

Implementation of HACCP and Halal Assurance System in Chicken Slaughterhouses in West Kalimantan

Adisty L. Virgianda^{1*}, A. T. Soelih Estoepangesti², Mas'ud Hariadi²

¹ Department of Food, Livestock and Animal Health West Borneo Province

² Faculty of Veterinary Medicine, Airlangga University, Surabaya

Corresponding email: adisty_virgianda@yahoo.com

ABSTRACT

The aim of this study was to observe the hazard analysis and critical control points (HACCP) and halal assurance system (HAS) implementation in chicken slaughterhouses in West Kalimantan. This explorative study was using primary and secondary data by field survey during October to December 2016 in modern PT. X and semi-modern PT. Y chicken slaughterhouses. The results showed : (1) there were 6 critical control points (CCP) and 3 halal critical control points (HCCP) in PT. Y; (2) there were 3 CCP and 2 HCCP in PT Y.; (3) HACCP and HAS in chicken slaughterhouses could be implemented in West Kalimantan. The challenges to optimize HACCP and HAS in chicken slaughterhouses in that area are the high production cost and poultry product trading in wet market. Public awareness related to animal originated food chain preparation, halal products and internal company commitment are essential to implementation of HACCP and HAS practice.

Keywords: Chicken slaughterhouses, West Kalimantan, Hazard Analysis and Critical Control Points (HACCP), Halal Assurance System (HAS).

INTRODUCTION

The demand of livestock production selling especially chicken meat in the ASEAN free trade area has been challenging for chicken slaughterhouse industries to compete the global markets with the quality food safety, enhanced security assurance and halal standarization. Following the increasing of moslem population and public awareness to consume the halal food creating the growth prospects of the halal market around the world including in Indonesia. Since 2006, implementation of HACCP, ISO 9001-2008 and halal assurance system has been used in many modern chicken slaughterhouses and food processing industry in Indonesia (Brahmantya, 2016).

Furthermore, the challenges for this industries are the limitation of implementing HACCP and halal certification caused by many factors. HACCP is the new systematic approach to identify all of the potential hazards, assessment of risks and control hazard during production process (Kohilavani et al., 2013). HAS is a system to fulfill halal standards, regulations and requirements in halal certification. HAS could be collaborates, connects, accomodates and integrates the Islam Shariah concepts particularly related to halal haram, bussiness ethics and company management, procedures and mechanisms of planning, implementation and evaluation in the production process of halal food (LPPOM MUI West Kalimantan, 2009).

Veterinary control number (NKV) and halal certificate have also been used to processing food safety products as the first requirements in chicken slaughterhouses

including in West Kalimantan. They're contributing to supply of chicken meat for West Kalimantan consumer.

The aim of this study are to explore the process HACCP and HAS implementation in poultry slaughterhouses in West Kalimantan and to offer information about the problems and barriers involved into the process.

MATERIALS AND METHODS

Materials. Two poultry slaughterhouses, modern PT. X and semi modern PT. Y were done by surveys : interviews and observation during October-December 2016. The tool of interview session using quistionare which divided by two type. Quistionare A contains open-ended quistion were used for interviewing of Chief Department of Food, Livestock and Animal Health West Kalimantan Province, Director of LPPOM MUI West Borneo Province and Manager of PT. X and PT. Y. Quistionare B close-ended question used to interview the supervisor or personal staff from poultry slaughterhouse.

The interview session were focused on main criteria that involved HACCP and HAS implementation such as documentation, system and internal audit. Overall processing operating, start from supply of raw materials until distribution process. The good manufacturing system (GMP) and sanitation standard operational procedures (SSOP) as the prerequisite system of HACCP were included in quistionare. Assesment of GMP aspects refer to the standard method (SNI 01-6160-1990).

Observation is used to understand the procedures, identify monitoring criterias and control performed in chicken slaughterhouses. The point of observations were halal status, company lisences, food safety details and managements. Identification of hazard and prohibited (haram) risks during the processing used to develop the CCP and HCCP. Observations were started from the arrival of live chicken, handling, preparation of facilities and processing equipments, slaughtering processing, carcass handling, packaging, storage and distribution. In addition, surveys supposed to collect the information about enterprise characteristics and the challenge factors of implementation HACCP and HAS.

Study on HACCP and HAS using The Guidelines of HACCP Preparations (BSN 1004-1999) which contains the list of raw and addtional materials, flowchart from production process, risk level tables and decision trees of CCP and HCCP. The preparations process was followed with 7 principles of HACCP (SNI 01-4852-1998).

