

Conference Paper

Implementation of Hazard Analysis and Critical Control Point (HACCP) in Cu's Chicken Crispy Production Process

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ABSTRACT

Food safety issues are still an important issue in the food sector in Indonesia and need special attention in food control programs. Therefore, it is necessary to improve the quality and safety of the products produced by developing a food safety assurance system in the form of a Hazard Analysis and Critical Control Point (HACCP). HACCP is a food safety assurance system in the form of a systematic approach to identifying hazards and put in place control systems to prevent them. One of the important reasons for implementing the HACCP system in the food industry is because the ingredients used during the production process have the possibility of contamination that can harm consumers. Cu's Chicken Crispy is a small industry that produces food. His party wants to implement a Hazard Analysis Critical Control Point (HACCP) management system to improve product quality assurance. This study aims to identify hazards related to the production aspects (raw materials, packaging, and processes) of Cu's Chicken Crispy and determine the CCP related to the production of Cu's Chicken Crispy. This study conducted a direct interview with the owner and made a direct visit to Mrs. Cu's food stall. In this study, it was found that there is a significant potential danger to chicken meat raw materials. At the stage of the production process that falls into the category of salting, draining and packaging refer to CCP.

Keywords: Food Safety, HACCP, Cu's Chicken Crispy, CCP

Introduction

The home industry has a very important role in efforts to improve the community's economy, in this case, the food home industry sector. The home industry is one of the activities engaged in the business sector but with equipment that is not commensurate with the existing equipment in large industries. The home industry has less sophisticated equipment, but it must also be noted that the home industry can also produce a type of goods and does not rule out the possibility of providing high-added value (Lamusa, 2015).

Mrs. Cu's Chicken Crispy is one of the MSMEs engaged in food processing and producing crispy chicken products, located in Gunung Anyar, Surabaya. The production process starting from the provision of raw materials to becoming crispy chicken products is carried out by Mrs. Cu alone so that the processing has the potential to cause errors that violate HACCP. Currently, there are many cases of disease spread in Indonesia caused by the spread of the virus through direct contact with sufferers or indirectly through contaminated objects around it. Food is one of the causes of the spread of the virus due to a lack of awareness of the hygiene and safety of the food consumed. This can happen because the food will enter the body directly and if it is not kept clean, the virus will more easily infect the body. One of them is crispy chicken products. Crispy chicken has enough animal protein content to meet human dietary needs.

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the products produced by developing a food safety assurance system in the form of a Hazard Analysis and Critical Control Point (HACCP). HACCP is a food safety assurance system in the form of a systematic approach to identifying hazards and putting in place control systems to prevent them. One of the important reasons for implementing the HACCP system in the food industry is that the ingredients used during the production process have the possibility of contamination that can harm consumers (Citraresmi & Putri, 2019). Based on Surahman and Ekafitri (2014), more than 90% of diseases are caused by microbiologically contaminated food. The HACCP system is not a risk-free food safety assurance system but is designed to minimize the risk of food safety hazards. The HACCP system is also considered a management tool used to protect food supply chains and production processes against contamination by microbiological, chemical, and physical hazards. HACCP can be applied in the food production chain, starting from the main producers of food raw materials (agriculture), handling, processing, distribution, and marketing to consumers. Therefore, to overcome the problem of food safety, it is necessary to apply the HACCP system in the home industry. Like HACCP that we have applied to Cu mom crispy chicken.

Alin and Siddika (2014), have researched HACCP, the design of a food safety system for Fried Chicken plants on HACCP system. To decrease of food born diseases and long time health complications by unsafe meat products due to pathogens, and chemical and physical contaminants from Fried Chicken production, this research implements HACCP by prerequisite program, hazards, critical control points, preventive measures, critical limits, monitoring procedures, and corrective actions. The production process of fried chicken is also analyzed scrupulously for this HACCP model. HACCP systems are assessing hazards and building control systems that focus on prevention rather than relying mostly on final product testing (BSN, 1998). If this system is carried out continuously, it will reduce dependence on traditional methods such as inspection and testing of the final product (Mortimore & Wallace, 2013). This study aims to identify the dangers associated with the production aspects (raw materials, packaging, and process) of Cu's Chicken Crispy food stalls and determine the CCP about making Cu's Chicken Crispy.

