

Chapter 1:

Introduction to Halalan Toyyiban Processing, Utilization, and Applications

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This book, "Halalan Toyyiban Lipids Processing and Utilization: Concepts, Technologies, and Applications," delves into the Islamic principles of Halal and Toyyiban concerning lipids. Halal, meaning lawful, and Toyyiban, meaning wholesome, collectively emphasize the importance of purity, safety, and beneficial consumption. The text explores the origin and significance of Halal in Islamic law, including related terms such as Haram (prohibited), Makroh (disliked), and Shubhah (doubtful). A core focus is the Halalan Toyyiban concept, which ensures that food and consumer products are not only permissible but also pure and beneficial. This is particularly relevant in the context of lipids, which are essential in diets for energy, fatty acids, and vitamins. The book discusses sourcing, processing, and utilizing lipids in alignment with Islamic dietary laws, highlighting the importance of maintaining their purity and quality. Key topics include the extraction and refining of Halalan Toyyiban Lipids (HTL) from permissible sources, adherence to Islamic guidelines during processing, and the application of HTL in various industries, including food, pharmaceuticals, cosmetics, and personal care. The book also addresses lipid oxidation, its impact on product quality, and strategies to prevent it, ensuring the products' wholesomeness. Furthermore, the text explores halal certification, sustainable and ethical practices, and technologies employed in HTL production. It underscores the significance of quality control, traceability, and compliance with food safety standards. Additionally, it discusses the economic implications of the halal industry and its contributions to market development. By integrating religious principles with modern scientific practices, this book provides comprehensive insights into producing and utilizing halal and wholesome lipids, catering to the needs of halal-conscious consumers and promoting ethical and beneficial consumption.

1 General Introduction to Halal

Halal is a Qur'anic term meaning 'permitted, allowed or lawful'. Halal when used concerning food and other consumer goods, means "permissible for consumption and used by Muslims" (Chopra, 2005; Qaraḍāwī, et al. 1988). The word Halal is derived from the verb Halla "to be or become lawful, legal, licit, legitimate, permissible, permitted, allowable, allowed, admissible, un-prohibited, unforbidden." (Jallad, 2008)

"O ye who believe! Forbid not the good thing which Allah hath made Halal for you, and transgress not. Lo Allah loveth not transgressors. (87) Eat of that which Allah hath bestowed on you as food Halal and Good, and keep your duty to Allah in Whom ye are believers (88)."

Al-Maidah (verse 87 –88)

Ensuring food and other consumer products are authentically Halal is obligatory for every Muslim. There are other terms used by Muslim scholars regarding halal and non-halal products such as:

Mubah is the origin of Halal (everything created by Allah is *mubah* unless mentioned in Alqura'an or hadith) (Mas'ad & Hisham, 2018).

Haram, which is opposite to halal in other words, is prohibited, unlawful, not permissible and sinful for any Muslim as well as for all mankind. The word Haram is the opposite of Halal. According to Baalbaki



(1993), the word Haram means “taboo, inviolable, sacred, holy, ill-gotten, sin, wrongdoing, offence.” (Jallad, 2008).

Makroh is very close to Haram: (disliked, hated or detested. Actions and deeds that are referred to negatively in the Sunnah or the Quran (E.g., growing long fingernails.) (Dodge, 2009).

Shubhah or **Mashbooh**, means doubtful or suspected (the main domain for halal certification.) (Mirghani, 2021).

Halal and haram are serious matters in Islam. Here is a hadith by Apostel (Nabi) Mohammad (peace and blessing be upon him)

“Halal is clear and Haram is clear; in between these two are certain things that are shubbah (suspected). Many people may not know whether those items are Halal or Haram. Whosoever leaves them, he is innocent towards his religion and his conscience. He is, therefore, safe. Anyone who gets involved in any of these suspected items may fall into the unlawful and the prohibition. This case is similar to the one who wishes to raise his animals next to a restricted area, he may step into it. Indeed, for every landlord, there is a restricted area. Indeed, the restrictions of Allah are unlawful (Haram).”

