



Application of Hazard Analysis of Critical Control Point (HACCP) on "Urutan" Chicken Products at Dapur Ayuna Catering

A.A. Made Semariyani¹, I Wayan Sudiarta² dan Ni Made Ayu Suardani Singapurwa³

¹²³ Program Studi Ilmu dan Teknologi Fakultas Pertanian, Universitas Warmadewa, Bali, Indonesia

ARTICLE INFO

Article History:

Received: 29 January 2023

Final Revision: 06 July 2023

Accepted: 06 July 2023

Online Publication: 07 July 2023

KEYWORDS

Foodborne illness, HACCP, Food safety, 'Urutan' chicken product

CORRESPONDING AUTHOR

*E-mail: semariyanimega@yahoo.com

ABSTRACT

This Applied Research is expected to be able to identify, analyze and control the hazards that may occur in the food manufacturing process. Hazard Analysis Critical Control Point (HACCP) is a food safety system that analyzes materials, processes, and food products. HACCP analysis can be used to control the final product's quality to meet the requirements for healthy, safe, and halal food products. Dapur Ayuna Catering is a catering company for the general public that processes traditional Balinese menus, one of which is a sequence of orders made not only from pork but also made from chicken meat to meet the wishes of consumers who should not or are allergic to pork and casings. The sleeve used is a synthetic casing made from collagen. This company has implemented HACCP in every food production, including chicken orders. This type of research is descriptive with observing the production process of chicken (Balinese sausage) menus. The application of HACCP in the production process of Urutan menus is to control the temperature and time during the production process to prevent microbial growth in food. Of the ten applications of HACCP according to Indonesian National Standard SNI No. 01-4852-1998 regarding the HACCP system, only one point of application is not in accordance with SNI, namely monitoring. Monitoring activities are not carried out routinely during the empon-empon washing process in the manufacture of 'basa genep' (Bali complete spices) and the storage of the final product has not been carried out in a special freezer because it is still using a refrigerator for households so that it is still one with other product storage. The HACCP system at the Dapur Ayuna Catering for Urutan chicken products for the general public has been implemented properly, from receiving raw materials, processing, packaging, labeling, and storage (storage freezer). Critical of every CCP set by Dapur Catering Ayuna Buduk Mengwi Badung. It takes handling and prevention of contamination in every stage of the chicken menu processing process to ensure that the food consumed by consumers is safe from contamination.

1. INTRODUCTION

Food safety is the main and most important requirement of all food quality parameters. Currently, consumers realize that food quality, especially food safety, cannot only be guaranteed by the results of final product tests from the laboratory. Consumers believe that products that are safe to obtain from raw materials handled properly, processed and distributed properly will produce good final products [1]. To produce food products that are safe for consumption, it is necessary to use food safety standards [1]. One of the recognized food safety standards is HACCP. HACCP is a tool (system) that focuses on prevention.

HACCP is applied to the entire chain of food product processing processes [2,3,4].

Traditional meat processing has better prospects and development opportunities. Traditional meat processing is very complex and is based more on hereditary conceptions. One traditional processed meat product is the 'order' of chicken. 'Urutan' is a food product analog of traditional Balinese seasoned meat sausage processed by the Balinese people. The 'sequence' was originally made from pork, lard and spices, both fermented and unfermented. To meet consumer tastes and food diversity, especially 'order', lately, many chicken 'sequences' have been marketed in traditional and modern markets. In the traditional meat processing process, the type and quality of raw



This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License
Published under licence by SAFE-Network

materials and auxiliary materials vary greatly, environmental conditions are difficult to control, and the endpoint of the process is uncertain. An unfavorable picture characterizes traditional product technology. Namely, traditional products are processed with a low level of sanitation and hygiene, using raw materials with a low quality or freshness, food safety is not guaranteed, technology is used for generations, and companies are managed by families with inadequate management capabilities [3,4].

