The Halal Capsule Shell in the Perspective of Comparative Islamic Law and Health Law: Opportunities and Challenges

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Abstract
This research aims to analyze and compare the perspectives of Islamic law and health law regarding the use of halal capsule shells. This study is a comparative research that explores legal, ethical, and health aspects in the use of capsule shells that meet halal criteria. Using a qualitative approach, this research collected data from various relevant sources, including Islamic legal texts, health regulations, and related scientific literature. The results show that there are both similarities and significant differences in the standards and interpretations of halal between Islamic law and health law. From the perspective of Islamic law, the halal status of capsule shells is determined by the source of materials and the manufacturing process, while health law focuses more on the safety and effectiveness of the product. The study also identifies opportunities, such as a large market potential for halal products, and challenges, including the need for standardized and integrated halal certification. This research provides new insights into the importance of harmonizing the principles of halal in Islam with health standards, which are crucial not only for Muslim producers and consumers but also for broader social and economic integration. Recommendations for further research and related policies are presented to support the sustainable development of the halal capsule industry.

1. Introduction

As a country with a majority Muslim population, Indonesia guarantees freedom of religion and worship for all its citizens, as stipulated in the 1945 Constitution, Article 29 paragraph (2). This is also in line with Law Number 8 of 1999 concerning Consumer Protection, especially Article 4 letter c, which ensures
consumers' rights to accurate, clear, and honest information about the conditions and guarantees of goods and/or services. In this regard, the state has an obligation to provide protection and assurance regarding the halal status of products consumed by Muslims, including in the context of halal certification.¹

The Global Islamic Economy Report 2019 reveals that the top five exporting countries of live animals and meat commodities to the member countries of the Organization of Islamic Cooperation (OIC) are Brazil, Australia, India, Sudan, and Turkey. Meanwhile, Indonesia is recorded as the largest importer of halal food with expenditures of around USD 173 billion in 2018. Furthermore, in the halal pharmaceutical and cosmetic industry, countries such as Germany, France, the United States, India, the United Kingdom, the United Arab Emirates, and China are the main exporters to OIC countries.²

Despite having a growing domestic pharmaceutical industry, Indonesia still depends on gelatin imports for capsule production. Gelatin, a primary raw material for capsule shells, is mostly imported from Thailand, Bangladesh, and India. Interestingly, gelatin is a hydrolysis product of collagen derived from the skin, tissue, and bones of animals such as cows, buffaloes, and pigs. This fact presents significant challenges in terms of halal compliance, considering that pork and its derivatives are not halal according to Islamic law.³

In the pharmaceutical industry, gelatin has long been an essential component, especially in capsule production. Gelatin, derived from collagen hydrolysis, traditionally comes from animal sources such as the skin, tissue, and bones of cows or pigs. However, the need for halal gelatin, especially in the context of the Muslim community, has significantly transformed the pharmaceutical industry landscape. In Islam, the consumption of products derived from pigs or animals not slaughtered according to Islamic Sharia is considered haram. Therefore, the presence of non-halal gelatin in pharmaceutical products, including capsules, becomes a critical issue for Muslim consumers. This concern extends beyond religious aspects and includes health and ethical considerations, driving an increased demand for halal gelatin in pharmaceutical capsule production.⁴

In response to this need, the industry has begun exploring and adopting alternative sources for halal gelatin. Halal gelatin is typically obtained from

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animals slaughtered according to Islamic law or from non-animal sources, such as fish. The use of fish gelatin, for example, has become a popular alternative as it not only meets halal criteria but also caters to vegetarian consumers and those with concerns about animal allergies. The production of halal gelatin presents unique challenges, particularly in terms of certification and maintaining consistent quality. The halal certification process for gelatin involves verifying the source of raw materials and ensuring that the entire production process complies with halal principles. This demands transparency and strict compliance with standards set by halal certification bodies. Additionally, there are challenges in achieving consistency in the quality and technical characteristics of halal gelatin equivalent to conventional gelatin.