Material and Methods

Date and Place

The research was conducted in March-May 2022 at Cu's Chicken Crispy which is located at Jalan Foodcourt Gunung Anyar, Surabaya.

Method

This study used a survey method by following the entire process of making crispy chicken, from receiving raw materials to packaging the final product. This study conducted direct interviews with restaurant owners and made a direct visit to Cu's Chicken Crispy, located in Gunung Anyar Foodcourt.

Data analysis was carried out descriptively and qualitatively by analyzing the application of HACCP. HACCP analysis was carried out by following the 7 principles of the HACCP system recommended by the Indonesian National Standard (1998) issued by BSN, including:

1. Hazard analysis and prevention
2. Identification of Critical Control Points (CCP)
3. Set a critical limit (CP) for each CCP
4. Build a CCP monitoring system
5. Define corrective actions
6. Develop verification procedures
7. Establish recording procedures (documentation)

Hazard analysis is carried out by writing down all possible hazards in the raw materials and stages of the production process. The hazards that have been identified are then entered into a table containing the source of the hazard, the level of risk, and precautions. The degree of risk is determined based on the magnitude of the consequences and how often danger is likely to occur.

Each stage of the production process is analyzed taking into account the level of risk and based on the answers to questions from the IPP decision tree to determine which stage is the CCP or not.

Results and Discussion

This research was conducted at Cu's Crispy Chicken, which makes Crispy Chicken products. The ingredients needed to make the chicken crispy are chicken meat, water, and secret seasoning flour. Making crispy chicken begins with preparing the ingredients to be used. After that, the cleaned chicken meat is put in the secret seasoning flour. Then the cooking process until the crispy chicken is brownish yellow. After the cooking process, the crispy chicken is put in a styrofoam package. The crispy chicken that has been made, is served directly to customers in Gununganyar.

Analysis of hazards and risks in the cu's crispy chicken industry

Hazard identification and analysis includes the physical, chemical, and microbiological potential in raw materials and packaging used in the crispy chicken production process at Bu Cu's food stall. The analyzed ingredients are fresh chicken meat, secret seasoning flour, and water. The crispy chicken production process is carried out starting by preparing ingredients, salting chicken meat, making secret flour, chicken meat flour, cooking chicken meat, draining crispy chicken, and packing crispy chicken. Based on the analysis shows that a significant risk and danger is chicken meat, which should be stored in the vicinity or the refrigerator. The results of the hazard analysis can be seen in table 1.

Table 1. Hazard analysis, risk assessment, and meat control mechanisms

Material	Potential Hazards	Risk Assessment		Result	significant risks	Explanation / Reason / Evidence / Cause	Control Mechanism
		S	PO				
Raw Chicken Meat	Physical (P)	3	2	6	Not	Inappropriate conditions for storage and distribution Contamination in the environment or chemicals that are passed on to chickens from feed or sanitary chemicals	Approved suppliers
	Chemical (C)	3	2	6	Not		Providing quality animal feed and quality stores
	Biology (VP)	4	3	12	Yes	Poor storage	Has a good storage container with the recommended temperature
	Biologists (SP)	4	3	12	Yes	Poor storage	Has a good storage container with the recommended temperature
	Allergens (A)	4	3	12	Yes	Allergen ingredients	Allergen control and labeling programs
	Radiation (R)	1	1	1	Not	Very rare	Radiation tests NA
	Halal (H)	1	1	1	Not	-----	NA

The type of danger found in chicken raw materials is usually dust and dirt that pollutes the surrounding environment as well as salmonella. This danger can be controlled by isolating the storage of chickens from the surroundings and regulating the temperature at a low level. It is necessary to do this to avoid various physical, chemical, and microbiological contaminations. For

the packaging process using styrofoam is the main packaging. These packages are potentially contaminated with the toxicity of migrating styrofoam into the food because they are resolved by the product while it is still in high temperatures after the frying process. Choosing the right packaging and storing it in a clean and dry condition can prevent dust or other dirt from sticking to the packaging.

Analysis of prerequisite programs in cu's chicken crispy food stall industry

Prerequisite programs are programs and practices that are put in place to safeguard the sanitary environment and minimize risks that pose food safety hazards, or it can be defined Prerequisite programs are programs and practices implemented to address the role of the production environment in producing safe food products (Baş et al., 2006). Prerequisite programs in Cu's Chicken Crispy as shown in Table 2.

