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Critical control point in the provision of *halalan thayyiban* poultry meat at the slaughterhouse

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Abstract: Broiler meat is a source of animal protein favoured by the community with its complete nutritional content; however, the price is affordable. The community's need for animal protein from poultry has encouraged various Poultry Slaughterhouse businesses to develop to meet these needs. Indonesia has a Muslim majority population, requiring business actors to provide *halalan thayyiban* poultry meat. The critical point of halal food products is the point or stage in a series of production processes where the factors that can cause the product to become non-halal can be eliminated. Knowing the critical point of providing *halalan thayyiban* poultry meat is a crucial factor that needs to be known. There is an improvement in procuring poultry meat, especially in the Poultry Slaughterhouse. The study was conducted at 15 Poultry Slaughterhouses in Takalar Regency, South Sulawesi Province. Based on the study results, it was found that there were 9 CCPs at the poultry slaughterhouse in Patalassang District, Takalar Regency, South Sulawesi Province, including unloading, temporary cage, slaughtering, bleeding, scalding, de-feathering, evisceration, washing, and storage. Among these CCPs, 3 HCCPs are based on halal aspects, namely unloading, slaughtering, and bleeding. In comparison, 7 HCCPs are based on thayyib aspects, namely, temporary cage, bleeding, scalding, de-feathering, evisceration, washing, and storage. The results of this study are expected to be a reference for business actors in poultry slaughterhouses and local governments in making strategic policies in the provision of *halalan thayyiban* poultry meat for the community.

Keywords: critical control point, *halalan thayyiban*, poultry meat, poultry slaughterhouse

Abstrak: Daging ayam broiler merupakan sumber protein hewani yang digemari masyarakat dengan kandungan gizinya yang lengkap; namun, harganya terjangkau. Kebutuhan masyarakat akan protein hewani yang berasal dari unggas mendorong berbagai usaha Rumah Potong Hewan Unggas berkembang untuk memenuhi kebutuhan tersebut. Indonesia dengan mayoritas penduduknya beragama Islam, mengharuskan pelaku usaha menyediakan daging unggas *halalan thayyiban*. Titik kritis produk pangan halal adalah titik atau tahapan dalam rangkaian proses produksi dimana faktor-faktor yang dapat menyebabkan produk menjadi tidak halal dapat dihilangkan. Mengetahui titik kritis penyediaan daging unggas *halalan thayyiban* merupakan faktor krusial yang perlu diketahui. Terjadi peningkatan pengadaan daging unggas khususnya di Rumah Potong Hewan Unggas. Penelitian dilakukan di 15 Rumah Potong Hewan Unggas di Kabupaten Takalar Provinsi Sulawesi Selatan. Berdasarkan hasil penelitian ditemukan 9 CCP yang ada di Rumah Potong Hewan Unggas di Kecamatan Patalassang Kabupaten Takalar Provinsi Sulawesi Selatan, antara lain pembongkaran, kandang sementara, pemotongan, pendarahan, merebus, pencabutan bulu, pengeluaran isi perut, pencucian, dan penyimpanan. Di antara CCP tersebut terdapat 3 HCCP yang berdasarkan aspek halal yaitu pembongkaran, penyembelihan, dan pendarahan. Sebagai perbandingan, 7 HCCP berdasarkan aspek *thayyib* yaitu, kandang sementara, pendarahan, luka bakar, pencabutan bulu, pengeluaran isi perut, pencucian, dan penyimpanan. Hasil penelitian ini diharapkan dapat menjadi acuan bagi pelaku usaha rumah potong hewan unggas dan pemerintah daerah dalam mengambil kebijakan strategis dalam penyediaan daging unggas *halalan thayyiban* bagi masyarakat.

Kata Kunci: daging unggas, *halalan thayyiban*, rumah potong unggas, titik kendali kritis

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Introduction

Broiler chicken meat, known to the general public as broiler chicken, is an alternative commodity for food of animal origin. Broiler meat is a source of animal protein favoured by the community, and its complete nutritional content is affordable. This enthusiasm can be seen from the increase in broiler meat production in Indonesia by 217.23% from 2009 to 2019, which reached 3,495,090.53 tons with an average consumption of broiler chicken meat per week of 0.12 Kg (BPS Indonesia, 2020). The community's need for animal protein from poultry has encouraged various Poultry Slaughterhouse businesses to develop to meet these needs.

