

## 1. Introduction

Products and halal services refer to products that are permitted to be produced and used by consumers according to Shariah law. For halal products and services, Muslim consumers are allowed to purchase and use them. Conversely, products and services that are produced without complying with Shariah regulations are categorized as haram (forbidden). A product or service that is categorized as haram will not be purchased or used by Muslim consumers because its acquisition would violate Shariah law. Furthermore, halal products and services are also characterized as *toyyiban* (wholesome). *Toyyiban* is defined as being of quality, clean, pure, and safe for use according to Shariah law. Therefore, halal products and services can be defined as something permitted by Shariah law, of quality, clean, pure, and safe for use.

The production of halal products and services is essential to meet the needs of the Muslim consumer community. The demands of Muslim consumers for halal products and services are extensive and encompass various product and service categories. Generally, there are seven categories of halal products or services worldwide: food and beverages, cosmetics, pharmaceuticals, consumer goods, logistics, slaughterhouses, and medical devices. The halal certification of a product or service is typically overseen by a halal certification body (HCB) in a country, such as the Department of Islamic Development Malaysia (JAKIM) in Malaysia, Japan Muslim Association (JMA), Japan Halal Association (JHA), Japan Islamic Trust (JIT), Muslim Professional Japan Association (MPJA), Nippon Asia Halal Association (NAHA), and Japan Halal Foundation (JHF) in Japan.

The existence of these certification bodies is to ensure the integrity of halal products and services is upheld and protected. The integrity of halal products and services refers to the true value of a product or service as provided to the consumer. Integrity, in this context, implies honesty, sincerity, or a state of perfection. Therefore, integrity can be inferred as the assurance that the value of a product is perfect and aligns with what was promised to the consumer. Consumers expect producers to maintain the integrity of the halal products they produce, so that the value and quality of the purchased halal products match what is described on the product packaging or in advertisements.

Assurance of value in a halal product can also be viewed from various perspectives or categories and depends on factors of sales appeal provided by the producer. Sales appeal can arise from different angles, such as product quality. Examples of quality-based appeal include taste, weight, cleanliness, and shelf life. At the same time, the assurance of value in a product can also be seen from the perspective of the applied production methods. For instance, whether local materials are used, state-of-the-art equipment is employed, waste management practices are followed, and quality assurance systems like Good Manufacturing Practice (GMP) or Hazard Analysis Critical Control Point (HACCP) are practiced.

Furthermore, sales appeal can also come from the angle of assurance based on social principles. Assurance of social principal value can be viewed from environmental or humanitarian perspectives. The integrity of existing values refers to products produced using green technology or

free from child labour issues and any criminal elements. In the context of halal products, the integrity of the product refers to the assurance that the halal value is maintained from the source of raw materials to the consumption by the consumer.

Therefore, the integrity of a product can be referred to as the assurance of a promised value by the producer to the consumer. The integrity of a product needs to be protected and maintained according to suitable industry practices. Failing to protect the integrity of a product will undermine the promised value to the consumer. For halal products, the emphasized integrity pertains to honesty about the halal value. Failure to uphold the halal integrity of a product will give rise to doubts about the halal status of that product.

## 2. Halal Integrity

Halal integrity refers to the assurance that the halal value of a food product remains intact from the use of raw materials to the point of completion and purchase by consumers. Halal integrity can also be defined as a guarantee of the halal status of a product in terms of being safe for purchase, maintaining quality, and being free from improper practices starting from raw material sources all the way to the hands of consumers. Halal integrity also refers to a state where the halal status of a product will not be questioned. Based on these three definitions, it can be summarized that halal integrity refers to the unquestionable status or value of a product's halal nature as well as protected from any Haram elements through suitable efforts to maintain its halal value.

Activities related to halal integrity protection are associated with efforts made by halal product producers to preserve the halal integrity from the stage of raw material sourcing to reaching consumers. Protecting halal integrity also involves a firm's efforts to maintain halal value through the use of halal logistics, including halal transportation and warehousing throughout the supply chain activities. To ensure the preservation of halal integrity, protection should start from the stage of raw material utilization. The selected and used raw materials need to be sourced from suppliers with halal certification. Halal product producers have a clear responsibility to ensure that contracts for raw material purchases involve only partners with valid halal certification. Through this approach, the halal integrity of the utilized raw materials will be preserved and protected.