Table 2. Prerequisite program at cu's chicken crispy food stall

No	Prerequisite Programs	Yes/No
1	Personnel Hygiene (p)	Not
2	Pest Control (p)	Not
3	Foreign Materials Control Program (f)	Not
4	Facility Location (f)	Yes
5	Withdrawals and withdrawals (r)	Yes
6	Rework Management (r)	Not
7	Waste Management (w)	Yes
8	Equipment Design (e)	Not
9	Supplier Approval	Not
10	Transportation and Distribution Control (t)	Not
11	Cleaning and Sanitizing (c)	Yes
12	Allergen Control Program (a)	Not
13	Traceability (t)	Yes
14	Storage and Reception RM(s)	Yes
15	Calibration (c)	Not
16	Utilities (u)	Yes
17	Training (t)	Not
18	Maintenance (m)	Yes
19	Biological Hazard Control Program (b)	Not
20	Customer Communications (c)	Yes
21	Layout (l)	Yes
22	Chemical Control Program (c)	Not
23	Food Defense (f)	Yes

Table 2 shows the prerequisite program at Cu's Chicken Crispy Food Stall. The high degree of danger of raw materials can be caused by the absence of programs of personal hygiene, and biological and chemical control in the production process. Personal Hygiene is not because the owner at the Cu's Chicken Crispy does not use headgear, chef uniform, trousers, and safety shoes. On food security at food stalls, mothers are given styrofoam to protect food from environmental contaminants while traveling.

Critical Control Point (CCP) in the material and process production of cu's chicken crispy analysis

A Critical Control Point (CCP) is a point that must be properly controlled to ensure food safety. Critical Control Points can be determined after hazards at each stage of the process are identified at the hazard analysis stage. Any identified and significant hazards are classified as CCP or non-

CCP using the CCP determination chart. The insignificant dangers of hazard analysis need not proceed with CCP determination. Hazards that are not CCP will be analyzed and determined whether or not they fall under the Operational Pre-Requisite Program (OPRP). Established critical boundaries should not be violated to ensure that the CCP effectively controls biological, physical, and chemical hazards (Sutanto & Widiawan, 2017). The analyzed ingredients are chicken meat, water, and secret seasoning flour. Based on the analysis shows that a significant risk and danger is chicken meat, in which the ingredients are stored in the vicinity or refrigerator. Critical control point (CCP) results in the Raw Material Acceptance Process as shown in Table 3.

Table 3. Critical Control Points (CCP) in Raw Material of Cu's Chicken Crispy Analysis

Ingredient Name	Potential Hazards	Risk Assessment		Entire	Significant risk	Explanation / Reason / Evidence / Cause	Control Mechanism	Question 1*	Question 2*	Question 3*	Question 4*	PRP/OPRP (SPPs) or CCPs
		S	PO									
Chicken meat	Physical (P)	3	2	6	Not	Inappropriate conditions for storage and distribution	Approved suppliers and screeners	Y	Y	-	-	CCP
	Chemistry (C)	3	2	5	Not	Contamination in the environment or chemicals that are passed on to chickens from feed or sanitary chemicals	Providing quality animal feed and quality stores	Y	N	N	-	OPRP
	Biology (VP/SP)	4	3	7	Yes	Poor storage	Has a good storage container with the recommended temperature	Y	Y	-	-	CCP

Note:

- Q1* : Do they have a measure of control in this step for the identified hazards and controls on this step that are necessary for food safety?
- Q2* : Does this step eliminate or reduce the possibility of harm occurring to an acceptable level?
- Q3* : Can the identified contamination occur beyond unacceptable levels?
- Q4* : Will the next step eliminate the identified hazards or reduce the probability of occurrence to an acceptable level?

Table 3 shows the determination of CCP on raw materials. The raw material belonging to the Category Of CCP is chicken meat. In chicken meat, potential physical and chemical hazards can be caused by conditions unsuitable for the storage and distribution of raw materials, while biological hazards can occur due to the growth of fungi and bacteria due to storage temperatures of less than 5°C. This suggests that chicken meat has a significant potential danger in the production process.

At this stage of the pia manufacturing process, there are several kinds of physical, chemical, and biological hazards found. Determination of CCP at the production process stage is important

to determine critical points so that control efforts can be made to reduce potential hazards. Critical control points (CCP) in the Production Process as shown in Table 4.

