

Lean Food Supply Chain Management Within Agro-Food Distributors In Malaysia

*Tan Owee Kowang¹, Chung Pei Yun¹, Ong Choon Hee¹, Goh Chin Fei¹, , Lim Kim Yew²,
Wong Chee Hoo², Tan Seng Teck²

Abstract— The Malaysia National Agro-Food Policy (DAN) 2011-2020 was introduced to ensure the agro-food supply in Malaysia is ascertained. The main focus of DAN is to improve the self-sufficiency level of agro food. However, another challenge in food security is to ensure the food that available is delivered from farm to consumers effectively, or namely the management of food supply chain (FSCM). As such, one of the core focuses in the Malaysia Agro Food Policy 2.0 is to capitalise the entire agro food sector value chain in order to improve the performance of agro FSCM. This only could be done via high degree of coordination and continuous value creation across all activities in the agro food supply chain, which is in line with the principle of Lean. Hence, this study aims to assess the implementation level of Lean Food Supply Chain Management (LFSCM) practices and performance within agro-food distributors in Malaysia, and to assess the relationship between both. The research is quantitative based. Five LFSCM performance attributes and four LFSCM practices were identified from literature review and formulated into a survey questionnaire which was answered by 50 agro-food distributors within Malaysia. Data collected is analysed via descriptive analysis and Pearson correlation. Analysis result reveals that LFSCM practices within agro-food distributors in Malaysia tends to focus on soft lean practices, in addition all LFSCM practices are positively correlated with LFSCM performance. Finding from the study implies that Lean concept and principle could be applied in agriculture or agro-food industry as the approach to improve performance.

Keywords— Lean; Food Supply Chain Management; Agro-Food; Distributors; Agriculture

I. INTRODUCTION

The overgrowing of world population is attracting the focus of international organisations as well as local governments on provide continuous supply of quality foods to match the domestic market demands, or namely to ensure food security. Within the context of Malaysia, food security is one of the National Priority Area for Malaysia government. In conjunction with this, the Malaysia National Agro-Food Policy (DAN) 2011-2020 was released in year 2011 with the ultimate aim to ensure the core level of agro-food supply in Malaysia is always ascertained. World Food Security (CSF) (2010) committee suggested that Food Availability, Food Accessibility and Food Utilization are the three fundamental dimensions for stable and sustainable food supply. Food availability refers to the “physical existence” of both domestic food production as well as imported food, and the main challenge for local government in term of food availability is to improve the self-sufficiency level (SSL) of available food, which is the core of DAN 2011-2020. DAN 2011-2020 focused on expanding food production to ensure food supplies are sufficiently fulfilled in term of quantity, quality, nutritious and at affordable price, with the ultimate aim to ensure the core level of food supply is always ascertained

¹Azman Hashim International Business School, Universiti Teknologi Malaysia, 81310, Johor Bahru, Johor, Malaysia

²Faculty of Business, Communication & Law, INTI International University, Persiaran Perdana BBH, Putra Nilai, 71800, Nilai, Negeri Sembilan, Malaysia.

*Corresponding author: oktan@utm.my

The government is currently studying a draft of Agro Food Policy 2.0 (2021 - 2030) in order to spur the agro food sector in line with technological development and Industrial Revolution 4.0. According to the Prime Minister of Malaysia, the main objective of Agro Food Policy 2.0 will be to enable agro food producers, distributors and entrepreneurs to gain greater economic threshold via accessing to a bigger market. Hence, the main focus of Agro Food Policy will be on optimising existing logistic facilities and logistic assets, which cover storage and distribution centres, as well as transportation of food with the ultimate aim to improve food supply chain performance. As such, food supply chain and food security shared a common interest in sustaining the balance of food's demand and supply. This only could be done via high degree of coordination and continuous value creation across all activities in the supply chain, which is in line with the principle of Lean. Hence, this research aims to develop the fundamental framework of assessing the adoption of Lean Principle as Food Security strategy for agro food supply chain management in Malaysia, or namely Lean Food Supply Chain Management (LFSCM). In conjunction with this, three research objectives developed for this research, which are

1. To assess the implementation level of Lean Food Supply Chain Management (LFSCM) practices within agro-food distributors in Malaysia.
2. To evaluate the Lean Food Supply Chain Management (LFSCM) performance of agro-food distributors in Malaysia.
3. To investigate the relationship between LFSCM practices and performance within agro-food distributors in Malaysia.

