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HAZARD ANALYSIS AND CRITICAL CONTROL POINTS IN HANDLING PATIN FILET AT KURNIA MITRA MAKMUR PURWAKARTA LTD, WEST JAVA

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Patin filet, Mycobiology, Organoleptic, Hazard Analysis Critical Control Point (HACCP)

ABSTRACT

This research aims to analyze hazards and determine critical control points in the process of handling patin filets at Kurnia Mitra Makmur Purwakarta Ltd, West Java. This research was conducted at Kurnia Mitra Makmur Purwakarta Ltd, West Java from July to November 2019. This research was conducted using the case study method. Research procedures include observing the path of the processing of patin filet, analysis of potential hazards, and identification of critical control points, microbiological testing, and organoleptic testing. The data obtained were analyzed descriptively. Possible hazards in the processing of patin filet in the form of biological, physical, and chemical hazards. The results of the hazard analysis obtained at the critical control point are at the stage of the washing process 2. The overall organoleptic test results of the raw material are categorized as acceptable. Microbiological test results on raw materials are 3.6 x 10^1 colonies / g and the final product of the catfish filet is 5.7 x 10^2 colonies / g. The results of the catfish filet microbiology still meet the quality standard that is under 1.0x10^5 colonies / g. Filet products can be accepted and accepted by the public.

Introduction

Potential fisheries Patin (Pangasius hypophthalmus) is one of the freshwater fish commodities that is determined as a national flagship commodity in the acceleration of industrialization programs. Patin has a delicious taste, is easy to cultivate, and has a high nutritional content (Khairuman and Sudenda 2009).

Patin can be used as industrial material by processing it into filet. The advantages of patin as filet include non-scaly, relatively little thorns, and reddish-white flesh and easily skinned so that it is relatively easy to make a good filet (Susanto and Amri 1999 in Aprilia-ana 2010).

The ban on patin filet imports causes threats and challenges regarding the competitiveness of domestic products, so processing companies in Indonesia need to apply food safety quality standards in order to improve product quality and have competitiveness. Processing companies need to apply GMP (Good Manufacturing Practices), SSOP (Sanitation Standard Operating Procedures), and HACCP (Hazard Analysis Critical Control Point) in the fisheries processing industry and are monitored continuously by the government so that products that are processed to have good food safety quality standards.

Research Methods

This research was conducted at Kurnia Mitra Makmur Purwakarta Ltd, West Java from July to November 2019. The method used in this research is the case study method. Case studies are research that emphasizes a deeper understanding of certain phenomena. Case studies are also useful in exploring problems that are not yet known about certain phenomena (Yona 2006). Retrieval of data through active participation and interviews. Active participation means participating in part or all of the activities directly in process flow in a production unit (Nento 2015). Interviews are a way of collecting data using question and answer unilaterally carried out systematically and based on research objectives (Marzuki 1986 in Nento 2015).

The research procedure was carried out by following the path of the process of processing the catfish filet, from receiving raw materials to filet products which were then analyzed the potential hazards and identification of critical control points, microbiological and organoleptic testing and comparing the results of microbiological testing with SNI 2332 in 2006 and 2015 and organoleptics with SNI 2729 of 2013 concerning fresh fish.

Result

No	Deskription	Information
1	Product name	Frozen Fresh Water Fish Fillet
2	Spesies name	Pangasius hypophthalmus
3	origin of raw materials	Aquaculture in Jatiluhur, Cijambe, Cikadu, Tulung Agung, Indramayu and Bogor
4	Receiving raw material	Raw material was receiving from supplier The temperature maintaine 5^0C
5	Finish Product	Frozen Fillet
6	Raw material	Main ingredients: catfish Auxiliary materials: water and ice
7	Processing step	Recieving, sorting, Weighing 1, removing belly fat, filleting, Washing 1, bowning, skinning, trimming, cutting, Weighing 2, Washing 2, Layyering, 1 Freezing 1, Glazing , Freezing 2, Final Weighing, packing and labeling, storing, Loading/ Staffing
8	Packaging	Patin filet is packed with 68 x 48 x 0.05 polyethylene plastic with a weight of 10 kg and then packed with a white master carton with a size of 55.2 x 35.3 x 10.8 cm which is used for dory portion products.
9	Packing type	- Inner package : Plastik polyethylene - Outer package :Master carton and plastic bag
10	Storage conditions	Storage in frozen cold storage central temperature min – 18^0C
11	Labeling	Production number, product name, quality, production date, supplier

