



Development of Flavor Variants and Packaging in the Fish Processing Community in Perancak Village, Jembrana District, Jembrana Regency, Bali

Ni Made Ayu Suardani Singapurwa¹, I Putu Candra², I Nyoman Rudianta³, Ni Komang Armaeni⁴

^{1,2,3} Food Science and Technology Study Program, Faculty of Agriculture, Warmadewa University, Bali, Indonesia

⁴ Civil Engineering Study Program, Faculty of Engineering, Warmadewa University, Bali, Indonesia

ARTICLE INFO

Article History:

Received: 19 October 2023

Final Revision: 13 March 2023

Accepted: 15 March 2023

Online Publication: 15 March 2023

KEYWORDS

Sardinella lemuru; flavor; variant; Bali, community service

CORRESPONDING AUTHOR

*E-mail: a.suardani@gmail.com

ABSTRACT

"Pedetan" is a kind of food product made of dried fish with traditional Balinese spices which are manufactured by people in the Jembrana Regency, Bali. It is made from lemuru fish (*Sardinella Lemuru*) which is mostly produced in the coastal areas of Jembrana Regency. "Pedetan" is also one of the superior products from the Jembrana area, because it is one of many authentic foods of Jembrana. The development of traditional manufacturing was carried out with several improvements by applying basic feasibility in food processing. However, a study for business development and product marketing development on aspects of quality management and safety of raw materials and products was necessary to be conducted. The improvement was carried out in several sequenced activities starting from the processing step, so that the community could apply the technology being shared and was able to handle problems in the production of "Pedetan". After that, knowledge sharing on kinds of good processing methods, sanitation, and hygiene was done. Furthermore, the improvement also covered quality control starting from the selection of raw materials to the distribution of food products. Everything had been made sure to be carried out properly. The improvement of the production method managed to produce several product variants, decent packaging, and labeling. Based on the results of community service activities, new flavor variants were created which made it into 6 flavor variants in total, namely the original flavor, the *Balado* flavor, the sweet spicy flavor, the sweet flavor, the silver herring fish variant, and the cutlassfish variant.

1. INTRODUCTION

1.1. Research Background

One of the traditional fish products available in the market is 'Pedetan' lemuru fish. 'Pedetan' is a type of food product of dried fish with traditional Balinese spices which is produced by some communities in the Jembrana Regency, Bali Province. It is made of lemuru fish (*Sardinella Lemuru*) (Fig 1.) which is mostly produced in the coastal areas of Jembrana Regency [1], and is one of the superior products of the Jembrana area because it is one of the authentic foods in Jembrana. In this kind of traditional fish manufacture, the type, quality of raw materials and additional materials vary greatly, moreover, the environmental conditions that are difficult to control, and the uncertain end point of the process are also very influential. The technology of the production of traditional fishery products is often underestimated.

There are so many bad views on this product such as the assumption that traditional products are processed with low levels of sanitation and hygiene, allegations of using raw materials with low quality or freshness levels, the food safety that is not well-guaranteed, the technology used is old-fashioned, and managed by family businesses with inadequate management ability[2].

The various process of fishery products manufacture generates different characteristics for each village that produces them. This also affects the quality and safety of them. Therefore, traditional processing needs to be upgraded with some improvement by applying basic feasibility in food processing. Their quality management and the safety of raw materials and products need to be studied for business development, and product marketing development [3]. Problems caused by the various process of 'Pedetan' production make it necessary to apply the basic feasibility of GMP (Good Manufacturing Practice) or CPMB (Good Food Production Methods) and SSOP



(Sanitation Standard Operating Procedures) to produce high-quality 'Pedetan' which is also safe to consume [4],[5],[6],[7].

There are several communities which involves in this business in Jembrana Regency, one of which is the Mina Sari Sejahtera. to be more precise, this group is located in Perancak Village, Perancak District, Jembrana Regency, chaired by Ni Wayan Darwati and formed in 2019 with a total of 10 members. This group processes an average of 25-50 kg of raw fish per day, with a revenue of Rp. 300,000 – Rp. 500,000 per day. This group has already had simple bookkeeping to record the finances and savings and loan activities of group members. The fish product that has been produced are usually marketed to markets around the village, to the Negara sub-district.