Bukhari and Muslim

2 Introduction to Halalan Toyyiban

Halalan Toyyiban (HT) product means any product, which is not harmful and safe to be consumed as underscored by the Syariah law; thus it is allowable and permissible. HT refers to a concept in Islamic teachings that emphasize the importance of consuming food and beverages that are not only permissible (halal) but also wholesome, pure, and beneficial for both the body and soul. As Allah says in the Qur’an:

“O mankind! Eat of that which is lawful and good on the earth”

[Surah Al Baqarah 2:172]

Halalan Toyibban lipids processing and utilization is a term used to describe the production and use of lipids (fats and oils) under the principles of HT (Omar, Jaafar, & Osman, 2013).

Lipids play a crucial role in our diet as they provide energy, essential fatty acids, (omega 3), and fat-soluble vitamins (Zhang, et al., 2021). In the HT context, lipids must be obtained from permissible sources and processed using methods that maintain their purity and quality. This includes sourcing lipids from halal animals or permissible plant-based sources even for soap, cosmetics and personal care products (Tukiran & Anuar 2022).

3 Concept of Halalan Toyyiban Lipids (HTL)

The concept of Halalan Toyyiban Lipids (HTL) is rooted in the Islamic principles of halal (lawful) and Toyyiban (wholesome). There are three essential elements involved in food consumption designed for Muslims, which are consumers, producers, and products. Halal refers to products that are permissible for consumption according to Islamic law, while Toyyiban signifies that the products are not only halal but also wholesome, pure, and beneficial for human well-being (Othman, et al., 2018). In the context of lipids, HTL emphasizes the production and utilization of lipids that meet these criteria.

The processing of HTL involves adhering to specific guidelines and standards set by Islamic dietary laws. These guidelines ensure that the entire production process, from sourcing raw materials to the finished product, meeting the requirements of halal, which is free from any impurities or forbidden substances. In this way, it will comply with concepts of Maqasid Shariah which ensures the betterment of the welfare of humankind, giving protection from any harm that may occur (Shuhaimi, et al., 2022).

Utilization of HTL involves incorporating them into various food and non-food products while maintaining their halal integrity (Osimani, 2018). Food products such as cooking oils, margarine, dairy products, and bakery items can be formulated using HTL to provide consumers with wholesome and permissible options (Rahman, 2015). Non-food products like cosmetics, pharmaceuticals, and personal care

items can also utilize HTL to cater to the needs of individuals who seek halal alternatives in these areas. In halal products apart from quality, safety and efficacy issues, the niche lies in the implementation of the Halalan Toyibban concepts about the source and manner of preparation conforming to the tenets laid down by the teaching of Islam (Ehsan, 2008).

HTL processing and utilization not only focus on meeting the halal requirements but also prioritizing the products' overall quality, safety, and health benefits. This includes sourcing, handling, using sustainable and ethical practices in lipid production, ensuring proper labelling and traceability, following food safety standards like HACCP and GMP to protect consumers (Avento & Wright, 2020).

By incorporating the principles of Halalan Toyibban into lipid processing and utilization, individuals can make informed choices and have confidence that the lipids they consume meet the requirements of their faith. They are beneficial for their well-being and align with their values of ethical and wholesome living (Lands, 2008). The challenges to be addressed relate to standardizing procedures and generating acceptable parameter standards apart from specialized expertise, and training of personnel befitting the needs of the HTL industry.

4 Halalan Toyibban Lipids: Concepts, Technologies and Applications

Halalan Toyibban Lipids (HTL) refers to the concept, technologies, and applications related to the production and use of halal-wholesome lipids. It encompasses various aspects, including the source, processing, and applications of lipids that comply with Islamic dietary laws, which are considered as healthy and beneficial for human consumption. Hazards such as product contaminations with raw materials during storage or chemical hazard arising out of lipid oxidation problems are important consideration. The risks may affect the quality and shelf life of the product, thus affecting the Toyibban aspect of the product. The elements embedded in Halalan-Toyibban Control Point (HTCP), Hazard Analysis Critical Control Point (HACCP), and good manufacturing practices (GMP) could be implemented as quality control measures to prevent any food safety issues (Nawawi, et al., 2018; Senanayake & Fichtali, 2006).

