

## Supply Chain Resilience Practices among Halal Food Manufacturers for Business Performance and Sustainability

Teh Zaharah Yaacob<sup>1</sup>, Norhayati Zakuan<sup>2</sup>,  
Hanini Ilyana Che Hashim<sup>3</sup>, Mohd Zulfabli Hasan<sup>4</sup>,  
Siti Zaharah Ishak<sup>5</sup>

<sup>1</sup> Department of Management and Technology, Faculty of Management,  
Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia  
tehzaharah@utm.my

<sup>2</sup> Department of Management and Technology, Faculty of Management,  
Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia  
norhayatimz@utm.my

<sup>3</sup> Department of Accounting and Finance, Faculty of Management,  
Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia  
haniniilyana@utm.my

<sup>4</sup> Department of Management and Technology, Faculty of Management,  
Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia  
zulfabli@urm.my@utm.my

<sup>5</sup> Malaysia Institute of Transport, Universiti Teknologi MARA, Shah Alam,  
Selangor, Malaysia  
sitiza406@uitm.edu.my

### *Abstract*

Supply chain resilience refers to the ability of a supply chain process to withstand disruptions and to recover quickly from the impact of the risks, while maintaining its normal functions and meeting customer demand and expectation. In the context of halal food manufacturers, supply chain resilience involves the ability to ensure that halal products are produced, delivered, and sold to customers, according to timeline given despite of any potential risks. Halal manufacturers face challenges when it comes to supply chain resilience. The impact of pandemic COVID-19 has resulted to the disruption in food supply chain due to lack of Government policies and roles to coordinate the supply chain process from the farm to the fork, as well as ensuring that all stages of the supply chain comply with the halal standards. This study reviewed all the relevant literature on the supply chain resilient practices among Halal food manufacturers during the uncertain event of pandemic.

In addition, a thorough review of policy, regulation, standard and Acts related to Halal food manufacturing process was also being included to get more critical analysis on the issues discussed. Indeed, an interview was conducted with stakeholders in Halal supply chain to validate the data. It was indicated that the practices of supply chain collaboration, supplier diversification, obligation to Halal certification and advancement of technology adoption were considered as the critical practices in supply chain resilient. With these practices, Halal food manufacturers can develop resilient supply chain strategies to manage the impact of disruptions and to improve business performance and sustainability.

**Keywords:** Supply Chain Resilience, Halal Manufacturer, Business Performance, Sustainability

## Introduction

Halal supply chain resilience refers to the ability of halal manufacturers and their supply chain partners to manage the business and to recover from the potential disruptions to the halal supply chain. Disruptions in halal supply chain can be described as the natural disasters, political unrest, economic downturns, and other unexpected events that can affect the production and distribution of halal products. Halal supply chain resilience is an important practice for halal manufacturers, as these practices and strategies will help to meet the customers need and maintain the business reputation. Indeed, strategies in supply chain resilience practices will produce high-quality and halal certified halal products. A study by Khan (2021) examined the factors that influence halal supply chain resilience in the food industry. The study found that halal certification, collaboration among supply chain partners, and the use of technology were considered as the important factors to improve the strategies in halal supply chain resilience. The study also highlighted the importance of risk management strategies, such as contingency planning and supply chain mapping, in mitigating the impact of potential disruptions. Another study by Ali et. al (2021) explored the role of halal certification in improving supply chain resilience for halal food in Malaysia. The study found that halal certification was an important certification and element to build trust among supply chain partners and to ensure the authenticity and quality of halal products. Communication and collaboration among supply chain partners, and the importance of contingency planning and risk management strategies. Previous studies highlighted the importance of halal certification, collaboration among supply chain partners, and the use of technology and risk management strategies in improving halal supply chain resilience (Aibogun et. Al, 2018). Halal manufacturers should consider many factors when developing their supply chain resilience strategies and at the same time to reduce or minimize the impact of the recent pandemic. The supply chain practices

will help to mitigate any impact that would affect the business performance. Consequently, halal supply chain practices are important for halal manufacturers and their supply chain partners to ensure that the products comply with the requirements of halal standard and Islamic dietary laws. The practices of halal supply chain will help to ensure that halal products are produced, processed, and distributed in a way that is consistent with Islamic principles and values. Nevertheless, still many halal food manufacturers will face uncertainties and challenges to ensure the halal food supply chain will remain halal from the point of delivery to the point of consumption. The recent pandemic of COVID-19 has impacted the flow of supply chain process due to international cross border restriction and the issues of food security. A study by Tseng et. al (2022) examined the importance of halal supply chain resilience practices in the halal food industry. The study found that halal supply chain practices were practices were important for ensuring the authenticity and quality of halal food products and for building trust and reputation among Muslim consumers.