By carrying out community service activities, funded by Warmadewa University, it is expected that the fish processing group community in Perancak Village would have skills and insight in managing local natural resources as well as an entrepreneurial spirit so that they can open business opportunities in accordance to the conditions of the Perancak Village area. The group was also given knowledge about work management, and business management so that they would be able to manage their time and run their business as well as possible. Thereby increasing family income and welfare.

1.2. Literature Review

Preservation by drying fish can be done traditionally with a dryer made of bamboo with hot sunlight [1][8]. This dryer is commonly used by fishing communities in Jembrana Regency, Bali in preserving lemuru fish into 'Pedetan'. 'Pedetan' is a traditional food product made by drying lemuru fish that has been seasoned. The community processes lemuru fish into 'Pedetan' by firstly cleaning the scales, entrails and spine. Then, it is cut into fillet shapes and washed. Cleaned lemuru fish are then mixed with traditional Balinese spices and dried in the sun for 2-3 days [1]. The different processing of 'Pedetan' from the receiving of raw materials to the distribution process [9] [10] as well as the storage of 'Pedetan' with different packaging materials will affect the quality and quantity of the calves produced [11].

The presence of microbes in 'Pedetan' can contaminate it which will also reduce product quality due to spoilage. The application of the basic feasibility of food processing with Good Manufacturing Practice (GMP) and Sanitation Standard Operating Procedures (SSOP) will be able to reduce microbial contaminants that can contaminate lemuru calves [10][12][13]. The total microbes in lemuru calves before and after applying GMP and SSOP were 1.56×10^7 CFU/g [10] and 5.5×10^4 CFU/g [13], and after packaging was 15.22×10^3 CFU/g [11]. The common problem that occurs in this product is the presence of molds on the surface of the fish, and the mold that often contaminates dried fish is *Aspergillus* sp [14]. Garlic and sand ginger seasoning can inhibit the growth of *Aspergillus* sp mold that contaminates the product being studied [15][16].

1.3. Research Objective

The purpose of this community service was to solve the problems faced by the Group, namely:

- Providing Appropriate Technology in processing fishery products
- Sharing knowledge on good processing methods, sanitation and processing hygiene, [17], [18], [19], packaging and storing, marketing, entrepreneurship, and business management.
- Sharing bookkeeping knowledge in a well-organized system,
- Provide equipment assistance and repair of fish processing facilities

2. MATERIALS AND METHODS

This partnership program with Mina Sari Sejahtera Fish Processing Community in Perancak Village, Perancak District, Jembrana Regency was carried out by doing the following methods:

- Conducting discussions to find out the problems experienced by the group (Fig 2.)
- Conducting training, so that the Group gains knowledge about Good Food Processing Methods (CPMB/GMP) and Hygiene Sanitation (SSOP) for processing fishery products, and business management. This was done because the quality of human resources was still low in relation to several business skills and the ability to process fishery and livestock products. The solutions offered in the training activities focus on exploiting local potentials into products that have more economic value than products that have been made as additional activities for community groups [18].
- Carrying out processing practices, so that the Group could apply the technology provided and could also handle problems in the processing of Pedetan production, both made from lemuru fish or tuna. Provide knowledge about business management, good processing methods (GMP), sanitation, and processing hygiene (SSOP) [19] [20] (Fig 3.)



Figure 1. Lemuru fish (*Sardinella Lemuru*)



Figure 2. Fish Processing Community



Figure 3. Community Service Activity

3. RESULT AND DISCUSSION

3.1. Development of Product Variations with Various Flavors

The existence of a business in society is becoming increasingly growing and people are getting smarter in purchasing activities. Manufacturers take advantage of the existing business opportunities and strive to implement appropriate marketing strategies to dominate the market. This change in consumer perspective also requires producers to be able to innovate to be able to compete and stay afloat in the competition. The main purpose of marketing is to attract buyers or potential buyers to be willing to buy the product. In achieving it, producers strive to provide what consumers need, and marketers must be able to know their tastes, and how these targeted consumers make decisions in making purchases.