II. LITERATURE REVIEW

1.1 Food Security and Food Supply Chain Management

There are various definitions of food security proposed by prior researchers. The definition suggested by the Food and Agriculture Organization (FAO) is the most common definition adopted. FAO define food security as "a situation involving all levels which always obtain sufficient food supply, safe and nutritious food to meet the needs and requirements of an active and healthy lifestyle".

The linkage of food supply chain management (SCM) and food security has received little research attention, particularly in the context of developing countries. Study done by Kepe and Tessaro (2014) revealed that food supply chain and food security shared a common interest in sustaining food security, while food supply chain plays an important role on balancing the demand and supply of food. Study done by Joni (2010) on rice supply chains in Indonesia suggested that from the food security perspective, it would be beneficial for the government to move from production focus, towards a more whole-chain focus. In addition, studies done by prior researchers (Shapouri and Rosen, 2001; Dharni and Rodrigue, 2015) also reveal that due to lack of collaboration among food supply chain partners, the relationship between farmers and agro food distributors is retained within the scope of "sell and purchase" connection. The absence of collaborative relationship among supply chain partners will very unlikely promote value creation and waste reduction initiatives along the supply chain network (Cronin, 2015).

In addition, creating an environment of continuous value creation and improvement, as well as more equitable value sharing among chain partners are also equally important. This only could be done via high degree of coordination, continuous waste elimination and value creation across all activities in the supply chain network, which is in line with the principle of Lean.

1.2 Lean Principle

Lean is an operational philosophy that focuses on a business' internal need to maximize value added activities by identifying and eliminating waste in an organization. This concept originated from Toyota Motor Corporation in early seventies and focused on reducing cycle time and waste in processes (Frank et. al., 2014; Chakraborty and Leyer, 2013; Sandra, 2009). The good side of lean is not only focusing on cost reduction while improving quality, but also guide organization to achieve tremendous growth (Sisson & Elshennawy, 2015).

The basic fundamental of Lean concept is the ability to see waste in the organization or process as waste identification is one of the way to increase profit. Waste is typically defined as any activity that customer is not willing to pay for. Traditionally, Taiichi Ohno has classified waste into seven major categories which are overproduction, waiting, transportation, inappropriate processing, excess inventory, unnecessary motion and defects (Andrew, 2009; Vijaya, 2016). Additionally, Frank et al. (2014) in their book introduced nine wastes with additional two waste: Underutilized people and employee behaviour.

1.3 Lean Food Supply Chain Management

The main challenge in global food supply chains is to reduce resource use and minimizing food waste across the entire agro food value chain network, with the ultimate aim to improve efficiency of food supply chain management for food security According to the Prime Minister of Malaysia, Tun Dr Mahathir Mohamad, one of the main focuses for the new Argo Food Policy 2.0 (that currently under drafting) is to enhance the efficiency of food supply chain (NST 2019). Hence the entire agro food sector value chain will be capitalised under Argo Food Policy 2.0, with the ultimate objective to enable the farmers, breeders, fisherman and agricultural entrepreneurs to access to bigger market and to gain greater economic threshold (NST, 2019). In conjunction with this, optimising the components of supply chain, such as facilities and logistic assets, storage, distribution centres and transportation are the key focus areas for the new Argo Food Policy 2.0 in order to enhance Food Supply Chain Management (FSCM) performance.

FSCM performance refers to continuous reduction on non-value added activities as measured in cost, time and inventory across the entire supply chain, and eliminating food waste, which is in line with the principle of Lean (Shamah, 2013). As such, food security could be enhanced by adopting the Lean concept in food supply chain management. Lean Food Supply Chain Management (LFSCM) represents a new way of thinking about demand and supply networks across the entire agro food sector value chain. LFSCM principle emphasize on cooperative supplier partnerships and strategic alliances. A lean food supply chain management concept should allow a flow of agro food from farm to consumer without waste (Goldsby et.al. 2006; Wee and Wu, 2009).

1.4 Lean Food Supply Chain Management Practices

Within the context of agro-food supply chain, Lean Food Supply Chain Management (LFSCM) practices refers to a set of activities that change the mind-set of supply-chain partners from the traditional "trading mentality" to the lean principle based "strategy relationship" approach (Jasti and Kodali, 2015).

