GAP ANALYSIS IN HALAL MEAT TRACEABILITY: TOWARDS IMPLEMENTATION OF A HALAL PRODUCT ASSURANCE LAW IN INDONESIA

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by

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ABSTRACT

After the enactment of the Halal Product Assurance Act number 33 of 2014, a wide range of products circulating in Indonesia must be halal certified. The deadline for the completion of its implementation for foods, beverages, and slaughterhouse services is October 2024. To ensure smooth implementation, the halal status of all raw materials must be traceable, including meat as it is an important ingredient with significant requirements to be halal. This paper discusses the readiness of halal certification implementation, specifically in terms of the traceability of meat circulating in the market. Information cited in this paper comes from literature research and interviews and observations by the author. The results suggest that gaps still exist, ranging from regulation to education regarding the implementation of halal certification.

BIOGRAPHICAL SKETCH

Dofactora Rocky Mega Buana Iskandar was born in Bogor, Indonesia in 1991 and graduated from IPB University with a bachelor's degree in Animal Science in 2013. He has over 7 years of experience in auditing, training, and consulting for multinational companies in the halal industry. In 2022, he enrolled at Cornell University to pursue a Master of Food Science degree under the supervision of Professor Joe M. Regenstein. In May 2023, he will obtain his MFS degree that includes a capstone project “Gap analysis in halal meat traceability: Towards implementation of a halal product assurance law in Indonesia”.

For the country that I love, Indonesia, which is currently in the process of implementing a halal assurance system.

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1. INTRODUCTION

Halal refers to practices that are lawful, wholesome (*thayyib*), and permissible for Muslims based on the Quran and the Hadiths. There are two approaches to determining the halal status of something if its status is not clearly stated in these two books, as mentioned by Regenstein et al. (2003) these are Ijma and Qiyas. Mahsun and Hakim (2021) explained that Ijma is the basis for making decisions on the status of something or an action that is not regulated by the Quran and Hadith by reaching a consensus among the scholars, while Qiyas is the process of analyzing by analogy from a situation that has been previously determined to decide the new issues. In Indonesia, the Indonesian Council of Ulama or the Majelis Ulama Indonesia in Bahasa Indonesia (MUI) uses these approaches to make decisions and has established a halal standard known as the Halal Assurance System 23000 (HAS 23000) to guide companies in obtaining halal certification. According to Statistics Indonesia (BPS, 2023) nearly 87% of Indonesia's population, about 240 million people, are Muslim and require halal food, beverages, cosmetics, and pharmaceutical drugs. The halal certificate made available for a product and/or a trademarked halal logo on a product's packaging serves as proof of the product's halal status when sold in the marketplace or as an ingredient to another manufacturer. According to Mardhiyah (2020), 98% of Muslims in Indonesia believe that the halal logo on a product's label is necessary and helpful for consumers.

In 2014, the Indonesia government through the parliament enacted the Halal Assurance Product Law number 33, which made halal certification mandatory for all products marketed in the country, except for haram products, whether produced domestically or imported. This means that all goods derived from sources deemed haram, i.e., alcoholic beverages, pork, and blood,

can still be distributed with special labeling as non-halal products. Similarly, products that fail to meet halal certification standards will be labeled as non-halal after examination. The law defines products as goods and/or services related to food, beverages, drugs, cosmetics, chemical products, biological products, genetically modified organism (GMO) products, and customer goods used by the community. Prior to the law, halal certification was voluntary, and LPPOM MUI (the Assessment Institute for Foods, Drugs, and Cosmetics of the MUI) was the only body allowed to issue policies and procedures for halal certification, with the Fatwa Committee of MUI determining the halal status of products based on LPPOM MUI's audit reports. The conditions for halal certification have since evolved, and the law has been actively implemented, with companies required to obtain halal certification from the Indonesia government to use the halal logo on their products.

According to the National Islamic Economic and Finance Committee (KNEKS, 2021), the development of micro, small, and medium enterprises (MSME) has indeed shown an increase in the past 10 years. Based on data from the Ministry of Cooperatives and Small-Medium Enterprises as of March 2021, the number of MSME currently reached 64.2 million with a contribution to the Gross Domestic Product (GDP) of 61% or equivalent to eight trillion Indonesian Rupiah (10,000 Rupiah equaled US 67 cents on April 9, 2023). In addition, MSME also have a role in creating employment as the number of micro and small business employees represents over 99% of employees in Indonesia. However, data from LPPOM MUI (2021) indicated that about 10,500 MSME have obtained halal certificates, which is only 0.01% of the total. The low number of certified MSME is mainly due to their lack of knowledge about the halal product assurance law (Law No. 33 of 2014), the process for obtaining halal certification, and the misconception that all products are inherently halal in Indonesia, except for pork

(Anandai, 2016). One of the challenges faced by businesses in the halal industry, particularly MSME, is ensuring that all ingredients used in their products are halal, especially those that are derived from meat. Obtaining proof of the halal status of these ingredients is important but often difficult, which can create challenges for businesses seeking to comply with halal standards. Tambunan (2009) reported that 70% of meat consumption in Indonesia comes from traditional markets, which lack a traceability system, making it challenging to ensure the halal status of meat. The halal status of meat is determined by three factors: the animal, the slaughtermen, and the slaughtering process. Animals must be halal animals, such as cattle, buffalo, sheep, goats, rabbits, camels, birds (chicken, turkeys, ducks, geese, and ostriches), or animals that live their entire life in the water or sea. There are varying opinions on the halal status of certain animals, such as horses which are deemed halal by the Shafi'i school of thought and haram by the Hanafi school of thought. Similarly, eels are deemed haram by the Maliki school of thought and halal by other schools of thought. Haram animals include carnivorous animals, birds with talons used to hunt prey, animals that go in and out of the water, and many other animals that are defined as najis (filth). Animals must also be healthy and alive at the time of slaughter, which for some may not include consciousness. To be considered halal, the slaughtermen must meet three requirements: they must be an adult Muslim or ahlul kitab (people of the book), understand right from wrong, and always perform the five daily prayers. The slaughtering process is divided into three sub-concerns: the slaughtering instruments (e.g., the knife), and the pre-slaughtering and post-slaughtering handling. Fangs and claws/nails cannot be used as slaughtering instruments, and a stainless steel knife is typically used for the slaughtering process. Other materials may be used if they are sharp enough to cut the animal's neck.

The pre-slaughtering stage may involve rendering the animal unconscious before the bleeding process. The use of stunning methods prior to cutting differs due to various perspectives, including which specific method should be adopted to ensure that the animal is only rendered unconscious without causing death, i.e., that the stunning is reversible.

The slaughtering stage has two concerns: how the slaughtermen say a blessing during the bleeding process and the way the bleeding process is done. Opinions vary as to whether the slaughtermen must speak the blessing aloud for each animal or if it can be done once for a batch of slaughtered animals. The opinion of the Shafi'i school even states that reciting a blessing is not an obligation to be performed during the process of slaughter, so it is possible that there are slaughter processes where the halal butcher does not audibly recite a blessing, as long as the slaughterman is a Muslim or ahlul kitab. For the bleeding process, cutting the four vessels (oesophagus, trachea, and the two blood vessels, i.e., both carotid arteries and both jugular veins) is commonly cited as the standard. Abdullah et al. (2019) stated that according to the Hadith from Shahih Bukhari, the recommended location for slaughtering is the neck just below the gullet, which is the core of the neck. The Hadith also emphasizes that the cut must include the jugular veins and carotid arteries, as well as the oesophagus and trachea.

Although slaughtering services are included in the October 2024 deadline, the rate in achieving this target is still far from satisfactory. KNEKS (2022) highlighted that the completion of halal certification in slaughterhouses is necessary for Indonesia to achieve its vision of becoming the world's largest halal production center by 2024. Unfortunately, only 26% of the total registered slaughterhouses have been officially certified as halal, including 62 ruminant slaughterhouses and 139 poultry slaughterhouses (KNEKS, 2022). Therefore, it is important to identify the reason for the gaps between the government’s target and the actual conditions on the ground.

Part of the difficulty has been that businesses, particularly MSME, face difficulties in obtaining evidence that all the ingredients they use are halal, particularly those derived from meat derivatives.