In the search for alternatives to halal capsule shell raw materials, seaweed has emerged as a promising candidate. The use of seaweed in the pharmaceutical industry, particularly as the primary material for making halal capsule shells, is an evolving innovation aligned with the global market's demand for halal products.² Seaweed, a natural source of polysaccharides such as agar and carrageenan, offers gelling and stabilization properties suitable for capsule manufacturing. The main advantage of seaweed lies in its status as a non-animal raw material, automatically meeting halal and vegan criteria. This makes seaweed an ideal choice not only for Muslim consumers but also for those following a vegetarian diet or having concerns about animal allergens.³

The development of capsule shells from seaweed involves research and technological innovation to optimize the extraction and processing of polysaccharides. This process must ensure that the produced capsules have the strength, stability, and release quality suitable for pharmaceutical applications. The main challenge here is achieving consistency and performance equivalent to traditional gelatin capsules while maintaining halal standards. Seaweed, as a renewable and environmentally friendly resource, offers additional advantages in terms of sustainability. Seaweed cultivation does not require the use of valuable agricultural land or freshwater sources, making it a more sustainable option compared to animal sources. This aspect is particularly relevant in the context of climate change and the need for a more environmentally friendly industry.⁴

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From an economic perspective, the use of seaweed as a raw material for halal capsule shells opens up new market opportunities, both in countries with large Muslim populations and in the global market in general. It can also stimulate economic growth in coastal regions where seaweed is cultivated, providing economic benefits to local communities. Adopting seaweed as a raw material for halal shells requires clear regulatory pathways and reliable certification processes. This includes ensuring that the entire seaweed supply chain, from cultivation to processing, complies with halal standards. Collaboration between producers, halal certification authorities, and health regulators is needed to ensure compliance.8

The use of seaweed as a raw material for halal capsule shells offers an innovative solution that meets religious, ethical, and environmental needs. With its advantages of sustainability, affordability, and compliance with halal standards, seaweed has the potential to become a revolutionary material in the pharmaceutical industry, especially in meeting the growing demand for halal and environmentally friendly products. This advancement will not only benefit the Muslim community but also contribute to a more inclusive and sustainable global industry.9

2. Research Method

Research on halal capsule shells in the context of a comparison between Islamic law and health law requires a structured and multidisciplinary methodological approach. To capture the nuances of both legal fields, this research adopts a qualitative comparative research design. This approach allows for in-depth analysis of the different principles, norms, and legal applications in these interacting legal domains. The primary goal of this design is to uncover how halal standards in Islamic law and compliance with health regulations may converge or diverge, and their impact on the production of halal capsule shells.10

The data collection method involves two main components: documentary study and in-depth interviews. The documentary study focuses on collecting and analyzing official documents, including Islamic legal texts, health regulations, and industry standards related to capsule shell production. This approach enables researchers to identify and understand the existing legal frameworks and standards. Additionally, in-depth interviews will be conducted with various experts, including Islamic legal scholars, health officials, and pharmaceutical industry professionals. The aim of these interviews is to gain a deeper understanding of the legal and regulatory challenges and opportunities in producing halal capsule shells.

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perspective and practical understanding of how these standards are interpreted and applied in practice.\textsuperscript{11}

After data collection, the data analysis stage becomes crucial to understand the dynamics between Islamic law and health law in the context of halal capsule shells. This analysis will use content analysis techniques to identify main themes, patterns, and perspectives emerging from the data. This process aims to build a comprehensive understanding of how these two legal fields influence each other in the pharmaceutical industry context. The interpretation of this analysis is expected to reveal opportunities and challenges faced in harmonizing halal standards with health regulations and provide recommendations for stakeholders to address these challenges and leverage existing opportunities.\textsuperscript{12}

3. Results and Discussion

The Use of Seaweed in the Production of Halal Capsule Shells

In the context of seeking alternatives for halal capsule shell raw materials, seaweed, especially the Eucheuma cottonii variety rich in carrageenan, offers significant potential. Red and brown algae, such as Sargassum and Laminaria, are the main types in this group. However, Eucheuma cottonii, which thrives in the tropical waters of Indonesia, stands out due to its economic value and excellence in producing carrageenan. Carrageenan, a polysaccharide extracted from seaweed, demonstrates exceptional ability as a material for making capsule shells. When combined with plasticizer substances like sorbitol, carrageenan can produce capsule shells with the desired elasticity. These seaweed-based capsules not only ensure halal compliance but also cater to vegetarian consumers, opening new opportunities in sustainable halal capsule shell production.\textsuperscript{13}

Traditionally, capsule shells are made from gelatin, a protein derivative from animal collagen. The main sources of gelatin include the skin and bones of mammals such as cows and pigs, with variations such as type A gelatin from the skin and type B from the bones. The use of gelatin, especially derived from pigs, poses significant issues in the context of halal compliance, considering that almost 60% of gelatin in the global market comes from this source. Therefore, the use of gelatin in capsule shell production becomes a critical point in terms of compliance with Islamic law. Additionally, the Indonesian National Agency of Drug and Food Control (BPOM) has set strict standards regarding the origin of gelatin, but there are still concerns about compliance with halal slaughter

