. Farouk, 2013; Lever & Miele, 2012; Nakyinsige et al., 2012 and Velarde et al., 2014) conducted the research in the way of slaughter based on Islamic Law. They performed several researches on slaughter by considering the animal welfare and they also mentioned that not all animals, which are slaughtered in Islamic way will become *halal* meat. For example, even though a pig is slaughtered in Islamic way, it still considered as *haram* meat because specifically Al-Qur'an mentions that pigs are type of animal that are not allowed to be consumed by Muslim.

Farouk (2013) stated that the important requirement for *halal* meat is the animal has to be slaughtered alive without stunning process. Farouk et al., (2015) mentioned some animals that are allowed to consume according to Islamic law, those are cow, sheep, goat, buffalo, rabbit, camels, horse, chicken, duck, turkey, goose, ostriches, emus, fish (animal in sea are allowed to be consumed without slaughtering process) and some which are *haram* or not allowed to be consumed such as pig, eagle,

donkey, tiger, lion and the other animal that fangs and sharp-toed. Those allowed-to-consume animals above also allowed to be consumed by the Jews and Christian.

Based on Al-Quran and Hadits and supported by the research above the way to stunning in Islamic Law as follows:

1. The animal is included in allowed-to-consume animal based on Al-Quran and Hadits.
2. The animal has to be slaughtered alive except sea animal that can be consumed without slaughtering and still allowed to consume even it found in death condition.
3. The tools to slaughter must be sharp, it can be made from metal, stones or bamboo (tools from teeth and nails are not allowed).
4. Starting slaughtering by saying *basmalah*(the name of Allah).
5. Then inscribe the knife on the neck of slaughtered animal until the vessel of eating, drinking, breathing, right and left jugular vein break .

#### **2.2.4.2 Delivery Process & Inventory**

When the meat has already slaughtered in correct procedure according to Islam, , it is possible to be *haram* (forbidden) meat when it comes to customer hand, if the supply chain in not conducted in *halal* way. To keep the meat in *halal* condition then, supply chain management must be maintained *halal* as well. Some methods to conduct *halal* supply chain have been suggested by following researchers, (Kassim et al., 2014;

Ngah et al., 2014; Spiegel et al., 2012; Tieman & Ghazali, 2014; Wright & Annes, 2013 and Yunus et al., 2014).

The steps that must be considered to obtain the *halal* status are started from the slaughtering process. Ngaha et al., (2014) stated that talking about *halal* food, then the supply chain for the *halal* product must be *halal* as well, because *halal* food is not guaranteed will be *halal* to be consumed unless the supply chain is also *halal*. Based on the journals reviewed above, there are three important things that should be considered in *halal* supply chain, those are delivery process, warehousing and packaging.

#### 1. Delivery Process

*Halal* and non-*halal* goods must be separated (not allowed to be mixed), different load carrier, container and transportation vehicle. Before stuffed or load the *halal* goods, the vehicle or container must be cleaned, to avoid the contamination of non-*halal* things especially for wet (chilled, frozen) environment.

#### 2. Warehousing

Same as the transportation, warehouse of *halal* meat must be separated with non-*halal* meat. Logo of *halal* also needs to be attached in the outside of warehouse which facilitates only for *halal* meat.

### 3. Packaging

Package is the way of communication. Special package for *halal* meat must be attached with the logo or label. Yunus et al., (2014) said that descriptively, majority of the customer will see the statement of *halal* and product ingredient on the package which encourages the willingness to buy the product.

#### 2.2.4.3 *Haram Contaminate Detection*

Food to consume usually reflection of the culture, for example in Indonesia rice is the daily food while in Europe is bread, Korean usually drink traditional fermentation drink / *soju, sake* in Japan, etc. But for Muslim, choosing food depends whether it is *halal* or not because even traditional food/drink might be considered *asharam*. *Halal* is determined by Qur'an and Hadits.

Currently, Muslim becomes more concern about meat. Meat product usually contained if pork, gelatin, blood plasma etc (Ali et al., 2015; Ali et al., 2015 and Demirhan et al., 2012) mentioned that method that can be used to detect whether that *halal* meat in market is contaminated with *haram* ingredients or not, it is PCR (Polymerase Chain Reaction). PRC is one of methods that can be used to detect *haram* contamination by detecting its DNA. Based on Nakyinsige et al., (2012) there are some analytical techniques to detect *haram* contamination in meat based on authenticity issues that want to be detected. Pork adulteration can be detected using PDR-RELP, Real time PCR, species-specific PCR, RAPD and PCR Sequencing, pork protein can be detected using ELISA, Chromatography, Peptide examination and

Isoelectric focusing, pork fat (lard) can be detected using FTIR spectroscopy, DSC and Electronic nose while blood plasma can be detected using Isoelectric focusing, ELISA, Immunodiffusion and LC-M5/MS.

All the methods above can be used to detect contamination in *halal* meat, but will not explain specifically since it contains chemical processes which exclude from industrial engineering studies.

#### **2.2.4.4 Company Management**

Company management becomes important in order to keep the *halal* of meat because *halal* meat should be maintained in the right way. Thus the company, in terms of organizational and employees must have knowledge and skills to handle *halal* meat. The management also needs to consider the quality of the product to keep the customer believes and loyalty.

Some researches related to company management have been carried out by following researcher, (Ibrahim, 2014; Mochtar et al., 2014; Ratanamaneichat & Rakkarn, 2013; Tarmizi et al., 2014; Yunos et al., 2014 and Zulfakar et al., 2014).

Tarmizi et al., (2014) mentioned five internal factors of company that should be considered to maintain *halal* meat, those are;

1. In a way to ready and prepare to change towards *halal* product, new vision of leadership must be prepared.

2. Support the organizations to be ready and able to perform *halal* system in their company and provide proper preparation for the whole system to face any failure or problems and risks. Yunos et al., (2014) also stated that marketing strategy including preparation to improve the production of *halal* product.
3. Setting the environment. An efficient workplace will promote better performance among employees to perform the *halal* system according the *Halal* requirement.
4. Employee acceptance also important to consider. Training related to *halal* requirement needs to be conducted in order to deliver the *halal* concept to the workers. In Yunos et al., (2014) *halal* is included in training, which is to create and educate both entrepreneur and employee behavioral toward *halal* system.

