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Halal Laundry Detergents: Ingredients and Regulations in Malaysia

Raihanah Badrul Hisham[a] & Nur Azira Tukiran[b*]

[a]Abdul Hamid Abu Sulayman Kulliyyah of Islamic Revealed Knowledge and Human Sciences (AHAS-IRKHS), International Islamic University Malaysia (IIUM), 53100 Jalan Gombak, Selangor, Malaysia.
[b]International Institute for Halal Research and Training (INHART), International Islamic University Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia.
*Corresponding author: E-mail address: aziratukiran@iium.edu.my

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Abstract

Cleaning products are necessary for our daily lives since they are highly effective in cleaning and washing. They assist in personal hygiene by loosening and removing soil and dirt from the surface, diminishing germs or bacteria that are the source of infectious diseases and making the surroundings comfortable. There are three most common detergents in various places: laundry, dishwashing, and household cleaning. Hence, this review paper focuses on laundry detergent to clean the dirt on fabrics and clothes. This paper aims to provide general knowledge for consumers, particularly Muslims, of the ingredients used in laundry detergents and the halal-related regulations in Malaysia. Ingredients used in detergent products, such as enzymes derived from animals, plants, fungi, and bacteria, have issues with where the sources were obtained, which subsequently become one of the reasons many productions have issues fulfilling the halal certification requirement. Other than enzymes, many other ingredients are added to detergent products to provide specific properties and characteristics, such as surfactants, builders, alkalis, bleaches, colourants, and fragrances, which consumers should know before purchasing. Manufacturers must inform Muslim consumers about the purity and impurity of the ingredients used in laundry detergents to make wise decisions in purchasing halal products.

1. Introduction

Globally, Muslims are the second-largest religious group, with 1.9 billion people in the world's population in 2020. The huge Muslim population has increased demand for halal products. Simultaneously, halal products have also started to gain worldwide recognition as a new standard for following the *Shari'ah* requirements and the concept of hygiene, sanitation and safety (Azmi *et al.*, 2018). Furthermore, it has also piqued the interest of non-Muslims in purchasing halal products (Chong *et al.*, 2021). The term halal means permissible, allowed, and lawful in Islam. Everything related to *najs* or animals not slaughtered according to *Shari'ah* is prohibited for Muslims. Thus, every halal product must follow the standard requirements and *Shari'ah* compliance. In particular, halal products include food and beverages, detergents, and other household products.

Detergents are often used as a cleaning agent at home and are also commonly found as good-performance products. They function effectively, cleaning the dirt or soil from the surface and making it easier to wash away (Kogawa *et al.*, 2017; Tan, 2019). The industry has introduced detergent products such as laundry detergent, household cleaners, and fabric softeners, pending the interest of many consumers(Cheng *et al.*, 2020). Every detergent production has various ingredients and mixtures to produce their specific brands, intended to appeal to consumers. Thousands of chemical compositions have been formulated to clean the surface. Detergents can be formulated with various organic and inorganic chemicals to produce a particular level of cleaning power or biodegradability at the same concentration (US Environmental Protection Agency, 1974). Furthermore, each ingredient in the detergent formulation and combination affects its cleaning capacity and ability.

However, detergent products may contain ingredients that can bring *syubhah* (doubtful) to Muslim consumers. Moreover, if there is no halal certification that verifies the status of halal and *ṭoyyibān* of the detergent, it will cause doubt among Muslim consumers. In modern production, animal fats are a basic component in the manufacture of detergents. For instance, animal fats can be found in enzymes like protease and lipase, commonly used in detergents (Naganthran *et al.*, 2017). It raises concerns among Muslim consumers since the ingredient used in the detergent may be derived from haram animals or animals that have not been slaughtered following *Shari'ah*, or the product was not manufactured under conditions that comply with halal production. It must be emphasised because Islam attaches great importance to personal hygiene and cleanliness (Armutcu, 2020). Islam requires Muslims to ritually clean themselves from any *najs* or dirt since it is required by Islamic rituals such as *wudu'*, cleansing before praying or reading the Qur'an, which is practised regularly and requires ritual cleanliness.