Halal integrity protection is not solely focused on the content of raw materials. Issues of cleanliness that align with the concept of *toyyiban*, honest and accurate labelling, production processes that adhere to Shariah principles and follow relevant standard procedure manuals, as well as product safety aspects, are also critical components in safeguarding halal integrity. This is because the halal value also encompasses honesty in every aspect of production and marketing of halal products. Good manufacturing and marketing practices can help reinforce the management aspect of protecting halal integrity.

Halal integrity protection is a central focus in the halal certification practices of Malaysia. The obligation of company management with halal certification regarding halal integrity protection is clearly stated in standard procedure manuals for halal product production, such as MS 1500: 2019 Halal food - General requirements (Third revision) for food products. The same obli-

gations are also explicitly stated for halal logistics services through the standard manuals MS 2400-1: 2019 (Transportation) and MS 2400-2: 2019 (Warehousing). Emphasis on protecting halal integrity is also mentioned in the halal policies of Malaysian halal product producers, which is part of the Halal Assurance System (HAS) developed by these producers.

Management sensitivity towards halal integrity issues is crucial. The world has witnessed several instances where management failures have led to mishandling halal integrity concerns in products of various companies. The failure of a halal food product company to protect halal integrity could lead to scandals in the halal food industry. Scandals involving halal integrity are considered more serious due to their impact on religious trust and their potential to negatively affect the sustainability and development of the global halal industry. Repeated scandals can erode consumer confidence in the halal integrity of products, making it challenging for Muslim consumers to enjoy halal products without doubt. Halal-related scandals have occurred globally and across various countries and types of products. The issues affecting halal integrity can be seen from three angles: the aspect of halal compliance itself, the aspect of *toyyiban*, and the aspect of trade-related compliance.

Table 1 illustrates that the issue of halal integrity involves three main aspects which are halal compliance, *toyyiban*, and trade compliance. All three aspects directly contribute to risks on the halal integrity. The issue of halal compliance refers to situations where non-halal substances are used in the preparation of halal food. Non-halal substances that can affect halal integrity include raw materials derived from pigs, dogs, and alcohol. The issue of halal integrity involving the use of non-halal materials is a serious matter and can render a product as haram. Halal integrity issues related to the use of non-halal material can result in serious non-compliance with the standards set by the Malaysian Halal Management System (MHMS). Directly, products categorized as haram can no longer be purchased by Muslim consumers.

The issue of *toyyiban* refers to cleanliness problems involving production locations and unclean manufacturing practices. Halal integrity issues involving *toyyiban* aspects does not necessarily involve the use of non-halal raw materials. *Toyyiban* refers to quality, cleanliness, and safety for consumption or use. This definition shows that issues of quality, cleanliness, and safety for consumption are part of the components of halal integrity. On the other hand, trade fraud issues refer to the use of halal logos that are not valid or recognized by the Department of Islamic Development Malaysia (JAKIM). The issue of halal integrity encompasses every activity in the halal supply chain. Starting from raw material production, the process of manufacturing raw materials, logistics activities, and up to the retail stage before purchase by consumers, halal integrity needs to be protected from contamination and from damaging the halal value possessed by a halal product.

At the same time, the robustness of the safety network for protecting halal integrity needs to be carefully examined. Preventive actions are necessary to ensure that the steps taken to safeguard halal integrity are at their best. The use of halal logistics is one of the best prevention measures to confront halal integrity issues. Solely safeguarding halal integrity at the production stage is insufficient because potential threats to halal integrity can occur throughout the halal supply chain. Threats to halal integrity can occur at every stage of the halal supply chain, start-

Table 1 Global Halal Integrity Cases (2000–2021)