The processing of various chicken 'sequences' in each processor makes its own characteristics for chicken 'urtan' producers. It also affects the existence of different food quality and safety. Therefore, the products produced are not uniform quantitatively or qualitatively, with varying durability so it is difficult to standardize. Therefore, it is necessary to develop traditional processors with several improvement efforts with the application of basic feasibility in food processing. Quality management and safety of raw materials and products must be studied for business and product marketing development [5,6].

To maintain food quality and safety, an analysis is needed to identify hazards associated with making chicken sequences and provide recommendations to develop a HACCP system to produce safe products. With chicken order products that are safe for consumption, Ayuna Catering can compete in the market.

Based on the above background, a problem formulation is obtained to identify the hazards associated during the process of making chicken sequences and provide recommendations to develop a HACCP system so as to produce products that are safe for consumption.

2. MATERIALS AND METHODS

2.1. Research Methods

The method used is descriptive verification to obtain an accurate and actual picture of the facts and nature of the relationship between the phenomena of the object under study. In addition, accounting and hazard risk analysis methods are used, methods for determining hazard significance and decision tree diagrams for determining critical control points [7].

The methods used in this activity include identifying Quality Policy and implementing the HACCP System in Ayuna Buduk Catering, Mengwi, Badung. Identification is carried out to get an overview of the production process. Identification of the application of the HACCP system is carried out by tracing the basic principles of the application of HACCP in chicken order products. The HACCP system consists of 12 stages, which include 7 HACCP principles. The initial five stages consist of preparing the HACCP team, product description, product use identification, drawing up a flow chart and verifying the flow chart.

The preparation of the seven principles of the HACCP plan consists of hazard analysis, determination of critical points (CCP), determination of critical limits for each CCP, establishment of a monitoring system for the HACCP system and determination of corrective actions for each HCCP.

Field observations were conducted to observe the condition of the working environment and production process at Dapur Ayuna Buduk Catering, Mengwi, Badung, which included receiving raw materials, preparation, processing, serving, distribution, and marketing process. The results of these

observations will be compared with theoretical references relevant to the problems found.

Discussion and interview about the process of implementing the HACCP system. Interviews were conducted to explore information related to the HACCP system, the order of chickens and the application of HACCP in the production process. Discussions, questions, and answers were conducted to catering owners, office workers and field workers. Based on the interview results, the discussion researcher can submit suggestions and recommendations regarding suggestions for improvement and implementation of HACCP to maintain the quality management system that has been achieved.

2.2. Research Procedure

This research uses the HACCP method, which is divided into 2 stages: the Preliminary Step in Hazard Analysis and the stage of applying HACCP. Preliminary Step in Hazard Analysis consists of:

1. Formation of the HACCP Team with internal and external recruitment system. The team that has been formed must already understand the principles of HACCP and know the role and use of HACCP in the production process. Therefore, training is needed for the HACCP team on HACCP implementation and HACCP inspection
2. Description of products that have specific properties. Hazards that may occur from the receipt of raw materials to finished products that are ready for consumption must be identified in accordance with regulations and laws related to applicable food safety requirements
3. Identify the use of products to group consumers based on the risks that can be posed when consuming the product and provide information that the product can be distributed to all populations or only sensitive populations consisting of seniors, infants, pregnant women, sick people, and people with limited endurance.
4. Preparation of flow charts by recording the entire process from receiving raw materials to the final product.
5. Verify the flow chart by reviewing the production process directly, coordinating with production operators and testing product samples to prove the accuracy of the flow chart that has been prepared with the actual production process. If the application in the field of the flow diagram is not appropriate, documentation of the flow diagram is carried out by filling out the flow chart verification form [8].

3. RESULTS AND DISCUSSION

3.1. Application of HACCP System in Chicken Order Processing Process

3.1.1. Acceptance of raw materials

Receipt/purchase of raw materials is the earliest step in the food processing process at Dapur Ayuna Buduk Mengwi Badung catering. At this stage, the raw materials used to make chicken sequences are obtained through direct purchases to the market or brought by traders directly to Dapur Ayuna. Goods that arrive according to a predetermined request in quantity and date of arrival. The raw materials received must meet the standards set by Ayuna's kitchen. The types of raw materials accepted are

chilled products, frozen products, dry goods raw materials, fresh raw materials and so on. The types of raw materials included in CCP 1 are chiller and frozen.