The awareness of using halal products is currently increasing among Malaysian communities. Muslim consumers must

ensure that the products' ingredients, processing, and distribution follow halal requirements (Hashim & Mat Hashim, 2013). In Malaysia, products must adhere to the Malaysian Standard and the Halal Certification Procedure Manual– Domestic 2020 (MPPHM) under the consumer goods scheme and related Malaysian standards to be certified as halal by the Department of Islamic Development Malaysia (JAKIM). The halal certification ensures that products are high-quality, safe, and *ṭoyibān* to use. Based on the discussions above, this review will cover the ingredients used and the halal-related regulations in Malaysia.

2. What is detergent?

The use of detergents is not an innovation for cleaning. Since ancient times, traditionally, people have been washing their clothes using soaps made from heated animal fat, oils and wood ashes mixed in a kettle. Then, there are innovations in soap that use the same process, substituting caustic soda for wood ashes as cleaning ingredients (Whitten & Whitten, 1990). After that, the first laundry detergent was introduced in Germany (Smulders *et al.*, 2001), and soap was made as one of the ingredients in the components of detergents for washing clothes. In these, soap has been combined with builders, or usually, it can be found as sodium carbonate, sodium perborate and sodium silicate (Smulders *et al.*, 2001). Known today simply as detergents, they can be produced using any soap or non-soap ingredient used as a cleaning agent. Chemically, they are compounds or preparations containing soaps or other ingredients intended for water-based laundry processes (Osadebe *et al.*, 2018). They mainly aim to remove visible stains and provide a hygienically clean surface, including removing the microbiological contamination and malodorous compounds as apparent stains (Bockmühl, 2017). Therefore, there was a need for an effective cleaning agent such as detergents, and unlike soap, it does not react with the mineral salts in water that form an insoluble compound, commonly known as soap curd.

A detergent can also be defined as any compound used as a cleaning agent, a mixture of active components, additives and mainly from water. It includes laundry detergents, bleach, fabric softeners, glass, and toilet cleaners (Zarogianni *et al.*, 2017). Detergents can be classified into natural soaps and synthetic detergents. However, nowadays, detergent is a term that is commonly used to refer to synthetic compounds of soaps and detergents (Kogawa *et al.*, 2017). Synthetic detergents are multicomponent compositions that can be obtained in various forms. They are composed of surface-active agents, or surfactants, organic and inorganic chemicals that enhance the efficiency of the surfactants (Info Mine Research Group, 2012). A large number of surfactants are based mainly on various crude petroleum products. Nonetheless, for a healthy and self-sufficient economy and green environment, they are commonly derived from synthetic organic chemicals as raw ingredients for products (Deshmukh *et al.*, 2015; Osadebe *et al.*, 2018). The surfactants in the detergent are usually alkylbenzene sulfonates, a group of compounds related to soap, but they are more soluble in hard water and have better washing performance. These compounds are widely used in synthetic laundry detergent products because of their superior washing performance (Abadi Kiswandono & Akmal, 2020; Akyüz & Roberts, 2002).

3. How detergent are made

Producing laundry detergent is similar to making soap saponification since they have the same function: they can clean soils, germs, and other contaminants. Both also have many similarities regarding their molecular structure and how they clean the surfaces (Nurul Ika Amira, 2015). Practically, after the saponification process is made, which involves heating fats and oils and reacting them with a liquid alkali, the detergent is produced since the saponification process is part of the detergent formulation (Ranji *et al.*, 2019; SDA, 1994; Tareila, 2004). Although people commonly refer to laundry detergent as soap, it differs from soap since there are certain major improvements in the ingredients of detergents. A carboxylic group (fatty acids) and a hydrocarbon chain performed two important functions in the soap-making process. The carboxylate end of the soap molecule, also known as hydrophilic (water-loving), is attracted to water. On the other hand, the hydrocarbon chain, known as hydrophobic (water-hating), is attracted to the oil and grease and repelled by water (SDA, 1994). When the oil and grease chemically attach to the carboxylate end of the soap molecule, they are drawn away from the cleansed clothes.

