



Processed fish products based on diversification and standardization

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ARTICLE INFO	ABSTRACT
<p>Article history Received: 2021-11-05 Revised: 2021-12-24 Accepted: 2021-12-30 Published: 2022-02-21</p> <p>Keywords Fish processing industry Product diversification Innovative fish processed products</p>	<p>Pagerungan Besar is one of the villages in Sapeken District, Sumenep Regency with the potential for marine products that are very plentiful. Business actors engaged in the fish processing industry in Pagerungan Besar Village are currently experiencing problems are understanding product diversification from processed fish and fish processing processes according to the Indonesian National Standard. This activity aims to provide an understanding to fishermen and business actors (processed fish) in Pagerungan Besar regarding innovative fish processed products and fish processing processes according to SNI Activities are carried out in the form of socialization and training. The service that is packaged in socialization and training activities has been prepared since Monday, May 31, 2021, and will be held on Friday, October 15, 2021, at the Pagerungan Besar Village Hall. Participants know the products that can be produced both during the pre-test and post-test. The results of the pre-test and post-test conducted showed that there was an increase in participants' knowledge of the SNI from 6 people (20%) to 30 people (100%). Participants' knowledge about product diversification from fish waste has increased significantly from 6 people (20%) to 30 people (100). Through this activity, participants gained a lot of knowledge in terms of product innovation, i.e., fish heads, tails, scales can be processed into high-value products and fish processing with Indonesian National Standards (Standar Nasional Indonesia/SNI).</p>
<p>Kata Kunci Diversifikasi produk Industri pengolahan ikan Produk inovasi hasil olahan ikan</p>  	<p>Produk olahan ikan berdasarkan diversifikasi dan standarisasi. Pagerungan Besar merupakan salah satu desa di Kecamatan Sapeken Kabupaten Sumenep dengan potensi hasil laut yang cukup melimpah. Pelaku usaha yang bergerak di Industri pengolahan ikan di Desa Pagerungan Besar saat ini mengalami permasalahan terutama pemahaman tentang diversifikasi produk dari olahan Ikan dan proses pengolahan ikan sesuai Standar Nasional Indonesia (SNI). Kegiatan ini bertujuan untuk memberikan pemahaman kepada para nelayan dan pelaku usaha (olahan ikan) di Pagerungan Besar mengenai produk inovasi hasil olahan Ikan dan proses pengolahan ikan sesuai SNI. Kegiatan yang dilakukan berupa sosialisasi dan pelatihan. Pengabdian yang dikemas dalam kegiatan sosialisasi dan pelatihan sudah dipersiapkan sejak Senin tanggal 31 Mei 2021 dan dilaksanakan pada hari Jum'at, 15 Oktober 2021 di Balai Desa Pagerungan Besar. Hasil <i>pre-test</i> dan <i>post-test</i> yang dilakukan menunjukkan bahwa terdapat peningkatan yang cukup signifikan terkait pengetahuan peserta mengenai SNI dari 6 orang (20%) menjadi 30 orang (100%). Semua peserta mengetahui produk yang dapat dihasilkan baik ketika <i>pre-test</i> maupun <i>posttest</i>. Pengetahuan peserta mengenai diversifikasi produk dari limbah ikan terdapat peningkatan dari 6 orang (20%) menjadi 30 orang (100). Melalui kegiatan ini, peserta banyak mendapatkan pengetahuan dalam hal inovasi produk. misalnya kepala ikan, ekor, sisik dapat diolah menjadi produk bernilai tinggi dan pengolahan ikan dengan SNI.</p> <p>Copyright © 2022, Purwanto et al This is an open access article under the CC-BY-SA license</p> 

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INTRODUCTION

Fish is one of the rich alternative protein sources (Pawar & Sonawane, 2013; Tilami & Samples, 2018; Weichselbaum et al., 2013). Consuming fish is also a healthy way to get essential fatty acids that are important for the body (Huang et al., 2012; Kocatepe & Turan, 2012; Neff et al., 2014; Prato & Biandolino, 2012). Various essential minerals can also be obtained through fish consumption (Nurnadia et al., 2013; Olmedo et al., 2013; Tilami & Samples, 2018). Fish bones that contain calcium and phosphorus can also be consumed so that they help growth (Flammini et al., 2016; Logesh et al., 2012; Yang et al., 2019). The habit of consuming fish can also prevent a person from contracting various diseases, such as heart disease (Dalen & Devries, 2014; Lajous et al., 2013; Tong et al., 2019) to brain damage (Dacks et al., 2013; Raji et al., 2014). Therefore, fish is one solution to improve health and stamina.