A study by Qader (2022) highlighted the importance of collaboration and communication among supply chain partners, and the need for continuous improvement for innovation in halal supply chain practices. It was indicated that, a transparent communication among all the key stakeholder in halal supply chain will ensure the compliance and the authenticity of the halal product throughout the supply chain process. The collaboration among stakeholders in the supply chain is one of the importance elements in supply chain resilience practices. However, the supply chain practices can only be implemented when all the stakeholders in the supply chain process understand their roles and ensure the halal integrity will remain throughout the business transaction. The halal manufacturers also must have a diversification of supplier in the business process, to ensure the issue of delay, disruption and obsolete raw material supply can be managed. Henceforth, the aim of the study is to determine the halal supply chain resilience practices among halal manufacturers for business performance and sustainability post pandemic. It was very important to determine the right practices and strategies to manage the impact from pandemic. In view of that, the study has observed the challenges faced by halal manufacturers to cope with the impact of pandemic and the measures taken to overcome the challenges to sustain in business.

### **Literature Review**

Supply chain resilience practices among halal manufactures refer to the strategies and action taken to by the supply chain partners to improve their ability to respond to any disruptions, challenges and uncertainties while ensuring the business is still compliance with halal requirement. Supply chain resilience practices among Halal manufacturers are

significant to the halal business based on several reasons Aigbogun, et. al. (2016). Firstly, these practices and strategies helps to ensure the manufacturers to respond effectively to unexpected events or disruptions in the supply chain process, thus minimizing the impact of such events on the business operations. Secondly, the resilience strategy helps to promote sustainability by ensuring that the halal supply chain is environmentally friendly and socially responsible. Finally, the application supply chain resilience helps to build consumer confidence by demonstrating the commitment of Halal manufacturers to the highest standards of Halal compliance (Fauzi, 2021). A study by Maman et al. (2018) found that there is a positive relationship between supply chain resilience practices with business performance and sustainability in the Halal food industry in Malaysia. The study emphasized on the role of that Halal manufacturers and the needs to implement supply chain resilience practices such as diversification of suppliers, adoption of technology, and risk management to achieve better business performance and sustainability outcomes.

Furthermore, a study by Khatoon and Othman (2022) highlighted on the importance of Halal supply chain resilience practices to promote ethical and sustainable sourcing practices, which can enhance the reputation of Halal manufacturers. The study also emphasized on the importance of Halal certification and compliance the key factor in ensuring the integrity of the Halal supply chain and consumer trust. Indeed, the importance of supply chain resilience practices among Halal manufacturers cannot be overstated. These practices are essential for ensuring business continuity, promoting sustainability, and building consumer confidence. Halal manufacturers should consider implementing these practices as part of their overall supply chain strategy to be remain competitive in the global market.

Currently, there is limited research specifically on the challenges of implementing supply chain resilience in halal supply chains. However, some studies have highlighted the challenges of managing halal supply chains, which can make it more complex to implement resilient practices. A study by Fassam et. al (2017) identified several challenges in managing halal supply chains, including the lack of standardization in halal certification, the complexity of managing multiple stakeholders, and the need to comply with multiple regulations and guidelines. Another study by Xie et. All (2022) emphasized on the importance of implementing resilient practices in halal supply chains by identifying several factors that can affect supply chain resilience, such as supply chain visibility, supplier relationships, and contingency planning. The COVID-19 pandemic has had significant impacts on the supply chain resilience of Halal manufacturers, as noted by various researchers. According to Hendry (2019), the impact of pandemic has disrupted Halal supply chains globally, resulting in shortages of raw materials and disruptions in logistics and transportation. This has led to increased costs and delays in production for Halal