However, to effectively remove any hydrophobic or germs, it is necessary to use something much more capable of emulsifying so that the water can carry it away. Using animal or vegetable oils with a strong water-based solution, such as sodium or potassium hydroxide, lye or NaOH, can be more effective. These oils are mainly triglycerides containing three fatty acids, react with the alkali and produce glycerine and metal soap (Nurul Ika Amira, 2015). Thus, almost any triglyceride can be found in soap, but some salts of triglycerides are harsher than others. If any surplus base remains after the salt is formed, it must be neutralised, or it will be caustic and cause material damage (Tareila, 2004). Furthermore, adding alkali will not bond with the minerals in hard water because it will form scum, affecting the cleaning action's effectiveness. Therefore, soap sensitive to water hardness was eventually replaced with synthetic surfactants with more desirable characteristics.

A synthetic detergent is distinguished from soap by the absence of fatty acids, which are substituted by an acid formed when sulfuric acid reacts with hydrocarbons derived from petroleum. The resulting surfactant displays a reduced tendency to bond with minerals in water to form curds than soap and is more effective in hard than soft water (Whitten & Whitten, 1990). Surfactants, as main components in detergents, are made from petrochemicals derived from petroleum or oleochemicals derived from fats and oils. Both contain hydrocarbon chains repelled by water but attracted to oil and grease in soils, similar to the fatty acids used in soap-making. They are utilised to build the water-hating end of the surfactant molecule, composed of hydrocarbon chain sources (SDA, 1994). There are more ingredients in detergent besides surfactants, such as builders, which fulfil various functions. Since the new millennia, detergent production has been developing green and eco-friendly products, which are described as made using natural or oleochemical surfactants and do not affect the environment. These ingredients benefit the environment and consumers (Siwayanan *et al.*, 2015).

4. Types of laundry detergent

The use of laundry detergents becomes essential since it tends to make the process of cleaning easier. In ancient times, when it was time to wash the laundry, it would be taken to the river and rubbed against the rocks to help remove dirt and soil from the clothes (Tareila, 2004). However, various laundry detergents are available in the market, such as detergent bars, powders, and liquids. A detergent or soap bar made from saponification is one of the oldest cleaning and washing

methods. Detergent bars or soap bars are commonly made from fatty acids extracted from animal tallow or a combination of fatty acids extracted from animal tallow and vegetable oils (Bajpai & Tyagi, 2007). Other components, including colourants, fragrances, pigments, and other additives, are added to certain detergent bars. In most developed countries, detergent bars have been phased out in favour of detergent powder.

Detergent powders are used for both manual and machine washing, depending on the market that has been distributed. Depending on the manufacturer, surfactants, builders, bleaching agents, enzymes, and fillers are commonly found in detergent powders in varying amounts. Surfactants are among the most important of these components, and their cleaning activity has been a driving force in developing new detergents for many years (Siwayanan *et al.*, 2015). This type of detergent is particularly effective at removing dirt and soil from the surface (Bajpai & Tyagi, 2007; Zoller, 2008). However, the main limitation of detergent powders is that they do not dissolve well in the liquid and might leave marks of chalky residue on clothes after washing. As a result, it will be necessary to run another cycle in order to remove them completely.

Liquid detergents are gaining popularity worldwide due to their ease of use, dispersion, and dissolution in the wash water. Liquid detergents are often more profitable than bars or powders, as liquids are filled with water, whereas bars and powders are typically filled with additional fillers (Zoller, 2008). They developed rapidly due to their superior performance, laundering delicate fabrics such as silk, wool, and synthetic. This product has developed into extremely complex formulations incorporating builders and auxiliary speciality chemical ingredients (Dixit, 2003). Detergent production is competitive in the industry, where numerous laundry detergents have been produced globally. Powdered laundry detergent has dominated the Malaysian market, accounting for approximately 62% of the total value, followed by detergent liquid at 36% and detergent bars at 2% (Hee, 2017). Among the biggest global industries in laundry detergent are Procter & Gamble, Unilever, Henkel, Lion Corporation and Kao Corporation (Siwayanan *et al.*, 2015).