Data Analysis. The qualitative information obtained from interviews and observations were summarized in simple table from and explained with descriptive analysis.

RESULTS AND DISCUSSION

Determination of CCP and HCCP

In chicken slaughterhouse production process There were 6 critical control points (CCP) (ante mortem and post mortem inspections, scalding, chilling, freezing and cold storage) and 3 halal critical control points (HCCP) (ante mortem inspection, stunning and slaughtering) in modern slaughterhouse PT. X. In semi modern slaughterhouse PT. Y, there were 4 CCP (ante mortem and post mortem inspections, and chilling) and 2 HCCP (ante mortem inspection and slaughtering). Table 1 shows the matrix of CCP and HACCP in West Kalimantan chicken slaughterhouses. production process.

Table 1. Matrix of CCP and HCCP PT. X and PT. Y production process

Stage of production process	Type of hazard	Critical limits (CCP) and critical criteria (HCCP)	Monitoring				Corrective actions
			Method	Frequency	Object	Personel	
Antemortem inspection and (CCP PT. X and PT. Y)	Biological and Haram	Ensuring good health of chickens to minimize death risk after stunning. Culling of diseased, weak, wounded chickens to minimize died chicken and haram status during stunning.	Visual inspection. The symptoms unhealthy chickens such as greenish feces, water discharge from nostrils, swollen face, sneezing, snoring (Supriyanto, 2013).	Random checking, 10% from the total number of chicken	Live chicken	QC dirty area	Culling of diseased chickens and evaluation of suppliers
Water bath electrical stunning (HCCP PT. X)	Haram	Voltage (10-25V), duration (5-10 sec) and depth of water bath (not dipping up to the neck) are the crucial things in this process (Rahman and Shaarani, 2012).	Observation the chicken behavior, physical reflects and respiratory. Stunning should be reversible in 5 minutes after stunning	Random checking, 10% from the total number of chicken	The chicken have been stunned	QC of dirty area halal internal auditor	Culling the death after stunning
Halal slaughtering (HCCP PT. X and PT. Y)	Haram	All chickens must be slaughtered by certified muslim butcher (Juleha) with Islamic Law process using a sharp knife. Every chicken slaughtered are cut all the <i>marih</i> (esophageal), <i>hulqum</i> (trachea), blood vessels (vena and artery).	Juleha has a certified butcher from LPPOM MUI and postmortem inspection	Every 1 hr	Chickens after slaughtered	QC of dirty area halal internal auditor	Rejecting the imperfectly slaughtered chicken

Scalding	Biological and physical	Completely died and bleeding out Carcasses weren't over scalding cause the long duration (esp. in surface of breast muscles). Water in scalding bath must be renewed constantly with constant flow water	Monitoring hot water temperature (61-62°C), duration of scalding (1-2 min) water condition in scalding	Every 1 hr	Hot water and carcasses	QC of dirty area	Culling overcooked carcasses and Speed up the flow water filling. Controlled temperature and gass fuell.
Post mortem inspection (CCP of PT. X and PT. Y)	Biological and physical	Ensure the livers and gizzards (offal) are normal after the removal of entrails, liver and stomach (visceral).	Visual inspection of carcass	All of the offal and carcasses	Offals (Livers and gizzards) and carcasses	Evisceration staff and QC of dirty area	Culling the abnormal and damaged offals. Removed the residue of offals and pulled out the residue of feathers
Chilling (CCP of PT. X and PT. Y)	Biological and Chemical	The carcasses temperature exit from chilling tank \leq 4°C. Water temperature in chilling tank \leq 3°C. Residue control have not been observed	Monitoring temperature	10 carcasses/hr	Carcasses	QC of clean area	Inspection reports
Freezing (CCP of PT. X)	Physical	The carcasses and other products temperature on exit from air blast freezer (-20°C)	Monitoring carcasses temperature exit from ABF and the ABF	Monitoring of temperature, thermometer calibration, maintance of equipment	ABF	QC of clean area	Inspection reports
Cold storage	Biological	The cold room temperature max. 18°- (-20°C)	Monitoring cold room of	Monitoring of	QC of clean area	QC area bersih	Inspection reports

(CCP of PT.
X)

temperature

temperature,
thermometer
calibration,
maintance of
equipment

GMP Implementation. The PT. X score of all aspects GMP was 177 and score of GMP building was 327. The results showed the GMP implementation in PT. X at a good value and almost close to the correct application of the GMP. In PT. Y, the score of all aspects GMP was 137 and 123 to GMP building. It showed the GMP in PT. Y at a good enough because they applied half the right way (Suryanto *et al.*, 2015). GMP assessment showed that PT. Y will require much planning and higher costs to implementing HACCP system i.e improving plant layout, investing in new equipment, water and waste treatment system, and increasing in packaging materials if they want to package the products.