One of the challenges of the Poultry Slaughterhouse business is to provide Food of Animal Origin that is Safe, Healthy, Whole, and Halal (ASUH) for people in Indonesia, the majority of whom are Muslims. To guarantee this, through the National Standards Agency (BSN) and the Ministry of Agriculture, the government compiled SNI 99002:2016 concerning Halal Slaughter in poultry, referring to the Fatwa of the Indonesian Ulema Council (MUI) No. 12 of 2009. So the poultry slaughter business continues to meet the community's consumption needs for chicken meat from fulfilling nutrition and according to the concept of *halalan thayyiban*.

The concept of *halalan thayyiban* is a concept of food and drink that will nourish the human body because in *halalan thayyiban* food and drinks there are only those that nourish the body and calm the human soul, which is the principal capital to achieve happiness in the world and the hereafter (Nuraini, 2018). For this reason, the provision of poultry meat that meets halal and health standards must be an essential part to pay attention to, starting at the slaughterhouse to public consumption.

The critical point of halal food products is the point or stage in a series of production processes where the factors that can cause the product to become non-halal can be eliminated. Knowing the critical point of providing *halalan thayyiban* poultry meat is one of the crucial factors that need to be known. There is an improvement in providing poultry meat, especially in small-scale Poultry Slaughterhouses. All the problems make the author identify the critical point of providing *halalan thayyiban* poultry meat at poultry slaughterhouses. The result can be used as a policy basis for the government to provide guidance and improvement by business actors.

According to Nuraini (2018) that there are four verses in four suras in the Qur'an that use the sentence *halalan thayyiban* in the context of eating and drinking, including QS. Al-Baqarah verse 168, QS. Al-Maidah verse 88, QS. Al-Anfal verse 69, and QS. An-Nahl verse 114. Research on the verses mentioned above is related to the concept of food and drink that must be practised, especially Muslims, were forbidden food and drink can be used as a standard in assessing the halalness of an object while thayyiban has an approach through the selection of food and drink nutritious, safe for consumption, and good for health.

Several results of evaluation studies on poultry slaughter have been carried out, among others, by Muamar & Jumena (2020) on mobile chicken traders, retail chicken traders, and chicken dealer owners in Kertawinangun Village, Kuningan Regency, Saputra & Bakry (2020) at the Poultry Slaughterhouse in the Central Market Sungguminasa People, Gowa Regency, Rony & Edwin (2017) on Poultry Slaughterhouse in Morning Market and Segiri Market, Samarinda City; Ritonga (2018) at the Poultry Slaughterhouse at the Sukaramai Traditional Market in Medan City Area; and Delfita (2013) on Poultry Slaughterhouse in Tanah Datar Regency. All these studies indicate that the slaughtering poultry procedure follows Islamic Shari'ah and meets the slaughtering standards of MUI Fatwa No. 12 of 2009 concerning Certification Standards. However, the slaughterhouses have not yet been entirely labelled as halal by LPPOM MUI, so guidance is needed by supervising institutions such as LPPOM MUI and the local Livestock Service.

Animals have not separated between dirty and clean areas in all stages of the slaughter process. Research on the provision of thayyib poultry meat has also been carried out, among others, by Kaco & Fitriana (2020) at a poultry slaughterhouse at the Pekkaabata Market, Polewali Mandar Regency, who found that all of these places did not meet the standards of Government Regulation No. 95 of 2012 concerning Veterinary Public Health and Welfare. Other research that supports the provision of thayyib poultry meat is the evaluation of the application of animal welfare at poultry slaughterhouses in Takalar

Regency, which can impact the quality of the product produced. Research shows that most of the animal welfare concepts have been well implemented in poultry slaughterhouses except for the aspect of being free from wounds, disease and illness, where 53% still use storage facilities that can injure livestock before slaughter (Thaha et al., 2021).