5. Ingredients of laundry detergent

Numerous detergent products are available on the market, from which consumers can choose and purchase based on their preferences. Therefore, most laundry detergent production will follow consumer trends currently prevalent in the market. For instance, producing green innovation or eco-friendly products free of harsh chemicals harmful to the environment and humans. They will also produce detergents that appeal to consumers' emotions through touch, feel and smell. Some manufacturers also produce detergents based on the value of detergent that benefits consumers and enhances the washing efficacy of laundry, such as hygienic cleaning, whitening, colour protection, anti-bacterial, etc. (Hee, 2017). Nowadays, the need for detergents capable of killing germs and bacteria is high due to the outbreak of COVID-19 that has afflicted the entire country. Many customers will choose detergents that effectively kill germs and bacteria to avoid getting viruses or other diseases. The following are the basic ingredients used and their function in the manufacture of detergents.

5.1 Surfactants

Surfactants or surface-active agents are the most common ingredients in laundry detergent formulations. A surfactant molecule consists of two components. One component of the molecule is hydrophobic, whereas the other is hydrophilic. These molecules are highly active at the interfaces between oil and water (Tai & Nardello-Rataj, 2001). Their major function is to improve the wetting ability of water and reduce the surface pressure between soil and water. The soil and dirt are removed from the surface to be cleansed and disseminated in the aqueous phase (Bajpai & Tyagi, 2007; Showell, 2016). Surfactants are commonly found in laundry detergents in a variety of forms. Surfactants are classified into four major categories: anionic, nonionic, cationic, and amphoteric. These surfactants differ in their ability to remove different types of dirt, their effectiveness on various fabrics, and their reaction to changes in water hardness (Bajpai & Tyagi, 2007).

Surfactants are organic chemicals that serve a specific function in a process or product (SDA, 1994). However, there have been reports of surfactants derived from chemicals harming the environment at times. Thus, there are concerns regarding their impact on the environment, specifically their biodegradability and toxicity to organisms and humans. The term "chemical" has also become synonymous with "toxic chemical," which has raised concerns among human beings. According to the studies by (Rosen & Kunjappu, 2012), cationic surfactants are more harmful than anionic surfactants, and anionic surfactants have a higher level of toxicity than nonionic surfactants. As a result, every manufacturer is responsible for ensuring that the appropriate materials and quantities are used to ensure the safety of the finished products for human consumption.

5.2 Builders

Builders are often combined with surfactants to lower the content of surfactants in the detergent formulations (Gürkök, 2019). Builders are one significant ingredient generally added to control the water's hardness. Detergent manufacturers have recognised the significance of controlling water hardness to achieve an optimum level of cleaning by using builders. Divalent ions were found in most water, specifically calcium and magnesium, which negatively impacted the laundry process (Mole, 1990). Therefore, a wide variety of suitable detergent builders are needed. Sodium tripolyphosphate (STPP), sodium carbonate, sodium citrate, and zeolites are builders in laundry detergents (Camerson & Cameron, 2011).

STPP is one of the most well-known and commonly used detergent builders, providing excellent calcium control and dispersion, suspension, and anti-encrustation benefits (Showell, 2016). However, most phosphates are not biodegradable, and it will cause health problems and major environmental hazards. Phosphate residues on the surface may cause nausea, diarrhoea and skin irritations. Therefore, many countries, including Japan, Korea and China, have substituted zeolite for phosphates in their laundry detergent formulations (Siwayanan *et al.*, 2015). Zeolites were more effective in cleaning than STPP at low temperatures, but zeolites take time to diffuse into the wash. In order to compensate for the inadequacies of the detergent builder, an alkali ingredient such as soda ash or sodium silicate should be added (Yunusa *et al.*, 2018).

