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EVALUATION OF THE IMPLEMENTATION OF HACCP SYSTEM PRINCIPLES OF HAZARD ANALYSIS AND DETERMINATION OF CRITICAL CONTROL POINTS ON THE GRILLED CHICKEN MENU AT PT.X

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Abstract

Food service, such as restaurant and catering, should ensure the food safety of their products. However, the evaluation of food safety management in the food service is limited. This research aimed to evaluate the implementation of the HACCP principles, particularly on the first and second principles, such as the hazard analysis and determination of critical control points on the grilled chicken menu at PT. X. This research was qualitative descriptive research. Data collection used in-depth interviews, observation, and documentation. The research resource person was an executive chef and an operational manager. Data analysis conducted by the triangulation method. The application of HACCP principles of hazard analysis has not been carried out properly because the biological and physical hazards have not been analyzed carefully and there are still incomplete documents. The implementation of HACCP principle two determined critical control points in the field have not been synchronized with the HACCP standards that have been set. Follow up recommendations to address consumer complaints are to review the analysis of biological and physical hazards and control critical control points, especially in thawing, roasting, distribution, and serving. The implementation of the HACCP system in the first and second principles at PT. X needs to be re-evaluated even though the follow-up recommendations have been able to minimize food safety cases.

Keywords: *HACCP, Hazard Analysis, Determination of Critical Control Points, Chicken Grilled Menu*

INTRODUCTION

Food is the most basic human need. Government Regulation of the Republic of Indonesia Number 86 of 2019 concerning Food Safety states that what is meant by food is everything that comes from biological sources of an agricultural, plantation, forestry, fishery, animal husbandry, water, and water products, both processed and unprocessed intended as food or beverages for human consumption, including food additives, food raw materials, and other materials used in the process of preparing, processing, and/or making food or beverages (Peraturan Pemerintah Republik Indonesia Nomor 86 Tahun 2019 Tentang Keamanan Pangan, 2019).

Foodstuffs can be consumed both in raw and cooked form, but most foodstuffs must be processed into various types and forms of food so that they are easily accepted sensorily by the human tongue. Food processing must be carried out properly to avoid further deterioration or deterioration of food quality. This is because foodstuffs begin to experience a decline in quality from the harvesting process to the hands of consumers (Mamuaja, 2016).

The World Health Organization (WHO) states that food-borne diseases are called food-borne diseases. Symptoms and signs of food poisoning include nausea, vomiting, stomach cramps, fever, chills, facial flushing and itching, malaise, and fatigue (Reni Arisanti et al., 2018). One of the causes of foodborne disease is contamination between food ingredients and unwanted contaminants. Contamination between food and contaminants is called cross-contamination. Many related studies state that cross-contamination is the biggest reason for the entry of pathogenic microorganisms into food (H.R. et al., 2020).

The annual report from the Food and Drug Administration (BPOM) in 2019 recorded data on cases of food poisoning in 2019 by 257 hospitals from 2,813 hospitals in Indonesia as many as 6,205 cases of poisoning data. The cause of food poisoning is mainly due to household processed food in 265 cases, followed by processed food and catering services in as many as 97 cases (BPOM, 2019).

The number of cases of food poisoning that occur in Indonesia raises awareness of the importance of food safety as a basic prerequisite for food processing so that processed food ingredients are not only superior in terms of appearance, taste, and aroma but also must have a safety aspect when consumed. One of the food quality

assurance systems that are widely used in many countries, especially in developed countries is the Hazard Analysis Critical Control Point (HACCP) quality management system. HACCP is a risk analysis-based control system commonly used to manage food safety (King & Bedale, 2018). HACCP is used as a regulatory tool in food control systems and the food industry (Ndiaye et al., 2018).

In the production of food products in Senegalese SMEs, the application of the HACCP system has proven to be effective in determining the critical point of danger [7]. Research on the application of HACCP to MSMEs in Malaysia also proves that the application of HACCP opens new avenues for better product quality and greater export opportunities (Razzif & Norzaidi, 2020). Unfortunately, although the application of HACCP has proven to be effective in increasing the knowledge of producers and consumers in many countries, in Indonesia it is still not fully understood by the public and MSMEs (Nandari et al., 2019a).