\textsuperscript{11} Wahyudin Darmalaksana, \textit{Metodologi Penelitian Hukum Islam} (Bandung: Sentra Publikasi Indonesia, 2022).
\textsuperscript{12} Faisar Ananda Arfa and Watni Marpuang, \textit{Metodologi Penelitian Hukum Islam} (Jakarta: Prenada Media, 2016).
procedures. This emphasizes the importance of finding alternatives such as seaweed to address halal issues in capsule shells.14

Islamic law, which governs aspects of the lives of Muslims, including rules regarding food and medicines, has strict views on the halal status of products. On the other hand, health law, which regulates medical and pharmaceutical aspects, focuses on the safety, quality, and efficacy of products. The application of Islamic law in the pharmaceutical context, particularly in the production of capsule shells, demands strict adherence to halal criteria, while health law emphasizes the health and safety aspects of products. This research aims to understand how these two legal fields can complement each other in ensuring that capsule shells are not only halal but also safe and effective. This is crucial considering the need to meet halal standards in the pharmaceutical industry without compromising the health and safety aspects of the products.15

Opportunities for the Development of Halal Capsule Shells in Indonesia

Indonesia, as the country with the largest Muslim population globally, offers an extensive and potential market for halal products, including in the pharmaceutical sector such as halal capsule shells. The demographic reality signifies a substantial demand that has not been fully tapped, creating significant business opportunities for the pharmaceutical industry. With the increasing awareness and needs of the Muslim community for products complying with Islamic law, the demand for halal capsule shells is expected to continue rising. This is not only a matter of religious preference but also reflects consumer trust in the safety and quality aspects of the products. The economic growth and increased purchasing power in Indonesia also contribute to a larger potential market for halal products, including in the health and pharmaceutical sector.16

This sizable market opportunity not only paves the way for increased sales but also for innovation in product development. The pharmaceutical industry has the opportunity to research and develop capsule shells made from alternative halal materials, such as seaweed, which not only meet halal standards but are also environmentally friendly and sustainable. This can reduce reliance on imported animal-based gelatin and pave the way for national pharmaceutical industry self-sufficiency in halal capsule shell production. To capitalize on this

vast market, effective marketing strategies and educational approaches to consumers are required. The industry needs to build awareness of the benefits of using halal products, not only from a religious perspective but also health-wise. Consumer education about the health benefits and quality of halal products can boost market acceptance and demand.\(^\text{17}\)

Establishing strong collaborations with halal certification institutions will enhance credibility and trust in halal products. Certification from recognized institutions provides assurance to consumers that the products they use comply with Islamic law and health standards. The enormous market potential for halal products in Indonesia opens many opportunities for the pharmaceutical industry. With the increasing awareness and demand for products complying with Islamic law, the pharmaceutical industry has the opportunity to grow and innovate. However, seizing these opportunities requires a holistic approach, including product innovation, effective marketing strategies, consumer education, and strong collaboration with halal certification institutions. Through this approach, the pharmaceutical industry can not only meet the needs of the local market but also elevate the standards and quality of the pharmaceutical products as a whole.\(^\text{18}\)

In the pharmaceutical industry, especially in the context of halal capsule shell production, high health and safety standards are not just a necessity but also an opportunity. In Indonesia, where the demand for halal products is high, enhanced health and safety standards for halal capsule shells not only fulfill Islamic law requirements but also ensure the quality and safety of products for consumers. With increasing awareness of health issues, consumers are seeking products that are not only halal but also safe and of high quality.\(^\text{19}\)

Consumer trust is a crucial asset in the pharmaceutical industry. Capsule shells produced in strict compliance with halal standards are often perceived by consumers as safer and of higher quality. This is because the halal certification process often involves strict supervision of raw material sources and production processes. This trust can be key to attracting and retaining customers, especially in a highly competitive market. High health and safety standards provide a boost for innovation in product development. The pharmaceutical industry faces the challenge of finding and developing alternative materials that are not only halal but also meet high health standards. For example, the use of natural materials

\(^{17}\) Citra Atrina Sari and others, *Direktori Riset Sains Halal Nasional 2021 - 2023* (Jakarta: Kementerian Keuangan RI, 2022).


