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## Training of Red Devil Fish (*Amphilophus labiatus*) Processing into Catfish Feed at Kedisan Village, Bangli, Bali

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### Abstrak

Ikan *Red Devil* merupakan ikan air tawar yang invasif. Akibat kehadiran ikan ini, hasil panen ikan di Desa Kedisan berkurang akibat ikan budidaya dimangsa Ikan *Red Devil*. Kegiatan ini bertujuan untuk mensosialisasikan pemanfaatan ikan *Red Devil* menjadi pakan ikan lele berdasarkan permasalahan masyarakat pedesaan serta mengukur tingkat indeks kepuasan peserta. Berdasarkan pelaksanaan kegiatan pembuatan pakan ikan lele dari ikan setan merah terlihat bahwa ikan *Red Devil* dapat diolah menjadi pakan ikan lele dengan menambahkan bahan tambahan. Selain itu, kegiatan sosialisasi yang telah dilaksanakan dapat dikategorikan sukses karena tingginya tingkat kepuasan dari peserta.

*Kata kunci:* Ikan Red Devil; Pakan Ikan Lele; Batur, Ragi Tempe; Tingkat Indeks Kepuasan

### Abstract

*The Red Devil is an invasive freshwater fish. As a result of the presence of that fish, fish harvests in Kedisan Village have been decreased due to cultivated fish being preyed upon by Red Devil Fish. This workshop provided education and practice of repurposing Red Devil Fish into catfish feed at Kedisan Village based on rural community problems. It measured the satisfaction index rate by the participants. Based on the implementation of activities to make catfish feed from Red Devil Fish, it can be seen that red devils can be processed into catfish feed by adding additional ingredients. In addition, the socialization activities that have been implemented can be categorized as successful because of the high level of satisfaction from the participants.*

*Keywords:* Red Devil Fish; Catfish Feed, Batur; Tempeh Yeast; Satisfaction Index Rate



## Introduction

Mount Batur is one of the mountains located in Bali Province. Volcanic activity millions of years ago caused a large explosion on Mount Batur, resulting in the formation of a basin large enough to become a lake called Lake Batur (Raharja, 2018). Lake Batur is located in Kintamani District which is surrounded by several villages, such as Abang Batudinding Village, Abangsongan Village, Buahon Village, Central Batur Village, Buahon Village, Terunyan Village, Songan A Village, Songan B Village, and Kedisan Village (Samodra, 2018).

As one of the villages located in the Lake Batur area, economic activities in Kedisan Village cannot be separated from Lake Batur (Suryadana & Maha, 2023). The Kedisan Village community uses Lake Batur as a source of irrigation for crop production activities and fish ponds (N. Y. S. Putri et al., 2023). The leading fishery commodities in Kedisan Village include Nile tilapia (*Oreochromis niloticus*) and Mozambique tilapia (*Oreochromis mossambicus*), both of which are cultivated using a pond system on Lake Batur. However, in pond fish farming activities, farmers face problems with the presence of Red Devil Fish (*Amphilophus labiatus*).

Red Devil is an invasive freshwater fish (Hollings et al., 2016). As a result of the presence of this fish, fish harvests in Kedisan Village have been decreased due to cultivated fish being preyed upon by Red Devil Fish (Umar et al., 2015). Various control efforts have been made to control Red Devil Fish, one of which is large-scale fishing. However, this causes the carcasses of Red Devil Fish to pile up. Due to high protein content in Red Devil Fish which can reach 35% (Fatma, 2017), processing Red Devil Fish into food has already been done. However, due to the taste being less attractive, the fish was never processed into food again.

Based on these problems, processing Red Devil Fish is important to control the fish population in Lake Batur. Processing Red Devil Fish into Catfish feed is considered more appropriate because the community can reuse the resulting product and does not produce additional waste. Moreover, this product will be very profitable for catfish farmers in Kedisan Village due to it can reduce feed costs. Based on this, this research aims to process Red Devil Fish into catfish feed to control the Red Devil Fish population in Batur Lake.

## Methods

### Program Design

This community development program was held on Sunday, January 16, 2024 at Kedisan Village, Bangli Regency, Bali. This workshop provided education and practice of repurposing Red Devil Fish into catfish feed at Kedisan Village based on rural community problems and measured the satisfaction index rate by the participants. This program started with identifying current problems and

potential at Kedisan Village, demonstration activities to show product processing, and evaluation of demonstration effectiveness. Moreover, the expected outcome of this program is villagers can make an alternative Catfish feed from Red Devil Fish. The problem-solving framework of this community development program is provided in Figure 1.