2. HALAL MEAT IN INDONESIA

In Indonesia, the annual per capita consumption of meat and chicken is relatively high for a developing country, with an estimated total of >11 kg in 2019. However, this figure is considerably lower than the global average of ~27 kg reported by the Food and Agriculture Organization (FAO) of the United Nations in 2022 (Figure 1).

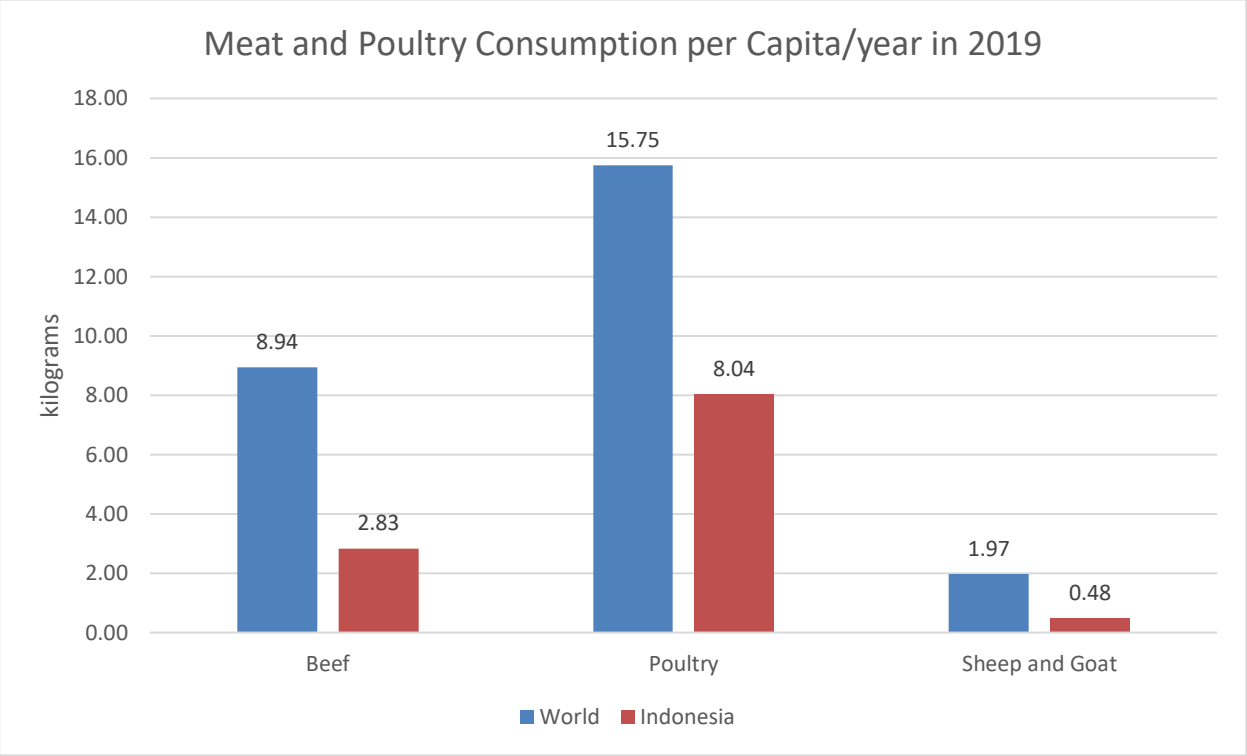

Figure 1. Meat and poultry consumption per capita in 2019

The meat supply in Indonesia comes from both domestic production and imports, with beef and water buffalo meat being the primary sources of red meat each year. Although sheep and goat meat can also be produced domestically or imported, the imported sheep meat has a relatively low value. According to the data obtained from the Center for Agricultural Data and Information Systems of Indonesian under the Ministry of Agriculture, the increase in imported sheep meat was only ~2,000 tonnes between 2009 and 2018. Chicken, however, are solely sourced from domestic production and not imported. According to Hanni et al. (2022), the rise can be attributed to the expansion of small-scale poultry farming, due in part to government backing in the provision of supportive facilities, and an increase in the public's consumption. However, there was no substantial change in beef and sheep production. All trends in domestic production movements can be seen in Figures 2, 3, and 4.