manufacturers. Indeed, Sumarliah (2023) highlighted s ////that the pandemic has disrupted the certification process for Halal products, as many Halal-certifying bodies and laboratories were closed during the pandemic. This has made it challenging for Halal manufacturers to source Halal-certified raw materials, leading to shortages of supplies and delays in production. Another study by Marcucci et al. (2022) highlighted on the importance of supply chain resilience practices among manufacturers. The study indicates that manufacturers who adopted supply chain resilience practices such as diversification of suppliers, adoption of technology, and risk management were able to respond to the disruptions caused by the pandemic. The pandemic has led to increased demand for Halal-certified products by the local manufacturers, particularly in the food and pharmaceutical industries. This situation has created opportunities for Halal manufacturers to expand their businesses and to manage the pressure and uncertainties to meet the demand for Halal-certified products (Firdiansyah, 2021). It was stated that the COVID-19 pandemic has had significant impacts on the supply chain resilience of Halal manufacturers, including disruptions in logistics and transportation, shortages of raw materials, and challenges in Halal certification. However, the pandemic has also highlighted the importance of supply chain resilience practices among Halal manufacturers and created opportunities for them to expand their businesses in response to increased demand for Halal-certified products (Vanany et. al ,2021)

Halal manufacturers have faced several challenges during the COVID-19 pandemic, as noted by various researchers. Here are some examples of challenges faced by Halal manufacturers during the pandemic: According to a study by Susilawati (2020), Halal manufacturers faced challenges in procurement and sourcing for Halal-certified raw materials during the pandemic due to disruptions in global supply chains. This has led to shortages of raw materials for production and increased the overall production costs for Halal manufacturers. A study by Tsolakis (2021) revealed that the pandemic has disrupted the certification process and the renewal of the certification for Halal products. This situation happened due to many Halal-certifying bodies and laboratories were closed during the pandemic. The delay of the certification renewal will affect the business reputation and demand. Indeed, this has made it challenging for Halal manufacturers to source Halal-certified raw materials, leading to shortages of supplies and delays in production.

Another study by Kadirov (2021) shows that the pandemic has led to uncertainty and doubt towards Halal products, as consumers have become more concerned about the safety and authenticity of Halal products. This has created challenges for Halal manufacturers to ensure the integrity of their Halal supply chains and to maintain the consumer demand towards Halal product. Simultaneously, a study by Madhavan. (2022) suggests that Halal manufacturers have faced challenges in logistics and transportation during the pandemic, as restrictions on

international travel and border closures have led to delays in the shipment of goods and supplies. All this evidence indicated that Halal manufacturers have faced several challenges during the COVID-19 pandemic, including disruptions in global supply chains, challenges in Halal certification, increased scrutiny of Halal products, and logistics and transportation challenges.

A study by Khan et al. (2021) emphasizes the importance of supply chain resilience for manufacturers to ensure the company able to respond to disruptions in the supply chain and to maintain the business continuity during the times of crisis. The study provides a framework for building supply chain resilience in the Halal industry and suggests several strategies that can be implemented by Halal manufacturers. Another study by Afif et al. (2022) examines the role of supply chain resilience in the Halal industry during the COVID-19 pandemic. The study suggests that Halal manufacturers can enhance their supply chain resilience by adopting various practices, such as diversifying their supply chains, leveraging technology, and collaborating with their suppliers and partners. Indeed, a study by Ali et al. (2021) highlighted on the need for Halal manufacturers to build resilient supply chains to address the challenges faced during the pandemic. The study recommends that Halal manufacturers must implement measures to ensure the continuity of their supply chains, such as developing contingency plans, maintaining inventory levels, and establishing partnerships with reliable suppliers. However, the implementation of supply chain resilience practices may face several challenges due to many reasons such as business coordination, budget, and management direction towards the resilient strategy implementation. This statement was supported by a study by Jamil et. al (2021) that emphasized on the issues of Halal raw material procurement and sourcing due to the limited availability of halal-certified suppliers.

The scarcity of halal-certified suppliers may lead to dependence on a few suppliers, making the supply chain vulnerable to disruptions. Halal certification requirements can be complex and vary across different markets, making it difficult for halal manufacturers to navigate the certification process. As noted by Khan et al. (2021), halal certification requirements may include the issue of increase cost for product ingredients, manufacturing processes, and transportation methods. As such, to deal with this situation the implementation of supply chain resilience practices which require the contingency plans, and the adoption of new technologies will be the solution to cope with challenges. A study by Alzate et al. (2021) highlighted on the cost considerations in supply chain strategies to cope with the challenges of small and medium-sized enterprises during the pandemic. Halal manufacturers may lack awareness and understanding of the importance of supply chain resilience practices.