4.1 Technologies for Halalan Toyibban Lipids

Various technologies are employed to ensure the production of HTL. Some key technologies include:

- a) **Halal Slaughtering and Processing:** For animal-based lipids, ensuring that the animals are slaughtered according to Islamic ritual practices is crucial. This involves methods such as the use of a sharp knife and proper draining of blood. The processing facilities must also be adhered to halal standards (Soon, Chandia, & Mac Regenstein 2017).
- b) **Halal Certification and Traceability:** HTL production involves getting the halal certification from recognized certifying bodies. The demand for halal certification has increased among food industries due to the positive impact towards sales. The process of certification, however, requires commitments from the commercial sectors, involving workers that provide services and products (Muda, et al., 2020). This ensures that the entire supply chain complies with Islamic requirements, including sourcing, processing, storage, and distribution. Implementing a traceability system helps in monitoring and verifying the halal status of the lipids (Zainuddin et al., 2020).
- c) **Sustainable and Ethical Practices:** HTL emphasizes the use of sustainable and ethical practices throughout the lipid production process. This includes ensuring animal welfare, responsible sourcing of raw materials, and environmentally friendly production techniques (Ahmad, et al., 2021).
- d) **Advanced Lipid Extraction and Refining:** Technologies for lipid extraction, such as solvent extraction, cold pressing, supercritical fluid extraction, etc are used to obtain high-quality lipids from various sources (Venteris, et al., 2014; Li, et al., 2022). Refining processes like degumming, neutralization, bleaching, and deodorization are employed to improve the quality, stability, and sensory properties of the lipids (Wang, et al., 2020). Serum lipids such as cholesterol and triglycerides, which are the most abundant in circulation, are well-known biomarkers of risk of major adverse cardiac events (Poss et al., 2020), which makes the lipids non-Toyibban, however, still halal.

4.2 Applications of Halalan Toyyiban Lipids

Halalan Toyyiban Lipids (HTL) find applications in various sectors, including food, pharmaceuticals, cosmetics, and personal care products. Some examples include:

- a) **Food Industry:** HTL lipids are used in the preparation of halal food products, including cooking oils, several types of margarine, bakery products, snacks, confectionery, dairy alternatives, etc. These lipids provide halal options to Muslim consumers and cater to the growing demand for halal-certified foods globally (Atalan-Helicke, 2015).
- b) **Pharmaceuticals:** HTL lipids may be used as excipients or active ingredients in pharmaceutical formulations. They can serve as carriers for drug delivery systems to enhance bioavailability, and provide nutritional benefits in specific formulations. Halal authentication analysis is very important to assure that pharmaceutical products are free from any non-halal components (Rohman & Salamah, 2018).
- c) **Cosmetics and Personal Care:** HTL is utilized in halal-certified cosmetic and personal care products. They can provide moisturization, emollience, and other functional properties in formulations such as creams, lotions, lip balms, and hair care products (Hussain-Gambles, 2020). Therefore, as a Muslim consumer, it is essential to know about the Halal cosmetic products used. In order to follow the Halal cosmetics standards, the products must comply with the Halalan Toyyiban concept to ensure product quality and safety. Although cosmetic products have gained scientific advancement, the development of cosmetics such as Halalan Toyyiban products must be queried further to fulfil global demand adequately (Tukiran & Anuar, 2022).
- d) **Nutraceuticals and Functional Foods:** Food scientists and consumers must realize the multiple health benefits of certain foods. Functional foods and nutraceuticals provide an opportunity to improve human health, reducing healthcare costs and support economic growth among rural communities (El Sohaimy, 2012). HTL lipids with specific health-promoting properties, such as omega-3 fatty acids, can be incorporated into nutraceuticals and functional foods to offer added health benefits to consumers (Gumus & Gharibzahedi, 2021).