Receipt of raw materials must be accompanied by a Quality Control officer, where this Quality Control officer is tasked with checking raw materials that come in terms of quality and quantity of raw materials to be received, weighing the weight of raw materials, sorting raw materials, recording the date of

receipt and expired date, recording the temperature of raw materials and labeling each raw material.

Chicken meat received at Dapur Ayuna is in fresh or frozen form. The raw materials for chicken meat received at the material receipt section are adjusted to the list made by Dapur Ayuna Catering. Raw materials will be given labels; the purpose of giving labels is to determine when the raw materials are received and how much they weigh.

Table 1. Specifications of Chicken Meat to be Processed by Dapur Ayuna

No	Parameters	Description
1.	Material Name	Chicken Meat
2.	Characteristics	Chicken
	a. Physical	Fur-free Bruis-free Whole and thick meat
	b. Max Chemistry	Formalin-free
	c. Max Biology	TPC = 1×10^6 cfu/g koliform = 1×10^2 cfu/g S. aureus = 1×10^2 cfu/g Salmonella = negative/25g E. coli = 1×10 cfu/g Campylobacter sp = negative/25g
3.	Composition	Daging ayam
4.	Raw Material orogin	Indonesia
5.	Production Method	1. Cutting 2. Cleaning 3. Housekeeping
6.	Packaging and shipping methods	Housekeeping: Plastic PP vaccum Delivery: In frozen / chilled / fresh conditions
7.	Storage conditions and shelf life	Cold storage (0-5°C), Frozen storage (-18 °C)
8.	Material Handling Before Process	Thawing (Frozen)
9.	Admission Criteria	Frozen temperature, according to < -80°C spec
10.	Related Regulations	SNI 3294-2009 Quality of Carcass and Chicken Meat

Source : Dapur Ayuna Buduk Mengwi Badung

Table 2. CCP 1 Critical and Actual Limits of Chicken Meat

Process Stage	Types of Hazards	Critical Limit/Specification	Current	Information
CCP 1 (Receiving) Acceptance of Chicken Meat Raw Materials (Frozen)	Biology: The growth of pathogenic microbes on food is potentially dangerous.	Reception temperature < -8°C. There was no sign of thawing before. Vacuum, No Expired, No Dagame Flesh Colour Red	Checking the temperature of raw materials during the receiving process, namely: -13,1°C. There was no sign of thawing. Vacuum, No Expired, No Dagame Flesh Colour Red	Based on CCP 1 (Receiving) Critical Limits and Actual Chicken Meat in Ayuna's Kitchen is appropriate and acceptable

Source : Dapur Ayuna Buduk Mengwi Badung

Acceptance of chicken meat raw materials in the receiving section must be considered. The standard acceptance temperature of chicken meat is <-8°C, and there are no signs of thawing before. The temperature check on the receipt of chicken meat raw materials in the receiving section can be seen in Figure 1.

Figure 1. Chicken Order Raw Materials



The ingredients received will be placed in the basket provided by Dapur Ayuna based on the type of item. The basket

is then arranged on the pallet provided to facilitate the transportation of goods into storage.

3.1.2. Raw Material Storage

The quality and quality of raw materials must be maintained. Therefore, Dapur Ayuna applies the FIFO (First In, First Out) system, which means that the first item to enter the storage room will be removed or used first. This FIFO system is generally used for items that are less durable or if stored for a long time, it will be damaged or reduce the quality of the goods.

The raw materials included in CCP 2 are only chillers and freezers. Chicken meat received will be stored in the freezer at a temperature of $\leq (-18)^{\circ}\text{C}$. The following is CCP 2 for Chicken Meat in Ayuna's Kitchen can be seen in Table 3.