Year	Country	Scandal Case	Halal Production Aspect	Aspect of Toyyiban Compliance	Aspect of Trade Compliance
2000	Mexico	Failed to declare pork content in sausage and burger meat	X		
2005	Italy	Horse meat sausages contain a mixture of pork	X		
2011	Malaysia	Alcohol content in food	X		
2013	Afrika Selatan	Pork meat is mixed into sausage and beef burger products	X		
2013	United Kingdom	Pork DNA in pastry and meat pie	X		
2013	United Kingdom	Pork DNA in frozen halal lamb burger	X		
2013	United Kingdom	Pork gelatine in medical vaccines	X		
2013	Amerika Syarikat	Chicken sandwich wrongly labelled as halal			X
2013	China	Homemade food products that are wrongly labelled as halal			X
2013	Malaysia	The bread factory is not clean		X	
2014	European Union	Mislabelling of chicken sausages containing pork mixture			X
2014	Malaysia	Pig DNA in halal chocolate that has been on the market	X		
2015	Britain	Slaughterhouses that do not adhere to halal procedures	X		
2015	Malaysia	Cleanliness of cake products		X	
2015	Italy	Pork DNA in chicken sausages	X		
2016	Spain	Pork DNA in candies	X		
2017	Malaysia	Mixing goat and pork meat in the same container	X		
2018	Malaysia	Use of raw materials that do not have halal certification	X		
2019	Malaysia	Cleanliness of seafood products		X	
2019	Malaysia	Use of fake halal logos			X
2021	Malaysia	Dirty production center		X	

ing from raw materials, production, transportation, warehousing, and at the retail stage.

Halal integrity cases can be addressed if all parties involved in supply chain activities use halal logistics to manage the transportation and storage of halal products in the market. This is because halal products transported using halal trucks will be protected from contaminants like pig DNA. Moreover, the concept of toyyiban, meaning pure and clean, will be applied in every process, from transportation and storage to the purchasing process by consumers. The issue of using non-recognized halal logos from JAKIM can also be better managed. Without a valid halal certificate, logistics providers such as trucking, container, and warehousing services will not provide logistic services to companies attempting to deceive with non-recognized halal logos. This action is in line with the halal logistics standard manual that stipulates only valid halal products are allowed to be transported using halal trucks.

The use of halal logistics is crucial to ensure the quality and integrity of halal products are preserved throughout the supply chain activities. This aligns with the requirement for halal logistics to ensure that halal products are not contaminated by non-halal products. Halal logistics has

been defined as a process of managing the acquisition, movement, storage, and handling of goods, animals, finished or semi-finished products, whether food or non-food items, along with the flow of information and documentation within the organization and supply chain, adhering to general Shariah principles. This definition implies that halal logistics involves all activities that occur throughout the supply chain process. Therefore, the assurance of maintaining the quality and integrity of halal can be provided by halal logistics, starting from the transportation and storage of raw materials to the point of purchase by end consumers.

Hence, the presence of halal logistics is seen to aid efforts in ensuring the integrity, purity, and quality of halal products are preserved. This aligns with the operational goal of halal logistics, which is to protect halal integrity from the production stage to reaching the consumer market (Tieman, 2011). The adoption of halal logistics can solve the problem of contaminating halal products throughout the supply chain activities, particularly the risk of contamination outside the production plant. Moreover, issues with using fake or unauthorized logos can also be curbed. Preventive measures can be taken to ensure that any product lacking a valid halal certificate recognized by JAKIM is not introduced into the local halal market. The presence of halal logistics can be considered as a definite solution to preventing fraud and contamination of halal products throughout the supply chain activities.

### 3. Halal Logistics and Halal Integrity Protection

The halal integrity protection by halal product producers can be defined as continuous efforts by these producers to maintain halal integrity throughout the supply chain activities through the use of halal logistics. Halal logistics refers to transportation or warehousing services that comply with Shariah principles. Halal logistics is one of the halal services presents in the world of the halal industry. Halal logistics is operated by logistics service providers who have obtained recognition certificates from halal certification bodies of a country, such as the Department of Islamic Development Malaysia (JAKIM) in Malaysia. Halal logistics is offered to halal product producers who desire their logistics activities to be managed in accordance with specific procedures to ensure that transportation or warehousing operations are compliant with Shariah principles. In Malaysia, halal logistics is operated based on two standard procedure manuals which are MS 2400-1: 2019 Halal Chain Management System Part 1 - General Requirements (Transportation) for halal transportation operations, and MS 2400-2: 2019 Halal Chain Management System Part 1 - General Requirements (Warehousing) for halal warehousing operations.