*Halal* Assurance system provides general guidelines for all *halal* operations on the company. Zulfakar et al., (2014) mentioned several assurances that should be earned by the company to prove that the product is truly *halal* all the way, those are *halal* certification, *halal* standards, *halal* traceability and *halal* dedicated assets.

#### **2.2.4.5 Islamic Purchasing**

*Halal* product must be handled in *halal* way and must be in *halal* way as well. Related to the purchasing according to Islam, there is a crucial lack in trading activity, which is *riba* (interest). Rahman & Manan (2014) mentioned one type of trading activity that really close *toriba* issue is *tawarruq*(purchasing a commodity on a deferred price, later selling it to a third party with the objective of obtaining cash). They explained that in *tawarruq* activity the purchaser has the privilege to sell the commodity to any third

party of his choice, but this concept of *Tawarruq* is disputed by some scholars, its usefulness as an instrument of financing (for now) is unarguable owing to the fact that it is necessary as a way to avoid the prohibited *riba*. While *tawarruq* is still in debating whether it is *halal* or *haram*, Puspitasari (2015) mentioned an Islamic concept that implemented in Islamic general insurance company in Indonesia, it is *mudharabah* contract.

*Mudharabah* concept is a partnership contract (partnership) which is based on the principle of profit sharing by someone to give their money to others for conducting business and both parties share the profits or losses based on the content of agreement. This concept is quite difficult to implement in retail business. But point that can conclude from this concept is partnership contract (partnership). Contract is really important in trading activity, for example producer and retailer have to agree on a contract in order to buy product so each party know how much the production cost and interest that will be taken by the producer. This contract is important to give clear information related to cost that will be spent in producing a product and interest that will be taken by the producer, so it will avoid loss in one side of party or each party feels that the transaction runs fairly.

Saleh & Shobahi (2007) mentioned that trading principal in Islam known as *mudharabah*, *istisna*, *salam*, *murabahan*, etc, is explained that trading principal in Islam implements product with low inventory cost but high profit. *Riba* (excessive interest) in Islam is *haram* since implementing interest in credit trading cause loss for one party (buyer/seller) in this activity. *Murabahan* principal should be implemented in trading since it will make the needs of both party balances; where in this principal

seller should be honest to inform the buyer about cost of goods and profit that will be taken by the seller. By implementing this principal, buyer will be familiar with production cost so it will easier to determine the number of profit.

#### **2.2.4.6 Customer Behavior and Believe**

The reason to develop the study on *halal* supply chain especially for *halal* meat, beside the improvement of Muslim population, *halal* meat is not only consumed by the Muslim but also by the Jews and other customers with certain ethnics and behavior.

The following researches, (Ahmad et al., 2014; Alqudsi, 2014; Aziza & Sulaliman, 2014; Ismoyowati, 2015; Kamaruddin et al., 2012; Khalek, 2014; Said et al., 2014; Verbeke et al., 2013; Yusof & Shutto, 2014) are conducted to identify the costumer's willingness and factor that influences the eager to buy the *halal* product especially *halal* meat, also to see the costumer's behavioral towards *halal* product.

Based on the above research, the most affecting attributes that encourage the willingness of the customer to buy *halal* product is logo or label. In Malaysia and Australia "the display of *Halal* Logo and Certificate" become the most important attribute to recognize the *halal* product, while the price of *halal* meat is not considered as the important consideration before making a purchase (Alqudsi, 2013). While for Belgian Muslim Logo of "Muslim Township" in the shop, which sell *halal* product is more important rather than labeling the product (Verbeke et al., 2013). Similar with Malaysia and Australia, Jamal & Syarifuddin (2014) mentioned that for British

Muslim, *Halal*-labeled win the heart of customer which impacts to the satisfaction, commitment and loyalty of the customer.

However, *halal* supply chain for *halal* meat must consider all process from the early process on the meat, which are: slaughtering process and delivery process and inventory, then company management have to guarantee that the employee whom handle the *halal* product must have skill and knowledge about *halal*. Assurance and *halal* standard also needed to be implemented well by the company in order to persuade the willingness of the customer to consume *halal* product especially *halal* meat. Not only by the end of supply chain but *halal* status must be considered in trading activity as well, especially from producers to retailer, it should have clear contract in order to avoid the loss in one side of the party.

## CHAPTER III

### RESEARCH METHODOLOGY

This chapter will explain the steps for conducting the research are applied as references in order to keep focusing on the primary goals, which are going to be achieved.

#### 3.1 Location of Studies and Selection

The process of studies' search for this research is conducted by using electronic database which is taken from Elsevier Publisher (sciencedirect.com). In order to find more valid information accordance with current issues, this research employs papers from the last five years, papers that were published from 2011-2015 including the papers in 2015 "in press" which will be published in 2016. According to the objectives of this research, the references that are reviewed focused on paper of supply chain management especially *halal* supply chain of *halal* meat. The keywords which are set on the *halal* meat supply chain search in electronic database, include supply chain, *halal* supply chain, and *halal* meat. Thus, based on the focus of the research there are two kinds of papers that will be reviewed; the paper of *halal* meat that related to the *halal* process in order to get *halal* meat and paper related to *halal* supply chain.

Search result includes peer-reviewed article, published in academic journals and the proceedings of international conferences only. According to Saunders et al.

(2012) and Garza-Reyes, (2015) these source papers are the most useful and reliable for literature review.

### **3.2 Planning and Research tool**

The topic that will be discussed is *halal* supply chain. Since literature review consists of a method, which is systematic, explicit, and reproducible (Fink, 2005), the research questions are presented in the previous section have been addressed based on a systematic review of the existing literatures.

There are some phases in conducting systematic literature review, Garza-reyes (2015) explained there are 5 phases in reviewing the literature systematically, those are; question formulation, locating studies, study selection and evaluation, analysis and synthesis, last is reporting and using the result.

The literature review will explain *halal* supply chain on *halal* meat, involving 32 papers of journals that found from selected electronic database. Several tools were also used for conducting systematic literature review, such as Microsoft excel for data extraction, and Mendeley desktop for paper selection.