According to Qader et al. (2021), halal manufacturers may not be fully aware of the risks associated with supply chain disruptions and the potential benefits for implementing supply chain resilience practices. In fact, Halal manufacturers may face geopolitical and macroeconomic factors that can affect the availability and the overall cost of raw materials, transportation, and labour. The COVID-19 pandemic has highlighted the impact of these factors on global supply chains, as noted by Khan et al. (2021). Simultaneously, there are some challenges faced by the halal supply chain in building resilience strategy. It was indicated that halal supply chain involves multiple supply chain partners, including producers, processors, distributors, and retailers, which can result in duplication of roles and lack of transparency during the process. As a result, it will be difficult to establish clear lines of responsibility and accountability, thus leading to a lack of trust and coordination among the partners in the supply chain. (Ali et al., 2021).

The issue of lack of standardization in the halal certification process can create confusion and mistrust among stakeholders. The absence of a unified certification process, particularly at the international level, results in multiple certifying bodies, which can lead to a lack of standardization and consistency in halal certification requirements. This lack of standardization can result in inconsistency and confusion for consumers and businesses alike. (Hashom et al, 2020). In addition, many supply chain partner still depend on the traditional methods of production, storage, and transportation, which can result in inefficiencies and delays in their lead time. Consequently, the supply chain partners faced the issues of lack of investment in technologies such as blockchain, GPS trace and tracking and application of IR 4.0 in the company digitalization proceed. The application of IR 4.0 technologies will enhance transparency, traceability, and accountability in the supply chain to manage the issues of delay and disruption. (Chen et al., 2023). The challenges faced during the pandemic requires a careful planning and effective strategies which can reduce the impact of the pandemic and to be resilient and relevant to the industry.

### **Methodology**

Literature searches were conducted at the beginning of the study to develop a better understanding of the-supply chain practices and the implementation of supply chain resilient among the Halal manufacturers. As such, the aim of this study is to get a clear understanding on the practical application of the supply chain resilient and the impact of pandemic towards business performance and sustainability among Halal manufacturers. Consequently, the literature searches continue with the halal procedure and implementation among the Halal manufacturers, the application of standards, certification, and legislation related to halal operation. The study explored the application and the implementation of

supply chain resilient practices among Halal manufacturers. It was stated that the implementation of supply chain resilience practices requires commitment and obligation towards implementing the right procedure of supply chain resilience. As such, it was indicated that the research objective of this study is to determine the application of supply chain resilient among halal food manufacturers to adapt with the risks and impact from the pandemic of COVID-19. The literature research was conducted by using various databases such as Science Direct, Springer Link, EBSCO, IEEE Xplore, Scientific Journal, Conference Proceeding, reports, books, and guidelines. Apart from that, a thorough review of halal legislation, regulation and standards was also being reviewed.

Literature research was very important to guide the researcher to develop the framework of research question for this study. The research question will be used during the interview session with the halal manufacturer and help to justify the findings of the study. It was clearly understood that this research is an exploratory study. An exploratory study is a valuable means of finding out what is happening; to seek new insights; to ask questions and to assess phenomena in a new light". Therefore, a qualitative approach was used as it allows the exploration of a subject with limited previous research that has been conducted (Mcvilly & Burton-Smith, 2008). Henceforth, an in-depth interview format is chosen as it provides informants with some guidance on what to talk about, while also allows for the discovery or elaboration of information that is important but may not have previously been thought of as pertinent by the research theme. An in-depth interview is an effective tool to obtain a rich understanding and information of a new phenomenon in a specific area.

The key informants identified in this study are those from Halal manufacturing company that have expertise in the company's halal procedure and deal with the company strategies and decision. Expertise and knowledge from the Halal manufacturers help the researcher to get accurate information on the issues discussed. Thus, sampling is done based on the numbers of halal manufacturers with halal certification. Six manufacturers' companies listed by JAKIM as halal certified manufacturers were identified and chosen as respondents. The manufacturers were certified by JAKIM as halal company according to the Malaysia Standard of MS 1500: 2019 (Halal food production). Feedback from six key informants which fell within the suggested sample size of four to ten cases for qualitative data.