Traditionally, agro food supply chain partners such as farmers, food collectors, food distributor ("center man") and food sellers are tend to focus on "profit target" as their main objective when dealing between each other, in which is impelled by the negotiation between "supplier" and "customer" throughout the supply chain network, and driven by the market price of agro foods. Under the "profit target" mentality practices, the relationship among supplier chain partners tend to short term based (Riet, 2015).

Lean food supply chain management principle moves away the traditional “profit target” practices to a “strategy based” mentality and approach. LFSCM principle lays on the basis of allow a flow of agro foods from farm to consumers without waste, and concurrently creates value to the supply chain network as well as supply chain partners (Petra and Marek, 2015). To achieve this, practices of LFSCM must be able to promote long time commitment among supply chain partners toward cooperation and systematic waste elimination along the chain.

Review of literature shows that the application of Lean principle in supply chain management improved organization performance (Lewis, 2006; Cagliano et al., 2006; Blanchard et. al., 2017). However, prior studies on supply chain management tend to focus on manufacturing based supply chain, or viewed supply chain management as general domain. Study of supply chain management for agro-food industry is lacking.

The adaptation of Lean principle and practices into agro-food supply chain management is not a simple process (Blanchard et. al., 2017) as the nature of agro food sector is different from manufacturing industry in term of product life cycle, mode and method of transportation. Study done by Guilherme, Miorando, & Marodin (2017) presents an holistic view of LSCM practices by grouping the full range of LSCM practices into four LSCM practices bundles, which are elimination of waste and continuous improvement; logistic management, top management commitment and customer-supplier relationship. The framework proposed by Guilherme, Miorando, & Marodin (2017) is used in this research in order to better comprehend the adaptation of lean to food supply chain management.

1.4.1 Elimination of Waste and Continuous Improvement

Elimination of waste and continuous improvement is the core principle of Lean. The concept of waste elimination and continuous improvement in Lean is implemented via 5 key principles as summarize in Table I.

TABLE I.

LEAN KEY PRINCIPLES

<i>r i n c i p l e s</i>	<i>Definition</i>
a l u e	Define value from the customer perspective
l o w	Identify the value stream
p t i m	Develop the value flow

r i n c i p l e s	<i>Definition</i>
i z e	
u l l	Implement Pull based production
m p r o v e	Strive for perfection continuously

Various Lean tools and techniques are applied throughout the waste elimination and continuous improvement process, such as 5S, Poka Yoke, Andon Board, One piece flow, Kanban, value stream mapping and pull system (Rahman, Sharif, et al., 2013).

1.4.2 Logistic Management

From food supply chain management point of view, logistics management refers to dealing with issues that related to excessive inventory, high transportation cost, massive amount of information processing, and multi-layer distribution channel (Vinod Saratchandran, 2018). LFSCM views these logistic management issues as the Deadly Wastes. Lean principle focuses on seven (7) Deadly Wastes, which are transportation, overproduction, waiting, motion (or movement), excessive processing, inventory and defects. Within the context of LFSCM, the main effort for logistic management is to eliminate or reduce the 7 Deadly Wastes across the entire food supply chain.

1.4.3 Top management commitment

Top management such as Chief Executive Officer (CEO), Chief Technology Officer (CTO) etc play a vital role in the implementation of LFSCM. On top of commitment in term of financial and human resources, top management team is meant to influence and integrate the physical flow of food supply chain with Lean concept across the entire food supply chain (Sandberg & Abrahamsson, 2010); strategize and initiate changes across the entire food supply chain in parallel to lean principle and practices.

1.4.4 Customer-supplier relationship

The relationship between customer and supplier implies a significant impact toward the process of dealing with product or service quality, deliveries as well as complaint handling (George Alukal, 2007). Customers and Suppliers

are the vital cogs in business, especially in the case of food supply chain which involved numbers of intermediaries who play the roles as customer and supplier concurrently. Hence, having a healthy Customer- Supplier relationship across the entire food supply chains is imperative for the success of LFSCM implementation (Myerson, 2012).