Figure 4. *Pedetan* of Lemuru Fish

The results of this program indicated an increase in the revenue. It increased, from Rp. 3,000,000 per week to Rp. 6,000,000 per week. Furthermore, the escalation also occurred in the product quantity and quality, the number of variants and product quality which increased, from only 2 products to 6 products (Fig 4), (Fig 5.), with original flavor variants, balado flavor variants, sweet-spicy flavor variants, sweet flavor variants, silver herring fish variants, and cutlassfish variants. In addition, it can be seen that there is an increase in people's understanding, skills, and knowledge about the development of product variations, packaging, and labeling as well as increased knowledge of marketing methods.

In marketing, manufacturers prioritize the quality of the products so that they can be accepted in the market. Intense market competition in the production of *Pedetan* and *pindang* fish has forced producers to win consumers, especially in the quality of the products provided and to be consistent in maintaining the quality of taste in the products as well as innovation and variety of products.

Taste is a way of choosing food or drink that also involves external factors and other senses besides the sense of taste in assessing food. The meaning is the involvement of appearance, smell, taste, texture, and temperature in assessing food. It also refers to a form of cooperation from the five kinds of human senses: taste, smell, touch, sight, and hearing. Taste itself is the result of the work of taste buds located on the tongue, cheeks, esophagus, and palate, which are part of taste. Variables of Operational Definition of Taste Indicators include: 1. The interesting appearance of the product 2. The pleasant smell of the product 3. The taste is delicious when eaten 4. The ideal temperature of the product. Referring to these variables, the quality of food that affects consumers is the overall characteristics of the food [20].

The taste of a food product is one of the determinants of consumer acceptance. Therefore, people who involve in this business must optimize the taste of the food they produce. This is one of the main factors determining the success of a business in the food sector. Hygienic food products that are claimed to provide health benefits and practicality will be difficult to accept by consumers if organoleptically the product is not favoured or even disliked. The main way to recognize the taste of food is by gustation which involves the tongue. Because the tongue is the foremost sense of the path of absorption of food ingredients into the human body. Therefore, the taste sensation on the tongue is the main and first indicator of problems related to the taste of food. On the other hand, implementing product packaging design has an important role in providing information and identity of the products being sold. With the addition of production equipment in the form of donation tools coupled with a good packaging design, the number of product capacities could be increased [22]. Consumer attitudes have a positive and significant effect on purchasing decisions [23]. One of the innovations that can be done to increase the competitiveness of Small, Medium, and Micro Enterprises is by developing the design of the product packaging. Packaging has a great influence on the sales of a brand for it is the first thing consumers see. That is why it has to be attractive and proper. There are several weaknesses in the product packaging of the community under study, one of which concerns the ability of the packaging to protect the content and the quality of the packaging design appearance that is not following the selling price and target market.



Figure 5. *Pedetan* in various flavors with the new packaging

Redesigning this packaging was carried out to overcome the deficiency in the previous packaging. It is expected that this will improve the image and the quality of the product from the consumers' point of view which will lead to increased sales. Before being redesigned, the product packaging only had several elements namely product name, company name, and flavor variant of the product in question. Product packaging must contain packaging elements such as information and communication factors. Furthermore, the packaging should be equipped with a logo, brand, taste description, net weight, nutritional content, composition, expiration date, producer name, P-IRT, and halal label. The new packaging design uses a combination of several colors and adds some pictures to make the packaging more colorful and eye-catching so that it is easier for everyone to remember. A good product will not be sold if the packaging concept is not right. Bad packaging can give a bad image of a very good product, no matter how good the packaging concept is. [24]

Setting the price of a product above the price of the competitors' product will not necessarily lower consumer interest in deciding to buy the product. It's been proven that it is very important to build and instill a brand image in consumers' minds. In addition, it is also important to develop our processed products with all the maximum innovation and creativity that is continuously built to become better and better. As a result, whatever the price set for our products will not affect consumer purchasing decisions, because consumers will still feel the need for our processed products [25].