In line with the importance of fish consumption, the fish processing industry is an important industry that needs to be optimized. The fish processing industry is one of the most important industries for the progress of a country's economy (Havice & Reed, 2012; Singh et al., 2012). The fishing industry is also recommended to be massively increased (Kara et al., 2018). Local government programs are also in line with central government programs. The local government encourages the fish products owned by each region to be put to good use. One of the fish-producing areas which is quite abundant is Pagerungan Besar Village, Sapeken sub-district.

Pagerungan Besar Village is one of the villages in Sapeken District. Pagerungan Besar Village has an area of 3.12 KM² with a population of 6,533 consisting of men (3,293) and women (3,240) (BPS, 2019). The location of Pagerungan Besar island which is far from the mainland makes fishermen and business actors of processed fish products often neglected. One of the urgent problems to be solved is the low level of community knowledge in processing all parts of fish so that interventions are needed to increase community knowledge (Prameswari et al., 2019). Therefore, through this activity, fishermen and entrepreneurs will be given an understanding of what products can be produced and how to process fish so that they can have high economic value.

Based on a survey conducted to fishermen and fish processing entrepreneurs in Pagerungan Besar Village, it is known that they do not yet know about the diversification of products that can be produced from fish and also how to process fish according to the Indonesian National Standard (SNI). Product diversification has been recommended several times to optimize the current industry (Ghosh, 2015; Klein et al., 2019). Through diversification, processed products become more diverse or not only focus on one type (Sulistiono & Mashadi, 2018). On the other hand, SNI is a standard that is set as a benchmark for a product to be able to circulate in the territory of Indonesia (Ikhwanasyah & Sirait, 2020). Guaranteed quality and safety of fresh fish marketed and offered abroad must comply with the provisions contained in SNI such as fish body surface, odor and texture (Dali & Husain, 2020). Lack of understanding of fish processing makes many people throw away fish parts such as offal, scales, bones, heads and tails of fish (Haris & Nafsiyah, 2019; Septiansyah et al., 2020). These parts should be able to be processed into products with a fairly high economic value (Rochima et al., 2015).

Accordingly, fishermen and fish processing entrepreneurs in Pagerungan Besar only catch fish and consume certain parts of it. Others sell it without processing it first. An interview conducted with Mr. Ayyub on March 23, 2021, concludes that fishermen in Pagerungan Besar really need an understanding of how to process fish. Thus, training and mentoring activities are very urgent to be carried out in Pagerungan Besar Village.

Related to the problems in Pagerungan Besar Village, several previous service activities have also been carried out in other locations involving fishermen or fish entrepreneurs as partners. These service activities include training partners to process fish into organic fertilizer (Hapsari & Welasih, 2013) flour (Daud et al., 2020) fish meal (Fahrizal & Ratna, 2018) animal feed (Sihite, 2013) to fish scales into chips (Mulyani & Farida, 2012). These service activities only train partners to use fish as a single product. On the other hand, service activities that train or assist partners in diversifying their products into various forms do not yet exist. Therefore, the purpose of this service is to provide an understanding of the diversification of processed fish products and to provide an understanding of the fish processing according to the standards that have been set, namely SNI. This activity is beneficial for all activity participants (fishermen and fish entrepreneurs) so that the fish catches can be processed to the maximum. This activity can also clearly improve the community's economy considering the price of processed fish products is quite promising. This service also supports one of the points of the sustainable development goals (SDGs) namely saving/protecting the environment. The understanding of the community in processing fish waste will certainly reduce fish waste that is disposed of by fishermen and business actors who have only used fish meat.

METHOD

This service activity collaborates with the Pagerungan Besar Village Government as a Partner. Participants in the socialization and training activities were 30 people consisting of fishermen and fish entrepreneurs. The business of the participants is engaged in the processed fish product sector, such as shredded fish made from processed fish.