\(^{19}\) Thoyyib Alfath, ‘Standar Halal Dalam Industri Obat-Obatan Dan Herbal’, *LIKUID: Jurnal Ekonomi Industri Halal*, 3.1 (2023), 30–44.
such as seaweed in capsule shell production is an innovative step that is not only halal but also safer for consumers with allergies to animal products.\textsuperscript{20}

With a focus on higher health and safety standards, the pharmaceutical industry can contribute to raising overall standards in pharmaceutical production. This not only benefits the halal product segment but also enhances the quality and safety of pharmaceutical products overall, strengthening the industry's reputation as a whole. The increased health and safety standards in halal capsule shell production offer significant opportunities for the pharmaceutical industry in Indonesia. This creates a conducive environment for innovation, strengthens consumer trust, and raises the overall standards of the industry.\textsuperscript{21}

Alongside the growing demand for halal products in Indonesia, the pharmaceutical industry faces significant opportunities to innovate and enhance local research capacity. The need to produce halal capsule shells in compliance with Islamic law opens doors for research and development (R&D) in search of alternative materials and new production technologies. This initiative not only strengthens the pharmaceutical sector but also marks a leap forward in scientific research and technological innovation in Indonesia. One key area for innovation is the development and utilization of local raw materials, such as seaweed, which offers a halal and sustainable alternative to animal-based gelatin. Considering Indonesia's biodiversity richness, especially in coastal and marine areas, intensive research into the utilization of these local resources can reduce dependence on imported raw materials. This research not only benefits the pharmaceutical industry but also provides an economic boost to the local agricultural and marine sectors.

These opportunities also create valuable synergy between the pharmaceutical industry and academic institutions. Such collaboration can assist in developing innovative standards, protocols, and technologies. This cooperation enables the exchange of knowledge and resources, opening the way for training and developing human resources in the fields of pharmacy and biotechnology. Investments in research and development are key to sustainable innovation. The pharmaceutical industry in Indonesia has the opportunity to not only focus on product improvement but also to build a strong research infrastructure. This includes establishing laboratories, recruiting and training scientific personnel, and funding research projects. This capacity enhancement not only benefits the pharmaceutical sector but also adds value to the national research and innovation ecosystem.\textsuperscript{22}

\textsuperscript{20}Febriana and others.
The drive for innovation and local research in the context of halal capsule shell production in Indonesia opens broad opportunities for technological and economic advancement. By leveraging local resources and building collaboration between industry and academia, Indonesia can develop innovative halal solutions while strengthening its position as a significant player in the global pharmaceutical industry. This investment not only meets market needs but also advances science and technology, encourages innovation, and contributes to economic and social progress.

Challenges in the Development of Halal Capsule Shells in Indonesia

One of the main challenges in the production of halal capsule shells in Indonesia is the complexity associated with halal standards and certification processes. Halal certification is not just a label but an assurance that the product has been produced in accordance with Islamic principles. This involves a detailed and stringent process, covering everything from the sourcing of raw materials, production processes, to the supply chain and distribution. This complexity arises from the need to ensure that every stage in the production of capsule shells complies with Islamic law, which is not always in harmony with standard industry procedures and practices.

While the pharmaceutical industry has long operated with its own standards and processes, aligning these with halal standards poses a challenge. For instance, replacing animal-based gelatin with alternative materials like seaweed for capsule shells requires changes in formulation and production processes. Additionally, to obtain halal certification, companies must undergo a series of audits and assessments that can demand additional resources both in terms of time and cost.23

Consistency and compliance with halal standards throughout the supply chain also pose a challenge. This applies not only to the manufacturers of the capsule shells themselves but also to raw material suppliers and all entities involved in the production and distribution chain. Ensuring this compliance requires a comprehensive management system and often significant changes in existing business practices. Halal standards are dynamic and can change over time, responding to developments in the understanding of fiqh (Islamic jurisprudence) and socio-economic conditions. The pharmaceutical industry must remain responsive and flexible to these changes, ensuring that they not only adhere to current standards but are also prepared to adapt to future changes.

The complexity of halal standards and certification poses significant challenges in the production of halal capsule shells in Indonesia. This requires investments in understanding Islamic law, adjusting business processes, and

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developing management systems capable of ensuring compliance with halal standards at all stages of production and distribution. Although challenging, this process is crucial to ensure the integrity of halal products and meet the expectations of Muslim consumers. By overcoming these challenges, the pharmaceutical industry can gain broader access to the halal product market and build stronger trust with Muslim consumers.