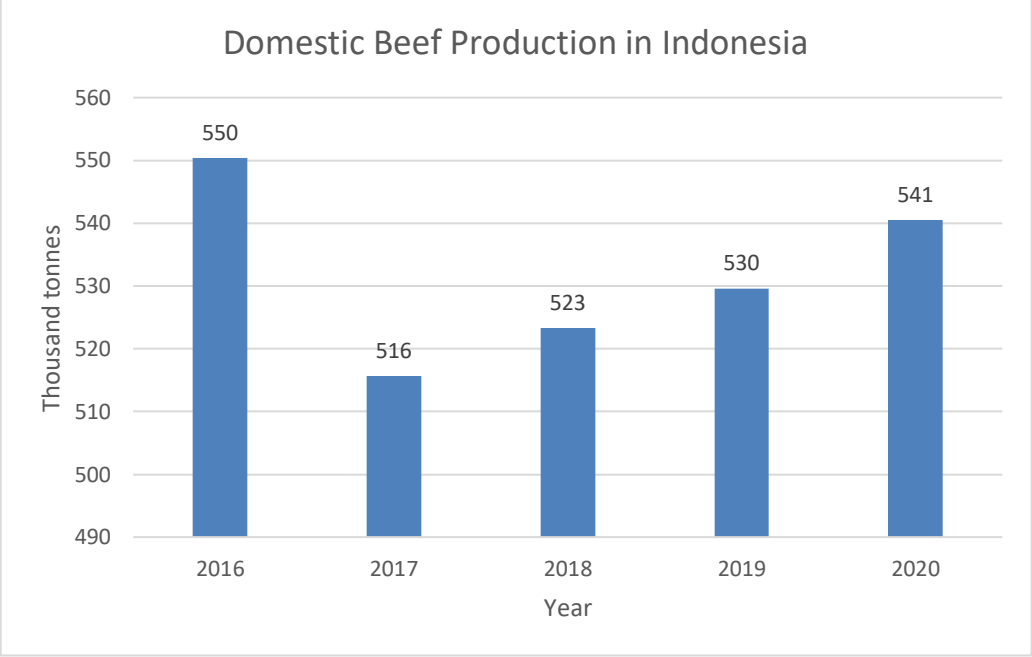

Figure 2. Domestic beef production in Indonesia

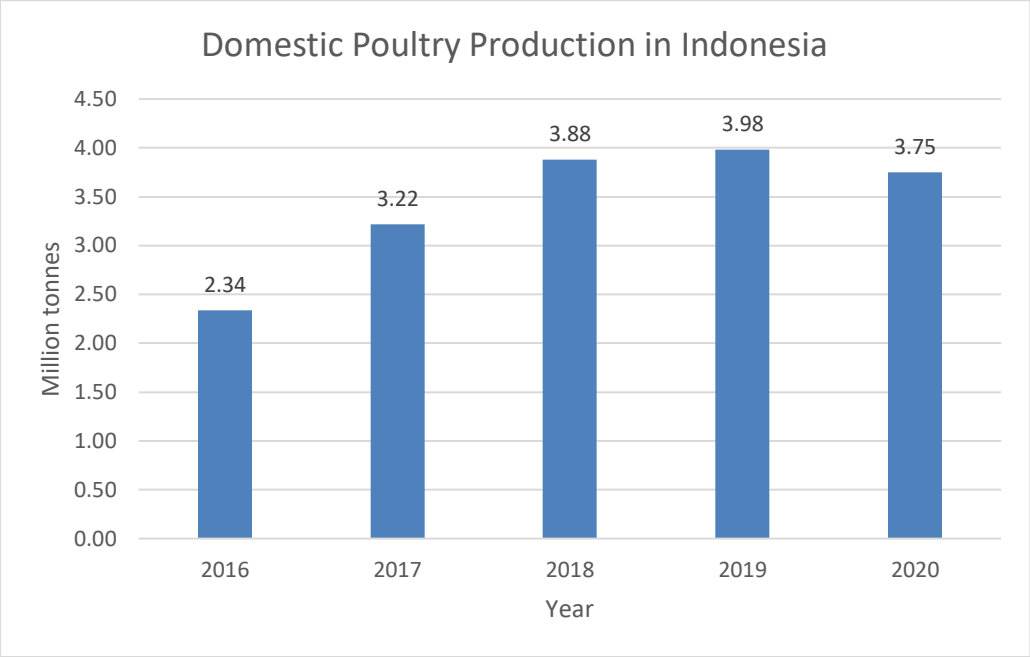

Figure 3. Domestic poultry production in Indonesia

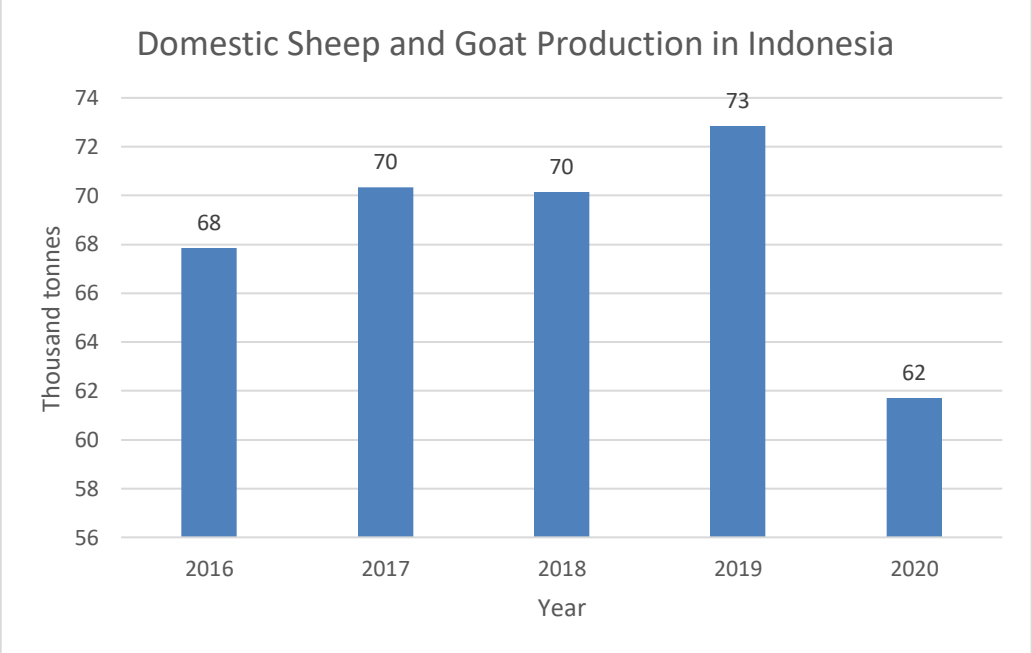

Figure 4. Domestic sheep and goat production in Indonesia

According to LPPOM MUI (2012) the Halal Assurance System (HAS) 23103 standard requires that halal meat is obtained from animals that are slaughtered in accordance with Islamic sharia

(law) as discussed above. To guarantee the halal status of meat, it is necessary to have a halal certificate.

According to Law No. 33 of 2014 on Halal Product Assurance, a halal certificate is a document issued by the Indonesian government through the BPJPH (Halal Product Assurance Organizing Agency). This halal certificate is issued after a written fatwa indicating compliance is obtained from MUI. Of course, the fatwa is not issued until after a verification process has occurred using the applicable standards. BPJPH issued the Head of Agency Decision No. 20 of 2023 establishing the Halal Product Assurance System (SJPH). The SJPH is a standard establishing halal certification requirements for products circulated in Indonesia. It consists of 5 sections dealing with the required commitment and responsibility, materials, halal product processes, products, and monitoring and evaluation. The scope of SJPH also includes halal certification requirements for slaughtering services in slaughterhouses.

The specific standards for slaughterhouses include the location of the slaughterhouse, the necessary facility conditions, and the required procedures for halal slaughter. The document states that the location of the halal slaughterhouse must be physically separated from non-halal animals. Facilities in the slaughterhouse must have separate facilities for all critical activities related to halal and non-halal slaughter. The explicit procedures mentioned in the document are related to stunning and slaughter procedures. However, the technical details and limitations of the stunning and slaughter procedures are not specifically explained.

There are several standards in Indonesia regarding the animal slaughter process, including SNI 99003:2018 about halal slaughter of ruminants, SNI 99002:2016 about halal slaughter of poultry, and HAS 23103 about the halal assurance system criteria in slaughterhouses. All three documents provide detailed technical requirements for halal slaughter, from handling animals,

stunning, slaughter, to post-slaughter handling. Among these standards, HAS 23103 is the most commonly used, as evidenced by the issuance of halal certificates based on HAS 23103 for slaughterhouses. SNI 99003:2018 and SNI 99002:2016 have not yet been used as a standard reference due to the absence of certification organizations using them and the lack of government regulations making them mandatory. Moreover, there are some additional criteria compared to HAS 23103 that make compliance more difficult including the obligation to provide worship facilities at the slaughterhouse location according to SNI 99003:2018 and the absence of regulations for the mechanical slaughter using a circular blade knife for neck cutting in SNI 99002:2016. Therefore, the halal certification standards to be referred to in this paper are HAS 23103 and SJPH.

In Indonesia, imported meats have an important role in ensuring an adequate supply of beef to meet the demands of the population. This is particularly important as the majority of the population is Muslim and thus there are two periods each year - during the Eid al-Fitr and Eid al-Adha celebrations - when the demand for meat increases significantly. Jiuhardi (2016) noted that the local meat supply has not been able to meet the demand, making imported meat an essential component of the supply.

In 2021, Indonesia imported ~274,000 tonnes of beef/buffalo. Figure 5 shows the amount of imported meat Indonesia received from different countries between 2017 and 2021. The majority of the imported meat came from Australia, followed by India, which exports its commodity buffalo meat to Indonesia. Additionally, the United States, New Zealand, Spain, and Japan are other significant exporters of meat to Indonesia. All such imported meat must have a halal certificate issued by a halal certification agency in the country of origin that is recognized by the Indonesian government.

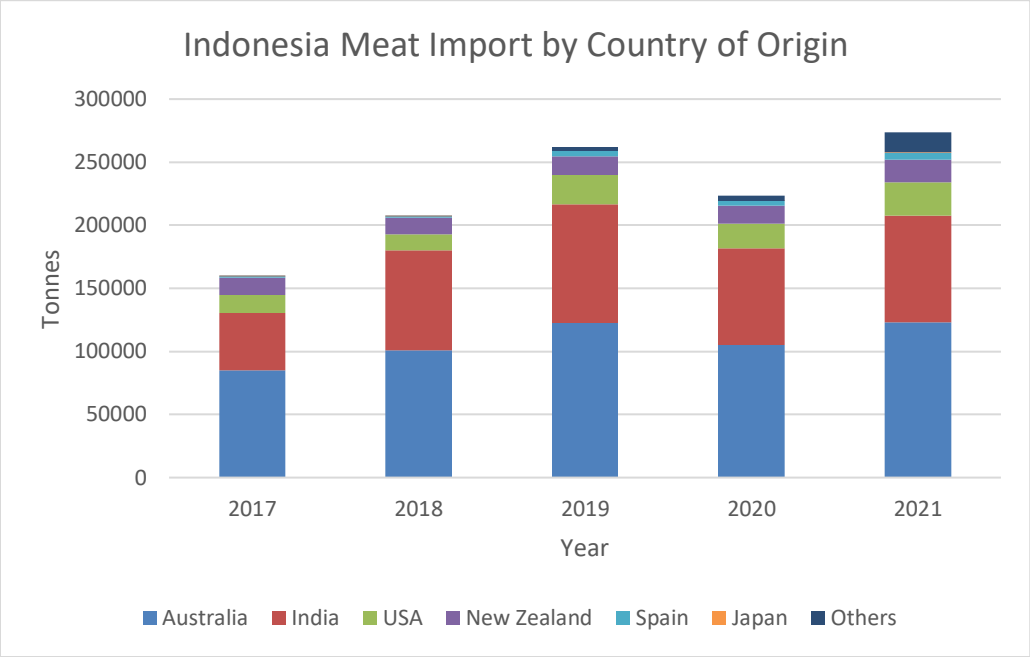

Figure 5. Total quantity of imported meat categorized by the exporting country of origin.

