

Pendekatan Analisis HACCP pada UMKM “Singkong Keju Alvano” Sidoarjo

HACCP Approach for “Singkong Keju Alvano” for Medium Enterprises in Sidoarjo

Shafira Sarah Adzra¹, Wahyu Bitu Pradana¹, Nadira Ismiyatul Finani², Ardika Nurmawati¹, Andre Yusuf Trisnaputra², Erwan Adi Saputro^{1,3} and AR Yelvia Sunarti^{1*},

¹ Department of Chemical Engineering, Faculty of Engineering, Universitas Pembangunan Nasional “Veteran” Jawa Timur, Surabaya 60294, Indonesia

² Department of Food Technology, Faculty of Engineering, Universitas Pembangunan Nasional “Veteran” Jawa Timur, Surabaya 60294, Indonesia

³ Departement of Environmental Science

ABSTRAK

Sidoarjo merupakan salah satu kota di Indonesia yang memiliki banyak sentra industri makanan ringan. Untuk menjamin keamanan dan mutu pangan, diperlukan analisis untuk mencegah dan menangani bahaya selama proses produksi. Singkong merupakan bahan pangan yang kaya akan karbohidrat dan nutrisi yang baik bagi tubuh. Singkong dapat diperoleh dengan mudah. Makanan olahan seperti singkong keju dibuat dari singkong yang telah dikupas kemudian dipotong-potong sesuai ukuran yang diinginkan. Setelah itu singkong direndam dalam air garam dan bawang putih lalu digoreng dalam minyak panas. Setelah digoreng, kemudian singkong keju ditiriskan agar tidak banyak mengandung minyak goreng. Setelah itu singkong dapat diberi topping sebagai varian rasa dan siap dikonsumsi oleh konsumen. Penelitian ini dilakukan untuk meminimalisir bahaya yang terjadi selama proses produksi Singkong Keju (makanan tradisional) dengan memberikan rekomendasi berupa penggunaan sistem Hazard Analysis Critical Control Point (HACCP). Berdasarkan hasil penelitian, diperoleh tiga hasil yang memiliki CCP, yaitu sarana sanitasi, higiene karyawan, dan label atau informasi produk. Higiene personal (pekerja) dan sanitasi (tempat produksi) sangat penting untuk menjamin mutu suatu produk pangan yang baik.

KATA KUNCI

Keamanan Pangan, UMKM, Singkong Keju, HACCP

ABSTRACT

Sidoarjo is one of the few cities in Indonesia that has many snack food industry centers. To guarantee food safety and quality, analysis is needed to prevent and handle hazards during the production process. Cassava is a food that is rich in carbohydrates and nutrients that are good for the body. Cassava can be obtained easily. Processed foods such as cheese cassava are made from cassava that has been peeled and then cut into desired sizes. After that the cassava is soaked in salt water and garlic and then fried in hot oil. After frying, then the cheese cassava is drained so that it doesn't contain a lot of cooking oil. After that cassava can be topped as a variant of taste and ready to be consumed by consumers. This study was conducted to minimize the hazards that occur during the production process of Cassava Cheese (a traditional food) by providing recommendations in the form of using the Hazard Analysis Critical Control Point (HACCP) system. Based on the research, three results were obtained that had CCP, namely sanitation facilities, employee hygiene, and product labels or information. Personal hygiene (workers) and sanitation (production sites) are very important to ensure the good quality of a food product.

