

Cross-Contamination with Impurity in Wet, Moist, and Liquid Conditions: Critical Insights from al-Syafi'i's Fiqh Discourse and the Malaysian Halal Standard Requirements

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Abstract

This article investigates cross-contamination management in halal logistics by bridging classical al-Shāfi'i's fiqh discourse with contemporary Malaysian halal standards to provide a coherent analytical framework. Specific attention is given to wet, moist, and liquid conditions, which significantly increase the likelihood and severity of impurity transfer in supply chain operations. Drawing from authoritative Syafi'i texts from the rulings on a dead mouse in ghee, to the seven-wash requirement for canine-related impurities, and the jurisprudential distinction between solid and liquid substances, the study demonstrates how classical legal reasoning provides a coherent conceptual framework for understanding impurity dynamics. These doctrinal insights are then aligned with regulatory provisions in MS 1500 and the MS 2400 series, which mandate segregation, environmental control, specialised sanitation, and risk-based handling procedures. By integrating fiqh principles with contemporary logistical practices, this article illustrates how traditional jurisprudence continues to offer practical relevance in addressing the modern logistics operational challenges. The analysis ultimately argues that combining classical frameworks with regulatory standards strengthens halal governance, enhances consistency in contamination control, and provides a robust, evidence-aligned foundation for safeguarding halal integrity across increasingly complex supply chains. This synthesis reinforces the enduring utility of Syafi'i thought in shaping an effective and comprehensive halal logistics management system.

Keywords: Halal Supply Chain, Halal Logistics, Halal Cross-Contamination, Halal Storage

Introduction

The rapid expansion of global demand for halal products has increased pressure on organisations to ensure full compliance with Shariah requirements across the entire supply chain, extending well beyond production to include packaging, storage, and logistics activities

(Harun et al., 2020; Tieman, 2013). As halal supply chains grow more complex, logistics has emerged as a critical control point where halal integrity is most vulnerable. Failure at this stage not only undermines consumer trust but also threatens the legal status of halal products, making this area an urgent subject of investigation. Among the various risks within halal supply chains, cross-contamination remains one of the most persistent and difficult challenges to manage (Ahmad & Shariff, 2017). Halal products may lose their lawful status through contact with non-halal items during handling, packaging, storage, or transportation, even if contamination occurs briefly or unintentionally (Supian, 2018). Islamic legal principles recognise that even minimal contact can alter a product's permissibility, highlighting the necessity for clearly defined and effectively implemented halal logistics systems (Ahmad & Shariff, 2016; Ahmad & Shariff, 2020). Despite the presence of modern halal standards, gaps remain in translating these requirements into consistent logistics practices, particularly in addressing contamination risks.

This study responds to this need by examining halal logistics challenges through the jurisprudential framework of al-Syafi'i's fiqh and assessing how its principles can be operationalised within Malaysian Halal Standards. The article demonstrates that Islamic jurisprudence, particularly the al-Syafi'i school of thought (madhhab), offers practical and systematic guidance for managing contemporary logistics issues related to halal integrity (Ahmad & Shariff, 2020). By emphasising principles such as product segregation, contamination prevention, and the appropriate treatment of different product categories, this study highlights the continued relevance of classical fiqh in strengthening risk mitigation strategies and ensuring halal compliance throughout the logistics chain, from origin to end-users.

Literature Review

The global halal market's expansion has heightened the need for meticulous halal logistics to ensure product integrity throughout the complex supply chain (Mahadi, 2023). This includes safeguarding halal products from non-halal contamination across all logistics activities, including transportation, storage, warehousing, and retailing (Ahmad & Shariff, 2020). The intricate process necessitates a dedicated halal logistics system to proactively avert potential cross-contamination risks and fulfil the stringent requirements for safe, hygienic, natural, nutritious, pure, and unadulterated products (Haleem et al., 2021). The fundamental principle underpinning halal logistics is the segregation of halal cargo from non-halal cargo during transportation to prevent cross-contamination and ensure compliance with Shariah law (Ahmad & Shariff, 2017). Cross-contamination, particularly in halal logistics, is understood as the undesirable transfer of non-halal elements or impurities (*najs*) into halal products, thereby compromising their permissible status under Islamic law (Ahmad & Shariff, 2017, 2016). The Malaysian Halal Standard defines "contamination" as the state of being affected by a "contaminant" or "precursor" that impacts halal status, with contaminants being any non-halal and/or detrimental substances, intentionally or unintentionally added, that render a product non-halal (Ahmad & Shariff, 2017; Department of Standards, 2019). This standard mandates strict segregation to prevent such contact during all stages, including handling, preparation, processing, packaging, storage, and serving (Mohd Dasuqkhi, 2024). In alignment with this, Sarwar emphasises the critical goal of "retaining the halal from procurement to end customer" (Sarwar et al., 2021), which inherently requires diligent

management of cross-contamination risks throughout the supply chain to ensure products remain safe, hygienic, pure, and unadulterated (Sarwar et al., 2021).