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No	Deskription	Information
		name, GMP number, halal number
12	Shelf life	18 months in frozen condition
13	Storage instructions	Keep frozen at -18°C
14	Intended use	Cooked before consumtion
15	Intended costumer	General public

Physical, Biological and Chemical Hazard Analysis

Hazard analysis is the determination of hazard points that may exist in the food production process flow. Possible dangers in the process flow (Afrianto 2008). Hazard potential analysis is the process of gathering and reviewing information about potential hazards and the conditions that can cause them (Afrianto 2008). What is meant by potential biological hazards are a) Pathogenic bacteria (contamination, growth, resistance) along with the toxins it produces b) viruses c) fungi and mycotoxins d) protozoa. The potential chemical hazards are a) Pollutants (heavy metals) b) Toxic products (pesticides, acids, mineral oils, products that leak from the engine) c) Residues of veterinary medicines and pesticides. Whereas what is meant by potential physical danger are: a) Glass or metal fragments from machines or containers b) Foreign objects such as sand, gravel or pieces of wood c) hair, bones, or body parts of insects and other animals.

No	Process	Hazard potential	Hazard source	Prob (L/M/H)	Sev (L/M/H)	Sign (S/NS)	Preventive measure
1.	Recieving	biological	Contamination from workers, equipment and raw materials	L	H	NS	supervision of GMP and SSOP can still be carried out during the process of receiving raw materials
		Chemical	Water pollution from fish suppliers	L	M	NS	testing the levels of Cd, Hg, Sn, As, and Pb in an external laboratory every 3 months to ensure the fish received meet the standards
		Physical	Contamination from suppliers when harvesting fish and transportation	L	L	NS	supervision of GMP and SSOP can still be carried out during the process of receiving raw materials
2.	sorting	Biological	Contamination from workers and equipment	L	H	NS	supervision of GMP and SSOP can still be carried out during the process of receiving raw materials
3.	Weighing I	Biological	Contamination from workers and equipment	L	H	NS	supervision of GMP and SSOP can still be carried out during the weighing process
4.	removing belly fat	Biological	Contamination from workers and equipment	L	H	NS	the equipment used is always clean and sanitary, and the process of removing fat from the stomach is done quickly and carefully
5.	filleting	Biological	Contamination from workers and equipment	L	H	NS	supervision of GMP and SSOP can still be carried out during the process of filleting
6.	Washing 1	Biological	Contamination from workers and stagnant water	L	H	NS	supervision of GMP and SSOP can still be carried out during the process of washing 1
		Physical	Contamination from workers and stagnant water	M	H	S	It is better to wash in running water and replace water regularly
7.	bowning,	Biological	Contamination from	L	H	NS	maintain the temperature of the

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No	Process	Hazard potential	Hazard source	Prob (L/M/H)	Sev (L/M/H)	Sign (S/NS)	Preventive measure
	skinning, trimming, cutting		workers and equipment				fish, and use clean and sanitary tools at the stage of the tidying process
		Physical	The remaining results of tidying	L	L	NS	Control control with consistent application of SSOP
8.	Weighing II	Biological	Contamination from workers and equipment	L	H	NS	using clean and sanitary equipment.
9.	Washing II	Biological	Contamination from workers and stagnant water	L	H	NS	supervision of GMP and SSOP can still be carried out during the process of washing 2
		Physical	Contamination from workers and stagnant water	M	H	S	It is better to wash in running water and replace water regularly
10.	Layyering	Biological	Contamination from workers and equipment	L	H	NS	supervision of GMP and SSOP can still be carried out during the process of receiving raw materials
11.	Freezing I	Biological	Freezing temperatures below -35oC	L	M	NS	maintain the temperature of the cooling room at -35oC with monitoring of the cooling room temperature every hour
12.	*Glazing*	Biological	Contamination from workers and equipment	L	M	NS	supervision of GMP and SSOP can still be carried out during the process of glazing
		Physical	The process of removing layers on the product is not correct	L	M	NS	supervision of GMP and SSOP can still be carried out during the process of glazing
13.	Freezing II	Biological	Freezing temperatures below -35^{o}C	L	M	NS	supervision of GMP and SSOP can still be carried out during the process of freezing 2
14.	Penimbangan Akhir	Biological	Contamination from workers and equipment	L	M	NS	supervision of GMP and SSOP can still be carried out during the process of final weighing
		Physical	The process of removing layers of the product is not correct	L	M	NS	supervision of GMP and SSOP can still be carried out during the process of final weighing
15.	packing and labeling	Biological	Contamination from workers and equipment	L	M	NS	supervision of GMP and SSOP can still be carried out during the process
16.	storing	Biological	Storage temperature below -20^{o}C	L	M	NS	supervision of GMP and SSOP can still be carried out during the process
17.	*Stuffing/ loading*	Biological	Compilation that is not good and right	L	M	NS	use monitoring of container and anteroom temperatures during the transportation process