KEYWORDS

Food Safety, MSMEs, Cassava Cheese, HACCP

1. INTRODUCTION

Safety Food (food safety) is defined as the condition of safe food for Consumed. Safety Food is broadly classified into 2, which is safe and physically safe. Spiritually safe is related to lawfulness, and physically safe includes food that is free from biological hazards or microorganisms dangerous, free of physical contamination and free of chemical contamination. A food can be said to be safe and of high quality if it has minimal risk or is free from the dangers of food contamination. The word free in this case does not always mean equal to zero or nothing. However, some of the causes of these contaminated materials cannot be completely eliminated, but some food management procedures that are still not good can be minimized through various studies and assessments on a national to international scale by setting standards or maximum limits for the existence of each of these materials. these materials (Lukman, 2015). The use of a food safety quality control system has certain objectives and stages, because HACCP (Hazard Analysis Critical Control Point) can be a guarantee in the safety of a product. Hazard Analysis Critical Control Point (HACCP) is a management system used to protect food or beverage products from biological, physical, or chemical hazards that is applied as an effort to prevent hazards that may occur. HACCP is also known as hazard analysis and critical control points. excluding responses to the development of potentially hazardous situations. Hazard Analysis and Critical Control Points (HACCP) has the aim of preventing and minimizing the risk of hazards that occur by implementing food safety control measures at every important process stage in the food industry. Hazard and risk are closely related, but have differences. Danger is something that has the potential to cause loss, while risk is the level of possibility of loss (Dewi, 2017).

The concept of the HACCP system as a guarantor of food safety for the first time developed by three institutions, namely food processing company Pillsbury Company in cooperation with NASA (The National Aeronautics and Space Administration) and U.S. Army's Research, Development and Engineering Center at decade of the 1960s in order to ensure the supply of food supplies for The astronauts. Concept It was originally developed with a mission to produce a product food with criteria that are free from pathogenic bacteria that can cause the presence of poisoning or free from other bacteria and also known as "zero-defects" program (HOBBS, 1991). HACCP is a supervisory and control management system preventive food safety that is scientific, rational and systematic with the aim of identifying, monitoring and controlling hazards(hazard) starting from raw materials, during the production / processing process, manufacturing, Handling and use of foodstuffs to ensure that foodstuffs It is safe when consumed. There are many possible hazards that can contaminate food. This can occur due to the presence of pathogenic bacteria, viruses and parasites which can pose a biological risk, the use of chemicals such as pesticides can also make food unsafe for consumption. Judging from the environment where food is produced, the presence of impurities such as dust has the potential to contaminate food. Therefore, a food business needs to implement procedures and controls that can minimize the risks posed by these food safety threats. A food safety management system based on the principles of hazard analysis and critical control points (HACCP) can be used to help businesses identify and control potential food safety hazards that will occur. Many other countries have used this system of legal requirements to guarantee food quality. Therefore, it is necessary to have a good understanding of the principles of food safety management for all food business people or food safety professionals (Ferris, 2022).

Cheese cassava is a food made from cassava or cassava telo in Javanese, which is processed using spices mixed with cheese with several flavors. Quality raw materials mixed with special seasoning, making cassava can be transformed into several products preparations that are quite classy and have a higher selling value than freshly boiled or fried. The Components of products are Cassava, Cheese, Garlic, Water and Oil. The purpose of using cheese cassava as a snack. especially consumers reach all groups ranging from small children to the elderly can consume it. however, if consumed in excess it will cause goiter due to lack of iodine and cause cholesterol because it is fried in oil that has been used many times. The process productines are start from preparation which is purchase the ingredients and doing a checking. If the cassava is good, the next steps are prepare the cassava. Peel the cassava and wash, then cut the cassava. Then, Boil the cassava until it soft. Drain the cassava and soak in cool water for 30 minutes. Marinated the cassava with a grind garlic and salt. Fry the cassava until it cracks dry surface. Then add a seasoning into the cassava like giving some cheese, matcha sauce, red velvet sauce, balado sauce and the others. This business is located on Jl. Monumen Utara No.17, Lemahasin, Kec. Gedangan, Kabupaten Sidoarjo, Jawa Timur 61254 (Beside of Monumen Patung Gedangan). The purpose of research and preparation of this paper is to analyze the Hazard Analysis Critical Control Point (HACCP) system. (HACCP) in the production of "Singkong Keju Alvano" which is a small and medium enterprise.

2. Material and Methods

The first is a literature study where Singkong Keju Alvano is processed cassava served with various toppings and flavors. The second is the observation of cassava cheese products located in Jl. Monumen Utara No.17, Lemahasin, Kec. Gedangan, Kabupaten Sidoarjo, Jawa Timur 61254 (Beside of Monumen Patung Gedangan). The purpose of this observation is to see how the production process of Singkong Keju Alvano. The third is an interview conducted with the seller, in which the cassava to be fried has previously been prepared from home so that at the point of sale they only need to fry.