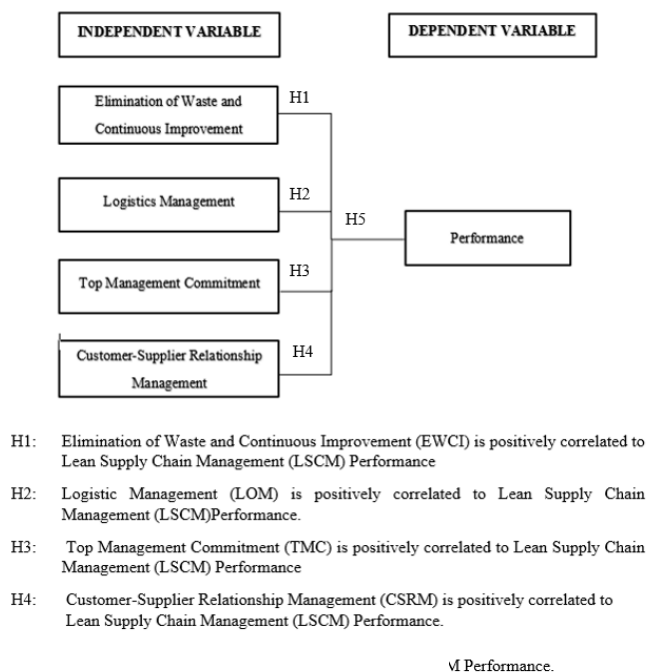
1.5 Lean Food Supply Chain Management Performance

Assessing performance is the fundamental requirement for monitoring the effectiveness of supply chain management as well as to identify areas that required further improved. Hence, on top of exploring the practices for LSCM practices, most of the prior studies have delved into the dimension for measuring the performance of LSCM. Overall, there are five common dimensions used by prior studies on assessing lean supply chain management performance, which are inventory levels (Bruce et al., 2004; Chiromo et al., 2015), quality (Wee and Wu, 2009; Perez et al., 2010), supply lead time (Naim and Gosling, 2011), delivery service level (Savino and Mazza, 2015; Petra and Marek, 2015) and cost (Theagarajan and Manohar, 2015).

1.6 Research Framework

Figure 1 shows the research framework for this study. The framework is developed bases on the concept that the implementation of the four LFSCM practices, which are elimination of waste and continuous improvement; logistic management, top management commitment and customer-supplier relationship management enhance LFSCM performance. In conjunction with the research framework, four hypotheses are developed as shown in Figure 1.

Fig. 1. Research Framework



2. RESEARCH METHODOLOGY

This research is quantitative based. The implementation level of LFSCM practices and LFSCM performance level within agro-food distributors in Malaysia are assessed via structured questionnaire

2.1 Population and Sampling

The targeted population for the research is agro-food distributor (vegetables and fruits) within Malaysia. The sampling size is defined based on the “10-times rules” recommended by Hair (2016), i.e. multiple of 10 to the

maximum number of arrows pointing at any latent variable in the research framework. Follows by factoring the norm of response rate (Barclay, Higgins, et al., 1995). Hence, the sampling frame for this study is 200 by taken into consideration 4 arrows pointing at latent variable and predicted respond rate of 20%.

2.2 Research Instrument

The study was quantitative based, the questionnaire consist of 42 questions which are divided into three parts. First part is to collect the respondents' demographic information, while the second part of the questionnaire is to assess the implementation level of the four FLSCM practices, and the third part of questionnaire assesses the FLSCM performance level. The assessment was done via 5-points scales from "1" representing "No implementation" to "5" indicating "Fully implemented".

2.3 Analysis Tool

The normality and reliability of data collected from part 2 and 3 of questionnaire are assessed via Skewness & Kurtosis value and Cronbach Alpha test respectively. Skewness & Kurtosis range of +/- 2 represents data is normally distributed. Meantime, Cronbach Alpha reliability value of greater than 0.60 is suggested to be adequate for testing the reliability of factors. Subsequently, the implementation level of each FLSCM practices and performance is derived via descriptive analysis, and the relationship between FLSCM practices and performance is analysed via Pearson correlation test.

III. ANALYSIS AND DISCUSSION

A total of 200 questionnaires were distributed with 53 responded. However, 3 unusable questionnaires were screened out due to missing value. As the result, 50 usable questionnaires were collected, with the respond rate of 25%.

2.4 Normality and Reliability Test

Result of normality test for all measurement items shown that the value of Skewness and Kurtosis are within -2 and +2, hence there is no issue in regard with data normality. In addition, Cronbach Alpha reliability values of 0.942. This implies that the data is statistically significant to proceed for further analysis.