PT. X is a company engaged in the category C catering industry in Yogyakarta, Indonesia. There are several cases of food safety found in PT. X, including the case on May 20, 2021, most of the customers complained of stomach pain after consuming the menu of roasted chicken with rujak seasoning. On June 18, 2021, customers found foreign body contaminants in the form of dishwashing wire on the fried chicken menu. In another case on January 20, 2021, a customer found fly eggs on the grilled chicken menu. These cases show that there are problems in implementing HACCP, especially on chicken-based menus. Regarding the security case on the grilled chicken menu, the HACCP team at PT. X has taken corrective action. Corrective actions that have been taken include checking the overall hazard identification in each processing process, changing the roasting process of grilled chicken which was originally roasted on the grill by grilling in the oven and shortening the delivery time of grilled chicken to consumers hands efficiently. Even though corrective action has been taken, it is still necessary to evaluate the implementation of HACCP as a whole, especially in principle 1 of hazard analysis and principle 2 of identifying critical control points.

Based on the description above, the purpose of this study is to evaluate principle 1 regarding hazard analysis and principle 2 regarding the identification of Critical Control Points (CCP) or critical control points at PT. X, especially on the grilled chicken menu. The results of the study are expected to improve the evaluation system regarding the application of HACCP in the catering service industry in Indonesia,

especially at PT. X thereby minimizing the risk of food poisoning to consumers and increasing public knowledge about the importance of food safety in the catering industry.

METHODS

This research uses a descriptive qualitative approach. Qualitative research is research that emphasizes the aspect of an in-depth understanding of a problem rather than looking at the problem for generalization research. Qualitative research with a descriptive approach aims to examine the phenomenon in detail or distinguish it from other phenomena [10]. The place of research was carried out at PT. X with its address at D. I. Yogyakarta, Indonesia from December 2021 to June 2022. The resource persons for this research are operational managers and executive chefs at PT. X. Data collection techniques in this study include in-depth interviews, observation, and documentation. In-depth interviews and observations used 50 observation items, consisting of 39 observation items for the evaluation of principle 1 and 11 observation items for the evaluation of principle 2. The data analysis technique in this study was carried out by the triangulation method. Research data is processed by: reducing, presenting, and verification of data (Siyoto & Sodik, 2015).

RESULTS AND DISCUSSION

Profile Company

PT. X is one of the category C catering service industries in Indonesia. PT. X serves the needs of catering services for corporate, special packages for weddings, social gatherings, and office gathering events, as well as rice boxes for tours and travel.

PT. X already has a Hazard Analysis Critical Control Point (HACCP) quality assurance management certification since 2019 with reissued once a year. HACCP certification is a system that has been developed, documented, and implemented by HACCP so that it is able to identify and control food safety hazards that may be encountered in food processing.

There are 10 HACCP team members consisting of the person in charge of the kitchen section, the quality risk verifier for the product, the person in charge of the material procurement section, and the person in charge of the packaging section. The people who are members of the HACCP team have been well trained,
so they have access to implement HACCP in the company (Rekomendasi nasional-Prinsip

umum higiene pangan, 2011). Menu processed by PT. X varies, including Chinese food, Indonesian food, Japanese food, and Continental food. One of the favorite menus ordered by consumers is the grilled chicken menu.

Evaluation of The Implementation of HACCP Principle 1: Hazard Analysis on Grilled Chicken Menu

The application of HACCP principle one, namely hazards analysis in the process of making grilled chicken menus, can provide an overview of food safety supervision in identifying potential hazards. In this principle, the grilled chicken menu is described as a processed menu of chicken meat that has a sweet and savory taste. Marinated chicken meat and then uncovered until the seasoning absorbs perfectly. The grilled chicken menu has a characteristic roasting process in the oven. The raw materials used consist of wet and dry raw materials, including chicken meat, onion, garlic, coriander, candlenut, cumin, pepper, bay leaf, kaffir lime leaves, margarine, sugar, salt, and soy sauce.

The procedure for making the grilled chicken menu flow chart begins with checking the quality and weight of the raw materials from the supplier at the time of receiving the raw materials until the final product is packaged. The flow chart aims to make it easier to identify hazards(Prayitno, 2018). The flowchart has been verified on the conditions in the field so that it can explain all stages of the grilled chicken menu processing process from beginning to end. The flowchart can be seen in Figur 1.