The papers that are selected to be reviewed are based on the topic of supply chain that is focused on *halal* meat. The position of *halal* supply chain in the topic of supply chain can be seen in the figure below:

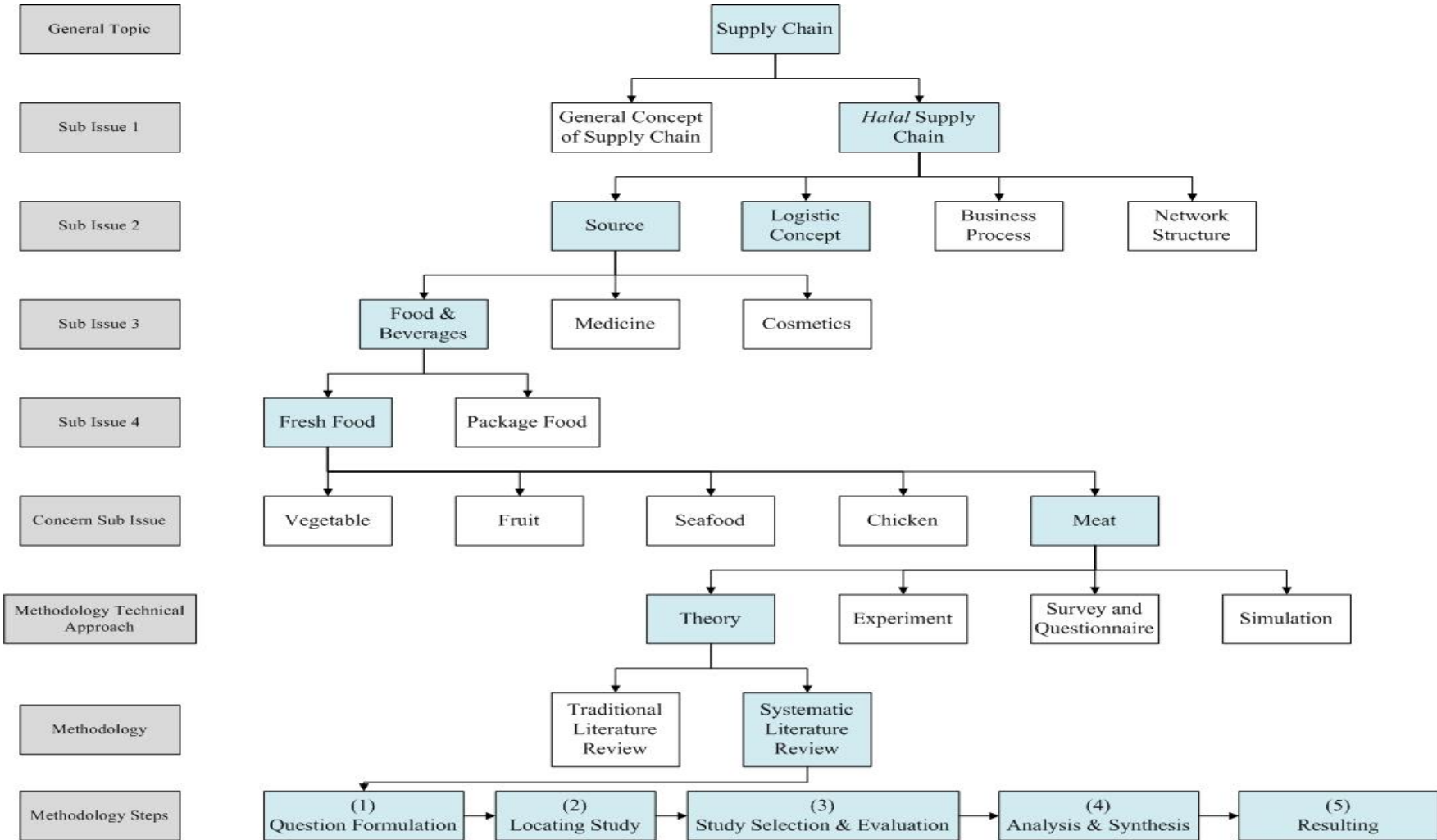


Figure 3.1 K-Chart Planning and Tools

### 3.3 Conceptual Model

By focusing on the topic that already mentioned in K-Chart above, the method and tools should be determined and prepared to review the literature systematically. The conceptual model of Garza-reyes (2015) is implemented to conduct systematic literature, so there are five phases that must be prepared. The picture below shows the steps and tools that needed to conduct systematic literature based on the reference.