2.5 Lean Food Supply Chain Management (LFSCM) Practices and Performance

To address research objective 1 (i.e. To assess the implementation level of Lean Food Supply Chain Management (LFSCM) practices within agro-food distributors in Malaysia) and research objective 2 (To evaluate the Lean Food Supply Chain Management (LFSCM) performance of agro-food distributors in Malaysia.), the average implementation level of Lean Food Supply Chain Management (LFSCM) practices (Part 2 of questionnaire) and performance (Part 3 of questionnaire) that perceived by argo-food distributors within Malaysia is analysed via descriptive analysis. The average performance of LFSCM is at moderate level of 3.262, while the analysis result of LFSCM practices is summarized in Table II.

TABLE II.

IMPLEMENTATION LEVEL OF LFSCM PRACTICES

Implementation Level of LFSCM Practices		
Bundles		
LFSCM Practices		
Elimination of waste and Continuous Improvement (EWCI)		

Implementation Level of LFSCM Practices Bundles		
<i>LFSCM Practices</i>		
Logistics Management (LOM)		
Top Management Commitment (TMC)		
Customer-Supplier Relationship Management (CSRM)		
Average		

The Lean Supply Chain Management practices bundles proposed by Guilherme, Miorando, & Marodin (2017) could be further categorized into soft and hard management practices. Soft management practices refers to practices that associated with methodological intangible management practices that applied in LFSCM. While hard LFSCM practices refers to the tangible methodology which mainly denotes to LFSCM tools and technique.

Three out of the four LFSCM practices bundles used in this study are viewed as soft management practices, which are Logistic Management, Top Management Commitment and Customer-supplier Relationship Management. However, LSFSCM practices bundle “Elimination of waste and continuous improvement” tends to be categorized under hard management practices due the nature of the practices bundle involved the application of Lean tools and technique for the purpose of waste elimination and continuous improvement.

As refer to Table 1, the implementation level for LFSCM soft practices bundles Top Management Commitment (TMC), Customer-Supplier Relationship Management (CSRM) and Logistic Management (LM) are implemented above the average with the implementation level of 3.356, 3.345 and 3.266 respectively. Whereas LFFSCM hard practices Elimination of waste and Continuous Improvement (EWCI) is perceived by agro-food distributors as implemented at below average level of 2.280.

Finding from the analysis result reveals that within the context of Lean Food Supply Chain Management in Malaysia, practices that adopted by the agro-food distributors in Malaysia are still confined within the scope of soft practices perspective. Most of the agro-food distributors in Malaysia are yet to explore the core concept of Lean, which is focusing one elimination of waste and continuous improvement.

2.6 Relationship between LFSCM Practices and LFSCM Performance.

To address the research objective 3 of this study (i.e. to investigate the relationship between LFSCM practices and performance of agro-food distributors in Malaysia), as well as to test the four research hypotheses, data collected from part 2 (implementation level of LFSCM practices) and part 3 (LFSCM performance level) of questionnaires is further analysed via Pearson correlation test. The purpose of Pearson correlation test is to assess the relationship between the implementation level of the four LFSCM practices and LFSCM performance level within agro-food distributors in Malaysia. The result of analysis is summarized in Table III.

As refer to Table III, the significant value (i.e. p-value) for all hypotheses are less than 0.05. This suggested that at confidence level of 95%, the relationship between all the four LFSCM practices with LFSCM performance are significant, with person correlation coefficient ranged between 0.538 (i.e. moderate positive correlation) to 0.715 (strong positive correlation).

TABLE III. HYPOTHESES TEST RESULT

	Hypotheses Test			
	LFSCM Practices	Coefficient of Correlation (r)		Result
	Elimination of waste & cont. improvement	0.621		Accepted
	Logistics Management	0.620		Accepted

	Hypotheses Test			
	LFSC M Practices	Coefficient of Correlation (r)		Results
	Top Management Commitment	0.538		Accepted
	Customer supplier relationship	0.715		Accepted

Finding from the study suggested that the adoption of LFSCM practices had significantly enhanced the LFSCM performance. Among the four LFSCM practices, the correlation between customer supplier relationship management practices and LFSCM performance is the strongest at correlation coefficient of 0.715. Perhaps this is due to the nature of agro-food supply chain that involves few layers of intermediaries from the source of agro-food (i.e. farmer) to consumer, the relationship among all intermediaries across the entire supply chain become very crucial toward LFSCM performance.