5.3 Alkalis

Alkalis are soluble salts that can neutralise or adjust the acidity of other ingredients in a mixture. Alkalis effectively clean the fabrics and remove dirt or soil without heavy rubbing. During the washing process, soluble salt of alkalis, such as sodium carbonate and sodium silicates, give negative charges to the soil

and substrate (Bajpai & Tyagi, 2007). The other purpose of alkalis is to slow the corrosion of metal components in washing machines, boost the anti-resorption capacity of detergents, and lower the hygroscopic qualities of detergents (Info Mine Research Group, 2012). However, using strong alkalis in the washing process may damage fabrics and cause the clothes to feel rough to the touch.

5.4 Enzymes

Many laundries detergent products contain at least one enzyme or a combination of enzymes, such as proteases, amylases, cellulases and lipases, to increase their efficiency in the laundry process (Hasan *et al.*, 2010). Enzymes are frequently used as stain removers in detergent formulations and are extremely effective. If the enzymes were not in the detergent formulations, some soils and dirt would be challenging to remove and require repeated attempts (Gürkök, 2019). Therefore, detergent enzymes are needed to break and dissolve certain compounds into their basic components (US SDA, 2005). For instance, proteases, which have a wide range of applications and have been used in detergent products (Park *et al.*, 2018), are needed in detergent formulations to break down stains (Singh, 2021). Amylases are generally used with proteases and increase detergent cleaning (Gürkök, 2019). Besides that, lipases have been used in detergent products to create biodetergents. Most can tolerate harsh circumstances, such as oxidising agents and surfactants (Devi *et al.*, 2020). Cellulose is the most abundant renewable biological resource and a relatively inexpensive energy source. It smooths the fabrics, removes dirt, and helps prevent stains and dust from redepositioning on the fabric's surface (Gürkök, 2019).

Enzymes are proteins that all living creatures produce. Many different species of enzymes have been derived from plants, animals, bacteria and fungi (Gürkök, 2019; Hasan *et al.*, 2010; Singh, 2021). However, sufficient enzyme exposure can result in allergy symptoms, including asthma (Basketter *et al.*, 2012). Even though enzymes can cause allergic reactions, this has generally been seen as a minor issue in detergent products (Vanhanen *et al.*, 2000). Besides, certain enzymes may leave an effect and irritate the skin or eyes and cause irritation of the upper respiratory system due to their proteolytic action (US SDA, 2005). Therefore, the industry is currently focused on manufacturing enzymes derived from natural sources that are environmentally benign (Hasan *et al.*, 2010).

5.5 Bleaches

Bleaches are agents to whiten, brighten, and remove stubborn stains from clothing. Bleaches have proven to be quite powerful and useful in removing and carrying away the soil and dirt that has accumulated in the wash water due to the presence of detergents. Two types of bleach can be categorised in detergents: chlorine bleach and oxygen bleach. Chlorine bleach is sodium hypochlorite that reacts swiftly with various inorganic and organic compounds. As a result, it is an effective stain remover, cleanser, sanitiser and disinfectant of fungi, viruses and bacteria (Girotti, 2015; SDA, 1997). At the same time, oxygen bleach acts as an all-fabric bleaching agent for soil and dirt removal in detergents. Additionally, sodium percarbonate and sodium perborate containing hydrogen peroxide are used for this purpose (Bajpai & Tyagi, 2007). Bleaching agents have several downsides, including an unpleasant odour and the ability to change the colour of coloured fabrics.

5.6 Colourants

Colourants are used in detergent products to bring the consumer's attention to a unique characteristic contributing to the product's performance. Detergent products normally add a transparent blue colour, which may provide bluing derived from ultramarine and organic dyes (Info Mine Research Group, 2012), impacting white fabrics. Sometimes, the product becomes transparent emerald with time. Discolouration of laundry detergents has been observed and investigated by many researchers. For example, oxidising phenolic antioxidant ingredients leads to yellowing and other ingredients that can lead to different colours (Missler *et al.*, 2014). The other significance of colourants in detergent products is that they provide a special identity to the product.