The socialization activity was carried out to provide an understanding of the importance of processing fish according to SNI and the quality product when processing fish according to standard provisions. In addition, socialization about product diversification from processed fish will also be carried out to encourage creative communities in managing

prosperous raw materials. The socialization activities will be followed by fishermen, fish processing entrepreneurs, and involve the local village government.

Training activities are carried out to provide insight to fishermen and fish processing entrepreneurs about the fish processing process according to SNI. This activity expects that the processed fish products produced by Pagerungan Besar fishermen have good quality and can compete with other competitors.

To measure the success of this study, participants were given a questionnaire before the socialization and training began (Pre-test). Then, after the activity was completed, participants were given a questionnaire (post-test). The data obtained were then compared to determine the increase in participants' knowledge and at the same time measure the success of this activity.

RESULTS AND DISCUSSION

The preparatory phase of the activity was carried out on May 31, 2021. First, the service team prepared administrative and licensing requirements for the implementation of socialization and training activities. These administrative needs include: discussions on the concept of implementing activities with partners, making assignment letters, partner agreements, attendance lists, and invitations to all participants. In addition, the team also prepared material on topics that would be disseminated in the form of power points. Details of the stages of preparation for this activity are presented in Table 1.

Table 1. Stages of preparation of activities

No	Type of preparation	Description
1	Literature Study	Prepare materials in PPT and Print Out form.
2	Administration and Licensing	Prepare for the administrative needs of activities (Duplicating materials and processing permits, Participant Invitations, etc.).

The implementation of socialization and training activities on fish processing based on diversification and product standardization in Pagerungan Besar Village was carried out at the local village hall on Friday, October 15, 2021 (Figure 1). The socialization activity was attended by business actors in the fish processing sector, fishermen, and the Pagerungan Besar Village government. There were 30 participants who participated in the socialization and training activities in fish management (Figure 2). The background of the participants in the activity are the government of the Great Pagerungan Village, business actors in the fish processing sector, and fishermen. From the three backgrounds of the participants, it is expected that all three will understand the importance of fish processing based on diversification and standardization. Details of activities at the implementation stage can be seen in Table 2.



Figure 1. Presentation of Socialization Materials



Figure 2. Photo session with participants

Table 2. Activities in the implementation stage

No	Main activities	Details of activities
1	Pre-Test	Giving pre-test questionnaires to participants
2	Socialization	Delivering material on product diversification from processed fish. Delivering material on fish processing according to SNI
3	Training	Providing training on how to process fish according to SNI

The activity begins with giving pre-test to all participants. The results show that only six participants know about SNI and product diversification (20%). On the other hand, all participants 100% already know the products that can be produced from fish meat, such as crackers, shredded, and so on.

The implementation of the socialization activity began with delivering material on product diversification from processed fish and also material on fish processing according to SNI. The core of the material presented was the definition of fish, the characteristics of fish, the importance of maintaining fish so that its quality and nature is maintained, product innovation from processed fish, examples of products made from processed fish both from fish heads, meat, scales, and also fish tails. Products that can be produced from processed fish are various as reported in previous publications, such as shredded fish made from fish body (Kolanus et al., 2019); fertilizer (Yusra et al., 2021) and feed (Kuswoyo et al., 2021) made from fish heads and tails. In addition, fish scales can also be used as material for making ornamental flowers (Hartanto, 2021).

In the implementation of the socialization and training activities, participants said that they were greatly helped by this activity because they could find out which products, they could make using fish waste that they had previously disposed of or not processed. The participants were also very enthusiastic in participating in the socialization and training activities. They hoped that in the future they would have access to a market place to sell what they would make.

The next stage is the implementation of training on how to manage fish according to product standardization. Training activities are carried out by training participants in processing fish and packaging so that they are durable. Activities in the evaluation stage can be seen in Table 3.

Table 3. Activities in the Evaluation Stage

No.	Main activities	Details of activities
1	Post-Test	Giving post-test questionnaires to participants
2	Study of Results	Asking participants about the understanding obtained Preparation of follow-up plans in fish management based on diversification and standardization

At the evaluation stage of the results of the activities, the participants were asked to respond to the implementation of the service activities they had participated in. The participants said they could understand well how they should process all parts of the fish. At first, they used to throw away the head, tail and other parts of the fish like the meat of the fish's stomach. This is done because of ignorance in processing these parts. To measure the success of this activity, a post-test was conducted through the provision of questionnaires. The summary of the results of the pretest and posttest is presented in Table 4.