Halal logistics is a new practice in logistic operations that offers a different approach compared to conventional logistic services that are already available. Therefore, the consumer segment for halal logistic services is also different from conventional logistics. Halal logistics represents an innovative form provided by logistic suppliers who are innovative in their effort to expand the services offered. Halal logistics operations are divided into two categories: halal transportation and halal warehousing. Halal logistics is a Shariah-compliant logistic activity that starts from the source of production to the hands of halal consumers. Halal logistics offers benefits to users in the form of protecting the halal integrity of a product from transportation and storage of

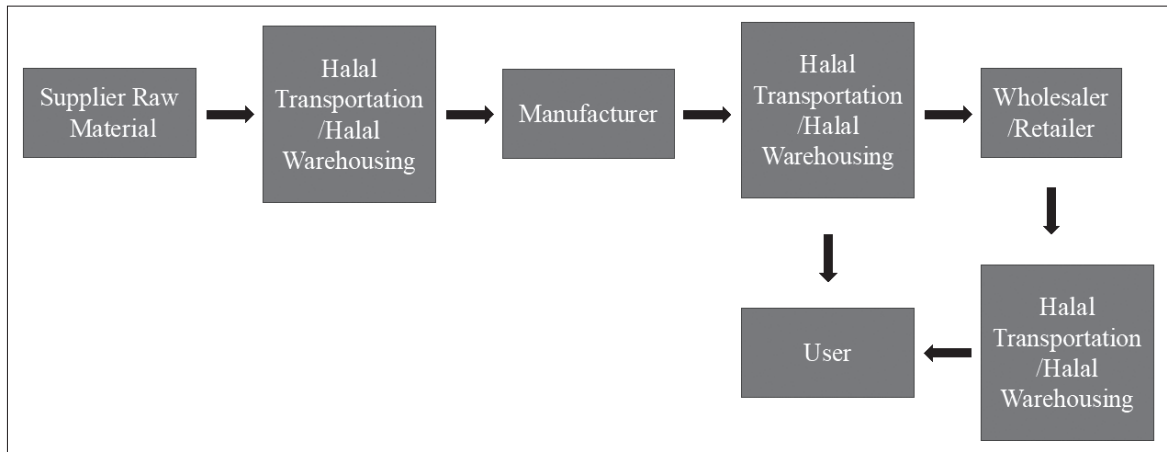


Fig. 1 Flowchart of halal logistics operations

raw materials to the production process until the halal product reaches the consumer. All halal logistics activities throughout the supply chain are designed to be Shariah-compliant and involve only halal products. Figure 1 illustrates the role of halal logistics that must be employed throughout the supply chain activities, starting from raw material suppliers to consumers.

The characteristics of halal logistics operations that exclusively manage halal products ensure the protection of halal integrity. The protected value of halal integrity comes from various aspects such as product quality and safety, as well as being free from the risk of cross-contamination with non-halal products. The design of halal logistics operations is not only intended to address the issue of preserving halal integrity but also emphasizes service quality and the preservation of the quality of transported and stored products. This can be seen through the manual development of standard procedures for halal transportation and warehousing that emphasize the protection of halal integrity. The use of halal logistics can effectively support efforts to preserve halal integrity along the supply chain. Cases related to halal integrity issues can be more efficiently prevented from occurring.

There are several examples that highlight the importance of halal logistics in preserving halal integrity. In 2013, it was reported that pig DNA was found in frozen halal lamb burgers in the United Kingdom. This discovery occurred when local authorities-initiated testing on frozen halal lamb burger products in the market and found pig DNA in the halal lamb burgers. However, a second test conducted by local authorities found no pig DNA in the frozen halal lamb burgers. This discrepancy in findings was due to differences in sampling methods between the first and second tests. The first test involved sampling frozen halal lamb burger products from the market, while the second test involved sampling from the production facility.

Following that, local authorities in the United Kingdom concluded that the contamination of pig DNA in the frozen halal lamb burgers occurred outside of the production facility. This conclusion suggests that cross-contamination occurred during the supply chain activities from the point the frozen halal lamb burgers left the production facility until they were purchased by consumers. This situation indicates that the halal integrity of the frozen halal lamb burgers was compromised due to the lack of halal logistics in the supply chain activities. If halal transportation and warehousing were employed, the integrity of the frozen halal lamb burgers could have been pre-

served by avoiding the risk of being transported or stored alongside non-halal items derived from pigs.

