



Study on the Application of GMP and SSOP in Efforts to Improve Food Safety in SMES Processed Shredded Milkfish Bunda Juminah Food in Cipadung Kidul Village, Bandung City

Ervira Octaviola Kurniawan ^{a*}, Rusky Intan Pratama ^a, Rosidah ^a and Iis Rostini ^a

^a *Department of Fisheries, Faculty of Fisheries and Marine Science, Universitas Padjadjaran, Indonesia.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJFAR/2022/v18i530454

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/90066>

Original Research Article

Received 12 July 2022
Accepted 02 August 2022
Published 05 August 2022

ABSTRACT

This study aims to analyze the quality control of food safety with the Good Manufacturing Practices (GMP) and Sanitation Standard Operating Procedures (SSOP) systems in Small and Medium Enterprises (SMEs) processed from milkfish shredded Bunda Juminah Food and compare it with the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 17/PERMEN-KP/ 2019 so that it can provide recommendations for improvement in efforts to improve food safety. This research uses a case study method, the discussion is descriptive with a qualitative approach. The parameters observed in this research include the Total Plate Count (TPC) test, water content test, and protein content test. The data obtained from this research were analyzed descriptively comparatively. The results of the research show that the application of GMP and SSOP in Small and Medium Enterprises (SMEs) Bunda Juminah Food is not in accordance with the standards set in the aspect of raw material selection. The implementation of SSOP in Bunda Juminah Food UKM is also not in accordance with the standards set in the aspect of preventing cross contamination, employee health and hygiene conditions, and controlling nuisance

animals. Based on the results of the Total Plate Count (TPC) test, water content and protein content tests, Bunda Juminah Food's shredded milkfish products meet Indonesian National Standards.

Keywords: *Shredded milkfish; good manufacturing practices; sanitation standard operating procedures; food safety.*

1. INTRODUCTION

In accordance with one of the government programs, namely helping to increase protein needs by campaigning for a love of eating fish, the effort that needs to be done is to diversify fishery products in processed form [1]. Food diversification is an alternative way to increase market demand and also to realize more efforts for fishery product processors to develop their businesses [2].

Based on the Center for Statistics and Information of the Ministry of Maritime Affairs and Fisheries, Indonesia has abundant fishery products with a total capture fishery production of 8.02 million tons and aquaculture production of 15.37 million tons in 2020. What can be done to take advantage of abundant fishery products is to diversify fishery products. One of the diversification of fishery products is shredded.

According to the National Standardization Agency on SNI No. 01-3707-1995, abon is a type of dry food with a distinctive shape made of boiled and sliced meat, seasoned, fried, then pressed. The process of making shredded meat is a process of reducing the water content in meat ingredients which aims to extend the storage process. Shredded fish has a relatively long shelf life, which is still acceptable in storage for 50 days at room temperature [3]. Actually, all types of meat such as chicken, even fish can be used as raw material for shredded. One type of fish that can be used as raw material for making shredded fish is milkfish (*Chanos chanos*).

Milkfish protein content ranges from 20-24%, amino acids glutamate 1.39%, unsaturated fatty acids 31-32% and contains macro and micro minerals, namely Ca, P, and Fe, also has vitamins A and B1 [4]. The high nutritional content of milkfish is very beneficial for the human body, but the main weakness of milkfish is that it has many spines [5]. Therefore, it is necessary to make efforts to overcome the main weaknesses of milkfish, one of which is making milkfish as a raw material for making shredded fish. Based on the Center for Statistics and

Information of the Ministry of Maritime Affairs and Fisheries, West Java is an area that has potential for fishery products with the ability to produce milkfish of 83,136.13 tons in 2020. The high amount of milkfish production can be absorbed by the Small and Medium Enterprises (SMEs) in the city of Bandung.