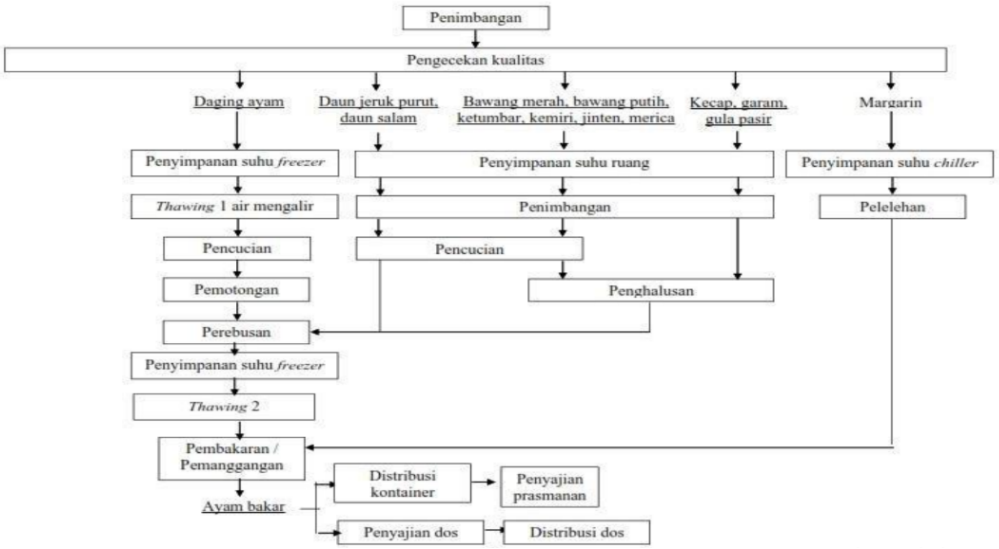

Figure 1. Flowchart of Grilled Chicken

The next procedure is to identify the hazard. The types of potential hazards in foodstuffs are divided into 3 groups: biological hazards caused by bacteria, viruses, and parasites; chemical hazards caused by natural toxins or toxic chemicals; and physical hazards consisting of foreign objects in food (Mortimore & Wallace, 2013).

The hazard identification stage is the stage that provides information about the risks of potential hazards that may be encountered in the entire production process so that inspections of biological, chemical, and physical hazards must be carried out in the first stage properly. This aims to avoid poisoning or infection caused after consuming the product. Hazard identification includes the possibility of a hazard and its impact on human health, qualitative/quantitative evaluation of the presence of a hazard, the survival of certain microorganisms, resistance to toxins in chemicals or physics, and conditions that trigger the hazard (Rekomendasi nasional-Prinsip umum higiene pangan, 2011). PT. X has identified the hazard specifically by determining the type and level of danger of the hazard on the grilled chicken menu.

The application of the HACCP principle, namely the identification of hazards on the grilled chicken menu, is still not running properly. This is indicated by the still-found complaints of contamination on the grilled chicken menu. Based on the results of a study conducted by researchers, physical hazardous contaminants have a risk in every processing of grilled chicken. Research by Suryansyah also states that one of the potential dangers of physical contamination such as staples is the risk of food (Suryansyah, 2018).

The case of stale grilled chicken menu is caused by biological hazards, in this case, susceptible microbes are found in the processing, distribution, and presentation processes. This is relevant to research conducted by Rachmadia that the highest cause of cross-contamination is the type of biological hazard (Rachmadia et al., 2018). Furthermore, Ali also stated that the microorganisms Salmonella spp., Shigella spp., and Clostridium perfringens were easy to grow on chicken meat (H.R. et al., 2020). Therefore, the evaluation is carried out by re-verifying the potential dangers in each process of making grilled chicken menus, starting from the process of receiving materials to the process of serving them to consumers.

Hazard risks in grilled chicken menus must be correctly identified based on categories and potential sources of hazards. Furthermore, the quality control stage using sampling must also be carried out not only to check the taste standards but also to take into account the length of time the quality of the grilled chicken menu can be maintained

until it reaches the consumers.

Evaluation of The Implementation of HACCP Principle 2: Determination of Critical Control Points on The Grilled Chicken Menu

The principle of determining critical control points on the grilled chicken menu at PT. X is carried out starting from the initial receipt of raw materials to the presentation process to consumers. Before determining the CCP on the grilled chicken menu, the act of determining the CCP using a decision tree is following the HACCP guidelines issued by the National Standards Agency that the determination of critical control points uses a decision tree as a guide that has a logical thinking approach (Badan Standar Nasional, 2011). PT. X makes a decision tree (decision tree diagram) of processes and raw materials based on flow chart analysis and identification of hazards and critical points of the grilled chicken menu.

The process parameters for determining critical control points have been carried out correctly after direct monitoring by the head chef of production and re-verification by the executive chef. This is in accordance with the National Standards Agency which states that if a food hazard has been identified and requires food safety control, while there are no control measures at that stage, the process or product is modified so that it is by control measures (Badan Standar Nasional, 2011). This is because the determination of critical control points is flexible or can change after verification.