Research related to thayyib poultry meat based on microbiological aspects has also been carried out by Ramadhani et al. (2020) on samples of broiler chicken meat at poultry slaughterhouses in Pasar in Banyumanik District. The results showed that 75% did not meet the requirements for good microbiological quality of chicken meat according to SNI 7388:2009 because the value exceeded the maximum contamination limit for Total Plate Count (TPC) is 1 x 106 colonies/gram. Apriyanti et al. (2014) also found similar chicken meat samples originating from poultry slaughterhouses in West Denpasar District with a lower amount of 51%, which exceeds TPC. Generally, possible sources of bacterial contamination in poultry slaughterhouses are slaughter equipment, environmental sanitation, and worker hygiene.

Materials and Methods

This research is descriptive-analytical using qualitative methods. Sources of data in this study consist of: (1) Primary data obtained from the research location directly; (2) Secondary data was obtained from the local government relating to the number of operating and licensed poultry slaughterhouses; and (3) Tertiary data were obtained based on supporting data from statistical data from BPS, MUI Fatwa on standardization of animal slaughter, and scientific articles related to standardization of animal slaughter.

Field data collection techniques were obtained through direct observation at 15 small-scale poultry slaughterhouses in Patalassang District, Takalar Regency, South Sulawesi Province in 2020. Observations were carried out repeatedly three times at different times to see and verify the entire series of activities at the poultry slaughterhouse. Field data collection was also conducted by conducting unstructured interviews with owners and workers. Data collection is also carried out through documenting activities and collecting information through digital search. All data obtained were then analyzed and described.

Figure 1 shows the general flow of slaughter at a poultry slaughterhouse in Patalassang District, Takalar Regency, South Sulawesi Province, on a small scale. The number of slaughters varies between 100-1,000 heads per day. The flow starts with unloading live chickens, resting in temporary cages, slaughtering, draining blood (bleeding), boiling the chicken in hot water (scalding), removing feathers (de-feathering), cutting neck and head, cutting offal and tail, washing carcasses, and selling carcasses to consumers. In small-scale poultry slaughterhouses, there are two zones, namely the dirty zone and the clean zone. The dirty zone consists of unloading stages, resting in a temporary cage, slaughtering, draining blood, boiling chicken with hot water. In contrast, the clean zone consists of removing feathers, cutting the neck and head, cutting offal and tail, washing carcasses, and selling carcasses to consumers.

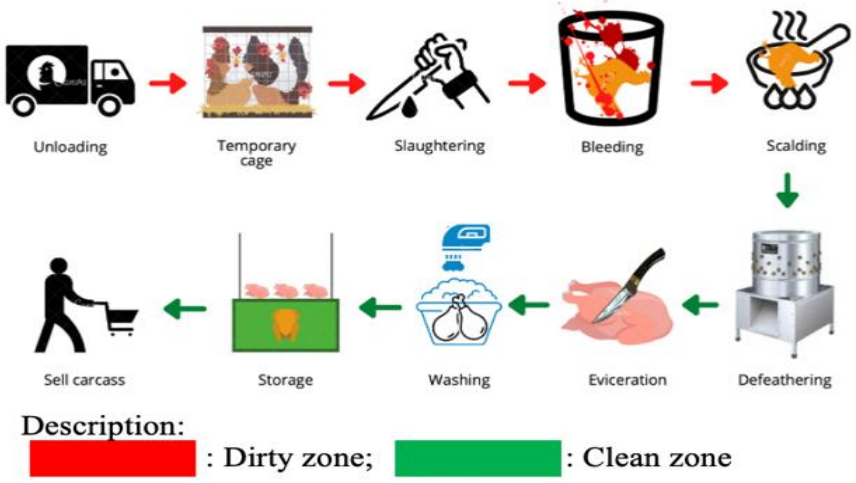

Figure 1. The flow of slaughter at a poultry slaughterhouse in Patalassang District, Takalar Regency, South Sulawesi Province

Result and Discussion

A. Identification of Critical Control Point (CCP) and Hazard Critical Control Point (HCCP)

Table 1 shows the Critical Control Point (CCP) and Hazard Critical Control Point (HCCP) for halalan thayyiban poultry meat at the poultry slaughterhouse in Patalassang District, Takalar Regency, South Sulawesi Province. The analysis of this research refers to the method developed by Halim (2020); Virgianda et al. (2016). Based on the research results, it is known that there are 9 CCPs in the unloading process, temporary cage, slaughtering, bleeding, scalding, de-feathering, evisceration, washing, and storage. There are 3 HCCP halal aspects: unloading, slaughtering and bleeding, while the thayyib has 7 HCCPs, namely temporary cage, bleeding, scalding, de-feathering, and evisceration, washing, and storage.