Overall, Halalan Toyyiban Lipids represent the convergence of halal requirements and the pursuit for wholesome, sustainable, and beneficial lipids required for various industries, catering to the needs of halal-conscious consumers worldwide.

5 Animal Fats and Halal Issue

The issue of animal fats and their compliance with Halal requirements is an important consideration for Muslim consumers. In Islamic dietary laws, certain animal fats are prohibited while others are considered permissible (Halal). To determine the Halal status of animal fats, several factors are taken into account:

5.1 Source of the animal fat

The source of the animal fat is crucial for the determination of its Halal status. Islam permits the consumption of fats derived from animals that are slaughtered according to Islamic guidelines (Alzeer, Rieder & Abou Hadeed, 2018). This means that the animal must be slaughtered by a Muslim who recites the appropriate prayers (known as the Bismillah and Takbeer) and follows the specified methods of slaughter (known as Zabihah). Fats derived from animals that are not slaughtered in this manner are considered Haram (prohibited) for human consumption. However, these fats may be used for the needs of other industries such as biodiesel or bio-lubricants.

5.2 Type of animal

According to Islamic teachings, the consumption of fats from certain animals is prohibited. For example, pork or pork-derived fat, dog or dog-derived fats are strictly forbidden in Islam. On the other hand, fats

derived from Halal animals such as goats, beef, lamb, rabbit, buffalo, deer, cattle, camels and giraffes are permissible animals for consumption. Birds including turkey, chicken, fowl, hens, geese and ducks are generally considered permissible (Chaudry, et al., 2000).

5.3 Processing and contamination

Another aspect of consideration is the processing of animal fats. Removal of fats from various parts of the animal body can be done by dry rendering and wet rendering processes. The most advantageous technique is low-temperature rendering which results in the highest yield of fat. Further processing of fat involves a series of purification steps such as settling and degumming, neutralization, bleaching and deodorization followed by modification into more usable products and finally packaging. The quality control of fats is as important as the purification of fat in order to increase its utilization among consumers (Sharma, Giriprasad & Goswami, 2013).

It is important to ensure that the fats have not been mixed with non-Halal substances or contaminated with Haram ingredients during the processing. Strict quality control measures and Halal certifications can help ensure the purity and integrity of animal fats. In the food industry, manufacturers producing Halal food products must carefully select and process animal fats to ensure compliance with Halal requirements. They need to source their fats from animals slaughtered according to Islamic guidelines or they may use alternatives such as vegetable oils or synthetic fats deemed Halal (Woodgate & van der Veen, 2014; Babaoglu, Karakaya & Öz, 2017).

Halal certification authorities play a vital role in verifying the Halal status of animal fats and other food ingredients. They conduct inspections, audits, and certifications to ensure that the entire production process, including sourcing, processing, and handling, complies with Halal standards (Al-Mazeedi, Regenstein & Riaz, 2013). It is worth noting that the Halal status of animal fats might vary based on regional interpretations and cultural practices. Therefore, Muslim consumers are encouraged to seek products that have been certified by reputable Halal certification bodies to ensure adherence to Halal requirements. The halal verification and authentication of halal animal fats are highly required. Non-halal items commonly found are pig derivatives such as lard, products from the blood, dead meats, and the permissible animals which are not slaughtered according to Syariah law (Mursyidi, 2013).

6 Halalan Toyyiban and Lipid Oxidation

Halalan Toyyiban principles encompass not only the Halal compliance of a product but also its wholesomeness and beneficial aspects. Lipid oxidation is a critical phenomenon in the processing and utilization of lipids as it can lead to undesirable changes in the quality and safety of the products (Chaiyasit, et al., 2007). However, Halalan Toyyiban principles guide the prevention and mitigation of lipid oxidation to ensure the production of high-quality and safe lipids (Barden & Decker, 2016).