Cases involving the need for halal logistics to preserve halal integrity have also occurred in Malaysia. In 2014, a case arose in Malaysia involving the discovery of pig DNA in halal products in the market. This discovery shocked the halal market in Malaysia and led to negative reactions from consumers toward the brand of the affected products. Two government agencies conducted investigations and reached different findings. These discrepancies can be attributed to differences in investigation methods. The first government agency investigated by taking the sample of halal products from the market and found pig DNA in the samples.

However, when the investigation was repeated by another local government agency, no pig DNA was found in the samples taken from the production facility. This difference in findings indicates that the halal products were not contaminated with pig DNA during the production process in the facility. At the same time, the discovery of pig DNA in the market samples indicates that cross-contamination occurred at the logistic stage that did not use halal transportation or warehousing. Cross-contamination can occur if producers use conventional logistics services that are not Shariah-compliant. Cross-contamination can happen during transportation or warehousing when halal products are transported or stored together with non-halal products. This situation can be prevented by using halal logistics throughout the supply chain, starting from the production facility to the consumer. Through halal logistics, the integrity of halal products can be well-preserved. This case has similarities to the 2013 case in the United Kingdom, where cross-contamination did not occur during production but in the market.

Another case from 2017 involved a situation where frozen halal lamb meat and frozen pork meat imported from Spain were placed in the same container at a port terminal in Malaysia. This case highlighted a mistake in managing imported halal products by storing frozen halal lamb meat and frozen pork meat in the same container. This mistake could have been avoided if local importers used halal logistics services to handle the transportation of frozen halal lamb meat. The use of halal logistics would ensure that frozen halal lamb meat would not be placed together with pork meat in a single container, thus preventing any risk of cross-contamination. This case could have been prevented if halal logistics were employed before the contaminated meat reached the terminal. The integrity of halal products can be maintained as the frozen halal lamb products will not be placed together with non-halal products in the same container.

For other cases where cross-contamination occurs during production, halal logistics plays a crucial role in ensuring that only halal products with preserved halal integrity are brought into the halal market. Through the use of halal logistics, any products that have been contaminated at the production stage and have had their halal integrity compromised will not be taken out of the production factory. This directly prevents the issue of contaminated halal products from worsening and allows for direct resolution at the production stage without involving consumers directly. Therefore, the use of halal logistics should be more widely adopted by producers, taking into account the benefits gained, whether directly or indirectly.

#### 4. Benefits of Using Halal Logistics in Preserving Halal Integrity

Generally, the use of halal logistics by producers of halal products aims to protect the integrity of their halal products. Efforts to preserve halal integrity through the use of halal logistics also provide several benefits to the producers of halal products. When producers employ halal logistics to protect halal integrity, they can directly enjoy several advantages. The first benefit refers to the ability to reduce the risk of consumer complaints or grievances against a producer company's halal practices. Cross-contamination involving mixing with prohibited substances can erode consumer trust in a company's halal integrity. Consumer complaints about a company's halal practices can occur, causing losses for the producers. Therefore, by using halal logistics, the risk of contamination outside the factory can be effectively avoided. Meanwhile, damages resulting from contamination during production can be contained and controlled to prevent reaching consumers.

The second benefit pertains to the capability of halal logistics to assist in meeting the requirements of halal practice compliance audits by local authorities. Through the use of halal logistics, the risk of cross-contamination can be avoided, leading to good halal integrity protection practices. This situation will aid halal product producers in meeting the requirements of halal practice compliance audits. This is because compliance audits are conducted to ensure the integrity of a product's halal status is maintained throughout the production process. The third benefit relates to the capacity for continuous improvement related to halal practices. Through halal logistics, producers can easily make continuous improvements to halal practices as issues concerning halal integrity can be effectively managed. Halal integrity issues are paramount in good halal practices.