Tabel 1. CCP and HCCP provide *halalan thayyiban* poultry meat at a poultry slaughterhouse in Patalassang District, Takalar Regency, South Sulawesi Province

Stage in Slaughter House	Type of Hazard	CCP and HCCP	Monitoring Method	Object	Corrective actions
Unloading	Haram and physical	Ensuring how to handle chickens properly during unloading to minimize physical risks	Direct observation and physical examination	Live chicken	Train staff in handling poultry during unloading
Temporary cage	Chemical	Minimizing stress on livestock while in the temporary shelter by applying the concept of animal welfare	Observing directly on the size of the cage 1 m^2 for 8-12 birds, drinking water ad libitum, not more than 24 hours without eating, the cage protected from direct sunlight	Live chicken	Improving the facilities and infrastructure of the shelter cages
Slaughtering	Haram	• All chickens are slaughtered by Muslim butchers in an Islamic process using. • Use a sharp knife. • The oesophagus, trachea, and blood vessels are cut off	Ensure the slaughterer has a certificate of training/competence and direct observation	Chicken after slaughter	Rejecting poultry that is not perfectly slaughtered
Bleeding	Haram and Biological	Ensure perfect blood flow	Observing directly for 50-120 seconds for bleeding	Chicken after slaughter	Observation report
Scalding	Chemical	Carcasses are not heated for a long time	Monitoring the temperature of soft scalding water (50-53°C) with a long time of 60-180 seconds and changing clean water periodically	Hot water and carcass	Rejecting carcasses that die due to high temperatures and overcooked as well as temperature control and heating devices
Defeathering	Biological and physical	Wash the appliance with a strong spray of water after use and ensure that the washing water	Observing directly after use	Water and carcass	Observation report

Stage in Slaughter House	Type of Hazard	CCP and HCCP	Monitoring Method	Object	Corrective actions
		does not hit the carcass			
Evisceration	Biological	Memastikan organ pencernaan dalam kondisi normal	Direct inspection of organs and carcasses	Carcass and digestive organs	Remove abnormal/damaged organs
Washing	Biological	Ensuring the digestive organs are in average condition	Observing directly the water used	Washing water	Observation report
Storage	Biological	Storage temperature range –25 to 18°C	Check storage temperature	Carcass storage	Observation report

B. Critical Control Point (CCP) and Hazard Critical Control Point (HCCP) based on Halal Aspect

Halal aspects in poultry slaughterhouses consist of 3 HCCPs, including unloading, slaughtering, and bleeding. In the unloading activity, moving poultry from transport vehicles to temporary cages can cause the birds to experience physical dangers that can cause them to become disabled, such as broken bones, so they do not meet the requirements of slaughtered animals. For this reason, workers need to have skills in handling live poultry so that physical hazards can be minimized. The next HCCP is poultry slaughter, where the slaughterer must be a person who has attended training and has slaughtering competence. Based on the MUI Fatwa No. 12 of 2009 that the slaughterer's standards are 1) Muslim and have reached puberty, 2) understand the syar'i slaughter procedure and 3) have expertise in slaughter. The results showed that all workers at 15 poultry slaughterhouses had attended training on technical guidance on slaughtering poultry held by the local government and LPPOM MUI. However, none had a halal slaughter interpreter certificate (JULEHA).

The slaughter of chicken meat based on Islamic law is a mandate of Law Number 33 of 2014 concerning Guaranteed Halal Products, which is described through the slaughtering criteria regulated in Islamic law as follows:

1. Beginning by reading the sentence "*Bismillahirrahmaanirrahiim*" followed by reading my intentional intention to slaughter a chicken for Allah Ta'ala";
2. Facing the body of the chicken to be slaughtered towards the Qibla while holding the two cuts and legs;
3. Slaughter the neck of the chicken until the throat and all the veins around the neck is cut off;
4. Using a sharp knife;
5. Not allowed to speak;
6. Do not put in hot water before the slaughtered poultry dies completely.

