



PE-002

## ANALYSIS OF HAZARD ANALYTICAL CRITICAL CONTROL POINT AT THE SHRIMP CRACKERS INDUSTRY UD DUA PUTRA

Erwan Adi Saputro<sup>1)\*</sup>, AR Yelvia Sunarti<sup>1)</sup>, Wahyu Firdansyah<sup>1)</sup>, and Izaaz Daffa Ulhaq<sup>1)</sup>

<sup>1)</sup>Department of Chemical Engineering, Pembangunan Nasional “Veteran” Jawa Timur University  
Jalan Raya Rungkut Madya No.1, Gunung Anyar, Surabaya 60294 Indonesia

\*Corresponding Author: ar.yelvia.tk@upnjatim.ac.id

### Abstract

*Sidoarjo is city coast in East Java where one of the product superior his is shrimp . one utilization abundance production prawns in sidoarjo is with made into prawn crackers . For guard quality and safety product need there is an analysis about security food and danger during the. Collected data are primary data and secondary data . Primary data in the form of on -site observation and observation research . This primary data in the form of SOP analysis and also hazard analysis in the form of CCP. For secondary data obtained from studies literature Type danger in production process there are 3 namely biology , physics , and biology . In Produc-tion process shrimp crisp shrimp this There are 3 processes included in CCP , namely the dry-ing process , the formation of kneading , and cutting processes . Things that can upgraded is cleanliness employee as well as care equipment. The purpose of this research is to develop small business products so that they can compete in the industrial world which increasingly demands product hygiene and safety*

**Keywords:** Shrimp, HACCP, Industry, Hygiene, Safety

### INTRODUCTION

In development and the era of globalization , society sued for follow play a role by active in it , so that you can implement government programs, one from so much many government programs among other things, sufficient needs food people. For that, the Indonesian nation must could self-sufficient to fulfill it.

Food securities is the main and most important requirements from all existing food quality parameters. The moment when consumer realize that food quality, specifically food security could only be guaranteed with the results of product testing in laboratory. They be-lieve that safe product could only be obtained from raw ingredients that is handled well, aswell as being processed and distributed with good will. ( Ministry of Industry, 2010).

To produce a safe food that could be consumed , it is necessary to use standards for food security (National Standardization Agency, 1998). The standard system for food security is the Hazard Analysis and Critical

Control Point (HACCP). HACCP is a system used to evalu-ate danger and determine the system control that is focused on prevention. HACCP applies to all processing chain on food production (Taheer, 2005). Program requirements base is the method to produce good food (Good Manufacturing Practice, GMP) or practice good hygiene ( Good Hygiene Practice, GHP) that is obeyed by all perpetrator of food business, which has a good reputation for ensuring that food provided to consumers is healthy and safe (Prasetyo, 2000). Quality management system is working as a framework or the reference in every pro-cess activities that is managed, including HACCP system ( Nurmawati , 2012).

Shrimp cracker is one of the typical food souvenirs from Sidoarjo and one of the popu-lar food for tourists. Because of that, it's necessary to apply HACCP in its production process. With applied HACCP, it is expected that the resulting product could be more safe and in a bet-ter quality, so it could increase the marketing power of the product

in both the domestic and international or foreign markets.

Based on background, the role of HACCP is very important in the production shrimp crackers at UD Dua Putra, so that they could obtain high quality products and could be consumed safely by all customers.

This study aims to analyze the HACCP system that is applied in the production of shrimp cracker at UD Dua Putra, as well as comparing them to the standards, to determine the CCP for the process from start to finish, and to obtain some suggestion that could be used to develop small business products so that they can compete in the industrial world which increasingly demands product hygiene and safety.

### METHODOLOGY

First stage in this activity is a site survey to know the production process, conditions of operation and layout of the factory to get easier insight before identifying problems to be analyzed. And this survey will make it easy formulate problem for research that will be conducted.

Second stage in this study is collecting data. Collected data are primary data and secondary data. Primary data is in the form of on-site observation and research. This primary data in the form of SOP analysis and also hazard analysis in the form of CCP. Secondary data is obtained from literature that is in the form of product description and also the description of the production process.