Hence, finding from the analysis reveals that within the context of agro-food distributors in Malaysia, in order to enhance competitive advantage via LFSCM performance, agro-food distributors should align their companies' supply chain management strategy to be in line with the concept of Lean principle and practices

IV. CONCLUSION

Lean is an operational philosophy that focuses on a business' internal need to maximize value added activities by identifying and eliminating waste in an organization. Finding from this study suggests that within the context of agro-food supply chain in Malaysia, LFSCM practices that adopted by the agro-food distributors are still confined within the scope of soft practices perspective. Whereas both hard and soft LFSCM practices are significantly correlated with LFSCM performance. Hence, the practical implication of this study is agro food distributors in Malaysia should explore the approach of adopting waste elimination and continuous improvement practices, which is the core concept of Lean. In addition, finding from this study has descriptive value in terms of implementing LFSCM practices and the relationships that govern LFSCM practices and performance, which is significant to the literature and study of Lean as well as Lean Food Supply Chain Management.

ACKNOWLEDGMENT

Authors wish to acknowledge the Malaysian Ministry of Education and Universiti Teknologi Malaysia under the Research Grant (Vote No. 5F136) for sponsoring this publication.

V. REFERENCES

Adebanjo, Dotun, Laosirihongthong, Tritos, & Samaranayake, Premaratne. (2016). Prioritizing lean supply chain management initiatives in healthcare service operations: a fuzzy AHP approach. *Production Planning & Control*, 27(12), 953–966. doi: 10.1080/09537287.2016.1164909

Boonthonsatit, Kanda, & Jungthawan, Siripong. (2015). Lean supply chain management-based value stream mapping in a case of Thailand automotive industry. In *2015 4th International Conference on Advanced Logistics and Transport (ICALT)* (pp. 65–69). IEEE.

CSCMP. (2015). The Importance of Supply Chain Management. Retrieved May 6, 2019, from https://cscmp.org/CSCMP/Develop/Starting_Your_SCM_Career/Importance_of_SCM/CSCMP/Develop/Starting_Your_Career/Importance_of_Supply_Chain_Management.aspx?hkey=cf46c59c-d454-4bd5-8b06-4bf7a285fc65

Cudney, Elizabeth, & Elrod, Cassandra. (2010). Incorporating lean concepts into supply chain management. *International Journal of Six Sigma and Competitive Advantage*, 6(1–2), 12–30.

Gapp, Rod, Fisher, Ron, & Kobayashi, Kaoru. (2008). Implementing 5S within a Japanese context: an integrated management system. *Management Decision*, 46(4), 565–579.

George Alukal. (2007). Lean Kaizen in the 21st Century. Retrieved from <https://search.proquest.com/openview/b26dbcd289658008c073bd7738cfbd9d/1?cbl=34671&pq-origsite=gscholar>

Guilherme Luz TortorellaJ, uliano Denicol Giuliano Almeida Marodin Tarcísio Abreu Saurin. (2015). How context factors influence lean production practices in manufacturing cells. *International Journal of Advanced Manufacturing Technology*, 79(5–8), 1389–1399. doi: 10.1007/s00170-015-6944-2

Gunasekaran, Angappa, Patel, Chaitali, & Tirtiroglu, Ercan. (2001). Performance measures and metrics in a supply chain environment. *International Journal of Operations & Production Management*, 21(1/2), 71–87.

Hashini Kavishtri Kannan. (2017). 2018 Budget: Gov't to push agro-food industry to benefit B40 group | New Straits Times | Malaysia General Business Sports and Lifestyle News. Retrieved May 6, 2019, from <http://www2.nst.com.my/news/nation/2017/08/264094/2018-budget-govt-push-agro-food-industry-benefit-b40-group>

Jasti, Naga Vamshi Krishna, & Kodali, Rambabu. (2015). A critical review of lean supply chain management frameworks: proposed framework. *Production Planning & Control*, 26(13), 1051–1068. doi: 10.1080/09537287.2015.1004563