Systemically, the application of the second principle of HACCP, namely the determination of critical control points is following the HACCP guidelines that have been set by the Indonesian National Standards Agency. However, the implementation in the field is still not running properly, as indicated by cases of contamination on the grilled chicken menu, such as the discovery of foreign objects and even worse cases of food poisoning after consuming the menu. This indicates that the critical control points that have been determined by the HACCP team have not been able to control the risk of food safety hazards.

Based on observations, the riskiest critical control points on the grilled chicken menu are the thawing process, roasting process, distribution process, and serving process. The case regarding the stale grilled chicken menu was caused by the second thawing process, namely before the roasting process was not carried out until the grilled chicken was not completely frozen, so the roasting process was not enough to cook the

grilled chicken. The temperature and time used in the thawing process of chicken meat is around 20°C and with a maximum time of 2 hours or until the chicken is no longer frozen (Nandari et al., 2019b). The second thawing process occurs in the danger zone. This has the potential for microbes to grow rapidly.

Control of critical points in the thawing process is done by checking the temperature and time during the process. Roasted chicken that has gone stale before being consumed by consumers can also be caused by the distribution process that exceeds the maximum period for consumer consumption, which is more than 4 hours after the cooking process. This is relevant to the research of Rachmadia which states that the time lag in the packaging process is also a critical point for contamination (Rachmadia et al., 2018). Cases regarding contamination of physical hazards such as hair, staples, and other foreign objects have the highest potential to occur in the presentation process in the packaging room. In addition to having to use complete and clean PPE, the quality control process by employees must also be carried out carefully by ensuring that there are no contaminants in food, especially in the packaging and distribution process. Most of the physical hazard contamination exists due to the lack of awareness of sanitation and hygiene among food handlers (Zeb et al., 2019).

Follow-up Recommendations

Based on the results of the HACCP evaluation on principle one hazard analysis and principle 2 determining critical control points, the case of food safety at PT. X includes stale grilled chicken, dishwashing wire, and the discovery of fly eggs, the follow-up recommendation for PT. X can be seen in Table

Table 1. Follow-up recommendations

No.	Complain	Follow-up Recommendations
1	Stale grilled chicken	- Conduct and re-verification related to the potential biological hazards on the grilled chicken menu. - Quality control is carried out to take into account the length of time the quality of grilled chicken can still be consumed, which is a maximum of 4 hours after the processing is complete. - The thawing process temperature and time are controlled. - Control of oven temperature setting and roasting process time is carried out carefully and ensures the standard size of the chicken is the same. - Distribute effectively and efficiently. The grilled chicken must be consumed within 4 hours after processing.

2	Dishwashing wire	- Food handlers wear complete PPE. - Food handlers must wash their hands and ensure that no contaminants stick to work clothes such as using a clothes roller and detecting with a metal detector. - The washing area and processing area are insulated. - Food handlers in the packaging room carefully ensure that there are no foreign objects when packing products.
3	fly eggs	- The cooling and packaging process is carried out in a closed room and has smooth air circulation. Checked the insect killer regularly every morning so that no insects enter the room. - Food handlers prevent flies from landing on the product by checking the product directly and taking several product samples to test the quality of the grilled chicken menu. - The grilled chicken products are distributed using closed containers. - The presentation of the grilled chicken menu in a buffet is done in a closed container equipped with a heater. Close the form of boxes is done immediately after the cooling process and tightly closed.

Follow-up recommendations have been carried out by PT. X such as controlling the temperature and time in each process and tightening quality control before the product is presented to consumers. After the recommendation for grilled chicken menu processing procedures was carried out, the number of cases of consumer complaints decreased.

CONCLUSION

The application of the HACCP system on principle one, the hazard analysis has not been carried out properly so needs further evaluation. Biological hazards and physical hazards are vulnerable in the processing, distribution, and presentation processes. Meanwhile, the application of principle two, the determination of critical control points on the grilled chicken menu in a system has been implemented but has not been synchronized with the standard critical control points that have been set. CCP grilled chicken menu is risky to occur in the thawing, roasting, distribution, and serving processes. Follow-up recommendations based on the evaluation of the application of principles 1 and 2, among others, need to review the potential hazards in each manufacturing process and proper control to control critical control points in the process of thawing, roasting, distribution, and serving on the grilled chicken menu.

RECOMMENDATION

Suggestions can be given in this research for PT. X is (1) It is necessary to document

each process and re-verify the hazard analysis process on the grilled chicken menu as a whole. (2) It is better to describe the details of critical control points on the grilled chicken menu and synchronize the control data in the field with the HACCP standards that have been set.

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