In halal logistics management, cross-contamination refers specifically to “haram – to – halal” cross-contamination, and it defined as ‘unlawful commingling or transfer of impurity (*najs*) substances from one product or environment to another may cause ritual impurities and make things impermissible (Department of Standards, 2019). Such a situation can arise through direct access, the sharing of paraphernalia and vessels in circulation, by breathing air contaminated by the particles, and even though the product that is otherwise deemed permissible becomes religiously impure or haram (Ahmad & Shariff, 2017). This strict requirement requires rigorous steps on the preventive side within the supply chain to ensure that no such forms of halal certification are compromised (Ahmad & Shariff 2017; Rahardjo 2023). The determination of impurity (*najs*) can be perceptible to the senses, or by way of shariah, and classified as severe (*mughallazah*), light (*mukhaffafah*) and moderate (*mutawassitah*) (Kamali, 2012). For example, the OIC/SMIC 1:2019, MS 1500:2009, and HAS 23103:2012 standards impose particular management protocols for the conversion of production lines and equipment which have been in contact with non-halal products to a halal state, as opposed to GSO 993:2015, which considers that regular cleaning is acceptable (Abdallah et al., 2021). This extreme thoroughness is applied to every other stage of forwarding (procurement, receiving, warehousing and transport) to eradicate even the possibility of cross-contamination and ensure that goods remain Shariah-compliant throughout the supply chain process (Haleem et al., 2021; Rahardjo, 2023). In this sense, paragraph [g] of the Malaysia Trade Description (Definition of “halal”) Order 2011 clearly highlights three main critical conditions, which may trigger cross-contamination for halal-certified goods/and or cargo with any product that fails to satisfy a specific halal requirement. The paragraph says:

“...[g] Has not, in the course of preparing, processing, or storing, been in contact with, mixed, or in close proximity with any food that fails to satisfy paragraph [a] and [b]”. (Malaysia Trade Description (Definition of “halal”) Order 2011)

This strict regulation is particularly critical in preventing cross-contamination, especially from impurity (*najs*), which may render halal products haram and unsuitable for Muslim consumption (Ahmad & Shariff, 2017, 2016). Paragraph [a] and [b] highlight the avoidance of containing or deriving from anything of non-halal animals or not slaughtered according to syariah law, and [b] emphasises avoiding impurity (*najs*). Therefore, maintaining halal integrity throughout the supply chain is paramount, especially given the global sourcing of products, which increases the potential for such compromises (Supian, 2018), and necessitates a robust framework for halal logistics management that integrates both regulatory standards and theological insights to mitigate risks effectively (Ali et al., 2021).

Methodology

This article applies the document analysis method to explore the very crucial part of Islamic ruling requirements regarding the cross-contamination from the al-Syafi'i school of thought. It provides a systematic approach to reviewing and evaluating both printed and electronic materials that are available. Much like other analytical methods in qualitative research, it involves carefully examining and interpreting data to reveal meaning, deepen understanding, and generate empirical insights. Crucially, the documents analysed, which

include both textual and visual elements, were recorded without the researcher's direct intervention. As Atkinson and Coffey (1997) explain (Bowen, 2009), documents can be seen as "social facts," created, shared, and applied within specific social structures. Morgan highlights that document analysis is a valuable and long-standing research method (Morgan, 2022). It encompasses the examination of diverse materials such as books, newspaper articles, academic journal articles, and institutional reports, making any text-based document a potential source for qualitative inquiry. This study also critically integrates and compares the classical Islamic legal texts from the al-Syafi'i school i.e.; *al-Hāwī al-Kabīr fī Fiqh Madhhab al-Imām al-Shāfi'ī* (1999), *Nihayah al-Muhtaj fī Syarh al-Minhaj* (1984), *Tuḥfah al-Muḥtāj bi-Sharḥ al-Minhāj* (1999), and *Mughnī al-Muḥtāj ilā Ma'rifat Ma'ānī Alfāz al-Minhāj* (1978), with a critical examination of contemporary Malaysian Halal Standard documents and relevant industry reports. This approach facilitates a comprehensive understanding of how jurisprudential principles can inform and strengthen contemporary halal logistics practices, particularly in mitigating risks associated with cross-contamination. The analysis involved a comparative assessment of the prescribed standards and the jurisprudential interpretations to identify areas of convergence and divergence, thereby enriching the framework for halal logistics management.

Results and Discussion

The Malaysian Halal Standard MS 1500 exemplifies a well-structured system of halal integrity along the supply chain, with a series of strict procedures for segregation and contamination suppression. The standard in this sense is a critical benchmark in the identification of cross-contamination between halal and haram, providing guidance on its avoidance within logistics (transport and storage) operations that falls under logistics categories covered by additional standards i.e MS 2400:2019-1; MS 2400:2019-2 and MS 2400:2019-3, which detailed particular operational requirements for logistics services including warehousing, transportation and retail so as not to compromise with the halal status. According to the Malaysian Halal Standard, "contamination" is referred to as anything that is tainted by a "contaminant" or "precursor" in such a manner that may alter the halal status. Contaminant: any non-halal and/or harmful (*mudhorat*) substance, whether added purely deliberately or accidentally, that will make a product not halal (Ahmad & Shariff, 2017; Department of Standards, 2019). The control point is defined at which control can be exercised to ensure that the requirements of halal are met, and the values associated with an expression are evaluated by operands culled from input according to Islamic principles. This also covers the filth, including dogs and pigs, any product containing parts of a dog's or a pig's body and any products tainted with *najs* things (Department of Standards, 2019). The wide-ranging term 'food safety' requires a holistic approach to risk assessment that is able to identify and manage instances of potential contamination at each stage of the food supply chain, including points often neglected by traditional quality control (Saidin et al., 2024). At the core of such an integrated vision is how it fits well with the higher objectives of *syariah* (Maqasid al-Shariah), grounded in a concerted effort to confirm that halal logistics not only achieve aims for purity but also secure an authentic and legitimate public interest (Harun et al., 2020). This holistic system is the secret of trust, and it thoroughly ensures the wholesomeness of halal from its inception to the consumer, which embraces physical safety and spiritual cleanliness (Hanifah et al., 2020). These strict regulations are of vital importance, where, without them, the halal product with all its certified status would be

threatened by incidental contact during transportation and storage with a non-halal commodity (Zailani et al., 2017; Ahmad & Shariff, 2020).