**Table 3.1 Respondent Profile**

Position	Company	Working Experience
Assistant Vice President	A	17
Production Manager	B	8
Compliance Manager	C	8
Halal Executive	D	3
Compliance Executive	E	7

### **Analysis and Findings**

All interviews recorded were transcribed verbatim and verified to ensure the reliability of the data. The interview transcripts in Malay were translated into English and verified by the researcher. Data analysis was performed to identify themes and sub themes of the data. The data were collected using specific questions based on previous literature, thus, some themes were pre-determined. New themes and sub- themes emerged from the data were added. Thus, the analysis was both deductive and inductive. From the interviews conducted, four categories were identified related to supply chain resilient practices among halal manufacturers. To achieve supply chain resilience, halal manufacturers must take several steps in their company's decision and strategies, including:

- A. **Diversifying suppliers:** Halal manufacturers can reduce their reliance on a single supplier by diversifying their sources of raw materials and ingredients. This will ensure that they have access to the materials that the company needs even if one supplier is unable to provide them.
- B. **Implementing Halal certification:** Halal certification needs to be acquired and renewed to ensure that all materials and ingredients used in the production of halal products meet the requirement in halal standards and policy. Having the halal certification will help to reduce the risk of using non-halal materials and ingredients, which can lead to contamination issues, supply chain disruptions and loss of customer trust.
- C. **Using technology:** Technology such as blockchain and RFID can help to track products and materials throughout the supply chain process. The application of technology in the production and logistics process can help to identify potential risks, disruptions and enable quick responses to the risk associated. In addition, the application of IR 4.0 technologies such as blockchain, IOT, cloud system, trace and tracking will help to improve the operation and reduce the potential risks that might happen during the production and logistics process.
- D. **Collaboration:** Collaboration among suppliers, manufacturers, and distributors will be able to build resilient supply chain strategies and decisions. This collaboration can be in terms of sharing the information and resources to help every partner in the supply chain to prepare for the potential risks and disruptions. The application of supply chain resilience practices among halal food manufacturers also will help to ensure the integrity and safety of halal products and maintain business continuity. The findings from the literature research and interview are relevant with the previous findings in this study that had been concluded from the findings of previous study.
  - **Diversification of suppliers:** Halal food manufacturers can diversify their supplier base to reduce dependence on a single

source of supply. This can help mitigate the impact of supply chain disruptions. A study by Khan et al. (2021) suggests that halal food manufacturers can collaborate with multiple suppliers to ensure a steady supply of raw materials and components.

- Adoption of technology: Halal food manufacturers can leverage technology to improve supply chain visibility and traceability. For instance, a study by Chen et.al (2021) suggests that halal food manufacturers can adopt digital technologies such as blockchain and RFID to track the movement of goods and ensure product integrity.
- Collaboration with stakeholders: Halal food manufacturers can collaborate with their suppliers, distributors, and other stakeholders to build resilient supply chains. A study by Ali et al. (2021) recommends that halal food manufacturers develop collaborative partnerships with their suppliers and customers to enhance supply chain resilience.
- Contingency planning: Halal food manufacturers can develop contingency plans to manage supply chain disruptions. A study by Madhavan (2022) suggests that halal food manufacturers can develop contingency plans that include alternative sourcing strategies, safety stock levels, and transportation options that are able to reduce the potential risks and disruption

**Table 4.1: Halal Supply Chain Resilient Practices**

Supply Chain Risk and Challenges	Application of Supply chain Resilient
Delay Risk	Diversification of suppliers Collaboration with stakeholders Contingency Planning Food security issues risk mitigation and planning Government and Regulation Procedure
Operational Issues	Adoption of technology Contingency Planning Risk Mitigation and Planning Halal certification renewal and implementation Government regulation and procedure Handling cross border issues
Technology Adoption	Investment on the halal transportation (GPS Trackers) Product Recall Government Regulation Handling for Different Food Products Specification Social Factors

Halal Integrity and Compliance	Logistics Operation and Readiness Behavior	Retail Operations Knowledge, Attitude, and Behavior	Awareness
	Structured Distribution Process		

The findings indicated that supply chain resilient practices are crucial for enhancing the resilience of the halal supply chain, ensuring compliance with halal requirements, improving business performance, and promoting sustainability. Halal manufacturers must develop their supply chain resilience strategies to ensure that their business operations are resilient, sustainable, and compliant with halal requirement and procedure. By having halal certification can improve supply chain resilience for halal manufacturers and improve the company reputation and performance. Halal certification is a process that verifies that a product or ingredient meets the requirements of Islamic law and is permissible for consumption by Muslims.