According to Harahap et al. (2019) and Nusran et al. (2018) that the six slaughtering procedures are the criteria that determine the halalness of slaughtered animals according to Islamic Shari'a. If the six criteria above are implemented correctly, poultry meat is categorized as halal and vice versa.

HCCP in the form of bleeding is also an essential part of the halal aspect. It takes around 50-120 seconds for poultry slaughtered without stunning to bleed completely (Azhari, 2012; Nurjannah et al., 2017). The phlebotomy process should provide a means for complete haemorrhage to occur and ensure that the poultry dies as a result of slaughter is not caused by immersion in hot water (Fuseini et al., 2016). One way to determine the death of birds is the loss of eye reflexes of the birds (Pisestyani et al., 2016).

C. Critical Control Point (CCP) and Hazard Critical Control Point (HCCP) based on Thayyib Aspect

The *thayyib* aspect of the poultry slaughtering process consists of 7 HCCPs, including temporary cage, bleeding, scalding, de-feathering, evisceration, washing, and storage. The danger in temporary

shelter cages is chemical changes in the form of decreased meat quality caused by improper handling of animal welfare. According to the Department for Environment Food and Rural Affairs (2018) that the concept of animal welfare was introduced by OIE (Organization Internationale Epizootica), which is known as an international animal health organization officially in 2014 which contains several concepts, namely 1) freedom from hunger and thirst; 2) free from heat and discomfort; 3) free from injury, disease and illness; 4) freedom from fear and suffering; and 5) free to express normal and natural behaviour. Poultry in temporary holding cages should not be left for more than 24 hours without being fed according to the dose and given water ad libitum. This is done to prevent poultry from starvation and dehydration, which can cause a decrease in muscle glycogen levels and body weight to reduce meat quality (Adzitey, 2011; Ejo et al., 2016; Thaha et al., 2021).

The next HCCP is bleeding, which can be a biological hazard. Poultry that is entirely out of blood in its body can cause bacteria to grow more efficiently so that the meat will rot more quickly. The scalding process is prone to chemical damage in overcooked meat due to the temperature and duration of scalding. According to Barbut (2004), the optimal scaling method for broiler chickens is soft scalding at a temperature of 50-53°C with a duration of 60-180 seconds. Next is de-feathering, namely the removal of poultry feathers using specific tools. Damage can occur in the form of biological and physical. Biological damage occurs in the form of cross-contamination of microorganisms if they ignore the sanitation of the equipment used. In contrast, physical damage is in the form of damage to the skin's surface or other body parts due to this process.

Manifestations of poultry disease in the form of damage to various organs in the body of livestock, both digestive tract, respiratory tract and others. The evisceration process removes digestive organs such as the liver, gizzard, intestines, head, and feet to produce a whole carcass. Several foodborne diseases are caused by humans consuming meat from sick and not adequately cooked poultry, such as Avian influenza. Therefore, organs that undergo pathological anatomical changes should be discarded not to harm those who consume them.

Washing aims to clean the dirt and blood remaining after the slaughtering stage. The hazard that can occur is biological, namely cross-contamination of the carcass, from unclean washing water. Therefore, it is essential to ensure the availability of clean water at the poultry slaughterhouse. The bacteria that can contaminate poultry meat include *Campylobacter* sp. and *Salmonella* sp. (Andriani et al., 2013; Thaha et al., 2020). The last HCCP is carcass storage to be sold. Biological hazards can arise in the cross-contamination of bacteria, mainly from the surrounding environment. Temporary storage temperature before sale ranges from -25 to 18°C. The optimum temperature for developing bacteria is 5-60°C, so outside this range, meat storage will spoil more quickly; therefore, business actors need to pay attention to the storage temperature of meat, mainly if it will be sold in large quantities and for an extended period.

Conclusion

Based on the study results, it was found that there were 9 CCPs at the poultry slaughterhouse in Patalassang District, Takalar Regency, South Sulawesi Province, including unloading, temporary cage, slaughtering, bleeding, scalding, de-feathering, evisceration, washing, and storage. Among these CCPs, 3 HCCPs are based on halal aspects, namely unloading, slaughtering, and bleeding. In comparison, 7 HCCPs are based on thayyib aspects, namely temporary cage, bleeding, scalding, de-feathering, evisceration, washing, and storage.

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