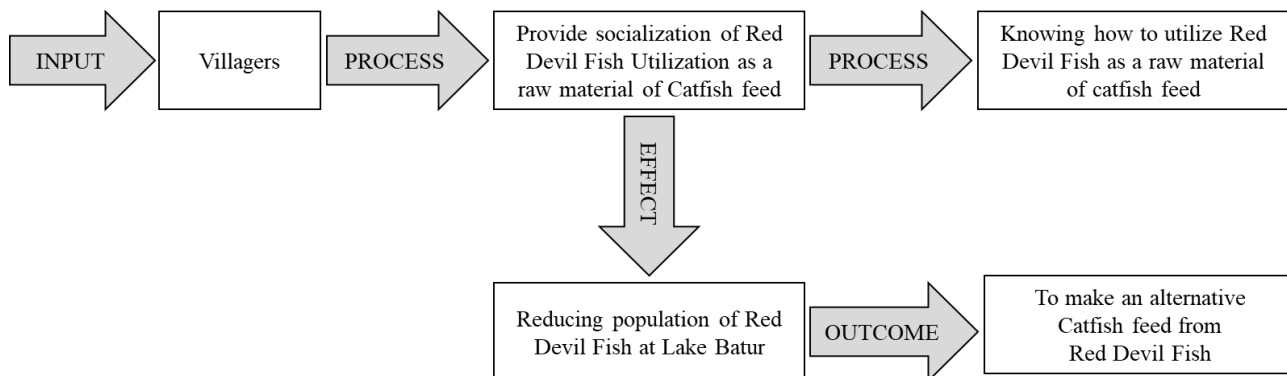


Figure 1. Problem Solving Framework of Community Development Program

### Catfish Feed Making

The Materials used in this program were 1 Kg fresh Red Devil Fish, 10 grams of tempeh yeast, 10 ml of multivitamin, and 200 grams of bran. Red Devil Fish were obtained from floating net cages at Lake Batur. The process of catfish feed-making is provided in Figure 2.

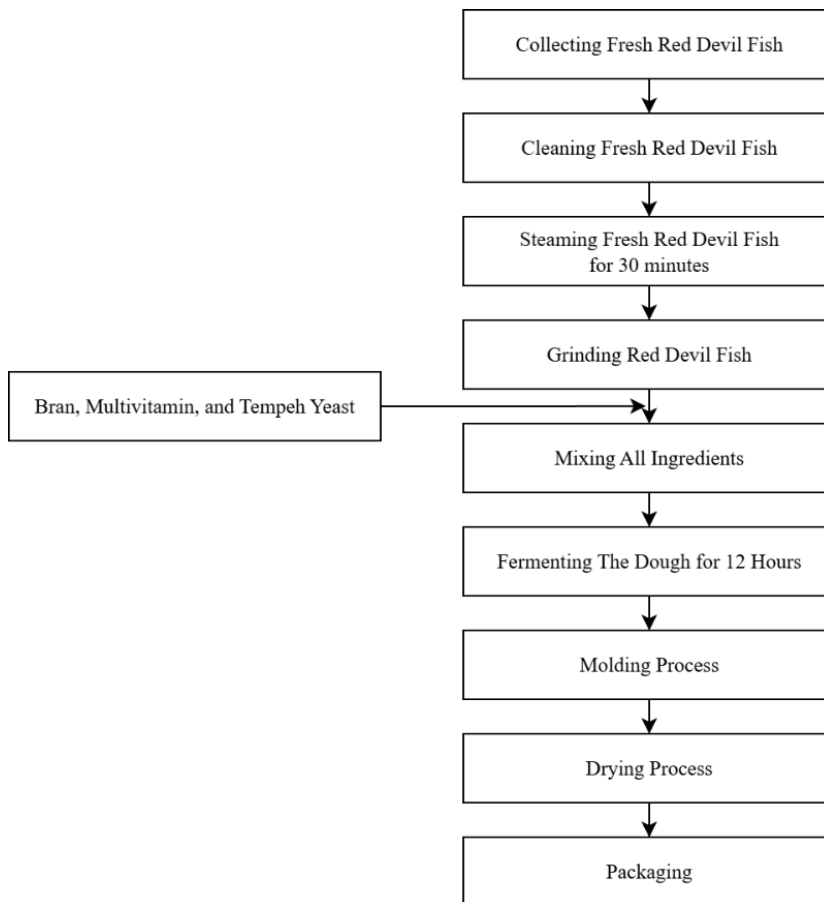


Figure 2. Product Processing Flow of Catfish Feed from Red Devil Fish

## Satisfaction Index Rate

The level of participant satisfaction with the program was assessed through a questionnaire and a scale from 1 to 5 (1 for dissatisfied; 2 for less dissatisfied; 3 for quite satisfied; 4 for satisfied; and 5 for very satisfied), with the average score providing an overall indication of satisfaction. There are ten satisfaction index to measured participant satisfaction from this community development program, including:

- a. Material presented by the team
- b. The method that is easy to apply
- c. Material that increases participants' knowledge and abilities
- d. Media or technology used in the program
- e. Methods used to help participants absorb the material
- f. Interesting material
- g. Training methods make participants more proactive
- h. Training methods appropriate to material
- i. The program held on time
- j. Participants' opinions regarding the entire event

## Result and Discussion

### Red Devil Fish Processing

Socialization of catfish feed making from Red Devil Fish was conducted at Kedisan Meeting Hall and attended by 15 participants who work as farmers and fish farmers in Kedisan Village. This activity begins with the presentation about the urgency of Red Devil Fish in Batur Lake and the solution to handle the existence of the Red Devil Fish by process it into Catfish feed.

Processing Red Devil Fish begins with collecting Red Devil Fish from Batur Lake. After that, cleaning the Red Devil Fish which is obtained to clean the fish from dirt and metal substances that stick to the body of the Red Devil Fish. Then the fish is steamed for 30 minutes to soften the Red Devil Fish meat. The steamed fish is then cooled and ground to crush the Red Devil Fish so it is easy to process. Then, the grounded fish added with bran and Multivitamin. The addition of bran aims to increase the carbohydrate content of fish feed. Moreover, bran contains 58.41% carbohydrates and 14.27% protein so the addition of bran can be a source of additional energy and nutrition for catfish (Sivamaruthi et al., 2018). Red Devil Fish meat which has been added with additional ingredients, then fermented for 12 hours using tempeh yeast. The use of tempeh yeast in making fish food functions to increase the protein content in catfish. The increase in protein content after fermentation using tempeh yeast occurs due to the role of microbes in converting organic and inorganic compounds into protein. Proteins that have been formed after the fermentation process will accumulate in the form of colonies (Kumitch et al., 2020). The fermented dough is then molded and dried using sunlight

until the fish food is completely dry. After that, packaging is carried out to ensure that the fish food is stored properly (Siregar et al., 2019).

Based on the feed manufacturing process that has been carried out, Red Devil Fish that have been steamed and ground have a very fishy smell. Apart from that, fermented Red Devil Fish meat can attract groups of flies. This is caused by fermented food which is very suitable as a breeding ground for flies and as a food source for flies (Putri, 2019).



Figure 1. Red Devil Fish Processing

### Evaluation of Socialization using Satisfaction Index Rate Form

Evaluation of activities is carried out using the Satisfaction Index Rate form which is filled in by counseling participants. The Satisfaction Rate form index measures how the socialization or training process is carried out and the extent to which participants understand the material that has been presented (Ke et al., 2017). The following are the results of the satisfaction index rate form.

Table 1. Satisfaction Indeks of Kedisan Villagers

Number	Aspect	Average	Description
1	Material presented by the team	4,2	Satisfied
2	The method that is easy to apply	4,0	Satisfied
3	Material that increases participants' knowledge and abilities	3,9	Moderately Satisfied
4	Media or technology used in the program	4,0	Satisfied
5	Methods used to help participants absorb the material	4,0	Satisfied
6	Interesting material	4,0	Satisfied
7	Training methods make participants more proactive	4,0	Satisfied
8	Training methods appropriate to material	4,2	Satisfied
9	The program was held on time	4,0	Satisfied
10	Participants' opinions regarding the entire event	4,1	Satisfied

Based on the results of the satisfaction index rate form, it can be seen that participants were satisfied with the implementation of the socialization with an average score of 4. However, there was 1 aspect that was below 4, namely regarding the material presented. The material presented received a score of 3.9 or quite satisfactory. This is due to less effective communication and delivery by researchers and the use of scientific terms that have not been simplified, so that simplification of scientific terms is needed to make the audience's understanding greater (Baaden et al., 2018). Moreover, the use of effective communication in outreach activities is necessary so that the information conveyed can be well received by the audience (Bâlc, 2018; Kamaruzaman et al., 2022).