Determination of Critical Control Points

Determination of critical control points can be done with the results of the identification of hazards that have been predetermined, obtained potential hazards that are categorized as significant hazards. Significant hazards are analyzed to determine the critical control points using the decision tree (appendix 2). Based on the identification using a decision tree, it is found that the critical control points in the patin filet, which is found in the washing process stage 2.

Washing step 2 that needs to be monitored is a physical hazard that is the residual impurities left in the washing water that does

International Journal of Advancements in Research & Technology, Volume 1, Issue 5, October-2012
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not flow. Water that does not flow and is not replaced regularly gives rise to bacterial growth from the rest of the raw material impurities that are washed beforehand. According to Afrianto (2008), leaching foodstuffs is intended to reduce the population of natural microbes (natural flora) contained in foodstuffs, so that the population does not affect the next process.

Actions taken against physical hazards that contain residual impurities left in wash water that does not flow can be controlled by using water to run clean so that the water is controlled and not contaminated from previous washing impurities. According to Afrianto (2008), washing raw materials should use running water, so that dirt is immediately discharged from the washing container. The use of water that does not flow will cause the concentration of microbes in the water to continue to increase.

Besides, the gloves used by workers are gloves made of cloth so that dirt easily attaches to gloves and can cause contamination of the product. Actions that can be done is to use rubber gloves to be waterproof and dirt does not easily stick.

Process Stages	Hazard Category	Q1. Are there control measures against identified hazards?	P2. Are the stages specifically designed to eliminate or reduce the danger that might occur to an acceptable level?	Q3. Can contamination with the identified hazard occur beyond the acceptable level or can this increase to an unacceptable level?	Q4. Will the next stage eliminate the identified hazard or reduce the level of likelihood of it occurring to an acceptable level?	CCP/ not CCP
washing 1	Leftover impurities in water	yes	No	Yes	Yes	not CCP
washing 2	Leftover impurities in water	Yes	No	Yes	no	CCP

Microbiology Test

Microbiological testing is carried out using the Total Plate Number (ALT) method according to the Indonesian National Standard 2332: 2015. This method aims to determine the total bacterial count without clearly identifying the bacteria. The ALT method means that the greater the number of bacteria found, the higher the contamination that occurs per gram of patin filet meat. Microbiological observations were made on the raw material and final product of the patin filet Kurnia Mitra Makmur Purwakarta Ltd. Microbiological Testing Results released by Saraswati Indo Genetec Bogor Ltd. The results of microbiological testing on raw materials and final products of processed patin filet can be seen in (Table 1).

No	Test Parameter	Unit	Product		Quality Standard
			Raw Material	Final product	
1.	ALT	Colony/g	3.6×10^1	5.7×10^2	1.0×10^5

Based on the test results in Table 1. The value of the total plate number (ALT) on raw materials is 3.6×10^1 Colony/g that value is below the fresh fish quality requirements limit of 1.0×10^5 Colony/g microbes. The ALT value in the patin filet final product is 5.7×10^2 Colony/g that value is below the frozen fish quality requirements limit of 1.0×10^5 Colony/g. The quality standard refers to SNI 2332 in 2006 and 2015 concerning the method of microbiological testing of fishery products.

The second results of ALT values on raw materials and final products indicate that the application of HACCP in Kurnia Mitra Makmur Purwakarta Ltd can be categorized quite well with the results of microbial testing below the quality standard. The test results showed that the patin filet product at KMMPLtd is suitable for consumption. This value can change during storage at room temperature due to an increase in the number of bacteria due to many factors. An increase in the number of bacterial colonies can be affected by eating (nutrition), humidity, temperature, oxygen content and pH (Widyaningsih et al 2017).