One of the Small and Medium Enterprises (SMEs) which is engaged in processed products of shredded milkfish is Bunda Juminah Food which is located in Cipadung Kidul Village, Bandung City and is under the banner of CV Tiga Raja. The implementation of GMP and SSOP in Bunda Juminah Food UKM is still not optimal because there are still conditions or activities that become production risks that have the potential to become product safety hazards. The range of production is quite wide, indicating that the potential of the food industry for processed milkfish shredded can continue to be improved, but the wider market conditions require the need for quality and safety improvements to shredded milkfish so that it can produce products that are in accordance with food safety for consumers.

Food safety is an important thing that needs to be considered in the midst of the rampant development of the food industry in Indonesia. Food safety is the condition and effort needed to prevent food from being contaminated by biological, chemical, and other objects that can interfere, harm, and endanger human health and do not conflict with religion, belief, and community culture so that it is safe for consumption. Currently, food safety issues are synonymous with small-scale industries due to low sanitation and hygiene practices [6].

Fish processing technology in Small and Medium Enterprises (SMEs) is usually characterized by an unfavorable picture, such as processing processes that are still traditional which have been passed down from generation to generation, low sanitation and hygiene, using raw materials of high quality and low quality. low freshness, food safety is not guaranteed and businesses are usually managed in a family manner with a poor level of management ability

[7]. This situation can be improved by applying the correct processing method or Good Manufacturing Practices (GMP), rationalizing and standardizing starting from raw materials, additional materials, processes to the final product and applying the principles of good sanitation and hygiene or Sanitation Standard Operating Procedures (SSOP). Good Manufacturing Practices (GMP) and Sanitation Standard Operating Procedures (SSOP) can be a solution to improve food safety in Small and Medium Enterprises (SMEs) because these two things can be preventive measures so that the food consumed is safe, appropriate, and of good quality [8].

2. METHODS

This research was conducted from January 2022 to February 2022 in Bumi Panyileukan, Bandung City. The research method used is a case study method, the discussion is descriptive with a qualitative approach. The parameters observed in this research include the Total Plate Count (TPC) test, water content test, and protein content test. The data obtained in this study are observations of each flow of the GMP and SSOP implementation process based on the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 17/PERMEN-KP/2019. The data obtained from this research were analyzed descriptively comparatively

2.1 Observation Parameters

The parameters observed in this study as follows:

2.1.1 Total Plate Count (TPC)

The calculation of the number of bacterial colonies was carried out using the Total Plate Count (TPC) method. Calculation of Total Plate Count (TPC) can be calculated by the following equation (BSN 2015):

$$N = \frac{\sum C}{[(1 \times n_1) + (0,1 \times n_2)] \times (d)}$$

Where:

N : Number of colonies of the product (colonies/g)
 $\sum C$: The number of colonies in all counted plates

n1 : Number of cups in the first calculated dilution
 n2 : The number of cups in the calculated second dilution
 d : First calculated dilution

2.1.2 Test water content and protein content

The water content test was carried out to test the water content contained in the shredded milkfish according to Afrianto [9] can be calculated by the following equation:

$$\frac{(B1 - B2)}{B} \times 100\%$$

where:

B : Sample Weight (g)
 B1 : Weight (Sample + Cup) before drying
 B2 : Weight (Sample + Cup) after drying

Protein analysis to determine the crude protein content in shredded milkfish. There are three stages in protein testing, namely extraction, distillation, and titration. Determination of crude protein content using the Kjehdal method in (AOAC 2005):

$$\% \text{ Nitrogen} = \frac{(\text{ml HCl sample} - \text{ml HCl blanko}) \times 14 \times \text{FP}}{\text{mg sampel}} \times 100\%$$

$$\% \text{ Crude Protein Level} = \% \text{ Nitrogen} \times \text{Conversion Factor (6,25)}$$

2.2 Good Manufacturing Practices (GMP)

Good Manufacturing Practices (GMP) is a guideline for every food processing industry regarding good food production methods with the aim of producing quality food products in accordance with consumer demands [10]. Aspects of GMP assessed based on the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 17/PERMEN-KP/2019 include:

- Selection of raw materials
- Handling and processing
- Additives/auxiliaries and chemicals
- Packaging
- Storage

2.3 Sanitation Standard Operating Procedures (SSOP)

Sanitation Standard Operating Procedures (SSOP) is a procedure that can assist the food

industry in developing and implementing sanitation control procedures, monitoring sanitation, and maintaining sanitary conditions and practices required in the sanitation process. Aspects of SSOP assessed based on the Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 17/PERMEN-KP/2019 include:

- Air and ice safety
- Surface cleanliness
- Prevention of cross contamination
- Maintain hand washing, sanitation and toilet facilities
- Protection from contaminants
- Labeling, storage and use of hazardous materials
- Supervision of the health and hygiene conditions of employees
- Pest control

3. RESULTS AND DISCUSSION

3.1 Total Plate Count (TPC)

The Total Plate Count (TPC) test results showed that the number of bacteria in the shredded milkfish of Bunda Juminah Food after 3 days was 8×10^1 colonies/g (Table 1). These results did not exceed the maximum limit of bacterial count on the quality requirements of shredded fish SNI 01-3707-1995, namely 5×10^4 colonies/g. A small amount of bacteria in the shredded milkfish of Bunda Juminah Food, very dry shredded fish. Based on the results of the TPC test, the quality of shredded milkfish from Bunda Juminah Food is in accordance with the standards set by the Indonesian National Standard.

Bacteria cannot grow in dust, but will grow if environmental conditions allow. Microbiological contamination in food can come from equipment for processing and serving food because the cleanliness of equipment in food is one of the sanitation and hygiene factors, it can also come from processors who make direct contact during the manufacture of a product.

3.2 Results of Water and Protein Content

The results of the water content test showed that the water content of shredded milkfish was 1.27% with a maximum water content of 7% (Table 2). According to Sulthoniyah et al. (2013), the water content in shredded fish will decrease due to the pressing treatment. The purpose of

the quality requirements of SNI No. 03-7690-2013 in the pressing process, namely reducing the air content contained in fish meat.

The protein content of shredded milkfish reaches 38.44%, indicating that the shredded meat meets the Indonesian National Standard because its value is above 15% (Table 2). The results of the protein content test showed that the addition of milkfish meat could increase the high protein content. According to Jusniati et al. [11], protein content is also influenced by the number of fish used, to get a protein value, more fish must be used.

3.3 Good Manufacturing Practices (GMP)

The application of GMP in the manufacture of shredded milkfish carried out by SMEs of Bunda Juminah Food is not in accordance with GMP standards according to PERMEN No. 17/PERMEN-KP/2019 in the aspect of raw material selection. Fresh milkfish raw materials are received from Caringin Market, Bandung City. The selection process for raw materials for fresh milkfish is transported by car and packaged using a styrofoam box containing ice, but during the process of transporting raw materials, no special means of transport are used. The process of unloading raw materials is carried out quickly and carefully and raw materials are cold to ensure the quality of raw materials is maintained. Selection of raw materials is not equipped with records or tracking and monitoring by producers such as records of the amount of each purchase of raw materials. The SME producer, Bunda Juminah Food, did not select the freshness and size of milkfish as raw material for making shredded fish.

3.4 Sanitation Standard Operating Procedures (SSOP)

The application of SSOP in the manufacture of shredded milkfish carried out by SMEs of Bunda Juminah Food is not in accordance with SSOP standards according to PERMEN No. 17/PERMEN-KP/2019 in the aspect of preventing cross-contamination, employee health and hygiene conditions, and controlling nuisance animals. Pathogenic microbes can be transferred from one food to another, either through direct contact or through the air. Unprocessed raw materials must be effectively separated from ready-to-eat food. Aspects of cross-contamination can occur due to tool contact with the product or between the raw materials