In this study, Singkong Keju Alvano business was analyzed using HACCP which was divided into 2 stages. These stages are hazard analysis and implementation of HACCP :

1. Formation of the HACCP team, involving internal and external parties. The team formed must have an understanding of the theory of food safety, the principles and main roles of HACCP, and the use of HACCP in the production process. Therefore, training is needed for the HACCP team on HACCP implementation and HACCP inspection.
2. Product details with certain properties or characteristics. It is necessary to identify the hazards that may occur and must be adjusted to regulations or laws related to applicable food safety requirements. Identification can be carried out at the time of receipt of raw materials until the process of processing the materials into products that are ready for consumption.
3. Information on the use of products for the benefit of the distribution process. This aims to provide information about people who are allowed or not allowed to consume these products, as well as provide information about possible risks that arise when consuming these products.
4. Flowchart verification. This can be done by direct observation of the production process, coordination and testing of product samples to prove the correctness of the flow chart. If there are discrepancies, the flowchart will be corrected. If the flowchart is appropriate, flowchart documentation and verification is carried out.

3. Results and Discussion

The ingredients needed to make Singkong Keju Alvano consist of cassava, cheese, garlic, water and oil and various flavors.

Table 1. Product description

Spesification	Descriptions
Product name	Singkong Keju Alvano
Raw materials	Cassava
Process	Deep-fried
Packaging Type	Paper box
Product Characteristics	Fried cassava is flavorful, savory, and soft inside yet crispy surface
Shelf Life	24 hours
Consumer	Children to the elderly people

The following is the production process of Singkong Keju Alvano until it can be sold to consumers. The first stage begins with the selection of cassava to be peeled and cut to the same size. Then it will be marinated with salt and garlic. Then soaking with cold water so that the savory taste is absorbed. After that, cold Singkong Keju Alvano can be stored in a cooler before deep frying. Cassava will be fried when there are consumers who will buy, this is done in order to maintain the taste of the banana and also prevent bacterial contamination. If there are consumers who will buy, then Singkong Keju Alvano from the cooler will be fried until browned and then given a flavor variant on top. Then Cassava are ready for consumers.