SSOP Implementation. There were differences stage of SSOP in between PT. X and PT. Y. PT. X applied the full-complex stage the SSOP before-after the production process. The procedures consist of sanitation personal staff, sanitation equipment and building, and pets control. PT. X don't have medical control programs for their staff and but the staff using health insurance from BPJS. PT. X using pressurized water cleaner 80 bar and chlorine 100 ppm to sanitation the crates. Maxifoam and water mixture are used to clean the floors, equipments and walls. The glue and insect killer are used to control the flies, control of rats using the bridifakum poison, Fogging is used to eradicate of mosquito larvae and other insects. Collaboration of PT. X and PT. Rentokill to control the pets. SSOP in PT. Y very simple than PT. X, they using sunlight as a cleansing to clean the walls, equipments, and floors. They claimed that will be residue if using the chlorine in their sanitation programs and effect on carcasses quality.

HACCP and HAS Implementation. The status of HACCP and HAS implementation in PT. X is being planned but not implemented. They declared that the document of HACCP plant and HAS plant even the operating system in their plants has being prepared since the company was established in 2014. Large-scale capacity of production, availability resources and infrastucture with effective HACCP and HAS implementation in PT. X could be improving competitive advantage in the market place. But, the situation of internal management cause HACCP and HAS implementation was delayed until their economic and management in a stable condition. PT. Y had no interest to implementation HACCP because it were spending high costs, small-scale production (1,500-2,000 chickens/day) lack the resources when their rent status of buildings and lands.

Challenging Factors For HACCP and HAS Implementation. Barriers and problems have been founded by this study as common factors preventing HACCP and HAS implementation.

Consumen awareness animal originated food chain handling and halal products. The reason for company is no report from konsumen to implement HACCP in chicken carcasses production. The live slaughtering process in wet market and getting the fresh meat are the behaviour of almost konsumen in West Kalimantan. Warm chicken meat condition compared with cold chicken meat from chicken slaughterhouses (PT. X and PT. Y) is the other konsumen reason to choose wet market products. Hygiene and sanitation aspects in slaughtering process are not essential motives. Halal aspect is the one positive motive in purchasing decision when they believe the butchers are Moslem and the sellers are "Pak Haji".

The gap of price between from chicken slaughterhouse and wet market. In West Kalimantan, the products from chicken slaughterhouse more expensive (IDR 8,000/kg for whole carcasses) than the wet market. The price of breasts was IDR 40,000/kg and IDR 50,000/kg for drumsticks which the cutting parts not selling in wet market. The company reasons gap of price as a cost production compentation because in they using modern process than wet market.

The domination of wet markets. The type of chicken meat markets are modern (Hypermart, Carefour, Fresh Mart and Dapur Segar) and traditional (wet market, street vendor and traditional chicken slaughterhouses). Since the wet markets are relatively important in the sales of chicken meat, it was creating a close personal relationship between consumer and seller. Consumer could choose the live chicken to slaughter and the early morning as the favourite time for consumer (esp. women) to purchase the fresh meat. Chamhuri *et al.*, (2015) explain that freshness is the important reason while the market share in wet markets inclines. The chicken meat sales in domestic markets is the other company reason not using the HACCP as quality assurance system. They claimed NKV and halal certification are enough as the requirements to produce a quality product.

The internal budgetary constraints and lack of resources in company. Between PT. X and PT. Y have been the same problems with lack of professional human resources and top management to understand the HACCP concepts. Lack of staff motivation and training programs for staff are the other barrier factors to implement HACCP. Report from FAO/WHO (2006) *cit* Sozen and Hecer (2013), the first successful HACCP implementation is a clearly concept that understood by management

CONCLUSIONS

However, HACCP and HAS could be implemented in poultry slaughterhouses in West Kalimantan but, there were some external and internal challenges for poultry slaughterhouses to implement these system. Public awareness and internal company commitment are essential to implement HACCP and HAS practise.

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