Lipid oxidation refers to the chemical reactions that may occur when lipids are exposed to oxygen, leading to degradation of fats and oils. This process can result in the development of off-flavours, off-odours, and the formation of potentially harmful compounds (Vercellotti, St. Angelo & Spanier, 1992). In order to maintain the wholesomeness and beneficial attributes of lipids, it is crucial to control and minimize the lipid oxidation. Halalan Toyyiban lipids processing and utilization involve several strategies to prevent or reduce the occurrence of lipid oxidation:

6.1 Quality of raw materials

Halalan Toyyiban principles emphasize the use of high-quality raw materials. Fresh and properly stored fats and oils with low levels of impurities such as free fatty acids and moisture, are less prone to oxidation. Proper sourcing and handling of raw materials can help ensure the initial quality and freshness of the lipids (Musakhanian, Rodier & Dave, 2022).

6.2 Storage and handling

Proper storage facilities could play a crucial role in preventing lipid oxidation. Lipids should be stored in cool, dark places, away from direct sunlight, heat, and air exposure. Lipids with high polyunsaturated fatty acids are highly susceptible to degradation processes such as oxidation. Packaging materials should be selected carefully to protect lipids from the exposure of light and oxygen (Secci & Parisi, 2016). Halalan Toyyiban guidelines emphasize the importance of appropriate storage practices to maintain the integrity of the lipids.

6.3 Antioxidants

Antioxidants are substances that can inhibit or delay the oxidation process. Natural and synthetic antioxidants are commonly used in the food and lipid industries to extend lipids' stability and shelf life. Plant materials are a rich source of antioxidants such as polyphenols “phenolic acids, lignans, stilbenes, and flavonoids such as anthocyanins,” carotenoids “xanthophylls and carotenes”, and vitamins “vitamin E and C” (Loi & Paciolla, 2021). In HTLs processing, Halal-certified antioxidants are preferred to ensure compliance with Islamic guidelines.

6.4 Processing techniques

Processing methods also impact lipid oxidation. Halalan Toyyiban principles encourage the use of gentle processing techniques that minimize exposure to heat, light, and oxygen. For example, cold-pressed oils or low-temperature extraction methods may be preferred to retain the nutritional value while reducing the tendency for oxidation (Chew, 2020). However, most animal fats are extracted using low-temperature rendering.

6.5 Quality control

Regular quality control checks throughout the production process are essential to identify and address any potential issues related to lipid oxidation (Goddard, McClements & Decker, 2012). Halalan Toyyiban guidelines emphasize the implementation of rigorous quality control measures to ensure the safety and wholesomeness of the final product.

By following these strategies, HTL processing and utilization aim to minimize lipid oxidation and maintain lipids' quality, safety, and wholesomeness (Rahim, et al., 2022). This ensures that the end products meet the Halal requirements and provide consumers with high-quality, beneficial, and safe lipid-based products.

This book entitled “*Halalan Toyyiban Lipids Processing and Utilization: Concepts, Technologies, and Applications*” will cover the Islamic term Halalan Toyyiban concept for lipids extraction, refining processing and utilization using various technologies and applications to explain the details of halal requirements, which means quality, safety, and wholesomeness (Toyyiban) for Muslim as well as all Humankind consumption and utilization. The book will cover the extraction techniques of fats and oils from various sources, the refining and processing of fats and oils and related materials. Also, the book shall cover some unconventional sources of lipids such as microbial and insects. Using lipids in cooking, salad dressing, frying and baking shall be covered as well as the important issues in lipid oxidation and the relation to the Toyyiban concept. Halal lipids adulteration and the importance of the traceability system concerning the quality, halal & toyyib of the adulterated products shall be covered. The utilization of lipids in nutraceuticals, pharmaceuticals, personal care and cosmetics will also be covered in this book from the view point of quality, halal and toyyib perspective. Halal sustainability in fats and oils and related materials products, halal industry and economic development from the points of products market outlook and halal industry development and contributions to economic development shall be enclosed as part of this book's sections.

7 Publisher's Note

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