Al-Shafi'i's Fiqh Discourse on Managing Impurities (Najs)

This section will delve into the classical Islamic legal interpretations within the al-Syafi'i school regarding the nature of impurities (*najs*) and provide a foundational understanding for contemporary halal logistics. In the al-Syāfi'ī tradition, *najs* refers to any substance deemed legally impure, the presence of which invalidates ritual purity and must therefore be removed before acts of worship can be performed. Classical jurists note that impurity covers both visible filth and materials identified as impure through explicit scriptural evidence. Al-Māwardī (1999) defines *najs* as “everything whose contact affects purity in worship and whose removal is required for the validity of ritual acts,” highlighting its legal—not merely physical—dimension. Al-Shīrāzī (n.d.) further classifies impurity into severe (*mughallaḥah*), moderate (*mutawassiṭah*), and light (*mukhaffafah*), each requiring different purification procedures. Al-Nawawī (n.d.) elaborates that the category severe (*mughallaḥah*) includes dog and pig derivatives, bodily discharges such as blood, urine, and faeces, and even their slaughtered carcasses. *Najs mutawassiṭah* refers to the category of moderate impurity that falls between the severe (*mughallaḥah*) and light (*mukhaffafah*) forms of impurity. Classical al-Syafi'i jurists treat this category as the broadest, encompassing most ordinary impurities encountered in daily life. According to al-Shīrāzī (n.d.), *najs mutawassiṭah* includes substances such as urine, feces, blood, vomit, pus, and other bodily discharges, as well as intoxicants like *khamr* and the carcasses of animals not slaughtered according to Shariah. Al-Nawawī (n.d.) states that these impurities require cleansing with water until their traces—of colour, smell, or taste—are removed, reflecting the school's emphasis on both physical and legal purity. Ibn Hajar al-Haytamī (1999) adds that impurity transfers through moisture, whereas dry contact does not necessarily cause contamination. Together, these works provide the core framework through which the Syāfi'ī school conceptualises impurity and underpin the principles now embedded in contemporary halal regulatory standards. The discussions in Islamic jurisprudence (*fiqh*) typically begin with divine commands from the Qur'an or the Prophet's traditions, offering specific guidance on managing various matters, always within the overarching framework of Shariah. In this context, the most relevant tradition of the Prophet PBUH is the hadith narrated by al-Bukhari and al-Nasa'i on managing impurities that come into contact with food. Both are:

“Allah's Messenger, PBUH, was asked regarding ghee (cooking butter) in which a mouse had fallen. He said, “Take out the mouse and throw away the ghee around it and use the rest.” (al-Bukhari, Kitab al-Wudu', Bab: Ma Yaqā' Min al-Najasat fi al-Samn wa al-Ma', no. 235)

“When it (the coking fat) is solid, then remove it (the mouse) and what was around it. And when it is liquid, then do not use it.”

(al-Nasa'ie, Kitab: al-Far' wa al-'Atirah, Bab: al-Fa'r Taqa' fi al-Samn, no. 4261)

Al-Mawardi (1999), in his masterpiece of *fiqh*, expounds these prophetic directives into a systematic juristic principle based on how impurities physically behave in solids versus liquids. According to al-Mawardi (1999), while elaborating the statement of al-Imam al-Syafi'i was recorded to say:

“If a mouse or any other animal dies in ghee (clarified butter), or in any type of fat, molasses, or milk, the ruling depends on whether the substance is solid or

liquid. 1. If the substance is solid (*jamid*), only the area immediately surrounding the dead animal becomes impure (*najs*). This is because the impurity contacted a moist surface, and a moist surface becomes impure when it comes into contact with impurity. It is similar to how a wet garment becomes impure when it comes into contact with dry impurity. Anything beyond the point of direct contact remains pure, since the solid state (*jumud*) prevents the impurity from spreading or mixing through it. 2. If the substance is liquid (*mā'i*), then the entire volume becomes impure, regardless of whether the quantity is small or large, and whether or not the impurity causes any noticeable change in smell, colour, or taste." (al-Mawardi, 1999)

This deep differentiation between solids and liquids is a central matter related to the drafting of laws for dealing with contaminated halal products, as the state of aggregation directly affects the level of impurity and therefore, a suitable method must be used to purify it. This juridical difference is significant with respect to cross-contamination management in halal logistics as it determines those corrective measures and separation measures required to guarantee product identity (Mohd Dasuqkhi, 2024). From the logistics perspective, this means that proper handling considerations should be carefully made regarding the physical condition of halal products, including applying specific methodologies for solid and liquid products to avoid cross-contamination across the whole consignment (Olya & Al-Ansi, 2017). This strict application of al-Syafi'i's *fiqh* discourse serves as a fundamental principle for an effective contamination control measure where minimal contamination with non-halal substances in liquid products automatically requires 100% rejection without any need for localised remediation in its surrounding area. Thus, in respect of liquid halal product, the above quotation illustrates the requirement for an absolute segregation rule, which minimises to zero or at least substantially eradicates any tainting of a large quantity by contact with any amount of non-halal material. In this case, the same point is also emphasised by one other al-Syafi'i expert, Ibn Hajar (al-Haythami, 1999), while discussing wearing an impure garment, states:

"...An exception to this is when the weather is hot such that the person sweats, causing his body to become impure through contact with the garment, and he would then be required to wash his body for prayer..." (al-Haythami, Ibn Hajar, 1999)

The passage explains the basic principle in the al-Syafi'i school that whatever is originally pure and wet becomes impure if it touches something that has been dryly contaminated. This concept is determinant for the comprehension of the dynamics of contamination, as it was decided that when a solid object, such as ghee, touches an impure dried thing, only where it is touched may be considered also contaminated, just like the wet clothing coming into contact with an impure dry thing (al-Mawardi, 1999). However, this principle is further highlighted in situations where a person sweats in hot weather, making their body moist and impure through contact with a dry, impure garment, necessitating purification before prayer (al-Haythami, Ibn Hajar, 1999). Such detailed differentiation underscores the nuanced complexities of contamination and has significant implications for establishing protocols in halal logistics, particularly in managing cross-contamination scenarios (Mohd Dasuqkhi, 2024). Imam al-Ramli, on another topic, also emphasised the same thought on cross-contamination with canines:

“[Anything that becomes impure through contact with any part of a dog]—whether through its body, its excretions, or through something that itself became impure by contact with either of them, such as when the dog laps from urine or from a large amount of water that has been altered by impurity, and then what it lapped touches a garment—even its bite (from dog is one used for) hunting or other purposes—must be washed seven times, one of which must be with soil. This ruling applies equally whether the dog is dry and contacts something moist or otherwise (such situation of impurity) [needs to be cleansed seven times, one of them with soil]...” (al-Ramli, 1984)

This stringent requirement for purification with soil, even for canine contact, underscores the principle that the presence of specific impurities necessitates particular cleansing agents beyond mere water (Abdallah et al., 2021). The same ruling was also proposed by al-Syarbini (1978) in his “*Mughni al-Muhtaj*” in elaborating the statement of al-Nawawi, says:

“Know that impurities are of three types: severe (*mughallaḥah*), light (*mukhaffafah*), and moderate (*mutawassitah*). The author mentions them in this order, beginning with the first of them, saying: [And anything that becomes impure]—even if it is a solid object, including part of a hunted animal or anything else—[through contact with anything from a dog] whether that be its saliva, its urine, or any of its other moist secretions, as well as its dry parts when they come into contact with something moist...”

(al-Syarbini, 1978)

The Islamic jurisprudence of the al-Syafi'i school, as interpreted by various scholars mentioned, meticulously addresses the critical aspect of wet, moist, solid, and liquid conditions in relation to impurity and cross-contamination. It holds significant implications for halal logistics, particularly concerning the transferability and remediation of *najis* (impurities). The al-Syafi'i school, as interpreted by various scholars, strictly addresses the critical aspect of wet, moist, solid, and liquid conditions in relation to impurity and cross-contamination. This detailed attention is not merely theoretical; rather, it provides a practical framework for determining how impurities spread, the degree of contamination, and the appropriate purification method. Within this school, moisture is understood as the primary medium enabling impurity transfer. A dry impurity cannot contaminate another dry object, but even minimal moisture on either surface creates a pathway for impurity to move. Consequently, the *fiqh* distinguishes between solid substances, which restrict impurity to the immediate area of contact, and liquids, which allow impurity to disperse throughout an entire volume regardless of perceptible changes. Jurists such as al-Mawardi (1999), Ibn Hajr al-Haythami (1999), al-Ramli (1984), and al-Syarbini (1978) expand these foundational principles by identifying how states of matter interact with *najis* under different circumstances, clarifying when contamination is localised, widespread, or severe enough to require specific ritual cleansing methods such as *sertu*.

These doctrinal principles carry significant implications for halal logistics. First, they provide a systematic way to categorise goods—solid, moist, wet, or liquid—and anticipate how contamination may occur during storage, transport, or handling. Second, the jurisprudential rules directly inform the development of risk-based operational controls, such as product segregation, dedicated equipment, and context-specific cleaning protocols. For

instance, the ruling that a liquid becomes completely impure from even a small amount of *najs* justifies the strict segregation and disposal requirements found in Malaysian standards for liquid cargo. Similarly, the recognition that moisture facilitates impurity transfer underpins modern hygiene measures, environmental controls, and humidity management in halal logistics facilities. Thus, the al-Syafi'i *fiqh* tradition provides a conceptual backbone that aligns closely with contemporary halal standards, offering both the theological justification and the practical reasoning necessary to design logistics systems that reliably safeguard halal integrity.

Moist, Wet, and Liquid Conditions: The Research on Logistics Perspective

The Malaysian halal standards underscore that halal food must neither contain nor come into contact with any form of *najs*, as defined by Shariah law and authoritative fatwa (Demirci et al., 2016,; Yahaya et al., 2024; Department of Standards, 2019). The term *najs* encompasses several categories of impurities, including dogs, pigs, and all their descendants or derivatives; halal food that becomes contaminated through direct contact with non-halal substances; and any liquids or materials discharged from human or animal orifices, such as urine, blood, vomit, pus, faeces, and placenta (Department of Standard, 2019; Islamic Consumer Goods – Part 2, 2013; Standards Malaysia, 2018). It also includes carrion and animals that are halal by species but not slaughtered in accordance with Shariah requirements, apart from specific exemptions granted to aquatic species and certain insects. In addition, *khamr*—defined as liquor or any intoxicating liquid—as well as any food, beverage, or item that contains or is mixed with such substances, falls squarely within the category of *najs* (Department of Standards, 2019; Department of Standards, 2018). Collectively, these definitions form the basis for ensuring that halal products remain uncontaminated throughout the supply chain and serve as a foundational reference for halal logistics and certification practices in Malaysia.