5.7 Fragrances

Another ingredient that brings to the unique identity of detergent products is fragrance. These ingredients are not added to detergent formulations to enhance their cleaning qualities but to provide a pleasant odour to the consumer's clothes. Fragrances are occasionally used to cover the odour of other chemical ingredients contained in a product, which might be unpleasant (Rastogi, 2002). For instance, lipases leave residual odours on clothes that need fragrances in detergent products to prevent bad odours (Hasan *et al.*, 2010). Nowadays, there is a concern that certain ingredients may be harmful to human health and the environment. Some of the chemicals used in detergent formulation can cause irritants or allergens, and when released into the indoor air, they can be detrimental and contribute to air pollution (Zarogianni *et al.*, 2017). Thus, it is essential to have effective detergents to prevent microbes that are too small to be seen by the naked eye but can cause disease and illness in human beings (Abney *et al.*, 2021).

In a nutshell, detergents used in daily life may contain doubtful sources due to a lack of awareness about the ingredients used in the detergent formulations. Moreover, only certain ingredients are listed on the product label, meaning most consumers are ill-informed about it. Furthermore, if a product does not have a halal label, it is not easy to know whether or not the ingredients used are halal. For example, there are issues with enzymes added to detergent products that are not labelled as being derived from animal or plant sources. Therefore, halal and haram aspects of detergent products should be considered, especially the sources derived. Detergent products can be derived from many sources, such as plants, animals, bacteria and fungi. It is not an issue for Muslim consumers if it is taken from plant sources. However, if it is taken from animal sources, it is a dubious source. In Islam, something derived from haram animals or halal animals that are unslaughtered according to *Shari'ah* are both prohibited.

Besides, it can be harmful and dangerous to humans when it comes from a chemical that does not follow the proper process and manufacture of products. Although most chemicals are neutralised and made harmless, some remain and cause environmental pollution. These concerns are growing in the public mind and have become a serious issue among Muslim consumers. In Islam, something that can harm human beings is not allowed to be used that includes the method of *fiqh* is *al-taḥrīm yatbaʿ al-khubthu wa al-ḍarar*, which means the prohibition of things due to their impurity and harmfulness. If something brings more harm than benefit, it is also categorised as haram, and what brings more benefit than haram is considered halal(Al-Qaradawi, 2013). Therefore, Muslims need

to know more about the ingredients used in laundry detergents. They must be careful in using a product, including detergents, by ensuring the products used are halal and *toyyibān* and safe to use daily.

6. Halal related regulations in Malaysia

6.1 General requirements for laundry detergents

The production of laundry detergents is expanding in demand and supply. They are important since they can reduce the number of germs and bacteria that have been contaminated with clothes. Therefore, regulations and guidelines have been enforced to ensure that products are considered safe and effective before reaching the consumer. There is a need for manufacturing requirements from Good Manufacturing Practice (GMP), which ensures that products are consistently produced and regulated according to quality standards. Other than that, the International Standards Organization (ISO), which establishes common standards for different countries, is important in ensuring the safety, reliability, and quality of products and services.

Every manufacturer is responsible for analysing applicable regulations and ensuring the products' safety, quality, and performance before releasing them to consumers. According to SGS Group Management (2013), there are standards and regulations for detergent products in Malaysia. It includes the Consumer Protection Act 1999, which protects consumers and fills gaps in other important laws that may be insufficient to protect customers. This act stated that no person or any company should supply, propose to supply or advertise for supplying any products or services that do not conform to the safety requirements under section 19. Thus, before the products are brought to the market, every manufacturer must ensure that the product complies with Malaysian safety standards. Apart from that, a need to meet an act of product safety established in Malaysia, the Environmental Quality (Prohibition on the Use of Controlled Substances in Soap, Synthetic Detergent, and Other Cleaning Agents) Order 1995. Every product that has been manufactured, including detergents, must adhere to the guidelines established by the government to comply with government standards.