Organoleptic Test

Organoleptic testing is the assessment of traits/characteristics using the human senses (sensory) in the form of responses or impressions of quality by a group of people called panelists. Organoleptic assessment is carried out by the Individual Panel. The individ-

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ual panel is a highly skilled person with a very high specific sensitivity obtained because of talent or very intensive training. The individual panel was very familiar with the nature, role, and method of processing the material to be assessed and mastered the methods of organoleptic analysis very well. The advantages of using this panelist are high sensitivity, avoidable bias, efficient judgment and not fatigue. Individual panels are usually used to detect not too many and identify the cause. The decision is entirely in a person

Organoleptic testing was carried out at Kurnia Mitra Makmur Purwakarta Ltd uses a scoring scale. Organoleptic testing of raw materials is done by taking a sample of 9 fish to be tested for temperature, odor, elasticity and physical refers to the standard of Kurnia Mitra Makmur Purwakarta Ltd and compared with SNI 2729: 2013 concerning fresh fish. Organoleptic test results on the reception of patin raw materials are recorded in the receiving control form. Organoleptic test results on the reception of patin raw materials can be seen in Table 2.

The Sampel	temperature (°C)	The scent	Elasticity	physical
1	4,7	2	2	2
2	3,2	2	2	2
3	9,4	2	2	2
4	3,4	2	2	2
5	3,8	2	2	2
6	3,6	2	2	2
7	3,6	2	2	2
8	7,8	2	2	2
9	4,9	2	2	2
information	good	good	good	good

Based on the organoleptic test results in table 13 according to the company standards Kurnia Mitra Makmur Purwakarta Ltd found that on the physical parameters the average organoleptic value was 2, with a description of bright, average, clear eyes. Whereas according to SNI 2729: 2013 (BSN 2013) the value is the same as the value of 8, namely the description of flat eyeballs, clear corneas and pupils, rather shiny specific types of fish. Gills have a value of 2 with a less bright red description without slime while according to SNI 2729: 2013 (BSN 2013) the value is the same as a value of 8, namely the color of dark red or reddish-brown gills, less brilliant with a little transparent mucus. The assessment of body surface slime has a value of 2 with a description starting to become slightly milky white. Meanwhile according to SNI 2729: 2013 (BSN 2013) the value is the same as the value of 6 ie the mucous layer starts to become cloudy. Assessment of meat and stomach has a value of 2 with a description of the smell of neutral stomach contents. This assessment cannot be compared because the meat rating is only in the 0-1 value while the 2-3 value is only an assessment of the contents of the stomach. According to SNI 2929: 2013 (BSN 2013) there is no evaluation of stomach contents specifications. then according to Kurnia Mitra Makmur Purwakarta Ltd physical assessment of patin tested in the good category whereas according to SNI 2729: 2013 the eyes and gills are categorized as good because they have a value of 8, while mucus is categorized as less good because it has a value of 6

According to Kurnia Mitra Makmur Purwakarta Ltd texture parameters, the average organoleptic value is 2. The value is included in the good category with a description of the consistency of elasticity rather dense/soft whereas according to SNI 2729: 2013 texture parameters has a value of 7 with a description of somewhat soft, somewhat elastic

The smell of patin obtains an organoleptic value of 2 meaning that the smell of patin received in good condition with a fresh description is somewhat lost according to Kurnia Mitra Makmur Purwakarta Ltd, whereas according to SNI 2729: 2013 the assessment of fish aroma obtained a value of 7 with a description of Fresh, specific species lacking

Conclusion

Based on the results of research that has been done in the handling and processing unit of patin filet at Kurnia Mitra Makmur Purwakarta Ltd, regarding the hazard analysis and critical control points in the processing of patin filet, conclusions can be drawn namely

1) Research results show that the process of patin filet at Kurnia Mitra Makmur Purwakarta Ltd has not implemented HACPP properly, as seen from each processing process that is following GMP (Good manufacturing practice) and SSOP (Sanitation Standard Operating Procedure) based on SNI 01-4851-1998 about hazard analysis and critical point control (HACCP) systems and guidelines its application.
2) Identified hazards in the form of physical hazards include contamination of residual impurities in non-flowing water at

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washing step 1 and washing 2. Critical control points are found at the washing process stage 2. Control by washing with running water.

3) The results of microbiological testing on the catfish filet at Kurnia Mitra Makmur Purwakarta Ltd uses the ALT parameter on the raw material is 3.6 x 101 colonies / g and the final product of the catfish filet is 5.7 x 102 colonies / g, it still meets the quality standard that is below 1.0 x 105 colonies / g indicating that the patin filet product can be accepted and safe for public consumption.

4) Organoleptic test results on the catfish filet at Kurnia Mitra Makmur Purwakarta Ltd as a whole got a value of 2, namely with good categories. So that raw materials can be continued for the next process.

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