Table 3. CCP 2 Storage/Critical and Actual Limits of Chicken Meat

Process Stage	Types of Hazards	Critical Limit/ Specification	Current	Information
CCP 2 (Storage) Chicken Meat	Biology: The growth of pathogenic microbes on food is potentially dangerous.	Temperature <i>Freezer</i> -18°C	Checking freezer temperature is -18,3°C	Based on CCP 2 (<i>Storage</i>), the Critical and Actual Limits of Chicken Meat in Ayuna's Kitchen are appropriate and acceptable.

Source : Dapur Ayuna Buduk Mengwi Badung

3.1.3. Thawing

Thawing is thawing frozen food ingredients such as meat and fish. This thawing process is very important to maintain the quality and taste of a food ingredient. The thawing process is not included in the CCP, but the thawing process is included in the Operational Prerequisite Programme (OPRP). The stages of thawing chicken meat are carried out in the room (room temperature). This process is carried out precisely so that the growth of pathogenic bacteria such as *Salmonella*, *E.coli*, *Listeria monosytogenes* and *Staphilococcus aureus* can be controlled.

The thawing process can be done by three methods: Refrigerator / Thawing box, running water and room temperature. Thawing on the refrigerator / thawing box uses a thawing room temperature of 10°C. Thawing using running water is monitored every 2 hours from the start of the thawing process to completion, the temperature of the flowing water is 21°C, the condition of the packaging is tightly closed, the final surface temperature of the product is < 8°C. Thawing uses room

temperature monitored every 6 hours from the start of the thawing process to completion; the room temperature used is < 21°C, and the final surface temperature of the product is < 8°C.

Thawing on chicken meat for chicken order menu using the Refrigerator / Thawing box method. The actual results obtained at the thawing room temperature are 8.9°C; these results have met the predetermined standard in the thawing room, which is 10°C.

3.1.4. Cooking

According to the kitchen is a special room intended as a place to cook food. The cooking process is done through frying, roasting, boiling, steaming, and grilling. During the processing process, there is a critical temperature limit that the owner of Dapur Ayuna will check. measurements on the product are carried out at the end of each cooking by measuring the temperature of the product. The cooking time of this chicken sequence is approximately 30 minutes at the time of steaming and 10 minutes at the time of frying.

Table 4. CCP 3 (Cooking) Critical and Actual Limits on the Chicken Order Menu

Process Stage	Types of Hazards	Critical Limit/ Specification	Current	Information
CCP 3 (Cooking)	Biology: The growth of pathogenic microbes on food is potentially dangerous.	The cooking temperature of chicken cuts is at least 74°C.	Checking the temperature of the chicken order is 75.1°C. at the time of steaming and 150.1°C at the time of frying	Based on CCP 3 (<i>Cooking</i>) Critical and Actual Limits on the <i>chicken order</i> menu at Katering Dapur Ayuna is appropriate and acceptable.

Source : Dapur Ayuna Buduk Mengwi Badung

CCP 3 examination is carried out by checking the temperature of the food core using a thermometer stick. If the final cooking temperature does not reach the predetermined temperature, the food will be cooked again until it reaches the set temperature. Quality Control in the kitchen Ayuna Kitchen Catering is responsible for labeling cooked dishes and checking the temperature of the food.

3.1.5. Cooling

The order of cooked chicken is then put into the chiller. Chiller is a food cooler that uses cold air and direct contact with food quickly. Inside the chiller, the food temperature is lowered to reach a temperature of 5°C - 10°C within a maximum of 1 4 hours. This chiller is included in CCP 4.

Food put into the chiller will maintain freshness by storing it in a sufficient and stable temperature so that food will not spoil easily. Not only the freshness of the food will be guaranteed but also includes colors and tastes that are not much different after the food is cooked so that the quality of the food is maintained.