Third stage is data processing to identify SSOP, GMP, and HACCP analysis. For HACCP analysis includes description product identification plan use, making flow chart, confirming the flowchart with the factory, hazard identification, CCP determination, CCP identification at each TTK (CCP), and finally suggestions for the factory based on the analysis so that it could produce a better product.

## RESULT DISCUSSION

Table 1 Description Product Shrimp

Specification	Information
Product Name	Shrimp crisp Shrimp Two Sons
Raw Material	Flour and Shrimp
Processing	With drying process
Type Packaging	Plastic
Characteristics product	Physical : Solid , Net 500gr, 1kg, 2kg
	Chemical:-
	Biology :-
Storage Time	3-4 Months
Use Product	Fried more formerly
Consumer	All Age

Table 2 Implementation of SOPs in UD Dua Putra

No	SOP Aspect	Inapropriate
1	Water Availability	Need existence water source again other than well water
2	Prevention Contamination	There is potential contamination from air because too much ventilation open
3	Cleanliness Worker	Workers who don't use sarong hand during the formation process batter
4	Condition Storage	Condition room storage batter before the packaging process is too open
6	Labeling	Not be included his date expired in packaging
7	Pest Control	Not there is obstructions in ventilation and pipelines for prevent enter his mice and insects

Table 3 Identification of GMP at UD Dua Putra

No	GMP Aspect	Deviation	Category
1	Location	The place Production close by with Street raya	Minor
2	Building	Ventilation no there is barrier so that insect can enter with easy	Major

3	Sanitation	Poor toilet conditions well-groomed	Serious
4	Employee	Employee no use sarong hand moment shape batter	Serious
5	Labeling	Not existence date expired on the packaging	Minor
6	Storage	The place storage ingredients and dough before packaging too open	Major
7	Maintenance tool	Many tools have been old and rusty	Major

Description :

Minor : Less deviation rate serious and not cause risk to security quality food product

Major : The degree of deviation that can be cause risk to quality security product

Serious : The degree of deviation is serious and can be cause risk to quality security product food and soon follow up

Based on Table 3, it can be seen that still there is a number of assessed aspects of GMP have de-variation serious that can cause risk to quality security product food . Aspect the covers facility sanitation, employees and labels or description product. Repair to condition third aspect the need quick followed up. An observation is done on the food safety management in the factory with Hazard Analysis and Critical Control Process (HACCP) with the analysis result:

### 1. Identification of Planned Consumers

The consumer of the cracker product usually comes from all kind of people in society, from the young to the olds. But this product might not be suitable for babies under 2/3 years old as it might be too hard for them to take a bite.

### 2. Flow-chart

A flow-chart that is made based on the observation during the cracker production process could be seen on the Operation Process Chart (OPC) that could be seen in the figure below:

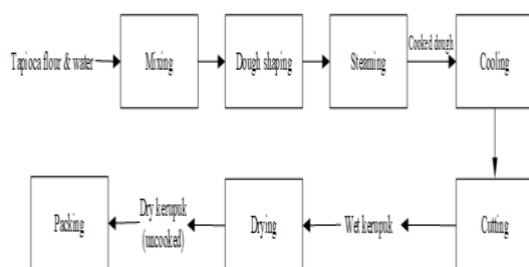


Figure 1. Flow chart of Cracker Production

### 3. Flow chart confirmation on-site

The flow-chart went thru a confirmation process on the factory as the worker confirmed the flow-chart made with the real production process.

### 4. Hazard Identification and Critical Control Point

A hazard identification was done to get an illustration on the hazard potential during the pro-duction process. Based on the hazard and critical control points in the production of cracker, then the critical limit to prevent biological, physical and chemical hazards on the food produc-tion process is gathered. The information is gathered from interviews and a few literatures as seen on the figure below:

Process Name	Potential Hazards	Risk Assessment		Total	Significant Rank	Explanation / Reason / Evidence / Cause	Control Mechanisms	Q1	Q2	Q3	Q4	PRP / OPRP (SPP) or CCP
		Severity (S)	Probability of Occurrence (PO)									
Mixing	Physical (P)	2	2	4	no	Foreign object from the outside mixer	periodically Check the mixing process.	yes	yes	no	yes	PRP
	Chemical (C)	2	3	6	no	Rust from the mixer	Check and maintains the mixer periodically	yes	yes	no	yes	PRP
	Biological (VP/SP)	2	2	4	no	Microorganism from the tools used and from the environment.	Clean the tools before we use it and make sure the environment is hygiene.	yes	yes	no	yes	PRP
Dough Shaping	Physical (P)	2	2	4	no	Foreign object that may enter the dough	Check the dough carefully	yes	yes	no	yes	PRP
	Chemical (C)	2	1	3	no	Rarely occur because the shaping is done by hand	Wash hand before shaping process	yes	yes	no	yes	PRP
Steaming	Biological (VP/SP)	3	4	12	yes	Microorganism from the employee hands	Wash hand before the process carefully	yes	yes	no	yes	PRP
	Physical (P)	2	2	4	no	Foreign object outside the steamer	Make sure the dough is clean before enter the steamer	yes	yes	no	yes	PRP
	Chemical (C)	2	2	4	no	Rise or increase in temperature during the steaming process	Check the steamer condition periodically	yes	yes	no	yes	CCP
Cooling	Biological (VP/SP)	2	3	6	yes	Microorganism and pathogen still survive after the steaming process.	Make sure the steaming temperature can kill the pathogen and microorganism	yes	yes	no	yes	PRP
	Physical (P)	2	3	6	no	Foreign object from the environment	Make sure the nearby environment is clean	yes	yes	no	yes	PRP
	Chemical (C)	2	1	2	no	Rarely occur	Make sure the nearby environment is clean	Yes	yes	no	yes	PRP
Cutting	Biological (VP/SP)	3	3	9	yes	Pathogen and microorganism contamination from the nearby environment	Make sure the nearby environment is clean	yes	yes	no	yes	PRP
	Physical (P)	1	2	2	No	Not being careful when using the tools	Being more careful when using the tools.	Yes	Yes	No	No	PRP
	Chemical (C)	3	1	3	No	Very rare to occur but a possibility of rust on tools	Checking the quality of the tools before using them	Yes	Yes	Yes	Yes	PRP
Drying	Biological (VP/SP)	3	1	3	No	Pathogens and other microorganisms that might possibly be contained in the tools used	Sterilizing the tools before using it.	Yes	Yes	Yes	Yes	PRP
	Physical (P)	1	2	2	No	Foreign matters aswell as dust	Checking the hygiene of the product before packaging	Yes	Yes	No	No	OPRP
	Chemical (C)	2	3	6	No	Critical moisture, enzymatic activity	Quality checking before packaging and keeping the environment clean	Yes	Yes	Yes	No	CCP
Drying	Biological (VP/SP)	2	2	4	No	Pathogens and other microorganisms, poor personnel hygiene	Quality checking before packaging and keeping the environment clean	Yes	Yes	Yes	Yes	PRP

Packaging process	Physical (P)	1	1	1	No	Very rare to occur	N/A	N/A	N/A	N/A
	Chemical (C)	2	3	6	No	Possible melting on the plastic of the package	Choosing the right quality of plastic for the package as well as quality check	Yes	Yes	Yes
	Biological (VP/SP)	2	2	4	No	Pathogens and other microorganisms, poor personnel hygiene	Quality checking and keeping the environment clean as well as the personnel hygiene	Yes	Yes	Yes

Based on the CCP identification or Hazard Identification, we could see that there are 3 main process that has CCP which is: steaming process, drying process and packaging process and here are the explanation:

a. Steaming process

This process have a decent amount of hazard potential as it is connected to heat-ing the product and could possibly have a potential of risk in temperature that could ruin the structure of the product itself. Other than that, it is possible for the product to be contaminated by things from outside of the steamer or inside the steamer. In this process, it is necessary, like all process, to have a high level of hygiene aswell as re-checking the condition of the steamer before using it.

b. Drying process

This process have a decent amount of hazard potential cause it is done outside and under the sunlight. While it is not possible to have all the potential risk con-trolled or removed during this process cause it is done outside a sterile enviro-nment, thus there might be a possible contamination from microorganisms in the open enviro-nment. In this process, it is necessary to have a high level of hygiene and keeping the enviro-nment clean, especially around the area that will be used for the drying process of the product.

c. Packaging process

This process have a relatively medium to high amount of hazard potential cause the packaging process is usually done with plastic and it is usually burned to close the package. Thus, it could possibly melt the plastic used and contaminate the product, making it inconsumable. It is necessary to be careful during this process and also having a high level of hygiene to prevent any other kind of contamina-tion.