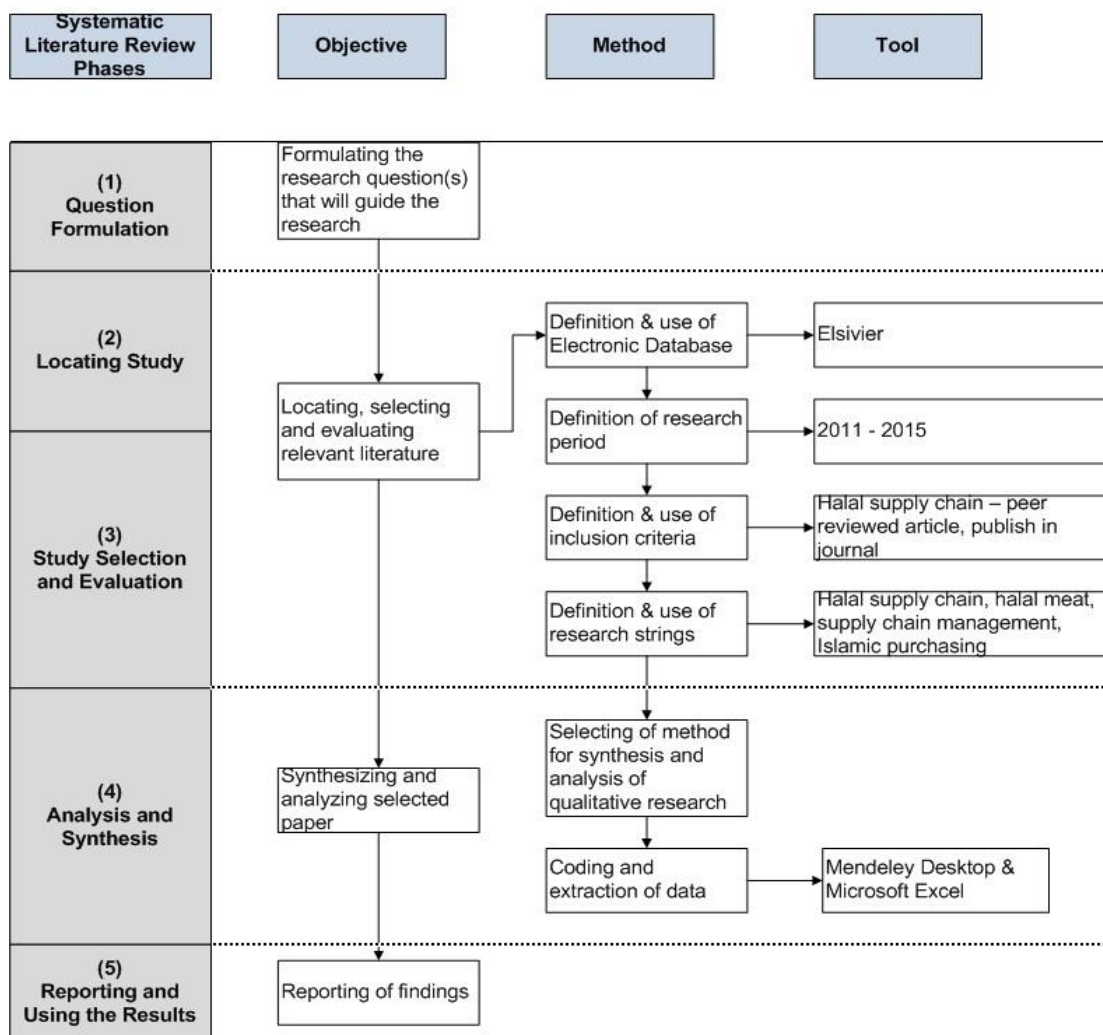


Figure 3.2 Step, method and tools Systematic Literature Review

Picture above shows that there are five steps of systematic literature review and there are three points of steps to get the result, those are objective, method and tool. Objective is the specific explanation on what will be done during the phase, and then method contains further information on how the phase is doing and the last is tool to complete the method. Further information of each step will be explained below:

1. Phase 1: Question Formulation.

This is very basic phase which formulates the question(s) that will guide the whole research steps to find the result. Research was conducted based on the question(s) formulation. It was started from background which explains the current condition or issues then based on it, question(s) related to problem is occurred and formulated related to the issues resumed in the background. Background, problem formulation, problem objectives to answer the problem formulation, and limitation are mentioned in Chapter 1.

2. Phase 2: Locating Study

After information related to current condition or issues that is formulated. To answer the problem, then study locating is needed. Study locating is conducted to focus the topic of studies and determine the media/database that provides the proper papers to support the research. Elsevier electronic database which can be accessed in [www.sciencedirect.com](http://www.sciencedirect.com) is chosen to gather paper that will be reviewed in order to answer the problem

formulation. Papers that used are related to *halal* supply chain focused on *halal* meat.

### 3. Phase 3: Study Selection and Evaluation

In phase 2, the main topic and the electronic database as media to provide proper papers are determined to support the research. Then, in this phase, papers that collected are selected and evaluated. Selection and evaluation are needed to make constrain or limitation of the research so the research will be focused on the topic that will solve the problem. Since Elsvier database has lots of paper. Even though, the papers that gathered are related to the research topic, but it is possible that the studies in that paper are inappropriate with the topic that will be discussed in this research. Literatures that will be reviewed in this research are papers which published during period of 2011-2015 about *halal* supply chain, *halal* meat, supply chain management and Islamic purchasing. Peer reviewed articles, which are published in journal are criteria of the paper that will be reviewed.

### 4. Phase 4: Analysis and Synthesis

Selected papers from phase 3 will be reviewed in this phase. This is very important phase since the main activity of literature review is located in this phase. Literature review is conducted to find the solution on the problem that mentioned in Chapter 1. Then papers of *halal* supply chain focused on *halal* meat will be grouped based on the sub-discussion-topic. This grouping is

conducted to see the aspects that affect the main topic which can solve the problem. Based on the papers that collected, there are five groups that influence the supply chain of *halal* meat, which are slaughtering process, *halal* supply chain which covers of warehouse, transportation and inventory, purchasing, customer behavioral and management of the company.

Mendeley Desktop and Microsoft Excel are used as tools in this phase. Mendeley Desktop is used to group the journal based on the sub-discussion-topic, based on journal publication and year of publication. Mendeley Desktop also will automatically input the citation in the reference if a journal is cited from Mendeley Desktop. Microsoft Excel is used to show the proportion of papers that reviewed in graph based on sub-discussion-topic, based on journal publication and year of publication.

## 5. Phase 5: Reporting and Using the Result

This phase is last phase which shows the conclusion of the problem that occur and the solution of the problem. This phase will facilitate the supply chain framework of *halal* meat and the development of the result can be used as recommendation for further research.

### 3.4 Study Protocol

Protocol is needed to conduct the study. Flowchart below shows the steps of the study from beginning until it end. It shows the whole chapters that are discussed in this study.

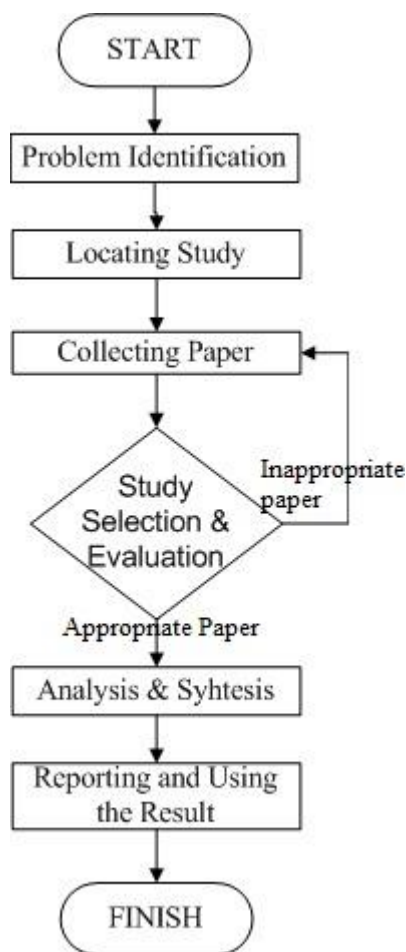


Figure 3.3 Flowchart of Study Protocol

The study is conducted based on the stages as shown in the flowchart above (Fig3.3). There are five main stages that conducted; first stage is locating study. In this stage, the main topic and media that used to collect the paper is determined. Then, based on the determination topic, Elsvier Electronic Database which accessed in [www.sciencedirect.com](http://www.sciencedirect.com) was chosen as media The collected data will be selected and evaluated, if the paper is can be used to support the study then it will transfer to next stage but if the paper is inappropriate then re-collecting paper is needed. Appropriate papers will be transfer to the fourth stage which is analysis and synthesis. This is the

most important stages since the main activity of the literature review to solve the problem formulation is conduct in this stage. In order to provide a comprehensive report, the analysis stage, were designed to discuss the result. And the last stage is reporting.