To be specific, descriptions of product variations include size, price, and taste; description of packaging consisting of shape, material, color, image, and label; a description of the purchase decision including the choice of product type, choice of product form, choice of brand, choice of seller channel, and time of purchase; and to find out how much influence product and packaging variations have on purchasing decisions [26]. Interest in purchasing affects purchasing decisions. In this case, it includes transactional interest, referential interest, and explorative interest. In addition to this, the purchase decision for this product is influenced by several factors such as cultural, personal, social, and psychological. Brand image has a positive significant effect on consumer loyalty, meaning that the better the brand image is, the more consumer loyalty will also increase [27].

Through this community service activity, it is hoped that group members can develop their potential so that they can improve the family's standard of living by providing training and entrepreneurial assistance to empower group members through productive economic business. [28]. innovation was administered to make food products one of the favorite culinary delights of the community. Efforts made in the community service program include training on how to make food products with the development of flavor innovations and training on creative product packaging techniques and product marketing strategies in this era. Packaging design techniques must consider several aspects: first, packaging must be a medium of communication between producers and potential consumers; second, it provides visual appeal and can provide information on the contents of the packaging to provide a good perception of the products being sold [29].

The proposed marketing strategy was based on consideration of customer satisfaction which was focused on promotional strategies to increase sales [30]. One of the causes of the low level of fish consumption in Indonesia is because of the practicality of consuming fish. Seeing this, increasing the availability of various fish-based processed products is a priority need. Efforts to revive the fisheries business are a must. This can be done by making several breakthroughs such as diversification of fishery product processing products. Food diversification is one of the efforts to increase fish consumption in society [31].

4. CONCLUSION

The production of "*Pedetan*" has been able to produce several product variants, good packaging, and labeling. Quality control from the selection of raw materials to the distribution of food products has also been carried out properly. Assistance by generating an entrepreneurial spirit continues to be carried out on an ongoing basis.

ACKNOWLEDGEMENT

Acknowledgements are conveyed to the Chancellor and Community Service Institute of Warmadewa University who have financed this Community Service based on the Activity Plan and Budget of the Warmadewa University Community Service Institute following the Contract Letter for the Implementation of Community Service Grants at the University of Warmadewa No. 149/UNWAR/LPM/PD-14/ 2022 April 11, 2022.

REFERENCE

- [1] Singapurwa, N.M.A.S., N.M. Darmadi., A.A.M. Semariyani. 2014. Characteristics of Traditional Food *Pedetan* in Jembrana Regency. *International Journal of Advanced Science Engineering Information Technology – ISSN:2088 – 5334*. 4 (2): 68-74
- [2] Singapurwa, N.M.A.S., A.A.M. Semariyani, I.P Candra. 2017. Identification of the Implementation of GMP and SSOP on the Processing of the Balinese Traditional Food *Sardine Pedetan*. *International Research Journal of Engineering, IT and Scientific Research*, 3 (3): 17 - 26.
- [3] Suharna, C., L. Sya'rani, T.W. Agustini. 2006. *Kajian system Manajemen Mutu Pada Pengolahan Ikan Jambal Roti di Pengandaran kabupaten Ciamis*. *Jurnal Pasir Laut*. 2(1): 13-25