Based on the study, these are the recommendation to improve the food safety man-agement in UD Dua Putra:

- a. Improving the worker’s hygiene  
Employees should use head coverings to protect the product from

hair, aswell as using masks and gloves to protect the product from unwanted bacterial contami-nation.

b. Improving the storage places for ingredients

To have a more hygiene product, it could be considered to add racks or shelves on the storage for a specific ingredients so it doesn’t mix up with other ingredients.

c. Improvement on the tools used for the product

It could be more convenient and safe to have a more modern way of packaging the product instead of using candles to close the plastic of the package, as it could prevent melting of the plastic and make sure the safety of the product.

### CONCLUSION

HACCP is a very useful for commercial business tool that be used for improving the quality of food product; ensure safety of food products and reduce the risk of food poisoning. It is an internationally recognized methodology for preventing food safety hazards. HACCP uses a system of monitoring Critical Control Points (CCPs) at steps in a food production pro-cess where a potential critical hazard to food safety has been identified. Based on field obser-vations and interviews with the staffs at UD Dua Putra, it was found that: (a) The overall process of food processing at UD Dua Putra has reached the minimum standards according to the Hazard Analysis Critical Control Point (HACCP). There-fore, all food produced at UD Dua Putra has been guaranteed the safety and health of the food that will be distributed and (b) Determination of critical control points has been done correctly with a systematic approach using a decision tree. UD Dua Putra determines 3 Critical Control Points (CCP) for the process from start to finish, namely: steaming process, drying process and packaging process.

### REFERENCES

1. Badan Standarisasi Nasional. (1998). Sistem Analisa Bahaya dan Pengendalian Titik Kritis (HACCP) Serta Pedoman

- Penerapannya. Standar Nasional Indonesia. SNI 01-4852-1998.
2. Bauman. (1994). The origin and concept of HACCP. London: Chapman & Hall.
  3. Cartwright. (2010) Hazard Analysis Critical Control Point (HACCP) Sebagai Model Kendali Dan Penjaminan Mutu Produksi Pangan. Invotec, Volume VI No. 17.
  4. Cusato. (2012). Implementation of Hazard Analysis and Critical Control Points System in the Food Industry: Impact on Safety and the Environment. Novel Technologies in Food Science: Their Impact on Products, Consumer Trends and the Environment. DOI: 10.1007/978-1-4419-7880-6\_2.
  5. Kementrian Perindustrian RI. 2010. Peraturan Menteri Perindustrian Republik Indonesia Ten-tang Pedoman Cara Produksi Pangan Olahan yang Baik (Good Manufacturing Practic-es). 75/M-IND/PER/7/2012.
  6. Nurmawati. (2012). Proses Pembentukan Pola Perilaku Kerja Karyawan PT. Indopherin Jaya Melalui Budaya Organisasi 5S (Studi Kasus Pada Karyawan PT. Indopherin Jaya, Kota Probolinggo). Brawijaya University Thesis.
  7. Pramesti, N. 2013. Analisis Persyaratan Dasar dan Konsep Hazard Analysis Critical Control Point (HACCP) dengan Rekomendasi Perancangan Ulang Tata Letak Fasilitas (Studi Kasus: KUD DAU Malang). Brawijaya University Thesis.
  8. Prasetyo, A.T. (2000). Implementasi GMP dan HACCP dalam Menunjang Quality Assurance Industri Pangan. Malang: Universitas Brawijaya
  9. Sonaru, A.C. (2014). Analisa Ketidaksesuaian Persyaratan Cara Produksi Pangan yang Baik Untuk Industri Rumah Tangga (CPP-IRT) Untuk Meminimasi Kontaminasi Produk Roti (Studi Kasus: Perusahaan X). Brawijaya University Thesis.
  10. Thaheer, H. (2005). Sistem Manajemen HACCP (Hazar Analysis Critical Control Points). Ja-karta: PT. Bumi Aksara.