Another challenge faced in the production of halal capsule shells in Indonesia is the harmonization between Islamic legal standards and health law regulations. This harmonization is not only important to ensure compliance with halal principles but also to guarantee that products meet safety and health standards set by health authorities. While Islamic law focuses on the halal aspects of products, health law emphasizes the safety, efficacy, and quality aspects of pharmaceutical products.24

Integrating halal standards with strict health and safety protocols can be a complex process. This involves not only meeting halal criteria regarding raw materials and production processes but also ensuring that the product meets all testing, quality, and safety requirements set by health regulatory bodies. Additionally, the product must be effective in achieving its medical objectives without compromising its halal status. Addressing these challenges requires continuous efforts to update and synchronize regulations in the pharmaceutical industry. This may involve updates in production standards, clinical testing, and post-market surveillance to ensure that halal products also meet internationally recognized health standards. This process requires collaboration among policymakers, health authorities, and halal certification bodies.25

Education and awareness among stakeholders are key to overcoming these challenges. Manufacturers, regulators, and consumers need to understand the importance of this harmonization and how it can be achieved without sacrificing halal or health standards. This involves ongoing dialogue and knowledge exchange between the medical community, Islamic legal experts, and the pharmaceutical industry. Harmonizing Islamic law and health law in the production of halal capsule shells is a significant challenge but crucial to ensuring product acceptance and success in the market. Overcoming these challenges requires joint efforts and effective coordination among various entities and sectors. By successfully addressing these challenges, the pharmaceutical industry can not only meet the specific needs of Muslim consumers but also raise overall health and safety standards in the pharmaceutical products. This will ultimately

contribute to public health improvement and confidence in the pharmaceutical industry.\textsuperscript{26}

In the development and marketing of halal capsule shells, one common challenge is public perception and acceptance. Despite the increasing demand for halal products in Indonesia, there are still significant challenges in changing public perceptions, especially regarding the acceptance of new products that may differ from long-standing traditions and habits. These perceptions are influenced by various factors, including consumption habits, awareness of halal practices, and trust in the quality of new products. To address this challenge, there needs to be sustained educational efforts to raise public awareness about the importance of halal in pharmaceutical products and the health benefits that can be derived from halal products. This education should include information about the halal certification process, product safety, and quality. Effective educational campaigns can involve media, seminars, collaboration with religious communities, and socialization programs in health centers and communities.\textsuperscript{27}

Misunderstandings or lack of information among the public about what halal products are and how they are made can be a barrier to the acceptance of halal products. Therefore, it is essential for manufacturers to directly engage in conveying messages about the health benefits and halal status of their products. This includes explaining how halal capsule shells can provide a healthier and religion-compliant alternative without sacrificing product effectiveness. Media and influencers play a crucial role in shaping public perception. Using these platforms to disseminate information about halal capsule shells and testimonials from satisfied users can enhance public awareness and acceptance. Positive stories and case studies about the benefits of halal products can help change the narrative and attract consumer interest.

Public perception and acceptance are key to the success of halal capsule shells in the Indonesian market. Overcoming these challenges requires a multifaceted approach involving education, effective communication, and leveraging media to change perceptions and open minds. In this way, the pharmaceutical industry can expand its market while supporting the health and religious needs of the community. Success in addressing these challenges will not only strengthen the position of halal products in the market but also promote a healthier and more sustainable lifestyle.\textsuperscript{28}

4. Conclusion

In the context of developing halal capsule shells, seaweed, particularly the Eucheuma cottonii type rich in carrageenan, has emerged as a promising and sustainable alternative. The use of seaweed not only meets halal criteria but also offers economic advantages and environmental friendliness compared to traditional sources such as gelatin derived from animals. This provides a solution to halal-related issues, especially considering that gelatin sources often come from pigs, a critical aspect in complying with Islamic law. The development of capsule shells from seaweed marks a significant step in pharmaceutical industry innovation, simultaneously showcasing the potential to support the local economy through the utilization of Indonesia's natural resources.

On the other hand, the development of these halal capsule shells also faces challenges, particularly in harmonizing with health laws and societal perceptions and acceptance. Integrating halal standards with global health protocols demands comprehensive and collaborative initiatives among manufacturers, health authorities, and halal certification bodies. Public awareness and education are crucial in changing perceptions and embracing new innovations in this pharmaceutical field. Overcoming these challenges will not only pave the way for products adhering to Islamic law but also ensure that the products meet high health and safety standards, thereby promoting a healthy and sustainable lifestyle.

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