The importation of meat involves two ministries, namely the Ministry of Trade and the Ministry of Agriculture. The Ministry of Trade has issued the Regulation of the Minister of Trade of the Republic of Indonesia number 29 of 2019, which governs the trading of animal and animal products for export and import. This document does not explicitly state that imported meat must be halal certified. On the other hand, the Ministry of Agriculture has released the Minister of Agriculture of the Republic of Indonesia number 42 of 2019, which deals with the entry of carcasses, meat, offal, and/or processed animal products into Indonesia. The regulation stipulates that all imported meat must have both a veterinary and halal certificate. Along with these two documents, Law No. 33 of 2014 on Halal Product Assurance mandates that all goods and services distributed within Indonesia must be halal certified, except the haram products. Thus, these three documents will serve as the basis for the examination of the halal traceability standards for imported meat in this paper.

3. GAP ANALYSIS

Gap analysis is a process used by organizations to identify discrepancies between their current situation and the desired situation. It helps organizations or people to pinpoint the areas that need improvement and provides a detailed analysis of the direction and magnitude of the gaps. By doing this analysis, those involved can develop an implementation plan to improve the effectiveness of their project towards some goals. The four steps of gap analysis include identifying the organization's key needs, determining the ideal future situation, highlighting the gaps, and modifying organizational plans to address the gaps (Kim and Ji, 2018).

The success of implementing the Halal Product Assurance Law is important to Indonesia's needs. Determining the ideal future situation involves smoothly implementing all the laws and regulations that currently exist and determining what laws might still be needed. Meanwhile, the gaps that will be focused on are based on those found within the meat supply chain. There will be some points that will be compared between the current conditions with the ideal situation in the future. The identified gaps will, hopefully, serve as a starting points for any plans for the government to follow-up and find solutions to resolve these gaps promptly and to successfully implement the Halal Product Assurance Law. It is the author’s plan to submit this document to all stakeholders that are involved in managing the Halal Product Assurance Law in Indonesia (e.g., the ministries, BPJPH, MUI, and KNEKS).

It would be beneficial to determine those points in the system that would most likely have the greatest effect on the halal status of the meat available in Indonesia (see Figure 6 for an overview of the Indonesian supply chain).

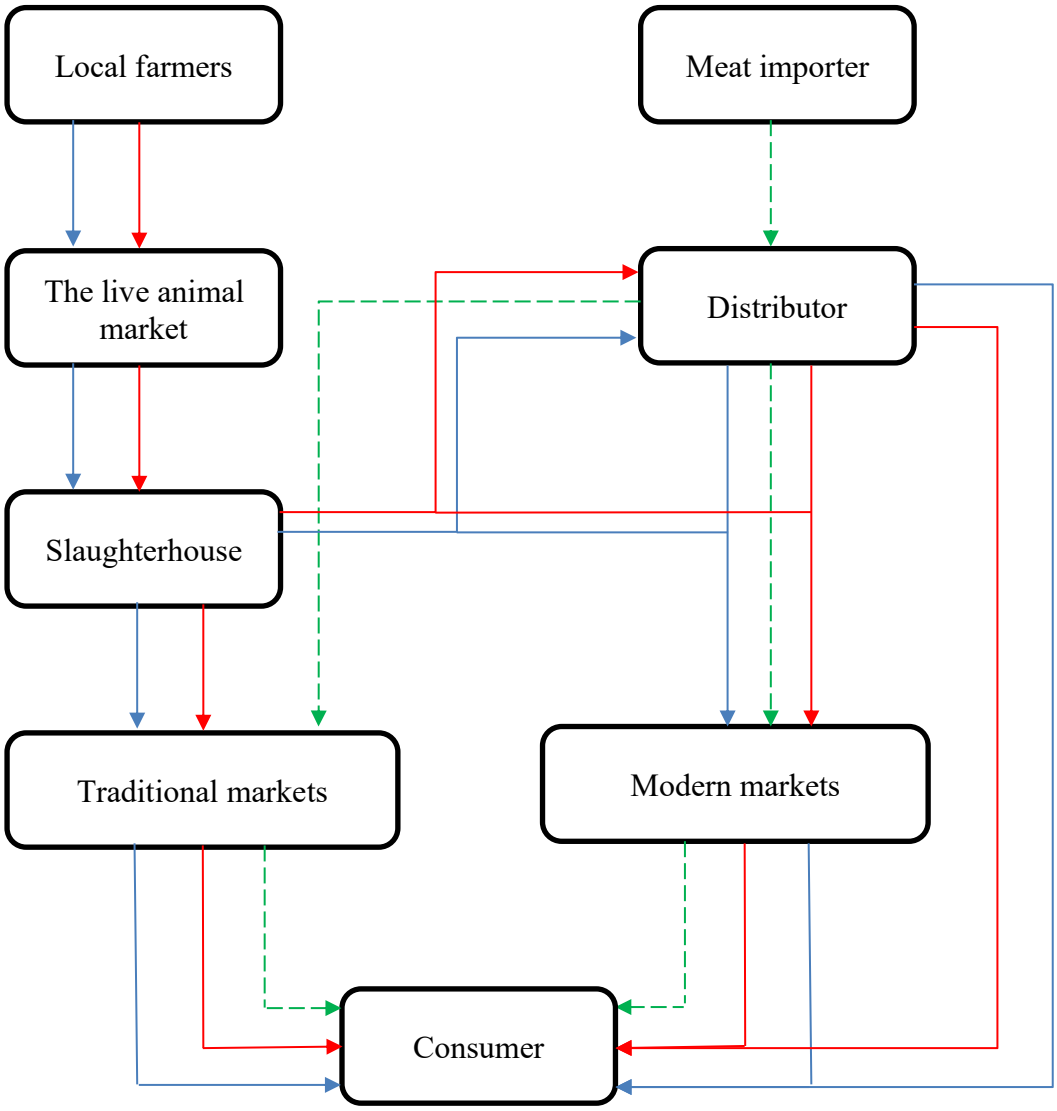

Figure 6. Overview of the meat supply chain in Indonesia

Meaning of symbols:

- = Imported meat (beef/water buffalo, and sheep/goat)
- = Domestic poultry
- = Domestic beef, water buffalo, and lamb/goat

In the case of domestic meat, the process begins with local farmers who raise the animals. These animals are then sold through livestock markets, which are often located far from the farms, requiring transportation and handling activities. The next step involves activities carried out at

the slaughterhouse, including verifying whether the facility is registered and meets appropriate standards, assessing the condition of these facilities and their resources, and overseeing the slaughtering process. Subsequently, the meat is distributed using traditional or modern markets, online sales, or sold directly to consumers. On the other hand, for imported meat, the process usually begins with the meat entering the country through an importer, followed by its distribution and sale by a distributor to traditional or modern markets, online sales, or directly to consumers.

Not all stages of the supply chain mentioned above are essential for ensuring the traceability of halal meat. According to Harrison and Hoek (2015), the supply chain is a network that connects multiple parties who work together to transform basic commodities into finished products that add value to the product. This process involves both upstream and downstream activities, with upstream activities referring to the buying-side activities undertaken by producers to acquire raw materials for manufacturing, and downstream activities involving the integrated efforts of a company to sell and distribute their finished products. Like downstream activities, suppliers in upstream activities are also classified into different tiers or levels. In addition to meeting halal requirements, it is essential that halal meat is free from any contamination with haram meat or substances. The halal certificate is then a document that confirms the compliance of the certificate holder with those aspects mentioned previously that they are responsible for. In other words, the participation of the entire supply chain is necessary to ensure the traceability of the halal status of meat from the point being certified to all downstream activities. The slaughterhouse serves as the focal point for domestically produced meat, whereas its arrival in Indonesia, either at the port of entry by government inspectors or at the importer's facility serves as the focal point for imported meat. Traditional and modern markets act as first-level

"consumers" for both domestic and imported meat, while the end consumers become the second-level consumers after inspection/certification at the focal point. Table 1 identifies the essential activities that can impact the traceability of halal meat.