As summarised in Table 1, moist conditions describe environments with high humidity but no water on surfaces. These conditions affect packaging stiffness, accelerate microbial growth, and reduce the mechanical strength of paper-based materials. Studies show that humidity directly changes the compression strength of corrugated fibreboard and increases the rate of degradation in biodegradable or composite packaging structures (Fadiji & Coetzee, 2020; Shah et al., 2019). Updated packaging and environmental standards also emphasise humidity as a critical protective factor in supply chain performance (ISO 18602:2023). Wet conditions, on the other hand, refer to situations where surfaces or cargo come into intermittent or short-term contact with liquid water, such as rainfall during loading, condensation on containers, or wet warehouse floors. Wet exposure always weakens the pallets, damages labels, and disrupts handling safety. Research in logistics and material-handling environments confirms that surface moisture increases slip hazards and reduces the strength of paper-based packaging, especially under compression (Saghir & Li, 2018; ISO 22461:2022). Operational studies of port and terminal environments also show that wet conditions significantly increase delays and material handling risks (Heilig et al., 2022), whereas the liquid conditions represent prolonged exposure or full immersion in water or other liquids. As for the liquid, it requires sealed packaging, robust containment, and adherence to international transport regulations. The logistics consequences of liquid exposure include contamination, product loss, and environmental damage. Maritime and chemical cargo research identifies immersion and leakage as major operational hazards

(Akyuz et al., 2021). For this, updated global regulations such as the IMDG Code and UN Model Regulations mandate spill-prevention systems, integrity testing, and performance standards for packaging intended for liquid transport (IMO, 2022; UNECE, 2023).

Table 1

Comparison Table: Moist vs. Wet vs. Liquid Conditions in Logistics

Condition Type	Definition	Typical Sources	Operational Risks	Implications for Halal Logistics
Moist	High relative humidity (RH%) without visible water on surfaces.	Humid climate, poor ventilation, high RH%, condensation risk areas.	Quality degradation during storage; mould formation; corrosion.	Moisture enables impurity transfer if surfaces are partially wet; increases vulnerability of sensitive goods.
Wet	Intermittent or short-term contact with liquid water.	Rain during loading, condensation in containers, wet warehouse floors, splashes.	Slip hazards; operational delays; packaging collapse during handling.	Wet surfaces allow direct <i>najs</i> transfer; higher risk during handling and loading.
Liquid	Prolonged exposure or full immersion in water or other liquids.	Leaks, spills, immersion during transit, container failure, flooding.	Major contamination events; environmental damage; product loss.	Liquids cause full impurity dispersion—entire batch becomes <i>najs</i> under Syafi'i fiqh.

Adapted from Fadji & Coetzee (2020); Shah et al. (2019); ISO 18602:2023; Burgess (1999). Saghir & Li (2018); ISO 22461:2022; Heilig et al. (2022); García-Arca & Prado-Prado (2014); Akyuz et al. (2021); IMO (2022); UNECE (2023); Mullai (2006).

Environmental moisture affects logistics performance in several distinct ways, and the literature consistently supports the need to differentiate among moist, wet, and liquid conditions. Research on the effects of humidity shows that elevated moisture levels, even without visible water, weaken material properties and accelerate degradation. Burgess (1999), Tang and Liu (2017), and Verghese et al. (2015) explain that high humidity promotes corrosion, mould formation, and chemical instability in foods, pharmaceuticals, and electronic components. Soroka (2014) adds that corrugated packaging and adhesives lose structural strength when exposed to moisture, which directly influences stacking performance and shelf life. These findings align with broader supply chain analyses, such as Christopher (2016) and Russo and Confente (2017), who argue that moisture variability introduces predictable quality losses that must be managed through environmental monitoring, packaging engineering, and controlled storage conditions. Studies focused on direct water contact and immersion highlight a different set of operational challenges. Wet conditions, such as rain exposure or condensation, compromise packaging integrity and create safety risks. Saghir and Li (2018) show that pallets and paper-based packaging lose strength when wet, while García-Arca and Prado-Prado (2014) detail the risk of water ingress during handling at docks and terminals. Berglund and Rowe (2016) further demonstrate how precipitation disrupts loading operations and increases accident rates. Ultimately, sustained

liquid exposure requires specialised containment due to the potential for catastrophic leakage, contamination, or environmental damage. Regulatory frameworks such as the UN Model Regulations (UNECE, 2021) and ISO 11607 (ISO, 2019) provide standards for sealing, pressure resistance, and spill mitigation, reinforced by industry analyses of bulk liquid risks (Kumar & Haq, 2018) and maritime cargo failures (Mullai, 2006). Collectively, the literature confirms that moist, wet, and liquid conditions represent distinct exposure levels that produce different logistical risk profiles and therefore require targeted preventive measures.

Al-Syafi'i's Fiqh Discourse on Managing Impurities

The al-Syafi'i school fundamentally distinguishes between solid and liquid substances when addressing contamination. This differentiation is crucial for establishing protocols for handling contaminated halal products, emphasising that the state of matter directly influences the extent of impurity and, consequently, the required purification methods (Olya & Al-Ansi, 2017). This jurisprudential distinction is particularly relevant to the management of cross-contamination in halal logistics, as it dictates the appropriate remedial actions and segregation protocols necessary to maintain product integrity (Mohd Dasuqkhi, 2024). From a logistics standpoint, this implies that proper handling procedures must account for the physical state of halal products, implementing distinct strategies for solid and liquid goods to prevent widespread contamination of an entire batch (Olya & Al-Ansi, 2017). All four leading scholars of al-Syafi'ies conclude a few critical requirements as follows:

Al-Mawardi (450H)

According to al-Māwardī's transmission of al-Imām al-Shāfi'ī's ruling, the distinction between solid and liquid substances plays a decisive role in determining how impurity (*najs*) spreads when an animal dies within them. In the case of solid substances (*jamid*), such as hardened ghee, solid fat, or other thick materials, only the part directly in contact with the impurity becomes contaminated. This is because solids do not allow foreign matter to disperse throughout their structure; the impurity remains limited to the exact point of contact, much like how a wet cloth becomes impure only where it touches a dry *najāsah*, but the dryness of the impurity prevents it from spreading further. Thus, the physical property of solidity acts as a natural barrier that restricts transmission, leading jurists to consider anything beyond the immediate area of contact as still pure (*ṭāhir*). Conversely, when the animal falls into a liquid (*mā'i*) substance—whether milk, melted fat, or any other fluid—the ruling shifts to complete impurity of the entire volume. Liquids, by their very nature, promote mixing and diffusion; once impurity enters, it cannot be prevented from permeating the whole mixture. Therefore, in Shāfi'ī jurisprudence, quantity and sensory changes (such as smell, taste, or color) do not alter the legal ruling: the entire liquid becomes *najs*, regardless of its size or whether the impurity is perceptible. This reflects a foundational principle in classical fiqh: liquids lack the physical resistance needed to contain contamination, thereby necessitating a more comprehensive ruling to maintain ritual purity.