The fourth benefit is from the perspective of image. The use of halal logistics as an effort to protect halal integrity is considered a commendable practice. Producers of halal products will be perceived as parties dedicated to and practicing good and quality halal practices. Indirectly, this effort enhances the image of halal product producers among customers and consumers. The efforts to protect halal integrity through the use of halal logistics will create an image that halal product producers are considerate company that values the needs of both customers and consumers.

The fifth benefit is from the perspective of customer satisfaction. Efforts by halal product producers to protect halal integrity through the use of halal logistics will enhance the level of customer satisfaction. The increase in customer satisfaction occurs because customers feel appreciated by the efforts of halal product producers to safeguard halal integrity and ensure they receive products with genuine halal value. The increase in customer satisfaction is crucial in cultivating loyalty towards a particular halal product. Consumer loyalty will ensure repeated purchases of a halal product, directly boosting the profits of the halal product producers.

Moreover, by striving to use halal logistics to protect halal integrity, halal product producers can enhance their competitive edge. This increase in competitiveness aids halal product producers in expanding their market and growing their market share for halal products. Directly, halal



product producers who endeavour to preserve halal integrity through the use of halal logistics can benefit from three distinct contexts. Firstly, it assures the preservation of the authenticity of halal product values. The use of halal logistics helps halal product producers ensure the integrity of halal products. Any guarantees of quality, wholesomeness, and the authenticity of halal values promised to consumers remain upheld throughout the supply chain activities.

The second context pertains to sustainable halal practice management. Through the use of halal logistics, halal product producers can manage halal practices to be at their best throughout the supply chain activities. Risks of being deceived by suppliers of raw materials into purchasing non-halal materials or the negligence of purchasing non-halal raw materials can be avoided. This risk can be avoided because if the purchased or ordered raw material is non-halal, it will fail to be transported out of the supplier's premises. This is because halal logistics providers will conduct inspections beforehand to ensure that the raw material to be managed is halal and comes with valid halal documentation. Indirectly, the risk of receiving non-halal raw materials at the raw material receiving terminal of the halal product producer's factory will be avoided.

The third context pertains to commercial considerations. Employing halal logistics to protect halal integrity can have a positive impact on halal product producers. The improvement of company image, customer satisfaction, and consumer trust and loyalty towards products made with the use of halal logistics can yield a positive effect on the value of subscriptions to halal products. Directly, the profits of halal product producers will increase as their market share for halal products grows. Halal product producers who use halal logistics to safeguard halal integrity will be seen as a company that not only prioritizes profit but also aims to implement comprehensive and effective halal management practices.

## 5. Conclusion

The use of halal logistics is a crucial element in the ongoing efforts of halal product producers to safeguard halal integrity throughout the supply chain activities. Through the utilization of halal logistics, halal product producers can ensure the preservation of halal integrity from the phase of purchasing raw materials all the way to the products reaching consumers' hands. Cases involving compromises to halal integrity serve as prime examples to be learned from, particularly when halal practices are implemented solely at the production level. Case of cross-contamination of halal products in the market, as observed in the United Kingdom and Malaysia, can be avoided through the use of halal logistics. Similarly, various other cases involving halal products that have been contaminated at the production stage can also be prevented from entering the market if halal logistics are employed.

Halal product producers need to exhibit a high level of awareness regarding the significance of halal logistics in managing issues related to halal integrity protection. The level of awareness of halal product producers regarding the importance of halal logistics can easily be determined. Producers who have implemented halal logistics can be seen as possessing substantial information and awareness about the benefits of using halal transportation and warehousing. Producers who utilize halal logistics can be perceived as business entities committed to practicing compre-

hensive halal activities throughout the supply chain. On the other hand, halal product producers who continue to employ conventional logistics need to be provided with better and continuous explanations. The role of providing explanations and awareness can be shared jointly between local authorities and halal logistics providers.

Efforts to protect halal integrity are not a seasonal endeavour nor should they solely focus on the production stage. Every entity within the halal supply chain should play their respective roles to ensure that efforts to protect halal integrity are carried out more effectively. Halal logistics providers should collaborate and work hand in hand with halal product producers and local authorities to promote the adoption of halal logistics. Through the collaboration of all parties, the effort to establish an improved halal ecosystem with more effective and sustainable halal integrity protection can be realized.