- [4] Yahono, S.B. 2004. Kajian Beberapa Aspek Pengolahan Ikan Secara Tradisional Dalam upaya Peningkatan Mutu Produk Perikanan di Kabupaten Jepara. Tesis. Program Studi Magister Manajemen Sumber Daya Perairan. Universitas Diponegoro. Semarang
- [5] Hariyadi, P dan R.D. Hariyadi. 2011. Memproduksi Pangan Yang Aman. Dian Rakyat. Jakarta
- [6] Kristina, F., 2010. Post Market Vigilance. Upaya Perlindungan terhadap Konsumen. Buletin Keamanan Pangan. Badan POM RI. ISSN 1693-9344. Hal 3-5.
- [7] BSN (Badan Standarisasi Nasional) 2009. Ikan Asin Kering – bagian 1: spesifikasi: SNI 01-2721.1-2009. Ikan Asin Kering – bagian 2: Persyaratan bahan Baku: SNI 01-2721.2-2009. Ikan Asin Kering – bagian 3: Penanganan dan Pengolahan : SNI 01-2721.3-2009. Jakarta.
- [8] Singapurwa, N. M. A. S., Candra, I. P., & Semariyani, A. A. M.. 2022. Profil Protein Ikan Lemuru dengan Pengeringan Oven, Pengering Matahari dan Sinar Matahari Berbasis SDS Page Jurnal Teknologi Hasil Pertanian, 15(2), 83-95. <https://doi.org/10.20961/jthp.v15i1.53612>
- [9] Singapurwa, N.M.A.S., I W. Sudarta, A.A.M. Semariyani. M.L. Kant. (2017a). The type of Fish and Storage Time to The Characteristics of Pedetan in Jembrana Bali. Sustainable Environment Agricultural Science 1(1): 12-18.
- [10] Singapurwa, N.M.A.S., A.A.M. Semariyani, I.P Candra. (2017b). Identification of the Implementation of GMP and SSOP on the Processing of the Balinese Traditional Food Sardine Pedetan. International Research Journal of Engineering, IT and Scientific Research. 3 (3): 17 - 26. <http://dx.doi.org/10.21744/irjeis.v3i3.449>
- [11] Singapurwa, N.M.A.S., I.P Candra, A.A.M. Semariyani. (2017c). Characteristics of Balinese Traditional Food Pedetan with Plastic Packaging in Storage. J. Biol. Chem. Research. 34 (1): 256 - 266.
- [12] Singapurwa, N.M.A.S., A.A.M. Semariyani, I.P Candra. (2016). Microbial Contamination in Traditional Food Processing Pedetan. Proceeding The International Conference in Bioscience. 26-27 July 2016. Denpasar, Indonesia. 135-140
- [13] Singapurwa, N.M.A.S., I.P Candra, A.A.M. Semariyani. (2017d). Application of GMP and SSOP in Balinese Traditional Food Safety Pedetan Sardine Fish (Sardinella lemuru Bleeker). Proceedings of the International Conference on Food Sovereignty and Sustainable Agriculture. 1-3 Agustus 2017. Jember, Indonesia. 327-333.
- [14] Singapurwa, N. M. A. S., Suprpta, D. N., Gunam, I. B. W., Wirya, I. G. N. Al. S., dan Khalimi, K. (2018). Identification of Contaminant Fungi on Pedetan, an Dry Fish Product of Lemuru (Sardinella lemuru). Journal of Biology, Agriculture and Healthcare 8(6): 75–82.
- [15] Singapurwa N M A S, Candra I P and Rudianta I N. (2019). The ability of garlic extract and Kaempferia galangal inhibit Aspergillus sp. isolated from Sardine fish 'Pedetan' Journal of Physics: Conference Series 1402 033055. <https://doi.org/10.1088/1742-6596/1402/3/033055>
- [16] Singapurwa N M A S, Candra I P. (2021). Antimicrobial activity of garlic and Kaempferia galanga on Aspergillus sp. growth isolated from sardine fish Pedetan. IOP Conf. Ser.: Earth Environ. Sci. 824 012037. <https://doi.org/10.1088/1755-1315/824/1/012037>
- [17] Badan Karantina Ikan Pengendalian mutu dan Keamanan Hasil Perikanan (BKIPM). 2014. GMP dan SSOP. Persyaratan di Unit Pengolahan Ikan. Pusat Sertifikasi Mutu dan Keamanan Hasil Perikanan. Kementrian Kelautan dan Perikanan. Jakarta