Ibn Hajr al-Haythami (974H)

Ibn Hajr al-Haythami (1999) elucidates a core principle within al-Syafi'i jurisprudence: a pure moist substance becomes ritually impure upon contact with a dry impure object (al-Haythami, Ibn Hajar, 1999). This concept is crucial for understanding contamination dynamics, as exemplified by the ruling that if a solid substance, such as ghee, comes into contact with an impure dry object, only the immediate area of contact is affected, akin to a

wet garment becoming impure when touching a dry impure item (al-Mawardi, 1999). However, this principle is further highlighted in situations where a person sweats in hot weather, rendering their moist body impure through contact with a dry, impure garment, necessitating purification before prayer (al-Haythami, Ibn Hajar, 1999). Such detailed differentiation underscores the nuanced complexities of contamination and has significant implications for establishing robust protocols in halal logistics, particularly in managing cross-contamination scenarios (al-Haythami, Ibn Hajar, 1999; Mohd Dasuqhi, 2024).

Al-Ramli (957H) and al-Syarbini (979H)

While the search results did not provide direct, extensive discussions from al-Ramli or al-Syarbini specifically detailing the nuances of wet, moist, solid, and liquid conditions in impurity transfer beyond the general principles of the Shafi'i school, their rulings on severe impurities (*najs al-mughallazah*) implicitly highlight the importance of physical conditions. Both scholars concurred on the stringent purification process for severe impurities, such as canine contact, which involves washing seven times, one of which is with soil (Abdallah et al., 2021). This rigorous method of cleansing, necessitated by a specific type of impurity, assumes that contact leading to such impurity can occur and that the method of purification is tied to the nature of the impurity and, potentially, the condition of the contaminated item (e.g., whether it can be washed). The Malaysian Halal Standard (MS2400:2010), in line with Shariah requirements, details *sertu* cleansing, which uses water and soil, indicating that the physical properties of the cleansing agents and the contaminated surface are considered (Ahmad & Shariff, 2020; Bukhari, n.d.). The comprehensive understanding derived from al-Syafi'i's fiqh, particularly through the interpretations of Ibn Hajr al-Haytami and al-Mawardi, highlights the meticulous attention paid to the physical state of substances (solid, liquid, wet, moist, dry) when assessing impurity transfer and the necessary purification. This jurisprudential framework provides a foundational basis for developing robust contamination control measures in halal logistics, emphasising strict segregation and tailored remedial actions based on the nature of the product and the contaminant.

Integrating al-Syafie's Fiqh Discourse with Malaysia Halal Standard Requirement

This section will examine how the detailed Shafi'i rulings on impurity management, particularly in the solid and liquid states, are translated into and supported by the Malaysian Halal Standard requirements, with a focus on preventing and managing cross-contamination in logistics operations. The Malaysian Halal Standard MS2400:2019 series, comprising MS 2400-1, MS 2400-2, and MS 2400-3, establishes a comprehensive framework for categorising products within halal logistics, emphasising their physical state and susceptibility to contamination (Bukhari, n.d.; Department of Standards, 2019; Department of Standards, 2019). This nuanced approach aligns with al-Syafi'i's fiqh discourse, which distinguishes between solid and liquid substances in terms of the transfer and removal of impurities. Juridical interpretations, such as those by al-Mawardi, highlight that while an impurity may only affect the immediate contact area on a solid, the entire volume of a liquid becomes impure upon contact, regardless of quantity, underscoring the heightened vulnerability of liquid products to widespread contamination (al-Mawardi, 1999). Consequently, the MS2400:2019 standards implicitly guide product categorisation by mandating stringent segregation protocols, dedicated facilities, and specialised handling procedures, particularly for wet, moist, or liquid goods (e.g., refrigerated products like fresh meat) that are more susceptible to cross-contamination by non-halal elements or *najis* than dry products (Ahmad

& Shariff, 2017; Mohd Dasuqkhi Mohd Sirajuddin, 2024; Tieman et al., 2012). This integration of jurisprudential principles into regulatory standards ensures that contamination avoidance measures are tailored to the intrinsic risk profile of products, thereby preserving halal integrity throughout the supply chain (Ahmad & Shariff, 2017; Mohd Dasuqkhi Mohd Sirajuddin, 2024). This article suggests four main critical aspects derived from all normative references of Malaysian Halal Certification:

Cross-Contamination Management in MS Standard

The management of cross-contamination within the halal supply chain is meticulously addressed by a confluence of Malaysian regulatory standards, jurisprudential rulings, and certification guidelines, collectively aimed at upholding halal integrity. The Malaysian Halal Standard MS2400:2019 series (Parts 1, 2, and 3), along with MS1500:2019, forms a foundational framework, mandating stringent measures such as the effective segregation of halal and non-halal products, dedicated facilities, and robust cleaning and sanitation protocols across all stages of handling, preparation, processing, packaging, storage, and transportation (Ahmad & Shariff, 2017; Department of Standards, 2019; Department of Standards, 2019b, 2019a; Mohd Dasuqkhi, 2024). This includes strict measures to prevent the contamination of ready-to-eat, raw, and uncooked products (n.d.). The standards also emphasise preventing contamination from personnel and equipment, requiring designated areas, proper hygiene practices, and scheduled cleaning and maintenance for equipment (Department of Standards, 2019a, 2019b).