In storage in the chiller using trays labeled production according to the processing date. Checking the temperature on the chiller is done to find out the condition of the food using a thermometer stick. If not used, food that has been processed and put into the chiller can be stored in the chiller with a temperature of 0 -5°C with a maximum time limit of 3 days. The following is CCP 4 on the menu. The order of chicken produced by Ayuna Kitchen Catering is listed in Table 5.

Table 5. CCP 4 (Chiller) Critical and Actual Limits On Chicken Order Menu

Process Stage	Types of Hazards	Critical Limit/ Specification	Current	Information
CCP 4 (Chiller) Order of chickens	Biology: -Growth of pathogenic microbes on potentially harmful foods	Food temperature is lowered from 75.1°C to reach 5°C - 10°C in a maximum of 4 hours.	By the time Blast chiller checking completed cooking temperature 75.1°C. After being put into the chiller the temperature of the order of chicken drops to 6.4 °C within 3 hours.	Based on CCP 4 (<i>Chiller</i>) Critical and Actual Limits on the menu <i>The order of</i> chickens is appropriate and acceptable.

3.1.6. Laboratory Quality Control

Food processing companies must ensure the quality of their products so that they are suitable and safe for consumption by consumers. Food safety, according to the Government Regulation of the Republic of Indonesia Number 28 of 2004 concerning food safety, quality and nutrition, is a condition and effort needed to prevent food from possible biological, chemical and other objects that can disturb, harm, and endanger human health.

One of the activities done by Dapur Ayuna Catering before food is delivered to consumers is quality control in the laboratory. Quality and food safety aspects are the main problems in production [8,9]. Therefore, proper processing can suppress microbial growth [10]. The catering industry, including Dapur Ayuna Catering, is highly susceptible to food transmission if food handling is improper [11,12]. Quality control aims to ensure that the product is safe from microbial contamination that can harm consumers and companies. According to (13,14) food contaminated with microbes can cause Foodborne Diseases or food poisoning, which can result in illness for people who consume it. The standard microbiological parameters of processed meat can be seen in Table 6.

Table 6. Microbiological Parameter Standards for Processed Meat

Microbiology Test (unit)	Quality Standards
TPC (colony/g)	10 ⁶
<i>Enterobacteriaceae</i> (colony/g)	10 ²
<i>Salmonella</i>	Negative/25g
<i>Staphylococcus aureus</i>	2x10 ² colonies/g
<i>Listeria monocytogenes</i>	Negative/25g

Dapur Ayuna Catering conducted external testing at the Laboratory of the Ministry of Agriculture, Directorate General of Livestock and Animal Health of the Denpasar Veterinary Center, Bali. Routine external testing is carried out every six months and is carried out on 10 samples taken randomly. The parameters tested by the Laboratory of the Ministry of Agriculture, Directorate General of Livestock and Animal Health of the Denpasar Bali Veterinary Center are *E. coli* Germ Numbers, *Staphylococcus aureus*, *Salmonella*, *Shigella*, *Listeria monositogenes* and TPC. From the test results, all of them meet the quality standards of meat sausages (SNI 3820/2015) [15,16].

4. CONCLUSION

The HACCP system in Dapur Ayuna Catering for chicken order products for the general public has been well implemented, from receiving raw materials, processing, packaging, labeling and storage (storage freezer). The chicken menu is suitable for consumption, because the processing process is still below the critical limit of each CCP set by Ayuna Buduk Mengwi Badung Kitchen Catering. Handling and preventing contamination is needed in every process of processing chicken order menus to ensure that the food consumed by consumers is safe from contamination.

ACKNOWLEDGMENT

The author also expressed his gratitude to the Rector of Warmadewa University, the Head of the Warmadewa University Research Institute, the Dean of the Faculty of Agriculture, fellow lecturers for their support in this activity and younger students involved in it. The author also expressed his gratitude to Dapur Ayuna as a partner in this study.