Table 4. Critical Control Points (CCP) in the production process of cu's chicken crispy analysis

Process Name	Potential Hazards	Risk Assessment		Entire	Significant risk	Explanation / Reason / Evidence / Cause	Control Mechanism	Question 1*	Question 2*	Question 3*	Question 4*	PRP/OPRP (SPPs) or CCPs
		S	PO									
Marination	Physical (P)	2	2	4	Not	Improper storage of raw materials	Proper storage of raw materials	Y	N	N	-	OPRP
	Chemistry (C)	2	3	5	Not	Contaminated by the surrounding environment	It is better to keep	Y	Y	-	-	CCP
	Biology (VP/SP)	3	3	6	Not	Contaminated by the surrounding environment	It is better to keep	Y	N	N	-	OPRP
Layering	Physical (P)	2	2	4	Not	Contaminated by the surrounding environment	It is better to keep	Y	N	N	-	OPRP
	Chemistry (C)	2	3	5	Not	-	NA	N	-	-	-	PRP
	Biology (VP/SP)	2	2	4	Not	The use of unhygienic tools	Clean the appliance before use	Y	N	N	-	OPRP
Frying	Physical (P)	3	4	7	Yes	Contaminated by the surrounding environment	Clean the appliance before use	Y	N	N	-	CCP
	Chemistry (C)	2	2	4	Not	-	NA	N	-	-	-	PRP
	Biology (VP/SP)	2	2	4	Not	-	NA	N	-	-	-	PRP
Drying	Physical (P)	2	3	5	Not	Contaminated by the surrounding environment	Clean the appliance before use	Y	Y	-	-	OPRP
	Chemistry (C)	2	2	4	Not	-	NA	N	-	-	-	PRP
	Biology (VP/SP)	2	2	4	Not	-	NA	N	-	-	-	PRP

To be continued...

	Physical (P)	3	1	4	Not	Contaminated by packaging	NA	Y	N	N	-	OPRP
Packaging	Chemistry (C)	3	3	6	Not	Impurities and residues during manufacture	Determine the quality of plastic	N	-	-	-	CCP
	Biology (VP/SP)	1	1	2	Not	-	NA	N	-	-	-	PRP

Note:

Q1* : Do they have a measure of control in this step for the identified hazards and controls on this step that are necessary for food safety?

Q2* : Does this step eliminate or reduce the possibility of harm occurring to an acceptable level?

Q3* : Can the identified contamination occur beyond unacceptable levels?

Q4* : Will the next step eliminate the identified hazards or reduce the probability of occurrence to an acceptable level?

Table 4 shows the determination of CCP at the stage of the production process that has potential hazard hazards that may arise during the process, including physical, chemical, and biological hazards. Some of the stages of the production process that fall into the CCP category are marinating, frying, and packaging. In marination, potential biological and chemical hazards are caused by the presence of toxins of pathogenic bacteria produced by fungi in food raw materials. While the potential physical hazard at the marination stage is caused by the presence of gravel, dirt, dust, etc. at the frying stage, it can be classified as CCP because this process is specifically designed to reduce the potential hazards contained in the dough using product maturation through heating. In the packaging process, the potential dangers found are in the form of bacterial contamination and dirt that cannot be removed/reduced in the next process, because this process is the final stage of the production process. Other stages of the production process are not included in the CCP, since they can be minimized, so the dangers that can be caused are not very significant

Conclusion

Based on research, was obtained from various aspects of making Cu's Chicken Crispy (raw materials, production processes, and packaging) in Cu's Chicken Crispy food stall. Three types of potential hazards in physical, chemical, and biological terms in HACCP (Hazard Analysis and Critical Control Points). The analysis showed that the danger in the raw material is chicken meat. Then, in the prerequisite program, it can be seen that Cu's Chicken Crispy does not have control mechanisms for personal hygiene, pest regulation, rework management, allergen control programs, equipment design, calibration, training, biological hazard control programs, chemical control programs and transportation and distribution control. Whereas in the production process, there are several necessary stages for the CCP category: marinating, frying, and packaging. Cu's Chicken Crispy food stall industry must control the mechanisms of personal hygiene and biological and chemical programs in the production process of Cu's Chicken Crispy. So that the process of receiving raw materials for the manufacture of products does not harm consumers.

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