Importer	Distributor	Slaughterhouse	Market	Consumer
Halal certificate	Transportation and handling	Registered/ unregistered	Meat sources	Type of consumer
		Slaughtermen	Facility	
		Slaughtering process		

Table 1. Essential activities along the supply chain that can affect the halal traceability of the meat

1) Importer

a) Halal certificate

As previously stated, imported meat must undergo administrative processes, including obtaining a halal certificate, before entering Indonesia. However, there are limitations in the requirements to obtain and use the certificate for importation purposes. Although the law mandates halal certification for all products circulating in Indonesia, there are still incomplete supporting regulations. For instance, the Regulation of the Minister of Religious Affairs of the Republic of Indonesia No. 2 of 2022 governs international cooperation in halal product assurance.

The regulation governs the cooperation between the Indonesian government and the foreign halal certification agency in the form of the development of a halal product assurance, conformity assessment and recognition of foreign halal certificates. The BPJPH requires that they have a halal certificate be issued by a foreign halal institution

that has submitted an application for recognition in Indonesia along with supporting documents, including:

i) Proof of the legal establishment of the institution from local authorities.

ii) Evidence of having a permanent operational office.

iii) Organizational structure.

iv) The listing of the shariah council/ulama authorized to declare the halal status of products.

v) The names and qualifications of at least three halal auditors who are competent to audit according to Indonesian halal auditor standards.

vi) The organization's halal standards showing that they are compatible with SJPH.

vii) Accreditation certificate from a local accreditation institution. The accreditation institution must already be credible, i.e., accepted by the Indonesian authorities.

viii) BPJPH accreditation certificate for institutions accredited by the Indonesian halal inspection team.

ix) Association with a laboratory that has ISO 17025 certification or equivalent.

Point vii is considered a challenging point for certification bodies to fulfill as there are many certification bodies located in countries without an accreditation body that accredits halal certification bodies.

The following sections specify the time required for the completion of documents by foreign halal institutions, and the examination of these documents by BPJPH. These

institutions must promptly complete all required documents and must correct any deficiencies within ten days from receiving a notice of a deficiency from BPJPH to avoid the cancellation of their applications. If the documents are complete, BPJPH has up to 30 days to verify their suitability. BPJPH also has the authority to conduct on-site inspections if deemed necessary.

The Ministry of Religious Affairs (2022) stated that 104 foreign halal institutions from 40 countries have submitted cooperation requests as of November 2022. However, BPJPH has not yet released any further updates on the progress of these requests. This is not in line with the timelines mentioned in the previous regulations just discussed in the previous paragraph, creating the first gap in the current situation.

Prior to the implementation of the Halal Product Assurance Law, MUI had already implemented a listing of the recognized halal certificates from foreign halal institutions. As stated by MUI (2009), MUI requires foreign halal institutions to meet seven criteria requirements, fill out a questionnaire, and follow the established procedures. The seven criteria referred to are:

i) Establishment by an Islamic institution that provides services ranging from education to local Muslim worship, with a minimum of 40 people in the area.
ii) Possession of a permanent office supported by credible and competent human resources.
iii) Having at least three ulama and two auditors capable of auditing animal slaughterhouses, restaurants, factories, and additive processing.

iv) Having procedures in place for the certification process from registration to determining the fatwa of the audited product.

v) Having good document tracing ability.

vi) Having broad connections, particularly with the World Halal Food Council.

vii) Able to collaborate with MUI to monitor halal products in Indonesia.

The questionnaire includes questions about the company profile, human resources available, and fatwa opinions on halal issues that often have differences of opinion among several ulama. The questionnaire mainly focuses on inquiring about the internal certification procedures of each institution, from the certification process flow to the issuance of halal certification. MUI will evaluate the sufficiency of the questionnaire responses after conducting a direct visit to the certification institution. There are 44 foreign halal institutions that have been recognized by MUI and their halal certificates have been accepted for the import of beef. Based on Table 2, these importing countries have halal institutions recognized by MUI for the importation of beef.

i) Australia

(1) The Islamic Coordinating Council of Victoria (ICCV)

(2) Supreme Islamic Council of Halal Meat in Australia Inc. (SICHMA)

(3) Australian Halal Development and Accreditation (AHDAA)

(4) Global Halal Trade Center Pty Ltd. (GHTC Pty Ltd.)

(5) Western Australian Halal Authority (WAHA)

(6) Australian Halal Authority and Advisers (AHAA)

(7) Global Australian Halal Certification (GAHC)

ii) India

(1) Jamiat Ulama Halal Foundation (JUHF)

(2) Jamiat Ulama I-Hind Halal Trust

iii) The United States of America

(1) Islamic Services of America (ISA)

(2) Halal Transaction of Omaha

(3) The Islamic Food and Nutrition Council of America (IFANCA)

(4) Halal Food Council USA (HFC USA)

(5) American Halal Foundation (AHF)

iv) New Zealand

(1) New Zealand Islamic Development Trust (NZIDT)

(2) The Federation of Islamic Association of New Zealand, Inc. (FIANZ)

v) Spain

Instituto Halal De Junta Islamica (Halal Institute of Spain)

vi) Japan

Muslim Professional Japan Association (MPJA)

If the meat does not have a halal certificate from one of these recognized authorities, a halal certificate issued by the authorities in Indonesia following the protocol discussed above can be utilized. In both cases the slaughterhouse must follow a series of certification procedures and comply with the halal certification standards applicable in Indonesia.

Country	2017	2018	2019	2020	2021
	Net Weight: Tonnes				
Australia	85,200	100,000	122,000	105,000	122,000
India	45,200	79,600	93,900	76,300	84,900
USA	14,400	12,300	22,900	19,500	25,900
New Zealand	13,600	13,300	14,900	14,400	17,900
Spain	1,120	1,230	4,050	3,920	5,550
Japan	7	12	13	15	194
Others	637	306	3,620	4,000	15,900
Total	**160,000**	**207,000**	**261,000**	**223,000**	**272,000**

Table 2. The quantity of beef and water buffalo imported into Indonesia, categorized according to the nation of origin. (BPS, 2022)

It is currently unclear whether imported meat comes from countries without recognized halal certification bodies, as the countries included in the "Others" category are unidentified. Although not explicitly stated in the previous regulation, the Minister of Trade Regulation number 59 of 2016 and the Minister of Trade Regulation number 29 of 2019 Article 13 paragraphs (1), (2), and (3) require importers to include a written recommendation to the Ministry of Trade from the Ministry of Agriculture when submitting an Import Approval request. In summary, despite the many regulations governing halal meat, there are still areas that leave many “loopholes’ that require further clarification and/or elimination, either through existing regulations or new regulations. Thus, another gap is inconsistencies between existing regulations, which may cause confusion among those in the supply chain and in some cases public perception of the regulations.

2) Distributor

a) Transportation and handling

Busyra and Ardi (2020) identified food storage and distribution as potential points to be concerned about food contamination. The three foundational elements of halal supply chain management are determined by the risk of direct contact with prohibited substances, contamination risk, and the perceptions of Muslim consumers (Tieman, 2011). Therefore, transportation and handling of halal meat must be adequately controlled to avoid contamination. Yaacob et al. (2016) defined the risk of contamination or cross-contamination as the physical transfer from a person, object, or location. According to halal principles, cross-contamination occurs when halal food products have a direct contact with non-halal food products or non-food items at any stage of the supply chain, including during storage and distribution by distributors. An example is when halal meat is stored in a warehouse that also stores non-halal meat. Storage conditions like this can lead to cross-contamination when halal meat is stored near or has a direct contact with non-halal meat. Another case is when defrosting occurs in a cold room and water drip from non-halal meat touches halal meat products. In accordance with the Halal Product Assurance Law, distributors are obliged to obtain halal certification if they are involved in logistical activities such as product storage, handling, and distribution. As reported by LPPOM MUI (2023), only 48 logistics companies have obtained halal certification from MUI as of January 2023, which is significantly lower than the estimated number of >150 logistics companies in Indonesia dealing with products that might need halal certification (Supply Chain Indonesia, 2016).