6.2 Halal requirements for laundry detergents

Producing halal detergents adheres to the applicable laws, standards and regulations and the halal standards. Although Malaysia does not have a halal act, the manufacturer must adhere to the requirements of the Manual Procedure for Malaysia Halal Certification-Domestic 2020 (MPPHM, 2020), which contains guidelines from the Department of Islamic Development Malaysia (JAKIM) and the States Department of Religious Affairs (JAIN), to obtain a halal certificate. The purpose of these guidelines is to clarify the requirements that must be followed in acquiring and maintaining Malaysia Halal Certification. Besides, there is a need to follow the Malaysian Standard that has described the general guidelines and basic requirements for halal products in Malaysia. The halal certification aims to provide quality indicators, assurance, and indicators of religious compliance that can assist Muslim consumers in reducing discomfort and instilling confidence in products (Rizkitysha & Hananto, 2022). Therefore, halal certification for detergents is important since they are used to clean clothes and other things that come into contact with the human body, which is intrinsically related to man's daily worship.

According to MPPHM, the standards for halal detergents were stated in Section 5 - Consumer Goods, which must ensure that products manufactured and submitted for Malaysia Halal Certification Certificates (SPHM) benefit consumers other than food and beverage products, cosmetics, pharmaceuticals and medical or products that are not have a specific certification. Among the criteria that do not have a specific certification because there are doubts about the source of manufacturing, whether the materials or ingredients used are obtained from halal or non-halal sources, or it was used as processing aids in manufacturing or manufacturing products under the Malaysian Halal Certification scheme, such as bleaching earth, alum and gas. Besides, there is a requirement to follow the MS 2200-2: 2013 Islamic Consumer Goods-Part 2: Usage of Animal Bone, Skin and Hair-General Guidelines (Malaysian Standard, 2013), MS 2565: 2014 Halal Packaging-General Guidelines (Malaysian Standards, 2014), as well as other current legislation and regulations enforced by the relevant authorities.

6.3 Guidelines for obtaining halal certification

The requirement for a halal certificate for a product is to certify that a product complies with the requirements and teachings of Islam for Muslims (Siala, 2013). Therefore, it is essential to check the ingredients used in a product and everything involved in making the product to obtain a halal certificate. It includes the ingredients used, processing, packaging, labelling, manufacturing, distribution, and anything related to the product. It must be free from all things that *Shari'ah* prohibits, which can cause human beings to doubt it. Thus, any product, including detergent submitted for approval for SPHM, must comply with the MPPHM 2020 (MPPHM, 2020), MS 2200-2:2013 Islamic Consumer Goods-Part 2: Usage of Animal Bone, Skin and Hair-General Guidelines (Malaysian Standard, 2013) and MS 2565:2014 Halal Packaging-General Guidelines (Malaysian Standards, 2014).

The formulation of halal detergent must begin with undoubted ingredients of the sources obtained. The raw materials or ingredients used in detergent products must be halal and safe for human consumption. Each ingredient must be able to identify the original manufacturer of ingredients. Critical ingredients such as enzymes and other chemicals are permitted if only the ingredient is certified halal. It is not recommended to use other critical ingredients with unverified halal certification status in the production of halal detergent (Sugibayashi *et al.*, 2019). Therefore, the ingredients used must adhere to the laws and regulations enacted by the Malaysian government. It must not include any ingredients that could prohibit it from obtaining a halal certificate and raise concerns for Muslim consumers. Besides that, all operations related to the preparation and processing of the materials used in the manufacture of detergents must adhere to the requirements of *Shari'ah* law, act and regulations. The processing area must be free from any *najs* or contamination, and no mixing between raw materials or products with non-halal materials or those with uncertain halal status. During the preparation, processing, handling, or storage of products, they must always remain clean and comply with Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP) and other standards.