## CHAPTER IV

### DATA ANALYSIS AND SYNTHESIS

This chapter will explain the analysis and synthesis in phase of systematic literature review. It will explain how the selection method carried out for synthesis and analysis, and how the extraction on data of papers will be executed.

#### 4.1 Data Synthesis

Studies for this research are derived by using electronic database which is taken from Elsevier Publisher (sciencedirect.com) with total number 32 papers that complied with selection criteria. The papers are referred to supply chain, *halal* supply chain which focused on *halal* meat. 32 papers of supply chain that focused on *halal* meat consist of some sub-topics that have correlation among each other which create a framework of *halal* supply chain of *halal* meat. Below, it will be shown the result of data synthesis from papers to conduct systematic literature review. They are synthesized based on sub-topic, publication of journal and year of publication. The percentage of each sub-topic contribution can be seen in figure below.

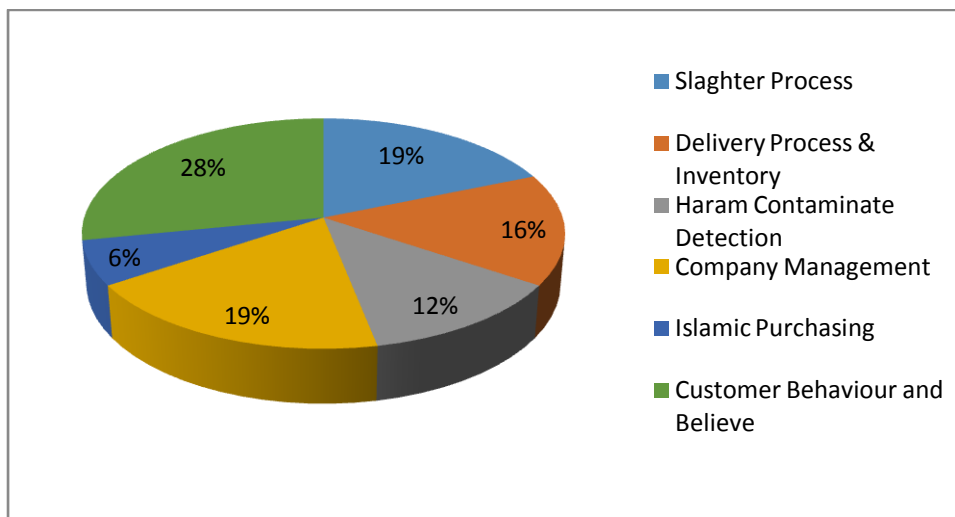


Figure 4.1 Studies of Supply Chain Framework of *Halal Meat*

The figure above shows the percentage of the studies of supply chain framework focus on *halal* meat which  $n = 32$ . The figure 4.1 shows the percentage of each sub-topic contribution which creates a framework of *halal* supply chain focuses on *halal* meat where customer behavioral and believe give the highest with 28% of contribution, followed by slaughter process and company management which contribute 19% each, then 16% for delivery process and inventory, followed by *haram* contaminate detection which contribute 12% and the last is Islamic purchasing which contribute 6%.

32 papers which consist of some sub-topics, which create the supply chain framework of *halal* meat is derived from some publication of journals. The number of papers that used based on publications of journals are shown in figure below.

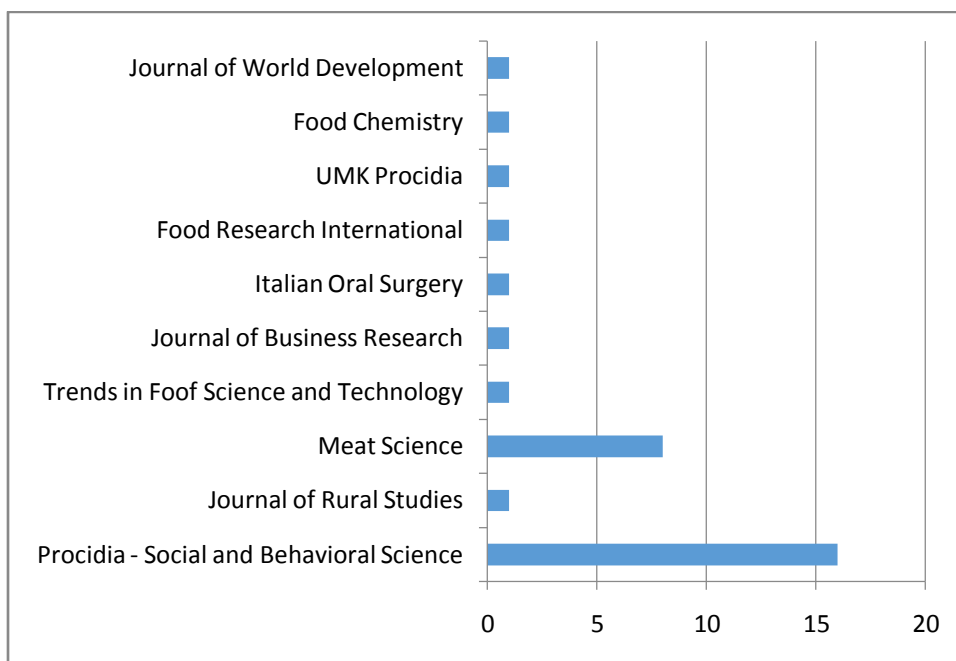


Figure 4.2 Publication Journal

The synthesizing process is started by synthesizing 32 collected papers based on the sub-topic which showed in figure 4.1, then, it is synthesized based on the publication of journal. Figure 4.2 shows that most papers are taken from Procedia – Social and Behavioral Science which contributes 16 papers, followed by International Journal of Meat Science with 8 papers, also followed by other publication with only one contribution of paper each.

In order to find the more valid information accordance with current issues, this research uses papers from past five years, which the papers only published during 2011-2015 including the paper 2015 “in press” that will be published in 2016. The number of paper contribution based on year of publishing can be seen below.