The implementation of halal certification in logistics services is hindered by several challenges, including a lack of information on what is required for the mandatory halal

certification for logistics and the use of third-party services by logistic providers such as independent truckers, which makes it challenging to ensure compliance with halal requirements. The halal requirements referenced here are based on the SJPH standard mentioned in the previous chapter.

Halal logistics services for meat and meat products and their derivatives must ensure that they are free from haram contamination and only use halal dedicated facilities. Halal dedicated facilities means that the facility should not have any non-halal items, including meat from halal animals such as cows, sheep, and chickens that do not have halal certification In practice, if there are slaughter results that are not categorized as halal, such as not cutting the oesophagus properly, the carcass will be separated and marked with clear labeling. Then, the carcass will be disposed of or used as feed for animals. However, it should still be possible to produce non-halal meat for non-Muslim consumers. Nevertheless, there is currently no clear distribution pattern for non-halal meat from halal animals circulating in Indonesia, making it difficult and adding to the burden of halal meat traceability in Indonesia. The lack of halal certification for all meats that can be halal circulating in Indonesia, especially domestic production, creates a challenge for distributors who may receive and handle meat from multiple sources. The uncertainty of the halal status of meat sources can lead to contamination of halal meat if contact occurs leading to a gap in this stage of the halal certification process.

3) Slaughterhouse

a) Halal certification and the legal status of the slaughterhouse

The ideal situation for the implementation of the Halal Product Assurance Law is to have all animal slaughtering services that supply domestically produced meat in Indonesia certified. According to Government Regulation number 95 of 2012 Article 8, all domestically produced meat must come from animals slaughtered in slaughterhouses that meet technical requirements and implement good slaughtering procedures. Both points are summarized in another document, namely the Regulation of the Minister of Agriculture of the Republic of Indonesia number 11 of 2020, which states that slaughterhouses must have a Veterinary Control Number (Nomor Kontrol Veteriner or NKV).

Many slaughtering activities are still done outside of licensed slaughterhouses, including animal slaughtering points, traditional markets, or slaughterhouses without an NKV. These places are unable to comply with the requirements set by the law due to a lack of resources and unacceptable facilities, especially for poultry slaughterhouses. According to KNEKS (2022), there are a total of 1,644 animal slaughterhouses (including those owned by private entities and those managed by the government) that have been identified, including those that are not considered as part of a formal slaughterhouse facility. Out of these, 485 ruminant animal slaughterhouses and 285 poultry slaughterhouses have been issued warnings by the head of BPJPH to promptly undergo halal certification procedures. The diagram below illustrates the distribution of identified animal slaughter facilities as reported by KNEKS.

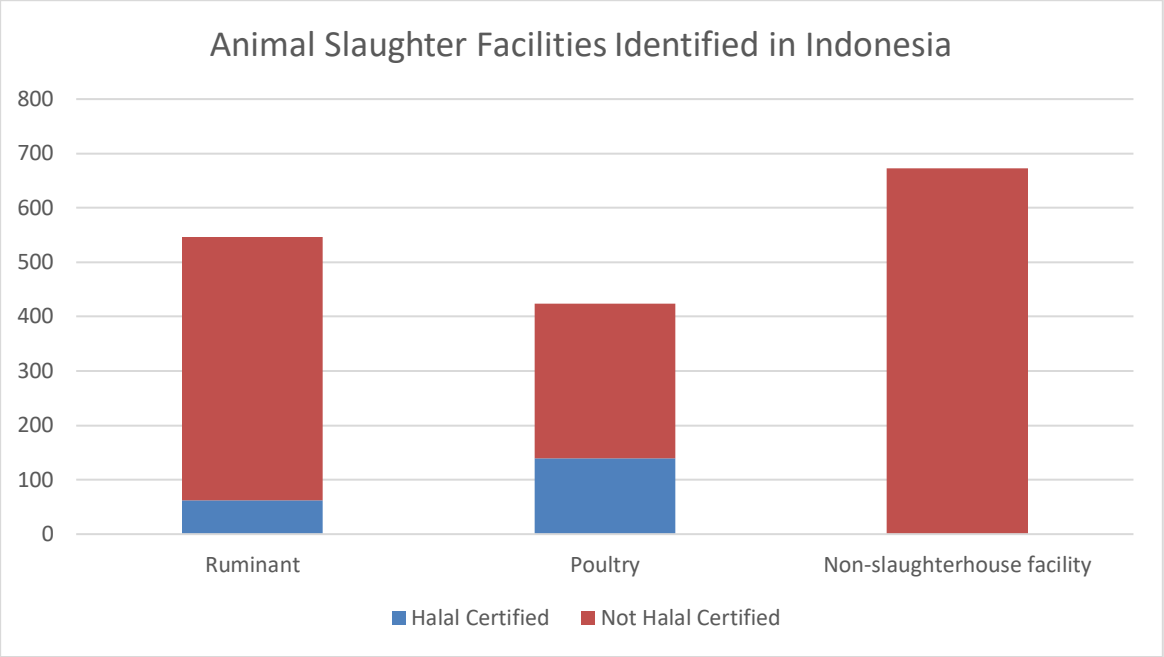

Figure 7. Animal slaughter facilities identified in Indonesia

Moreover, some government-managed slaughterhouses do not yet have an NKV despite being obligated to do so according to the regulation mentioned above. The main reason for this is the limited facilities and infrastructures available in government-managed slaughterhouses which meet the NKV's requirement. To obtain the NKV certification for all slaughterhouses, it is important to carry out renovations on the facilities and infrastructure. However, budgetary constraints in each region can be an additional obstacle in meeting the necessary requirements.

Figure 8. Slaughter being done outside an animal slaughterhouse facility

The author documented Figure 8 for the purpose of preparing this paper. The figure depicts live animal traders in traditional markets slaughtering animals in a non-slaughterhouse facility. Consumers purchase live animals and take home the meat for further processing. These observations reinforce the statement made by KNEKS (2022) regarding the prevalence of slaughtering practices outside of a slaughterhouse making it challenging to gather data and trace the origin of meat in circulation.

Based on the applicable halal certification standards, namely HAS 23103 and SJPH, to obtain halal certification, slaughtering services must meet many requirements, ranging from animal conditions, facility conditions, human resources including halal supervisors, halal slaughterers, and stunning persons (if any), to the slaughtering process.

The slaughtered animal must be a healthy and halal animal. Although the criteria for a healthy animal are not detailed in HAS 23103 and SJPH documents, Government Regulation number 95 of 2012 states ‘that the animal's health condition must be

examined by a veterinarian or veterinary paramedic under the supervision of an authorized veterinarian at the slaughterhouse'. The slaughterhouse must have three human resource competencies based on the Regulation of the Minister of Agriculture of the Republic of Indonesia number 13 of 2010 chapter 7 Article 41-42, namely at least one halal slaughterer, an authorized veterinarian, and a meat inspector (*keurmaster*) (Gaznur et al., 2020). However, slaughterhouses face various challenges related to the performance of veterinarians. In addition to the small number of veterinarians available and knowledgeable about halal slaughter supervision according to KNEKS (2022), Pakpahan and Anggriawin (2022) also mentioned other reasons for the suboptimal performance of veterinarians due to lack of attention from the government to the veterinarians, especially in terms of supporting a prosperous life for the veterinarians.

Moreover, according to the Ministry of Religious Affairs (2023), they have recently started developing guidelines for the certification of animal slaughterhouses in Indonesia as of January 2023. However, food and beverage products as well as slaughtering services in Indonesia are required to be fully certified by October 2024. There is a limited amount of time to complete the country-wide certification process following the guidelines for animal slaughterhouses for both poultry and ruminants. In other words, the current challenge is meeting the required certification standards, both halal and NKV in a timely fashion, which has led to a gap in the current implementation.

b) Slaughtermen

The halal slaughtering personnel have a central role in ensuring the halal status of meat. According to HAS 23103, the halal slaughtering personnel must meet certain requirements and their numbers at any plant should be sufficient to maintain optimal results for meat production. The requirements for halal slaughtermen are: Muslim, at least 18 years old, healthy in body and mind, devout in performing religious obligations, and knowledgeable and skilled in performing halal slaughter. Another regulatory document, the National Competency Standard for Indonesian Workforce (SKKNI) number 196 of 2014, provides further details on the knowledge, skills, and attitudes necessary for halal slaughtering personnel. However, there is currently no specific legislation linking the SKKNI and the Halal Product Assurance Law, i.e., there are no mechanisms in place to regulate the standards and requirements for halal slaughtermen in Indonesia. There should be a clause or derivative regulation that specifies that the standards and requirements for halal slaughtermen referred to the SKKNI, as the SKKNI cannot be used as a reference without a binding regulation.