Generally, there are no issues with the packaging of detergent products since most of the sources used to create bottles, pouches, and poly bags are halal. However, manufacturers of halal detergents must ensure that packaging materials are sourced from halal suppliers and adhere to all requirement standards. The packaging material must be halal, not

contaminating the products, and safe for human consumption. It must be carried out under hygienic and sanitary conditions. Besides, the primary packaging, including secondary and tertiary packaging, should be clearly defined with evidence of compliance with the *Shari'ah* requirement law and requirements stated in the guidelines and should not contain any other materials classified as *najs*. Then, halal detergent products must be labelled according to labelling requirements stated by the regulatory organisation of each country. In Malaysia, a halal Malaysia logo, which is a symbol to indicate the product is certified halal by JAKIM, must be labelled on the product's packaging. Labelling material that comes into direct contact with the product must be non-hazardous and from halal sourced. Labelling should not contradict the principles of *Shari'ah* law and should not highlight indecency, which contradicts *Shari'ah* law. The packaging label should contain the information required by applicable laws, regulations, and standards. On the product label, no declarations, symbols, logos, names, or images containing religious or divine elements should be used to contravene the principle of *Shari'ah* law, such as the name of God.

Besides that, the manufacturing environment must also be designed and located in an area with no risk of contamination by non-halal materials or products to avoid cross-contamination. If the manufacturing has been contaminated by *najs Al-mughallazah*, such as dogs or pigs entering the manufacturing, it must undergo mandatory ritual cleansing (sertu). All the facilities and resources must be in good condition, clean, and follow GMP requirements and other quality standards. The purpose of these standards is to ensure the quality and safety of products. Manufacturers must ensure that halal-certified and non-halal products are physically separated or located in a separate location to ensure no ambiguity about the halal status of the finished product. In addition, manufacturers engaged in Original Equipment Manufacturing (OEM) must apply and obtain Halal Malaysia Certificates under the OEM scheme before being eligible to offer product manufacturing services to other companies. Apart from the manufacturing standards, manufacturers must also have a Halal Assurance System (HAS). HAS is a procedure used by a company to maintain a comprehensive halal assurance, and it also meets the specific requirements of Malaysian Halal Certification. The Malaysian Halal Management System (MHMS) should also be developed, implemented and maintained by a company to manage products and services to maintain halal assurance through HAS.

The distribution system must ensure that halal detergent products reach the market in a halal state without being contaminated by haram materials or *najs*. It is recommended that halal products be handled and distributed separately from non-halal products to prevent them from being mixed or contaminated with non-halal things. It is because mixing haram and halal materials or products in the same place leads to *syubhah*. For example, there are leaks in detergents that can cause a mixture of halal and non-halal products. There is a *fiqh* method related to this issue, which is *itqāʾ al-syubhah khasyīah al-wuquʿ fī al-ḥaram*, meaning *syubhah* should be avoided at all costs for fear of being involved with haram things. It is because the products that have been mixed cannot be ascertained whether they are halal or haram. Thus, there is a necessity in Islam for Muslims to segregate at every stage to avoid any *syubhah* things in order to stay clear of something that is haram (Al-Qaradawi, 2013). Lastly, transportation should also be dedicated and appropriate to halal packaging and satisfy hygiene and sanitation conditions.

7. Conclusion

As discussed above, there are numerous detergent products available on the market. However, how many of these detergent products are genuinely halal and *ṭoyyibān* remains to be determined. Muslim consumers sincerely concerned with halal and *ṭoyyibān* products will scrutinise everything they use, including detergent products. Nowadays, many consumers are unaware of the ingredients used in detergents; compared to food, people are more aware of the ingredients used in food, whether they are good for them or not. This reality should not continue since an individual's attitude and behaviour reflect the individual's religious beliefs. This paper provides general knowledge for consumers, particularly Muslims, of the ingredients used in laundry detergents and halal-related regulations in Malaysia, which must comply with the standards and regulations established by the authorities.

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