REFERENCE

- [1] Ariani, R.P. 2017. Mengenal Kuliner Bali. Rajawali Pers. Depok.
- [2] BSN (Badan Standarisasi Nasional). 1998. Sistem Analisa Bahaya dan Pengendalian Titik Kritis (HACCP) Serta Pedoman Penerapannya. Standar Nasional Indonesia. SNI 01-4852-1998.
- [3] Citraresmi, A.D.P dan E.E. Wahyuni. 2018. Implementation of Hazard Analysis and Critical Control Point (HACCP) in dried anchovy production process. International Conference on Green Agroindustry and Bioeconomy. IOP Conf. Series : Earth and Environmental Science 131(2018)012021, 24-25 Oktober 2017. Batu
- [4] Gustiani, E. (2009). Pengendalian cemaran mikroba pada bahan pangan asal ternak (daging dan susu) mulai dari peternakan sampai dihidangkan. *Jurnal Litbang Pertanian*, 28(3), 96-100.
- [5] Handayani, T. (2012). Kajian sistem keamanan pangan untuk industri jasa boga, studi kasus pada PT. ELN, Jakarta (Tesis yang tidak dipublikasikan), Institut Pertanian Bogor, Bogor.
- [6] Hilman, M.S. dan Z.F. Ikatinasari. 2014. Faktor-faktor yang mempengaruhi Efektifitas Penerapan Sistem HACCP. *Jurnal Standarisasi*. 16(3): 223-234
- [7] Hermansyah, M., Pratikto, P., Soenoko, R., & Setyanto, N. W. (2013). Hazard Analysis and Critical Control Point (HACCP) Produksi Maltosa Dengan Pendekatan Good Manufacturing Practice (GMP). *JEMIS (Journal of Engineering & Management in Industrial System)*, 1(1).
- [8] Irianto, H. E., & Soesilo, I. (2007, November). Dukungan teknologi penyediaan produk perikanan. In *Seminar Nasional Hari Pangan Sedunia* (Vol. 27, No. 3, pp. 1-8).
- [9] Suharna, C. (2006). *Kajian Sistem Manajemen Mutu Pada Pengolahan "Ikan Jambal Roti" Di Pangandaran-Kabupaten Ciamis* (Doctoral dissertation, Program Pascasarjana Universitas Diponegoro).
- [10] Thaheer, H. 2005. Sistem Manajemen HACCP (Hazard Analysis Critical Control Points). Bumi Aksara. Jakarta
- [11] Widaningrum, W., & Winarti, C. (2007). Studi Penerapan Haccp Pada Proses Produksi Sari Buah Apel. *Jurnal Standardisasi*, 9(3), 94-105.
- [12] Wrsiati, L.P., I M.A.S. Wijaya, I K. Suter, A.A.P.A.S. Wiranatha. 2015. Kuliner Tradisional Bali. Undayana University Press. Denpasar
- [13] Semariyani, A.A.M., I W. Sudiarta, L. Suriati, N.M.A.S. Singapurwa, I N. Rudianta, 2018. The flavor of Urutan, a traditional Chicken –based food from Bali. *Journal of Biological and Chemical Research*. 35(2): 469-475.

- [14] Nandari, D., N. M. A. S. Singapurwa, AA M. Semariyani, I P. Candra, I N. Rudianta. 2019. Penerapan HACCP (Hazard Analysis Critical Control Point) Menu Chicken Butter Untuk Maskapai Penerbangan JQ di PT AF. Gema Agro, 24(2): 134 – 140.
- [15] Rasa, I. N. M. A. G., Astiti, M. P., Eryani, I. A. A. P., Yudiastari, I. N. M., & Semariyani, I. A. A. M. (2023). Pentingnya Kemasan Dalam Pemasaran Produk. Scopindo Media Pustaka. Scopindo Media Pustaka. ISBN 978-623-365-498-2
- [16] Ardaniworo dan Retno Adriyani. 2017. Penerapan HACCP Dalam Proses Produksi Menu Daging Rendang di *nflight Catering*. *Media Gizi Vol.12 No 1*. Hal 88-97