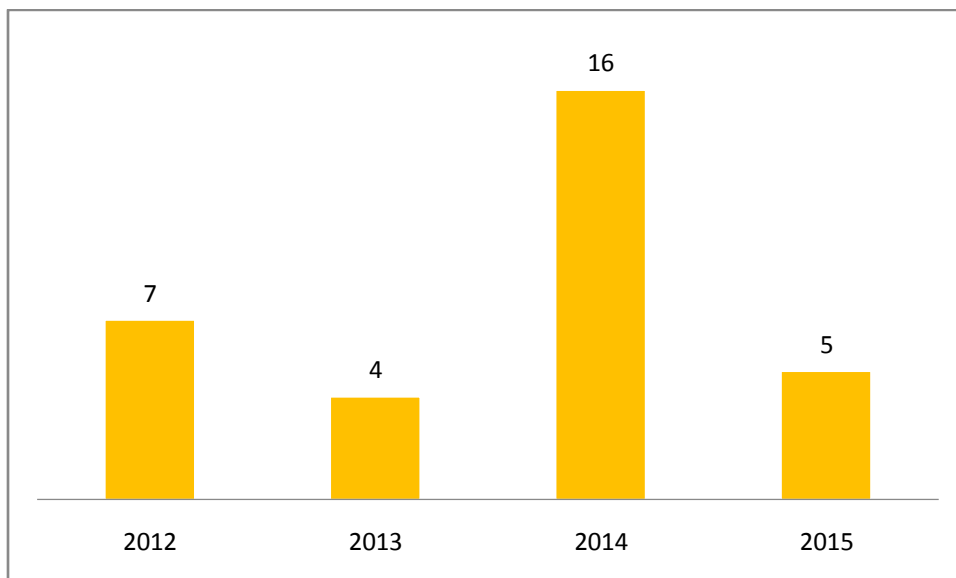


Figure 4.3 Publication Year

Figure 4.3 shows the publication year, it shows the publication year of the research was conducted, the year of research are scattered 2012 until 2015. In 2012, 7 were taken place for the research, 4 papers are conducted in 2013, 16 papers in 2014, and year 2015 contributes 5 papers.

## 4.2 Data Analysis

Total of 32 papers from Elsevier are selected. From synthesizing process, 32 papers are selected based on their criteria that have some sub-topics of the studies which create a supply chain framework of *halal* meat. Those sub-topics consist of *Halal* supply chain, company management, Islamic purchasing, and customer behavior and believe where for *halal* supply chain explains more about slaughtering process, delivery process and inventory and *haram* contamination detection.

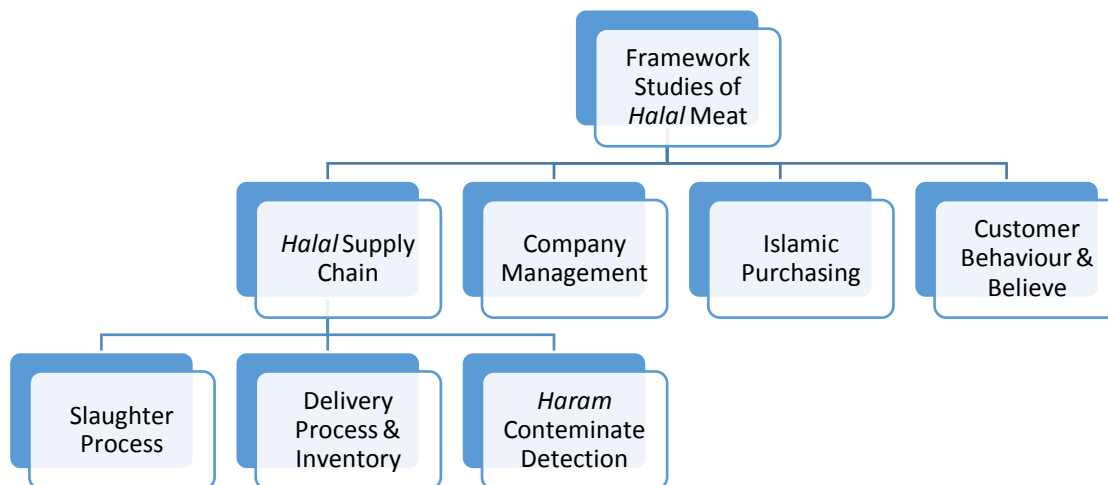


Figure 4.4 Framework Studies

Figure 4.4 shows the sub-topic of studies which create a framework of *halal* supply chain for *halal* meat. It shows that there several aspects that must be concerned and considered in order to create a supply chain framework to keep *halal* meat still *halal* until it delivered to costumer's hand.

Below is the short explanation on the contribution of each sub-topic in order to create a framework of *halal* supply chain for *halal* meat.

#### 4.2.1 Slaughtering Process

Slaughtering process is the basic but very important step to produce *halal* meat. The predicate of *halal* certification, label and logo are given to meat based on this slaughtering process.

Faurok et al., (2015) mentioned some animals that are allowed to consume according to Islamic law and they should be slaughtered before being consumed. Also mentioned by Farouk (2013) that the important requirement in slaughtering for *halal* meat is the animal has to be slaughtered alive without stunning.

#### 4.2.2 Delivery Process and Inventory

Eventhough that the slaughtering process has fulfilled the requirement, but it is still possible that the *halal* meat become *haram* if in the next process such as transportation and inventory there is contamination of *haram* thing. Thus, to keep the meat in *halal* condition then, process from the slaughtering until the *halal* meat ends in costumer's hand, the whole process must be considered *halal* especially in delivery process and inventory.

Ngaha et al., (2014) mentioned that all the tools that used in processing *halal* meat such as vehicle, transport load (trolley), knife, and inventory place must be separated (not allowed to be mixed) with non-*halal* product.

#### 4.2.3 *Haram* Contaminate Detection

Currently, Muslim becomes more concern about meat. Meat product usually contains pork, gelatin, blood plasma, etc, the analytical techniques to detect *haram* contamination in meat that can be used are PRC, PDR-RELP, Real time PCR, species-specific PCR, RAPD, PCR Sequencing, ELISA, Chromatography, Peptide examination, Isoelectric focusing, Immunodiffusion and LC-M5/MS.

#### 4.2.4 Company Management

Company management becomes important in order to keep the *halal* factors of meat because *halal* meat should be maintained in the right way, thus the company that represents by its organization and employees must have knowledge and skills to handle *halal* meat.

#### 4.2.5 Islamic Purchasing

*Murabahan* principal should be implemented in trading since it will make the needs of both party balance; where in this principal seller should be honest to inform the buyer about the cost of selling goods and profit that will be taken by the seller.