Table 4. Indicators of Activity Success

No	Questions	Percentage of participants			
		Pretest		Post-Test	
		Don't know	Know	Don't know	Know
1	Do you know SNI	24 (80%)	6 (20%)	-	30 (100 %)
2	Do you know products that can be produced from fish meat (contents)	-	30 (100%)	-	30 (100%)
3	Do you know products that can be produced from fish waste (head, scales, tail, fish belly)	24 (80%)	6 (20%)	-	30 (100%)

Based on Table 4, it is known that there is an increase in participants' understanding. For example, during the pre-test there were 24 people (80%) who did not know about SNI, especially in the aspect of fish processing and only 6 people (20%) knew about SNI. However, at the post-test, all participants were 100% aware of SNI. Then, during the pre-test only 6 people (20%) knew that fish waste could be processed into products that have a high selling value but after the post-test all participants (100%) already knew the products that could be produced from fish waste. Thus, the activity of delivering materials and training on fish processing based on diversification and product standardization was deemed successful in this activity. At this evaluation stage, a follow-up plan for this activity was also prepared. The community service team is committed to continuing to monitor and assist fish-based business actors as well as fishermen.

Through this service activity, fishermen are able to understand opportunities to diversify processed fish products. This kind of knowledge is able to encourage the ability of fishermen and business actors to increase innovation because innovation is very helpful in increasing the value of processed fish products produced (Fauzi, 2019). Product diversification is also important for the industrial sector because it can optimize ongoing industrial processes. Not surprisingly, several previous publications recommended business actors to diversify their products (Ghosh, 2015; Klein et al., 2019). In fact, diversification is not only beneficial for the food industry, but also has a positive impact on other industries, such as hospitality (Yang et al., 2017) and tourism (Benur & Bramwell, 2015).

In addition to diversification, this service activity also increases partners' understanding of SNI. So far, the government has encouraged SNI to ensure safe, nutritious, and quality products (Wardani et al., 2018). Product quality assurance will minimize negative impacts that may occur when the product is consumed or used. The reason is that although fish is highly nutritious, it can also have a negative impact on health if the product is of poor quality (Ahmed et al., 2016; Megasari et al., 2019; Thapa et al., 2014). In addition, the presence of the SNI label can also increase the competitiveness of the products produced (Rosiawan et al., 2018). Therefore, after participating in this service activity, it is hoped that the partners will be able to produce processed fish products with SNI.

Apart from the efforts to optimize fish products and quality from partners that have been carried out by the service team, various parties are expected to also support efforts to improve the fishing industry. The reason is, the development of the fishing industry not only has a positive impact on fishermen or local residents, but also Indonesian society as a whole. The growth and development of the fish processing industry has the opportunity to increase people's fish consumption. Fish is a source of highly nutritious food, because it contains protein (Pawar & Sonawane, 2013; Tilami & Samples, 2018; Weichselbaum et al., 2013), fatty acids (Huang et al., 2012; Kocatepe & Turan, 2012; Neff et al., 2014; Prato & Biandolino, 2012), to minerals (Nurnadia et al., 2013; Olmedo et al., 2013; Tilami & Samples, 2018) needed by the body. By consuming fish regularly, the body will avoid various diseases (Dacks et al., 2013; Dalen & Devries, 2014; Raji et al., 2014). Therefore, given the importance of the fisheries sector, all parties from the central government, local governments, fishermen, to academics need to contribute to optimizing this sector in Indonesia.

CONCLUSION

The conclusions that can be drawn from the socialization and training of fish processing based on diversification and product standardization are: fishermen and business actors in the fish processing sector need help from academics, government, and also practitioners to provide an understanding of the procedures for processing fish based on diversification and in standardized way. Through this socialization and training on fish processing, the participants were able to understand how to process fish that they had not previously used. Utilization of the fish parts can be a valuable and useful product. In addition, assistance needs to be carried out until the participants are able to make products independently until their products are sold.

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