Jasti, Naga Vamsi Krishna, & Kurra, Suresh. (2017). An empirical investigation on lean supply chain management frameworks in Indian manufacturing industry. *International Journal of Productivity and Performance Management*, 66(6), 699–723. doi: 10.1108/IJPPM-12-2015-0185

Laquita Harris. (2007). Lean Manufacturing Made Toyota the Success Story it is Today | Investing in our Economy. Retrieved May 6, 2019, from <http://www.rcbi.org/index.php/viewarticle/130-capacity-magazine/spring-2007/features/336-lean-manufacturing-made-toyota-the-success-story-it-is-todayinvesting-in-our-economy>

Lauren Fram. (2019). What is Food Distribution? Retrieved from <https://learn.g2crowd.com/food-distribution>

Manzouri, Malihe, Ab-Rahman, Mohd, Zain, Che, & Jamsari, Ezad. (2014). Increasing production and eliminating waste through lean tools and techniques for halal food companies. *Sustainability*, 6(12), 9179–9204.

Myerson, Paul. (2012). *Lean supply chain and logistics management*. McGraw-Hill New York, NY.

- Perez, Catalina, de Castro, Rodolfo, Simons, David, & Gimenez, Gerusa. (2010). Development of lean supply chains: a case study of the Catalan pork sector. *Supply Chain Management: An International Journal*, 15(1), 55–68.
- Rahman, Nor Azian Abdul, Sharif, Sariwati Mohd, & Esa, Mashitah Mohamed. (2013). Lean manufacturing case study with Kanban system implementation. *Procedia Economics and Finance*, 7, 174–180.
- Roger Jensen. (2017). Lean Purchasing for Manufacturers. Retrieved May 7, 2019, from <https://www.omep.org/lean-purchasing-for-manufacturers/>
- Rozhan Abu Dardak. (2015). Transformation of Agricultural Sector in Malaysia Through Agricultural Policy. *FFTC Agricultural Policy Articles*.
- Sam Ashe-Edmunds. (2016). Strengths & Weaknesses of the Supply Chain | Chron.com. Retrieved May 6, 2019, from <https://smallbusiness.chron.com/strengths-weaknesses-supply-chain-75987.html>
- Samuel, Michael Vinrald, Shah, Mrinalini, & Sahay, B. S. (2012). An insight into agri-food supply chains: a review. *International Journal of Value Chain Management*, 6(2), 115. doi: 10.1504/IJVC.2012.048378
- SCRC SME. (2017). What is Supply Chain Management (SCM)? | Supply Chain Resource Cooperative | NC State University. Retrieved May 6, 2019, from <https://scm.ncsu.edu/scm-articles/article/what-is-supply-chain-management-scm>
- Sonia Pearson. (2013). Value Stream Mapping: Definition, Steps, and Examples - Tallyfy. Retrieved May 6, 2019, from <https://tallyfy.com/value-stream-mapping/>
- Stewart, Gordon. (1995). Supply chain performance benchmarking study reveals keys to supply chain excellence. *Logistics Information Management*, 8(2), 38–44.
- Taleizadeh, Ata Allah, & Noori-daryan, Mahsa. (2016). Pricing, manufacturing and inventory policies for raw material in a three-level supply chain. *International Journal of Systems Science*, 47(4), 919–931. doi: 10.1080/00207721.2014.909544
- Tortorella, Guilherme, Giglio, Ricardo, Fettermann, Diego Castro, & Tlapa, Diego. (2018). Lean supply chain practices: an exploratory study on their relationship. *The International Journal of Logistics Management*, 29(3), 1049–1076.
- Tortorella, Guilherme Luz, Miorando, Rogério, & Marodin, Giuliano. (2017). Lean supply chain management: Empirical research on practices, contexts and performance. *International Journal of Production Economics*, 193, 98–112. doi: 10.1016/J.IJPE.2017.07.006
- Vorne. (2012). The Essence of Lean is to Eliminate Waste | Lean Production. Retrieved May 6, 2019, from <https://www.leanproduction.com/intro-to-lean.html>
- Wild, Ray. (1993). *Production and operations management: principles and techniques*. Cassell Educational.
- Zenjiro Imaoka. (2012). CRP (Continuous Replenishment Program) | Lean Manufacturing. Retrieved May 6, 2019, from <http://www.lean-manufacturing-japan.com/scm-terminology/crp-continuous-replenishment-program.html>