When a halal manufacturer obtains halal certification for their products, it demonstrates their commitment to producing high-quality of halal products and ensures that their products are accepted by Muslim consumers. Having halal certification can improve supply chain resilience in several ways. First, it can help to ensure that all materials and ingredients used in the production of halal products meet halal standards, which can help to reduce the contamination risk of using non-halal materials and ingredients that could lead to supply chain disruptions. Second, halal certification can help to build trust between the manufacturer and their suppliers, distributors, and customers. When suppliers and distributors know that a manufacturer's products are halal certified, they can have confidence in the quality and authenticity of the products were offered. Simultaneously, it can help to build strong relationships and partnerships between the manufacturer and their supply chain partners, which can improve supply chain resilience.

Based on findings, the respondents have highlighted on the important element of collaboration in supply chain resilient practices. Collaboration is a key element in managing supply chain resilience. Halal manufacturers must be transparent and able to establish clear communication channels with their suppliers, distributors, and other supply chain partners. This can involve regular meetings, conference calls, and other forms of communication to share information and coordinate activities. Halal manufacturers must be transparent and share the information with their supply chain partners especially information related to supply chain process. Shared information such as production schedules, inventory levels, and other relevant information is necessary for the product and process quality improvement. Additionally, these strategies will ensure that everyone in the supply chain is aware of potential disruptions and

able to take steps to mitigate the risks and reduce the impact from the risks associated.

The importance of technology adoption for supply chain resilient practices has also been highlighted in the research findings. Based on findings, the technology adoption among halal manufacturers will help to improve visibility, transparency, and efficiency in supply chain management process. This situation will reduce the risk of disruptions and increase the speed and accuracy of responses when the disruptions occurred during the supply chain process. The technology such as RFID, GPS, and blockchain can help to improve tracking and tracing of products and materials throughout the supply chain process. Consequently, the adoption of IR 4.0 technologies will help to identify potential disruptions, such as delays or quality issues, and enable quick and effective production and logistics process. The adoption of technology also can facilitate real-time information sharing between supply chain partners. This will help to improve collaboration and coordination among the supply chain partners, thus enabling faster and more effective responses to disruptions.

### **Conclusion And Recommendation**

The implementation of supply chain resilient practices among halal manufacturers is crucial to ensure the risks of the disruption to the flow of halal production can be avoided. This is very crucial to meet the demand of the consumers, especially in the face of unforeseen events such as natural disasters, pandemics, and geopolitical conflicts. Diversification of suppliers and logistics providers is also necessary to reduce the risk of disruption in the supply chain. As such the development of a contingency plan that outlines the steps to be taken in the event of a disruption to the supply chain must be in place. Integration of IR 4.0 technologies such as blockchain, internet of things (IoT), and artificial intelligence (AI) must be implemented to increase transparency and visibility in the supply chain process. The adoption of the technology also will help to improve product quality and reduce the potential operational risks.

The collaboration with stakeholders including suppliers, logistics providers, and regulators is necessary to mitigate the risk of disruption through the right platform of information sharing. Indeed, an implementation of a robust quality management system is very important to ensure the safety and integrity of halal products throughout the supply chain. In conclusion, supply chain resilience is critical for halal manufacturers to ensure the continuity of the halal supply chain, and the adoption of resilient practices is essential for achieving this goal. By implementing these practices, halal manufacturers can improve the agility, flexibility, and adaptability of their supply chain, thereby enhancing their ability to respond to disruptions and maintain the

integrity of their halal products. It was indicated that supply chain resilience refers to the ability of a supply chain to withstand disruptions and recover quickly from them, while maintaining its essential functions and meeting customer demand. Henceforth, Halal manufacturers must take the initiative and implement the supply chain resilience by increase the strategies and decisions to ensure that halal products are produced, delivered, and sold to customers, despite any potential disruptions in the supply chain. As a conclusion, supply chain resilience practices are critical for halal manufacturers to ensure the continuity of the supply chain and the adoption od resilient practices is essential for achieving goals in business. By implementing these practices, halal manufacturer can improve agility, flexibility, and adaptability of their supply chain operation. The flexibility and adaptability of the supply chain process will enhance the ability to respond to disruptions and maintain the integrity of the halal products.

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