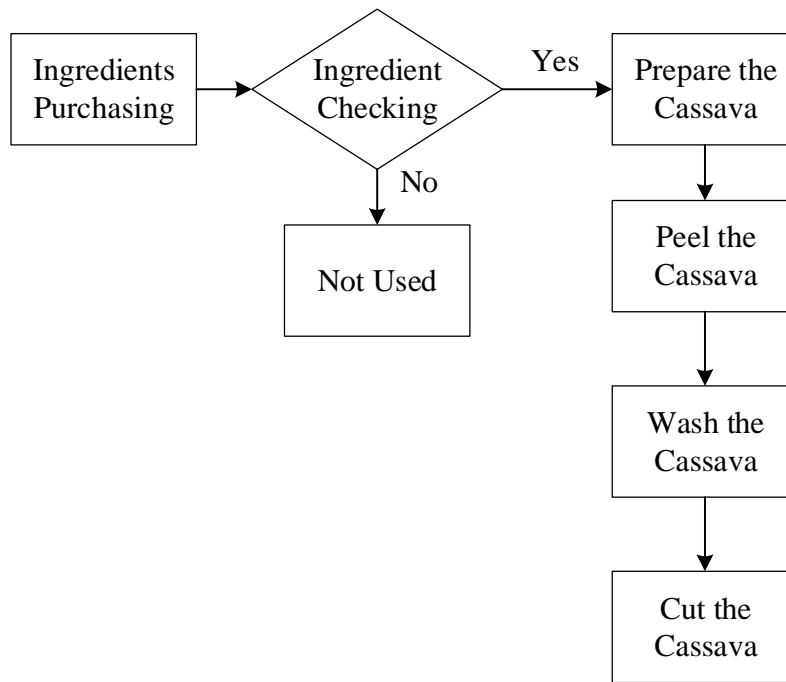


Figure 1. Draw A Flow Diagram to Describe the Process Preparation Steps

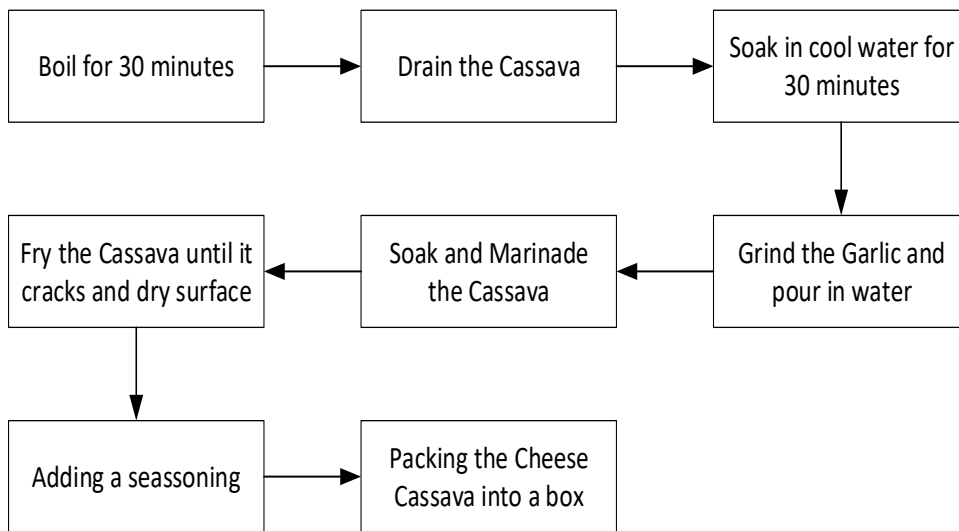


Figure 2. Draw A Flow Diagram to Describe the Process Cooking Steps

There are several aspects of GMP that are considered to have deviations that can pose a risk to the safety of food products. These aspects include sanitation facilities, employees, and labeling or product information. Improvement of the condition of these three aspects needs to be followed up immediately. For this reason, observations were made on the implementation of compliance with food safety standards, using the Hazard Analysis and Critical Control Process (HACCP) method. The development that can be done here is by storing the product at the appropriate temperature in the refrigerator so that the product is still fresh to the consumer's hand. Another thing that can be done is the placement of sales and packaging that must be kept clean. When viewed in terms of employees, employee hygiene must also be considered, employees must wash their hands frequently and when they want to produce they must use gloves and steril container.

Analysis HACCP Singkong Keju Alvano

1. Ingridient

No	Ingredient name	Storage condition	Potential Hazard	Risk Assessment		Outcome	Significant risk	Explanation	Control mechanism
				Severity (S)	Probability (PO)				
1	Cassava	Ambient	Physical	1	2	2	NO	Inappropriate condition of raw material and storage	Perform sorting on ingredients before cooking
			Chemical	1	2	2	NO	The presence of parts affected by fertilizers or pesticides	Avoid by cleaning and washing
			Biological	2	4	8	YES	Bacillus, Xanthomonas campestris	Proper storage and cooking
			Allergen	1	1	1	NO	Doesn't contain allergen	Don't eat too much because it can cause obesity
			Radiation	1	1	1	NO	Not under radiation process	NA
			Halal	1	2	2	NO	Cassava is a halal raw material	NA
2	Onion	Ambient	Physical	2	3	6	YES	Inappropriate condition of raw material and storage	Perform sorting on ingredients before cooking
			Chemical	1	2	2	NO	The presence of parts affected by pesticides	Avoid by cleaning and washing
			Biological	2	4	8	YES	Bacillus	Proper storage and cooking
			Allergen	1	2	2	NO	Contain allergen	Don't eat too much because it can cause red rash
			Radiation	1	1	1	NO	Not under radiation process	NA
			Halal	1	2	2	NO	Onion is a halal raw material	NA
3	Oil	Ambient	Physical	1	2	2	NO	damage to oil packaging and storage	check the condition of the packaging

			Chemical	3	2	6	YES	contains saturated fatty acids if used several times	don't use oil many times
			Biological	1	2	2	NO	Metal contamination	Proper storage
			Allergen	1	1	1	NO	Doesn't contain allergen	Don't use too much because it can increase cholesterol levels
			Radiation	1	1	1	NO	Not under radiation process	NA
			Halal	1	2	2	NO	Oil is a halal raw material	NA