In alignment with these standards, Malaysian Fatwas provide crucial guidance on handling and storage to manage *najs* (impurities), asserting that non-halal contamination can render products impermissible, even in areas such as animal feed, if non-halal ingredients or contaminated equipment are used (Mohd Dasuqkhi, 2024; Saidin et al., 2024). The *Manual Procedure for Malaysia Halal Certification*, as seen in the 2014 revision, specifies detailed *sertu* (ritual cleansing) procedures for *najs al-mughhallazah* (severe impurities), requiring one wash with water mixed with clay followed by six washes with clean water, a practice also outlined in MS2400:2019 for severe *najis* contamination (Bukhari, n.d.; Department of Standards, 2019; Department of Standards, 2019). This meticulous approach is also integrated into the broader Malaysian Halal Management System, which sets general requirements for hygiene, sanitation, and food safety, and necessitates measures to prevent physical, biological, and chemical contamination, ensuring proper environmental control, employee and product flow, and periodic internal audits to maintain the integrity of the halal system (Department of Standard, 2019; Department of Standards, 2019a, 2019b).

Furthermore, these regulatory and jurisprudential frameworks implicitly guide product categorisation based on their susceptibility to contamination, particularly differentiating between solid and wet/moist/liquid products. The al-Syafi'i fiqh discourse, as reflected in these standards, highlights that liquid substances are more vulnerable to widespread impurity transfer than solids, thereby necessitating stricter segregation protocols and handling procedures for wet, moist, or liquid goods to prevent irreversible contamination and preserve their *halalan toyyiban* status throughout the supply chain (Ahmad & Shariff, 2017; al-Mawardi, 1999; Mohd Dasuqkhi, 2024; Tieman et al., 2012).

Goods and Cargo Category: Wet, Moist, and Liquid

The management of cross-contamination for wet, moist, and liquid goods and cargo within the halal supply chain is a critical aspect meticulously addressed by the Malaysian Halal Standard MS2400:2019 series, Malaysian Fatwas, the MPPHM 2020, and the broader Malaysian Halal Management System. These frameworks are deeply informed by al-Syafi'i's *fiqh* discourse, which fundamentally distinguishes between solid and liquid substances in terms of impurity transfer and remediation, thereby necessitating heightened preventive measures for liquid and moist products (Mohd Dasuqkhi, 2024; Olya & al-Ansi, 2017). The al-Syafi'i school, notably through the interpretations of al-Mawardi (1999), holds that while an impurity in contact with a solid may affect only the immediate area, the entire volume of a liquid becomes impure upon contact (al-Mawardi, 1999). This principle underscores the significantly greater vulnerability of wet, moist, and liquid products to widespread contamination and provides the jurisprudential basis for stringent controls in halal logistics (al-Mawardi, 1999; Mohd Dasuqkhi, 2024). Consequently, the MS2400:2019 standards (covering transportation, warehousing, and retailing) implicitly guide product categorisation by mandating rigorous segregation protocols, dedicated facilities, and specialised handling procedures specifically for wet, moist, or liquid goods that are more susceptible to cross-contamination by non-halal elements or *najs* than dry products (Ahmad & Shariff, 2017; Department of Standards, 2019; Department of Standards, 2019b, 2019a; Mohd Dasuqkhi, 2024; Tieman et al., 2012). Key requirements include:

- i. **Cleaning and Sanitation:** Robust cleaning and sanitation protocols are mandated, especially after contact with non-halal substances. For severe *najs* contamination, *sertu* (ritual cleansing) procedures, which require one wash with water mixed with clay followed by six washes with clean water, are prescribed and outlined in MS 2400:2019 and MPPHM (Department of Standards, 2019). This is particularly applicable to equipment or areas that may come into contact with wet products.
- ii. **Contamination Prevention from Personnel:** Employees handling wet, moist, and liquid products must adhere to strict personal hygiene practices, including proper handwashing and the use of appropriate protective gear, to prevent the transfer of contaminants (Department of Standards, 2019).
- iii. **Traceability and Isolation:** Organisations must establish documented procedures for isolating and notifying any cross-contaminated products, ensuring proper disposition and maintaining traceability records, which are paramount given the rapid spread of impurities in liquid goods (Department of Standards, 2019).
- iv. **Malaysian Fatwas:** Malaysian Fatwas reinforce these requirements by emphasising that non-halal contamination can render products impermissible, including in upstream processes like animal feed if non-halal ingredients or contaminated equipment are used, highlighting the comprehensive nature of contamination risk across the supply chain, especially for materials that are wet or liquid (Mohd Dasuqkhi, 2024; Saidin et al., 2024). The Malaysian Halal Management System further supports these operational requirements by setting general standards for hygiene, sanitation, and food safety, requiring measures against physical, biological, and chemical contamination, and ensuring proper environmental control, which are all critical for safeguarding wet, moist, and liquid products (Department of Standards, 2019).

In essence, the collective framework meticulously integrates Shariah principles with modern logistics requirements, recognising the intrinsic vulnerability of wet, moist, and liquid products and mandating a proactive, comprehensive approach to cross-contamination management to ensure their *halalan toyyiban* status.