Figure 1. Socialization activity

### Conclusion

Based on the implementation of activities to make catfish feed from Red Devil Fish, it can be seen that red devils can be processed into catfish feed by adding additional ingredients. In addition, the socialization activities that have been implemented can be categorized as successful because of the high level of satisfaction from the participants.

### Suggestion

It is necessary to add ingredients that can reduce the fishy smell of Red Devil Fish so that the processed Red Devil Fish does not attract flies.

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### References

- Baaden, M., Delalande, O., Ferey, N., Pasquali, S., Waldispühl, J., & Taly, A. (2018). Ten simple rules to create a serious game, illustrated with examples from structural biology. *PLoS Computational Biology*, *14*(3), 1–9.
- Bâlc, S. (2018). The Role of Culture and Communication in the Socialization Process. *SSRN Electronic Journal*.
- Hollings, T., Jones, M., Mooney, N., & McCallum, H. (2016). Disease-induced decline of an apex predator drives invasive dominated states and threatens biodiversity. *Ecology*, *97*(2), 394–405.
- Kamaruzaman, Rahman, A., Alfian Sidik, M., Firdaus, Sudanto, Lumintang, A., Vathul Jannah, W., & Aulia Bidari, D. (2022). Peningkatan Minat Bakat dan Kemampuan Berwirausaha Komunitas Pebisnis Muda Melalui Pelatihan Kewirausahaan. *Dinamisia : Jurnal Pengabdian Kepada Masyarakat*, *6*(4), 978–986. <https://doi.org/10.31849/dinamisia.v6i4.11030>.
- Ke, Y. T., Kuo, C. C., & Hung, C. H. (2017). The effects of nursing preceptorship on new nurses' competence, professional socialization, job satisfaction and retention: A systematic review. *Journal of Advanced Nursing*, *73*(10), 2296–2305.
- Kumitch, H. M., Stone, A. K., Nickerson, M. T., Korber, D. R., & Tanaka, T. (2020). Effect of fermentation time on the physicochemical and functional properties of pea protein-enriched flour fermented by *Aspergillus oryzae* and *Aspergillus niger*. *Cereal Chemistry*, *97*(2), 416–428.
- Fatma, R. A. (2017). Pengolahan red devil (*Amphilophus labiatus*) Waduk Sermo menjadi asam amino sebagai sumber nutrisi tanaman durian (*Durio Zibethinus*). *Jurnal Agroekoteknologi Universitas Sumatera Utara*, *5*(1), 109190
- Putri, N. Y. S., Putra, I. D. G. A. D., & Rajendra, I. G. N. . (2023). Analysis of Land Use Suitability

in Batur Lake Border, Bali Province. *Journal of Regional and Rural Development Planning*, 2023(1), 29–41.

- Putri, Y. P. (2019). Keragaman Spesies Lalat Berdasarkan Lokasi Penangkapan Di Pasar Induk Jakabaring Palembang. *Indobiosains*, 1(2), 45.
- Raharja, I. (2018). Heritage, Knowledges and Memories on Pura Penulisan Architecture Bali at Ancient Mount Batur Caldera Area. *Cultura*, 15(1), 85-101.
- Samodra, H. (2018). Geotourism in Batur UNESCO Global Geopark, Indonesia. In *Handbook of Geotourism* (pp. 367–378). Edward Elgar Publishing.
- Siregar, G., Andriany, D., & Bismala, L. (2019). Program Inkubasi Bagi Tenant Inwall Di Pusat Kewirausahaan, Inovasi Dan Inkubator Bisnis Universitas Muhammadiyah Sumatera Utara. *Nasional Kewirausahaan*, 1(1), 45–51.
- Sivamaruthi, B., Kesika, P., & Chaiyasut, C. (2018). A comprehensive review on anti-diabetic property of rice bran. *Asian Pacific Journal of Tropical Biomedicine*, 7(1), 79–84.
- Suryadana, I. P. A., & Maha, A. (2023). Marketing Mix Analysis on Increasing Income of Floating Net Cage Farmers (Case Study in Kedisan Village, Kintamani). *Agriwar Journal*, 3(2), 53-57.
- Umar, C., Kartamihardja, E. S., & Aisyah, A. (2015). Dampak invasif ikan red devil (*amphilophus citrinellus*) terhadap keanekaragaman ikan di perairan umum daratan di Indonesia. *Jurnal Kebijakan Perikanan Indonesia*, 7(1), 55.