There are currently only a few halal slaughtermen in small-scale slaughterhouses who have received formal training in halal slaughter. As of now, there is no formal regulation that governs the authority or obligation to conduct training related to halal certification. However, in practice, MUI, the Animal Health Training Agency under the Ministry of Agriculture, BPJPH, universities, and several halal training institutions have started to organize such training. Most of slaughtermen rely on their experience and guidance from their seniors to perform their job. Anwar (2020) has stated that unlike large-scale slaughterhouses that have prepared resources for implementing the

Halal Product Assurance Law, small-scale slaughterhouses tend to wait for instructions and subsidies from the government to fulfill the requirements. This could be a potential hindrance to the implementation of the two regulatory. This could be a potential hindrance to the implementation of the two regulatory documents mentioned earlier. Moreover, the majority of halal slaughtermen in government-managed slaughterhouses are daily workers who are paid less than the Indonesian minimum wage. Therefore, there might not be a close professional relationship between the slaughterhouse management and the halal slaughtermen. This could lead to a lack of awareness and commitment among halal slaughtermen to the regulations set by the slaughterhouse (Mulyono et al., 2020).

c) Slaughtering process

To differentiate between halal and non-halal meat, the slaughtering process has a significant role. The HAS 23103 standards state that the process must involve the intention of slaughtering in the name of Allah for live halal animals. The animal's food and respiratory pathways, as well as both arteries and veins, must be cut to allow blood to flow out. The slaughtering must be done quickly with a single continuous cut to ensure that the animal's death is caused by the slaughter. Using tools made of nails, fangs, or bones for the slaughtering process is prohibited.

In the halal slaughtering process it is the responsibility of the halal slaughtermen to determine whether the animal is alive or dead. This is a crucial step as it helps ensure that the slaughtering process is carried out appropriately. There are various reasons why an animal may die prior to the slaughtering process, including illness, unfavorable transportation conditions, and pre-slaughter stunning. The illness of an animal that

leads to its death not only affects the halal status of the resulting meat but also the safety of the food produced. On the other hand, death due to unfavorable transportation conditions is usually caused by different stressors that the animals experience, such as overcrowding in crates, heat radiation, and lack of food and water. Tamzil et al. (2022) also included stressors like fear, pain, and social disruption, which may result from the capture process, handling during transfer, movement restrictions, and other factors.

The stunning process is one of the possible causes of livestock mortality prior to slaughter, which has led to debate among certification standards makers. Some argue that stunning is a common practice among large meat producers to optimize production yields as long as it does not cause the animal to die. Verification of the stunning results must routinely be done by the halal slaughtermen or the supervisors at the abattoir. HAS 23103 is an example of a certification standard that allows stunning under certain conditions and with validations. The requirements for cattle include the use of reversible non-penetrating stunning with a validation method that involves assessing the degree of skull damage. For poultry, only water bath stunning is allowed with a validation method that involves ensuring the animals being evaluated regain consciousness after the stunning process. If stunning results in the death of an animal, it is considered carrion and is no longer eligible for halal slaughter. To avoid contamination, carrion must be handled separately to avoid contamination and to assure that it is not mixed with halal meat in the slaughterhouse.

In brief, if there are no permanent skull injuries resulting from non-penetrative stunning (no fractures or holes), the stunning is considered successful. Figure 9 represents an example of the verification process for the stunning of animals. The

verification process takes place after the slaughter process, and the animal is declared dead. In accordance with HAS 23103, the death status of an animal, particularly cattle, is determined by the corneal reflex, respiratory rhythm, and blood flow. If there is no corneal reflex, no movement in the chest and abdomen due to breathing or gusts of wind from the nose, and blood flow is no longer pulsing with the heartbeat, then the animal is deemed dead. The verification results show if the stunning damages of the cow's skull does not meet the HAS 23103 standard. Substantively, if one of the requirements stated in HAS 23103 has not been met, the meat cannot be declared halal. This is an inevitability that can occur at any time, considering the lack of supervision and awareness of halal slaughtermen and of halal supervisors in the slaughterhouse. Consequently, there is a need for greater attention to the current stunning policy, particularly as the government is preparing halal certification guidelines for slaughter services.

Figure 9. A photo of a cow’s skull that has been hollowed out after the process of de-fleshing.

The subsequent step involves the slaughter process, which necessitates the cutting of the esophagus, trachea, carotid arteries, and jugular veins with a sharp knife in one or at most a continuous, consecutive back-forth-back (three strokes) without lifting the knife. The success of this process is significantly dependent on the skill level of the halal slaughtermen and the sharpness, shape, and length of the knife used.

The expertise and precision required for halal slaughtering are not solely obtained from training and experience in slaughtering, but are also influenced by the conditions and circumstances of the process, particularly for poultry. Poultry can be slaughtered traditionally or mechanically. Traditional slaughtering may involve a halal slaughterman if the bird is hung using shackles or in slaughtering cones. However, if no tools are used, the slaughtering process must involve two people. The halal slaughterer requires assistance from another person to hold the bird being slaughtered. In practice, many poultry slaughtering processes involve only one halal slaughterer who holds the bird with one hand and slaughters it with the other hand. The consequence of this method is not only the greater incidents of inaccurate slaughtering probabilities but also the risk of injuring the bird, especially on the wing held with force, resulting in broken wings or bruises.

HAS 23103 requires that the length of the knife used in the slaughter process should be at least 1.5 times the diameter of the animal's neck to be used for slaughter. A sufficiently long knife facilitates the halal slaughter process for the slaughterman, preventing any difficulty during the neck cutting process. Figure 10 is an example of a result of a slaughter that did not cut the intended channel perfectly due to being

carried out by single halal slaughterman without using tools or assistance from coworkers.

Figure 10. Photo of a cross-section of a chicken's neck after an incorrect halal slaughter process was done by a Muslim slaughterman at a traditional slaughterhouse.

On the other hand, mechanical slaughter is extensively regulated in HAS 23103. One of the critical requirements is that the slaughterhouse be able to prove that the failure rate of the slaughter is a maximum of 1% of the total slaughter. However, this requirement does not mean that the meat resulting from a failed slaughter can be declared halal. Although the regulations exist, there is room for improvement in terms of supervision to ensure the smooth running of the process. As such, monitoring is an important factor that warrants attention during halal slaughter.

4) Meat Market

Markets, whether traditional or modern, are the sources of all meat that the public consumes. In recent times, markets have diversified their services by incorporating

online channels to cater to the needs of customers seeking meat. The primary purchasers of both domestic and imported meat are the traditional and modern markets, as indicated by Harrison and Hoek (2015). Consequently, it is important to consider various factors and conditions when determining the halal status of meat sold in these markets. Irrespective of the market type, sellers typically engage in meat procurement, receiving, storage, processing (if applicable), and packaging activities.

a) Meat sources

The origin of meat in the market is important in determining the traceability and halal status of meat. Typically, traditional markets sell fresh meat, such as beef, lamb or goat, and newly slaughtered chicken that are offered for sale within 24 hours of slaughter. Furthermore, a significant number of meat vendors in traditional markets offer imported meat as a substitute to their customers, even though there is no specific label on them. As stated by Fayaqun and Sulistiyaningsih (2021), local beef is the largest part of the supply chain to traditional markets, meeting almost 80% of the demand.

Referring to the data shown in the previous chapter, which includes the domestic production and the number of slaughterhouses identified by KNEKS, the results can be seen in Table 3.