Segregation and Dedicated Facilities

The Malaysian Halal Standard MS2400:2019 series (Parts 1, 2, and 3), MS1500:2019, the MPPHM 2020, and the overarching Malaysian Halal Management System collectively establish a robust framework for segregation and dedicated facilities essential for maintaining halal integrity throughout the supply chain (Ahmad & Shariff, 2017; Department of Standard, 2019; Department of Standards, 2019a, 2019b; Mohd Dasuqkhi, 2024). This comprehensive approach mandates rigorous physical separation of halal and non-halal products at every stage, including handling, preparation, processing, packaging, storage, and transportation, with particular emphasis on preventing contamination of wet, moist, and liquid goods due to their higher susceptibility to widespread impurity transfer (Ahmad & Shariff, 2017; al-Mawardi, 1999; Department of Standards, 2019; Mohd Dasuqkhi, 2024; Tieman et al., 2012). Specific requirements include the use of dedicated or thoroughly cleansed facilities and equipment for halal products (Department of Standards, 2019b, 2019a), clearly identified and segregated storage areas that prevent direct contact with floors, and dedicated transport vehicles that must either exclusively carry halal goods or undergo *sertu* (ritual cleansing) if previously exposed to non-halal items or *najis mughallazah* (Ahmad & Shariff, 2017; Department of Standards, 2019). The MPPHM 2020 further details these requirements by prohibiting the storage of *najis mughallazah* in halal-certified warehouses, enforcing physical identification and separation of halal lots, and mandating distinct segregation between halal and non-halal kitchens in food establishments. It also requires that equipment and tools be used exclusively for halal processes, undergo *sertu* if contaminated, and that damaged or unused items be identified and removed. Furthermore, personnel handling halal products must adhere to strict hygiene standards (Department of Standards, 2019), and retail outlets must implement control measures such as separate areas, trolleys, and payment counters for non-halal items (Department of Standards, 2019). These standards are underpinned by the Malaysian Halal Management System, which requires proper environmental controls to prevent cross-contamination, meticulously planned employee and product flow, and regular internal audits to ensure continuous adherence to these stringent segregation protocols and the effective utilisation of dedicated facilities (Department of Standards, 2019; Department of Standards, 2019a, 2019b; Malaysian Halal Management System (MHMS, 2020). This collective framework ensures that products remain *halalan toyyiban* by preventing commingling and safeguarding against contamination from procurement to consumption (Ahmad & Shariff, 2017, 2016; Mohd Dasuqkhi, 2024).

Sertu in Halal Logistics

The Malaysian halal framework, encompassing the MS2400:2019 series, MS1500:2019, the MPPHM 2020, and the Malaysian Halal Management System, explicitly mandates *sertu* (ritual cleansing) to ensure halal integrity, particularly when contamination by *najis mughallazah* (severe impurities like those from dogs or pigs) occurs (Ahmad & Shariff, 2017, 2016). The purpose of *sertu* is to purify and remove all traces of *najis*, thereby ensuring cleanliness (*toyyib*) and halal status (Ahmad & Shariff, 2017, 2020). *Sertu* is specifically required if severe *najis* is present in warehouses, premises, or contaminates equipment, tools,

or transport vehicles, and also when machines, utensils, or equipment previously used for non-halal products are repurposed for halal use (Ahmad & Shariff, 2017, 2016; Department of Standards, 2019). The prescribed procedure involves one wash with a mixture of water and clay, followed by six washes with clean water, a method detailed in MS 2400:2019 and the MPPHM (Ahmad & Shariff, 2020; Department of Standards, 2019; JAKIM, 2020; Department of Standards, 2019). This holistic cleansing procedure applies to premises, equipment, clothes, and even human body parts, with the critical caveat that repeated conversion of production lines from *najs mughallazah* to halal is not permitted (Ahmad & Shariff, 2017). Furthermore, *sertu* cleansing must be conducted, supervised, and verified by a *Shariah*-competent person or an authorised professional certified by the Department of Islamic Development in Malaysia (Ahmad & Shariff, 2017, 2020). These stringent *sertu* requirements, applied across warehousing, equipment, premises, and transportation, underscore Malaysia's commitment to meticulously addressing and remediating severe impurities whenever contamination occurs (Ahmad & Shariff, 2016; JAKIM, 2020).

Conclusion

The Syafi'i fiqh tradition and contemporary Malaysian halal logistics standards converge on a shared and practically significant principle: impurity spreads in accordance with the physical state of the substance involved, and effective prevention depends on controls that are proportionate to the level of risk. Classical jurisprudence illustrates this through detailed rulings, such as the case of a dead mouse in ghee, where impurity is confined in solid substances but spreads fully in liquids due to mixing. Comparable reasoning underpins rulings on sweat-induced impurity, the seven-wash requirement for contamination involving dogs, and the classification of najasah into severe, light, and moderate forms. Collectively, these rulings demonstrate that moisture functions as a critical medium for impurity transfer, with wet and liquid conditions significantly increasing contamination risk. This jurisprudential understanding has direct relevance for modern halal logistics governance. Malaysian halal logistics standards, particularly MS 2400, reinforce these principles through operational requirements such as product segregation, containment systems, humidity control, and structured cleansing procedures during transportation and storage. Empirical studies in halal supply chain management further identify spills, condensation, liquid leakage, and wet handling environments as high-risk points for cross-contamination, closely mirroring Syafi'i assessments of impurity behaviour under moist and fluid conditions. This alignment confirms the practical applicability of fiqh-based reasoning to contemporary logistics challenges. By integrating Syafi'i jurisprudence with modern halal logistics standards, this study offers a coherent and actionable framework that benefits multiple stakeholders, including halal regulators, logistics service providers, certification bodies, and halal-certified organisations. Fiqh contributes a principled explanation of contamination mechanics, while logistics standards translate these insights into risk-based controls that can be implemented, audited, and improved. This integrated approach enhances halal supply chain integrity, supports consistent regulatory compliance, and provides a clear, rational basis for managing contamination risks in wet, moist, and liquid environments. Ultimately, the study demonstrates the utility and effectiveness of aligning classical Islamic legal principles with contemporary logistics practices to strengthen halal assurance from storage and transport through to end-users.

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