#### 4.2.6 Customer Behavior and Believe

As the final of the supply chain, the behavior of customer toward *halal* product must be seen and analyzed in order to get customer believe. In chapter II, it was mentioned that based on collected papers, the most affecting attributes that encourage the willingness of the customer to buy *halal* product is logo or label. Thus, the producer needs to concern on the label and also certification for *halal* product.

## CHAPTER V

### DISCUSSION

This chapter will discuss the research in a whole steps, and discuss the data analysis from systematic literature review step. There will be a framework of *halal* supply chain that focused on *halal* meat.

#### 5.1 Systematic Literature Review

Islam, Christian, Jews, Hindu, Buddha and other religions included culture believes are scattered all over the world. Each religion and culture has its own law in life such as Hindu that restrict its followers to consume cow meat, Islam as well rules certain type of animals that allowed to be consumed with its specific requirements in processing the animal before being consume, such as slaughtering.

Since the growth of Muslim in the world is increased thus, researches toward Islamic law become interesting. Based on the issues of Word Muslim growth, then some countries such as Europe countries, America, Korea, Japan, and other countries that run the daily life without Islamic law since the majority are Christian need to concern more to implement Islamic rule in some aspects in daily life. Not only to help the Muslim to be easier in performing activities in their life in Islamic minority country but also to conduct Islamic law in business to increase the profit. Focus on meat, in Islamic minority country, most of the people consumes pork while for

Muslim, pork is *haram*. That is why, it is important to recognize the *halal* animal for Muslim consumption especially for someone who runs food business such as restaurant. Not only the animal but also the slaughtering process determines whether the meat is considered as *halal* or *haram* since the improvement of current technologies makes the slaughtering process become easier but it does not mean that the slaughter process using technology is *halal*. Thus, in this research creating framework of supply chain for *halal* meat is important to show what steps that must be performed and the way to handle *halal* product. So, it finally will remain *halal* up to customer's hand.

Systematic literature review is a method to create supply chain framework of *halal* meat. It has already explained in chapter III that there are five steps to conduct systematic literature review; question formulation, locating studies, study selection and evaluation, analysis and synthesis, and the last is result and result's implementation. Question formulation was explained in chapter I, locating the studies, study selection and evaluation were explained in chapter II, data analysis and synthesis were explained in chapter IV and the last is result that will be explained in point 5.2 in this chapter and will be concluded in chapter VI.

The entire papers that reviewed are taken from Elsevier ([www.sciencedirect.com](http://www.sciencedirect.com)) electronic database. 32 papers of supply chain for *halal* meat are selected and separated based on the sub-topic of the studies, publication of the journal, and year of publication. Based on sub-topic of studies, there are 6 papers about slaughtering process, 5 papers explain about delivery process and inventory, 4 papers about *haram* contamination detection, 2 papers about Islamic purchasing and 9

papers about customer behavior and believe. Based on publication of journal, *Procedia – Social and Behavioral Science* contributes 16 papers of journal followed by *International Journal of Meat Science* with 8 papers, also followed by another publication, which contributes a paper for each. Last, papers are based on the publication years, which journals are reviewed above 2012 in order to get more valid data and referred to current technology. From 32 papers, 7 papers public in 2012 were taken for the research, 4 papers from 2013, 16 papers from 2014, and 2015 contribute 5 papers.

## **5.2 *Halal Supply Chain Framework of Halal Meat***

Framework of *halal* supply chain for *halal* meat is created from sub-topic of the studies related to *halal* supply chain for *halal* meat. By conducting systematic literature review, steps and aspects that needed to be considered in order creating *halal* supply chain framework of *halal* meat can be seen clearly, it is illustrated in the figure5.1.

The figure 5.1 below shows that framework of *halal* supply chain for *halal* meat is runby the company. First of all, in order to create *halal* supply chain people work on it should have enough knowledge, skills and understanding to handle *halal* product as well conduct enough trainings related to it. After it fulfilled, then *halal* supply chain can be conducted based on Islamic Law. Supply chain is started from the status of the animal, whether it allowed to be consumed or not. While in this research, the focus is meat thus early step that needed to be concerned about is slaughtering process. After that, delivery process of the *halal* meat must be considered since in this

process, there is probability of *haram* factor that may contaminate *halal* meat. Then, the vehicle that used to transport the *halal* meat, the carrier (trolley) even inventory place must be clean and not mixed with another product. In this research *haram* contaminate detection is included in supply chain management in order to help in labeling and certification. In this part will be mention some tools and chemical things that can help to know whether the meat is still *halal* or there is contamination during the supply chain process. This detection is the end of supply chain process but in order to create a framework then another aspect also need to be considered. The entire steps of supply chain are ended up in customer's hand. There is probability that from the beginning of supply chain process which is slaughter process until it is end in display of the market is conducted by more than a company, or it could say that there is trading activities between producers and retail until it ended up in customer's hand. So, implementing Islamic law in purchasing is needed because *halal* product should buy in *halal* way as well. And the last in the feedback, behavioral and customer's believe toward *halal* product need to consider as well, in order gaining customer loyalty.

More detail framework of *halal* supply chain for *halal* meat will be explain more detail in each sub-topic below.



Figure 5.1 Supply Chain Framework of *Halal* Meat

## 1. Slaughter Process

Slaughter process becomes one of step that needed to consider in running *halal* supply chain since there is the improvement of technology that makes an easy way to slaughter. Farouk (2013) mention that current technology makes slaughtering process able to conducted using both mechanical and electrical machine. He also mention that stunning before slaughter is needed considering the issues of animal welfare. But in Islamic ways slaughter process must be done while animal in normal alive condition. It is allowed to slaughter using machine without stunning. Slaughter with stunning is conduct since there is issue of animal welfare but in Islamic Law *halal* label of the meat is given because it is processed in Islamic way, not about animal welfare. Some must be considered about slaughter process in Islamic Ways are the tools to slaughter must be sharp, it can be made from metal, stones or bamboo (tools from teeth and nails are not allowed), starting slaughter by saying *basmalah*, then inscribe the knife on the neck of slaughtered animal until the vessel of eat, drink, breath, right and left jugular vein break.