Animal	Domestic production (tonnes)	Slaughterhouses identified	Production average per slaughterhouse (tonnes)	
			Per year	Per day
Poultry	3,750,000	424	8,800	24
Ruminants	603,000	547	1,100	3

Table 3. Calculation of average production per slaughterhouse

Table 3 shows that a single slaughterhouse on average produces three tonnes of beef per day, which is equal to roughly 7.5 tonnes of live cattle or 15 cattle weighing an average of 500 kilograms each. This estimation is based on Karisch et al.'s (2020) assertion that the meat yield from a live cow is 40% of its total live weight. Slaughtering 15 cattle per day seems feasible.

A poultry slaughterhouse produces 24 tonnes of meat per day, which is equivalent to ~34 tonnes of live chickens or 17,000 chickens weighing 2 kilograms each. This calculation is derived from Ertina et al.'s (2021) data, which suggests that the carcass weight of a chicken accounts for ~70% of its total live weight. However, slaughtering 17,000 chickens per day is almost impossible for all poultry slaughterhouses in Indonesia. Some of them may be able to accommodate such conditions with technology, but not all chicken slaughterhouses have modern technology and capacity. Therefore, there is a high probability that many animal slaughterhouses, especially those for chickens, remain unidentified as sources of domestic meat in the market. The existence of untracked and unmonitored animal slaughterhouses increases the probability of non-compliant meat circulation, particularly if it gets mixed in, either intentionally or by accident, with halal meat during storage, processing, or selling at the market.

Most meat sellers in traditional markets have poor record-keeping practices in terms of traceability and are often not aware of the sources of the meat they receive and process. They rely on their trust of their meat suppliers, who regularly supply meat for sale through traditional market vendors. Additionally, Ma'rifat et al. (2019) did research that showed that while vendors generally aim to provide high-quality halal

meat, they are not motivated enough to document and keep evidence that would support those claims. As a result, it would be difficult to trace the halal status of meat with unidentified origins.

On other hand where meat whether domestic and imported goes to modern markets, they typically have complex procedures for procurement, acceptance, processing, storage, and presentation of their meat. Traceability is an important aspect for retailers, especially in responding to defective or unsafe products. Therefore, modern markets can more easily trace the sources of the meat they handle, ensuring the traceability of the halal status.

b) Facility

Meat sellers in traditional markets not only offer meat for purchase, but also provide facilities for meat processing, such as cutting and making meatball dough. These facilities come into direct contact with the meat products being sold and are often used to fulfill buyers' requests for specific product specifications. Additionally, buyers may add their own meat from other sources, which is then processed by the seller without inquiry into its halal status. As a result, the facilities used by meat sellers can become contaminated, potentially compromising the halal status of the meat products sold.

The Halal Product Assurance Law also mandates that retail services or retailers need to be certified halal. However, to date, there is still no further information on who the retail services or retailers are that need to be halal certified. The certification standards have yet to be decided by BPJPH, which is the agency authorized to determine and ensure the standards to be used. However, LPPOM MUI has issued halal decrees for several retailers using the HAS 23000 standard. The standard states that a halal retailer

is one who can ensure that the halal products they sell maintain their halal status from product receipt to sale to consumers. This does not mean that halal retailers cannot sell haram products, but rather that they provide certainty that the halal status of a product will remain halal throughout their possession of the product. Therefore, the lack of further regulations from the Halal Product Assurance Law regarding halal retailer certification standards and the lack of awareness among meat sellers to always maintain their facilities free from contamination creates a gap in this area.

5) Consumer

a) Type of consumer

Sandhausen (2008) categorized business relationships into six types: B2B (Business to Business), B2C (Business to Consumer), C2B (Consumer to Business), C2C (Consumer to Consumer), B2G (Business to Government), and G2C (Government to Consumer). In traditional or modern retail markets, B2B and B2C interactions occur, where sellers can sell meat to both end consumers and other businesses such as restaurants, hotels, caterers, or other meat sellers. Pradana (2015) noted that in Indonesia, the C2C buying and selling interaction is on the rise with the growth of e-commerce. As an example, it can facilitate someone who is not actually a businessman but has the opportunity to buy meat in large quantities and then sell it to other consumers. Therefore, the term "meat consumers" can be divided into end consumers or other businesses that use meat as a raw material.

According to Apriantini et al. (2021), consumers perceive imported frozen meat to be generally competitively priced based on its quality. Moreover, consumers tend to believe that the status of halal meat can be traced in imported meat. The majority of

imported meat consumers are from the business sector, particularly restaurants, which prefer imported meat due to its tenderness and 85 CL (chemical lean) that suits the characteristics of Western-style cuisine. The term Chemical Lean (CL) refers to the ratio of lean red meat to fat content in a given meat sample (Watkins et al., 2019). Manufacturing meat such as flank steak (55-95 CL), diced meat, and ground meat are commonly used as raw materials for sausages and meatballs. Fancy and variety meats such as tongue, lips, tail, and head meat are mostly used by catering and local restaurant businesses (Fayaqun and Sulistiyaningsih, 2021). On the other hand, end consumers generally prefer fresh meat as their meat source. This is because the public perceives that fresh meat is more suitable for consumption compared to imported frozen meat. End consumers, who are mostly housewives, believe that the color of fresh meat looks better than the slightly pale color of imported meat. The public perceives the imported meat color as pork meat, not beef meat. However, according to Ernawati et al. (2018), there is no significant difference in terms of macronutrient quality and meat pH between fresh and imported frozen meat.

Both types of consumers mentioned above have an awareness of the importance of the halal status of the meat they consume. However, the handling of meat differs between them because end consumers generally do not store meat for consumption compared to restaurants or other business owners who stock meat to ensure consistent production. Several foodservice providers such as restaurants or catering services may lack their own storage facilities due to economic or accessibility factors, which are the same as those that apply to the storage and handling of meat at the distributor level, as

the halal status of meat may be compromised if it is mixed with non-halal meat during storage.

In addition, the halal status of meat can become untraceable due to processing into more complex products. As stated in the SJPH document, to produce halal products, all raw materials, facilities, and production processes involved must avoid cross-contamination of halal and haram. Raw materials, facilities, and production processes become the last critical point before the meat is consumed by the end consumers. Other raw materials used must also be halal, which can be proven by valid information from the raw material manufacturer. Valid information may take the form of a halal certificate or other documents such as process flow diagrams, specifications, or statements and questionnaires. Facilities used must be free from impurities and contamination that can occur due to other unknown ingredients in the kitchen or factory. Meanwhile, the production process must also be able to maintain freedom from contamination by ingredients with an unclear status. If there is a production flow that can cause personnel involved in the production process to bring contaminants into the halal production area, that must be addressed. An example of this would be the implementation of employee regulations that prohibit bringing food and drinks into production areas, or restaurant visitor rules that forbid consumers from consuming outside food and drinks due to concerns about contaminating the eating utensils or production equipment at the restaurant.

4. CONCLUSIONS

It is important to effectively implement the tracing of the halal status of meat circulating in Indonesia to ensure the smooth implementation of the Halal Product Assurance Law. The tracing of the halal status of meat is not only determined during the supply chain process of slaughter at the abattoir but also includes other supporting supply chain processes such as the handling of imported meat, storage, distribution at the distributor, market, and to end consumers before it is processed into ready-to-eat food.

At every stage of the supply chain, there are still gaps that need to be addressed. The importation process for meat has regulatory gaps, both in terms of the Halal Product Assurance Law and existing regulations that overlap and may have inconsistencies. For the handling and transportation of meat from distributors to consumers, the existing gap is the inability to ensure dedicated storage and transportation facilities for halal meat. For the slaughtering process, the gap is the inability to identify all the existing facilities for animal slaughtering in Indonesia and the lack of competence among slaughterhouse workers due to insufficient government support in providing competency and education for halal slaughtermen, halal supervisors, and the public.

Essentially, all these disparities can be addressed individually, starting with the completion of regulations and standards to be used in certifying all slaughterhouses in Indonesia. This should be followed by proper identification and data collection for slaughterhouses and market locations, to ensure good traceability. Furthermore, the use of technology such as artificial intelligence or blockchain can be utilized to support this effort.

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