2. Product Contact

No	Ingredient name	Storage condition	Potential Hazard	Risk Assessment		Outcome	Significant risk	Explanation/ Reason/ Evidence/ Cause	Control mechanism
				Severity (S)	Probability (PO)				
1	Mica Plastic	Ambient	Physical	1	2	2	NO	Quality doesn't meet standards	Sorting
			Chemical	1	3	3	NO	Packaging material	Don't expose to high temperature
			Biological	1	2	2	NO	Bad Storage and distribution (dust and moldy)	Make sure it is dry and perform color checks

3. HACCP

No	Process name	Potential Hazard	Risk Assessment		Total	Significant risk	Explanation/ Reason/ Evidence/ Cause	Control mechanism	Q 1	Q 2	Q 3	Q 4	PRP/OPRP (SPP) or CCP
			Severity (S)	Probability (PO)									
1	Marination	Physical	1	2	2	NO	Unhygienic conditions of the processing site	Cleaning	N				PRP
		Chemical	1	2	2	NO	Too long marination process makes cassava taste change	Do it at a time that suits	N				PRP
		Biological	2	3	6	YES	Carried out in outdoor place	Make sure the marination process is carried out in a clean place	Y	N	N		PRP

2.	Frying	Physical	2	3	6	YES	Burnt and crumbling look (overcook)	Cooking with moderate temperature and sufficient oil	Y	N	N	PRP
		Chemical	2	2	4	NO	Overcook or cooking oil is not suitable for use anymore	Don't cooking with high temperature	N			PRP
		Biological	2	3	6	YES	Mold arises due to undercooked cooking	Cook with the appropriate temperature until the cassava turns into golden yellow color	Y	N	N	PRP

For process stages that are more or less capable of causing biological contamination to cause illness to consumers, they are given a high score for severity and probability so that a significant risk of high biological contamination will occur if the cassava is not cooked, the cooking is related to the step that uses heat to kill the microbes in the marinating process. taking place in an open area will also cause mold there is a possibility of micro contamination from fungi. The stages that give a high value at significant risk (high risk with a value of 12-25) are immediately considered CCP, from the two main stages in the cheese cassava processing process there are stages with medium significant risk to consumer health related to biological contamination from microbes and fungi. The diagrams below can help to analyze SPP/PRP/CCP and help fill in the fields above.

4. Conclusion

The process productines are start from preparation which is purchase the ingridients and doing a checking. If the cassava is good, the next steps are prepare the cassava. Peel the cassava and wash, then cut the cassava. Then, Boil the cassava until it soft. Drain the cassava and soak in cool water for 30 minutes. Marinated the cassava with a grind garlic and salt. Fry the cassava until it cracks dry surface. Then add a seasoning into the cassava like giving some cheese, matcha sauce, red velvet sauce, balado sauce and the others. Based on these results, three results were obtained that had CCP, namely sanitation facilities, employee hygiene, and product labels or information. Personal hygiene (workers) and sanitation (production sites) are very important to ensure the good quality of a food product

Acknowledgment

The author hopes that this research will be useful for cheese cassava umkm and the author would like to thank the small and medium industry "Singkong Keju Alvano" for their assistance during this research process..

DAFTAR PUSTAKA

Dewi (2017), 'Analysis the Application of Hazard Analysis Critical Control Point (HACCP) in The Oriflakes Production at PT Serelia Prima Nutrisia, Yogyakarta', *Agroindustrial Technology Journal*, 6(1).
 Lukman (2015), 'Keamanan pangan untuk semua', *Journal of Food Safety*, 4(1).
 Rauf, Rusdin (2013), *Food Sanitation and HACCP*, Yogyakarta. Graha Ilmu

Ferris (2022). Hazard analysis and critical control points (HACCP).

Pramesti, N. (2013). Analysis of basic requirements and Hazard Analysis Critical Control Point (HACCP) concepts with recommendations for facility layout redesign (Case study: KUD DAU Malang). Facility layout redesign (Case study: KUD DAU Malang). Thesis. Brawijaya University, Malang.

Prasetyo, A.T. (2000), Implementation of GMP and HACCP in Supporting quality assurance of the food industry. Thesis. University of Brawijaya University, Malang