## 2. Delivery Process & Inventory

Talking about *halal* food, then the supply chain for the *halal* product must be *halal* as well, because *halal* food is not guaranteed that it is *halal* to consume without applying *halal* supply chain. In this process all the tools that used to process the *halal* meat must be clean and not contaminate (already used) with *haram* meat / *haram* product such as alcohol etc. different load carrier, container and transportation vehicle, warehousing such as fridge, knife, cutting tool of *halal* meat must be separated/ not

allowed to mixed with other product to avoid contamination. And also good package is needed to keep *halal* meat from outside contamination and label of *halal* should be attached in the packaging so the worker can differentiate *halal* and non-*halal* product.

Tieman & Ghazali (2014) proof *halal* logistics system which is assures system of transportation, warehousing and terminals that conduct in Malaysia, Netherlands and China.

- a. Warehouse – Label to differentiate *halal* and non-*halal* product should be clear as a communication code in supply chain. Logo of *halal* also need to attached in the outside of warehouse which facilitate only for *halal* goods.
- b. Transportation – Before stuffed or load the *halal* goods, the vehicle or container must be cleaned, to avoid the contamination of non-*halal* things especially for wet (chilled, frozen) environment. *Halal* and non-*halal* good are allowed to place in the same container IF it has a proper tertiary packaging.
- c. Terminal – Even for sea, air, river and another terminal are the critical place where the coding of *halal* and non-*halal* goods should be used. It is also critical because, a dedicated *halal* cold room is often not possible.

### 3. *Haram* Contaminate Detection

When all the process is done, then detection of *haram* contamination must be conducted. This detection is important in producing *halal* label and certification for the meat.

Based on Nakyinsige et al., (2012) there are some *haram* material that currently being topic to study because it is usually mixed with *halal* meat, those are:

- a. The issue of pork substitution occurs since the material of *halal* meat is similar with the material of pork, and also the price of non *halal* meat is cheaper. The authenticity can be done by PCR-based techniques for pork detection which able to detect the DNA of pork, protein based techniques for pork detection, and analytical techniques for lard detection.
- b. The issue of blood plasma, which used as binding agent in meat product. Where ever the source of blood, activity of adding the blood is unacceptable for Muslim. The authenticity of *halal* meat to avoid this issue is detection of blood plasma which is heat-treated meat products using ultrathin-layer isoelectric focusing.
- c. Another issues such as casings, sausages, non-meat ingredients, can be fixed using analytical techniques for lard detection which is successfully detect the contamination of pork in beef and chicken using 20nm gold particles as colorimetric sensors.

#### 4. Company Management

Support the organizations to be ready and able to perform *halal* system in their company and provide proper preparation for the whole system to face any failure or problems and risks should be done by the company. Held training for the worker is one of the ways of supporting. Training is needed to give knowledge and create the

sills to the worker about the way to handle *halal* meat. Another supporting ways is setting the environment. An efficient workplace will promote better performance among employees to perform the *halal* system according the *Halal* requirement. Tarmizi et al., (2014) mention about five factors influencing readiness towards *halal* logistics, those are :

- a. Vision to change - New vision of leadership should be put into consideration in a way to ready and prepare to change towards halal logistics.
- b. Management support - This will help the whole organization to be ready and able to perform *halal* logistics system in their companies and provide proper preparation for the whole system to face any failure or problems and risks.
- c. Environmental factors - An efficient workplace will promote better performance among employees to perform the halal logistics operations according the *Halal* logistics requirement.
- d. Employee acceptance - *Halal* training will be the most important part to deliver the *halal* concept to the workers.
- e. *Halal* assurance system - *Halal* assurance system provides general guidelines for all *halal* logistics operations on the company.

## 5. Islamic Purchasing

Since *riba* is *haram*, thus the way in purchasing activity must be avoiding excessive interest. *Murabahah* principal should be implemented in trading since it will make the needs of both party balances; where in this principal seller should be honest to inform the buyer about cost of goods sold and profit that will take by the seller.

## 6. Customer Behavior and Believe

Consuming *halal* food is an obligation to the Muslim. *Halal* product is not only confined to the Muslim population. It is also favoured by non-Muslims, who come from many backgrounds and ethnicities, be it Jews, Asians and even natural and organic consumers (Aziza & Sulaiman, 2014). Therefore, understanding customer behavior and believe become important to know what customer wish toward *halal* food. After the entire supply chain process of *halal* meat is done than giving certification and logo/label of *halal* product is needed since the research above shows the most affecting attributes that encourage the willingness of the customer to buy *halal* product is logo or label. Muslim *Halal*-labeled win the heart of customer which impacts the satisfaction, commitment and loyalty of the customer. Similar with the research of Alqudsi (2013) which mention that that in Singapore, Malaysia and Australia “display of *Halal* Logo and Certificate” become the most important attributes to recognize the *halal* product, while the price of *halal* meat is not considered as the important consideration before making a purchase. Mohtar (2014) mention there are five factors identified that may have an influence towards consumers in their selection decision towards *halal* product, which are product label, certification bodies, source of information, company image and product quality.

## CHAPTER VI

### CONCLUSION AND RECOMMENDATION

This chapter will mention the conclusion of the discussion result and recommendations, which are needed to be conducted in further research.

#### 6.1 Conclusion

The problem formulation that needed to solve in this research has already mentioned in chapter I. The problem solving has already revealed in chapters above and will be concluded in following points.

Based on problem formulation, there are two points that can be resumed in this research, as follows;

1. There are five steps in conducting systematic literature review; question formulation, locating study, study selection and evaluation, data analysis and synthesis and result.
2. The systematic literature review is conducted to create a framework of *halal* supply chain for *halal* meat and the paper of studies that collected consist of some sub-topics, which is *halal* supply chain, company management, Islamic purchasing and costumer behavior and believe,

while *halal* supply chain itself divided into slaughtering process, delivery process and inventory and *haram* contamination detection.

## 6.2 Further Research

Recommendations for further research related to *halal* supply chain are;

1. Consider the impact of culture on *halal* product labeling across a range of meat product. Investigating the impact of culture in consumption behavior.
2. Starting the research start from breeding the animal for *halal* meat in order to create more complete framework.
3. In addition to these improvements, to increase the competitiveness, Supermarkets must also do business with innovation-friendly business environment by implementing green supply chain business. Retail business in the future should refer to minimize emissions and maximize sustainability. This can be performed by innovations in retail management, including the usage of LED (Light Emitting Diode) for retail room, eco-friendly bags, packaging products that are recyclable, and by installing energy-efficient air conditioning.

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