- [18] Direktorat Jenderal Pengolahan dan Pemasaran Hasil Perikanan (Ditjen PPHP). 2007. Peraturan No. PER.011/DJ-P2HP/2007 tentang Pedoman Teknis Penerapan Sistem Jaminan Mutu dan Keamanan Hasil Perikanan. Direktorat Jenderal Pengolahan dan Pemasaran Hasil Perikanan, Departemen Kelautan dan Perikanan. Jakarta
- [19] Direktorat Jendral P2HP-DKP (Pengolahan dan Pemasaran Hasil Perikanan Departemen Kelautan dan Perikanan). 2007. Masalah dan Kebijakan Peningkatan Produk Perikanan Untuk Pemenuhan Gizi Masyarakat. Makalah seminar Hari Pangan Sedunia Tahun 2007. Jakarta.
- [20] Hadi, S.H. 2016. Analisis Pengaruh Cita Rasa, Label Halal, dan Diversifikasi Produk terhadap Keputusan Beli Konsumen pada Produk Olah Tuna Inggit Pacitan Jawa Timur (Studi Kasus Pada UD Bina Makmur Pacitan, Jawa Timur). AT-TAUZI: Jurnal Ekonomi Islam. 15: 131-142
- [21] Surahman, B., Winarti, W. Analisis Pengaruh Cita Rasa Terhadap Kepuasan Pelanggan HR Coffe SP. Empat, Bebesen. Gajah Putih Journal economics review. 3(2): 1-20. <https://doi.org/10.55542/gpjer.v3i2.70>.
- [22] Suwirmayanti, N.L.G.P., Hadi, R., Permana, P.A.G., Sukerti, N.K., Setiawan, I K R., Vijaya, I G.N.A.C. 2021. Penambahan Desain Kemasan dan Varian Rasa Pada Usaha Jajan Terang Bulan Mini. Widyabhakti. Jurnal Ilmiah Populer. 3(2): 75-82.
- [23] Keren dan Sulistion. 2019. Pengaruh Motivasi, Budaya, dan Sikap Konsumen Terhadap Keputusan Pembelian Produk Indomie. JIMKES Jurnal Ilmiah Manajemen Kesatuan. 7(3): 319-324.
- [24] Prameswari. N. S., Haq, M.H., Widagdo, P.B. 2021. Strategi Pembentukan Citra Produk UKM Melalui Perancangan Desain Kemasan Stick Snack "Sabilla Djaya". Citra Dirga. 03 (01): 1-9.
- [25] Bintarti, S. 2021. Keputusan Pembelian: Citra Merk, Cita Rasa dan Harga Consumer. Jurnal Pelita Ilmu. 15(01): 7-16
- [26] Nuryanti, L.B., Rahman, A.Y. 2008. Pengaruh Variasi Dan Kemasan Produk Terhadap Keputusan Pembelian Teh Kotak Ultrajaya (Survei pada Mahasiswa FPIPS Universitas Pendidikan Indonesia). Jurnal Pendidikan Manajemen Bisnis (Startegic). 7(14): 31-43.
- [27] Willya, Nurjanah, S. 2019. Pengaruh Kemasan Produk Dan Rasa Terhadap Minat Beli Yang Berdampak Pada Keputusan Pembelian Pelanggan Minuman Energi. Jurnal Ilmu Manajemen. 9 (2): 65-74.
- [28] Indriasari, R. 2021. Penyuluhan Tentang Pengolahan Dan Pengemasan Varian Rasa Produk Keripik Pisang Industri Rumah Tangga Desa Padang Kecamatan Pagar Gunung Kabupaten Lahat. Jurnal Anadara Pengabdian Kepada Masyarakat. 3(1): 1-5.
- [29] Sigit, H.T., Muttaqien, Z. 2020. Peningkatan Pengetahuan Inovasi Dalam Proses Produksi Dan Pemasaran Bagi Pelaku Usaha Kuliner Serabi Di Desa Panyaungan Jaya Kecamatan Ciomas. Bantenese Jurnal Pengabdian Masyarakat. 2(1): 62-70.
- [30] Rahayu, F., Barkah, C., Chan, A., Tresna, P.W. 2021. Analisis Kepuasan Konsumen Terhadap Produk Sambal Kemasan Untuk Formulasi Perbaikan Strategi Produk. Bisma: Jurnal Bisnis dan Manajemen. 15(1): 47 – 55. <https://jurnal.unej.ac.id/index.php/BISMA>
- [31] Wibowo, T.A., Darmanto, Y.S., Amalia, U. 2015. Karakteristik Kekian Berbahan Baku Surimi Ikan Kurisi (Nemipterus Nematophorus) Dengan Penambahan Daging Ikan Yang Berbeda (The Characteristic of "Kekian" from Threadfin Brems (Nemipterus nematophorus) Surimi with Different Addition of Fish Meat. Jurnal Pengolahan dan Bioteknologi Hasil Perikanan. 4(2): 17-24.