Table 1. Results of TPC shredded milkfish of Bunda Juminah food

SNI Limit	Test result	Unit
5×10^4	8×10^1	Colonies/g

Table 2. SS value of fisheries sector bandung regency 2015-2019

Test parameters	SNI limit	Test result	Unit
Water Content	Max 7	1,27	%
Protein Content	Min 15	38,44	%

used [12]. Prevention of cross-contamination has not been done well by the EMEs of Bunda Juminah Food. SMEs of Bunda Juminah Food has not designed a building design for a production site that moves in one direction so that it can cause product contamination. Employees who enter the production room have used work equipment in the form of masks and aprons, but employees do not use gloves, head coverings, and protective footwear. SMEs of Bunda Juminah Food has not implemented a pest control system, so that insects can easily enter when receiving raw materials, one of which is flies. The EMEs of Bunda Juminah Food has also not implemented a pest control system and control rats, pets, and other animals.

4. CONCLUSION

Based on the results of the Total Plate Count (TPC) test, water content and protein content tests, the shredded milkfish product of Bunda Juminah Food meets the Indonesian National Standard. The application of GMP in the manufacture of shredded milkfish carried out by SMEs of Bunda Juminah Food is not in accordance with GMP standards according to PERMEN No. 17/PERMEN-KP/2019 in the aspect of raw material selection. The application of SSOP in the manufacture of shredded milkfish carried out by SMEs of Bunda Juminah Food shows that the application of SSOP standards has not been fulfilled in the aspects of preventing cross contamination, employee health and hygiene conditions, and controlling nuisance animals.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Restu. Processing of shredded coral fish (*Channa pleurophthalmus*) with the

2. Addition of Grated Coconut. Tropical Animal Science. 2016;5(1):22–26.
2. Agustini TW, Swastawati F. Utilization of fishery products as value-added products in efforts to diversify food. Journal of Food Technology and Industry. 2003;14(1):74-81.
3. Anwar C, Irhami, Kemalawaty M. The influence of fish types and cooking methods on the quality of shredded fish. Journal of Fishery Products Technology. 2018;7(2):138-147.
4. Hafiludin. Analysis of nutritional content of milkfish from different habitats. Marine Journal. 2015;8(1):37-43.
5. Abriana A, Indrawati E, Rahman R, Mahmu H. Processed products of milkfish (Bandeng pulled thorns, shredded milkfish, and milkfish meatballs) in Borimasunggu Village, Maros Regency. Journal of Service Dynamics. 2021;6(2): 273-283.
6. Arkeman Y, Herlinawati T, Wibawa DS, Adinegoro H. Strategy formulation to improve food safety for small and medium bread industries through the implementation of good manufacturing practice. Journal of Agricultural Technology and Industry. 2015;25(1):43-51.
7. Heruwati ES. Traditional fish processing: Prospects and development opportunities. Agricultural Development Research Journal. 2002;21(3):92-99.
8. Triesty A, Ririh Y. Application of good manufacturing practices in the home industry of sea cucumber crackers in Sukolilo Surabaya. Journal of Environmental Health. 2011;7(2):148-158.
9. Afrianto E, Liviawaty E. Fish preservation and processing. 1st ed. Yogyakarta: Kanisius; 1989.
10. Thaheer H. HACCP (Hazard Analysis Critical Control Points) management system. 2nd ed. Jakarta: Bumi Aksara; 2008.

11. Jusniati, Patang, Kadirman. Making shredded from banana heart (*Musa paradisiaca*) with the addition of tuna fish (*Euthynnus affinis*). Journal of Agricultural Technology Education. 2017;3(1):58-56.
12. Rianti A, Christopher A, Lestari D, Kiyat W. Implementation of food safety and sanitation in the production of healthy beverages, nuts, Jukajo Sukses Mulia UMKM in Tangerang Regency. Journal of Agrotechnology. 2018;12(2):167–175.

© 2022 Kurniawan et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/90066>