



## DIVERSIFICATION OF TOFU WASTE INTO TEMPE GEMBOS AND TEMPE RAGI IN TELUK SENTOSA VILLAGE

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### Abstract

The diversification of tofu waste into soft tempeh and tempeh starter in Teluk Sentosa Village aims to optimize the utilization of tofu waste while increasing community income. Through participatory training, the community is taught techniques for processing tofu waste into value-added products. The results indicate that the produced soft tempeh has a tender texture and high nutritional value, while the tempeh starter shows good fermentation activity. Marketing these products has led to a significant income increase of approximately 30% within three months post-training. Additionally, this initiative contributes to waste reduction and enhances community awareness regarding sustainable resource management. It is hoped that this program can continue and provide positive impacts on the economy and environment in the village.

**Keywords:** Diversification, Residue, Soft, Tempe Yeast

### Abstrak

Diversifikasi ampas tahu menjadi tempe gembos dan ragi tempe di Desa Teluk Sentosa bertujuan untuk mengoptimalkan pemanfaatan limbah tahu serta meningkatkan pendapatan masyarakat. Melalui pelatihan partisipatif, masyarakat diajarkan teknik pengolahan ampas tahu menjadi produk bernilai tambah. Hasil dari kegiatan ini menunjukkan bahwa tempe gembos yang dihasilkan memiliki tekstur lembut dan nilai gizi yang tinggi, sementara ragi tempe menunjukkan aktivitas fermentasi yang baik. Dengan memasarkan produk ini, pendapatan masyarakat meningkat signifikan, sekitar 30% dalam tiga bulan setelah pelatihan. Selain itu, kegiatan ini juga berkontribusi pada pengurangan limbah dan peningkatan kesadaran masyarakat akan pentingnya pengelolaan sumber daya yang berkelanjutan. Diharapkan, program ini dapat terus berlanjut dan memberikan dampak positif bagi ekonomi dan lingkungan di desa tersebut.

**Kata kunci:** Diversifikasi, Ampas, Gembos, Ragi Tempe

### 1. BACKGROUND

Teluk Sentosa Village is an area with significant potential for tofu production. However, the tofu production process generates waste in the form of okara, which is often underutilized. This waste not only poses an environmental problem but also represents a neglected resource. By diversifying okara into soft tempe and tempe yeast, the community can reduce waste while simultaneously increasing their income. Utilizing okara allows the residents of Teluk Sentosa Village to contribute to mitigating



negative environmental impacts while creating new economic opportunities that enhance the overall well-being of the community (Putri et al., 2023).

Okara is the byproduct of tofu production that is frequently discarded. On a larger scale, this waste can accumulate and contribute to serious environmental pollution (Fitri et al., 2020). Although okara is rich in protein and various essential nutrients, it is often discarded without further utilization. This situation highlights the significant potential that remains untapped in managing this waste. With a creative approach, okara can be processed into high-value products such as soft tempe or animal feed, thereby reducing waste and enhancing community welfare while protecting the environment (Arisudin et al., 2021).

The diversification of okara into soft tempe and tempe yeast offers numerous benefits for the community. Soft tempe, as a fermented product, is rich in plant protein and can serve as a nutritious healthy food alternative (Hermayunita et al., 2023). This product not only provides better dietary options but also raises awareness of healthy eating habits. Tempe yeast, on the other hand, plays a crucial role as a starter in the tempe fermentation process, enabling the production of higher-quality tempe. By utilizing okara, the community can produce useful products while also creating high-value items that can significantly increase their income (Mujayyanah, 2023).

The diversification of okara into soft tempe and tempe yeast presents substantial economic benefits for the community. Producing these two products can boost community income while creating valuable new job opportunities. Beyond the economic aspects, the success of this program has the potential to strengthen social solidarity among village residents. Collaboration in production and marketing processes encourages closer interactions, fostering a sense of togetherness and mutual support. Thus, this initiative not only provides financial benefits but also reinforces social bonds that are vital for the overall development of the community (Heryadi et al., 2022).

Based on a field survey, one of the business groups partnering in community service activities is the Tofu Producers Group located in Teluk Santosa Village, Panai Hulu District. Members of this group consist of housewives and men who rely on tofu production as their primary source of income. Currently, their business focuses on producing tofu that is marketed only within the Panai Hulu and Bilah Hilir regions.

Despite the great potential for diversification, several challenges must be addressed. One significant challenge is the lack of technical knowledge regarding fermentation and processing (Wulandari et al., 2024). To overcome this, a systematic and continuous training program is necessary. Additionally, access to markets for selling the final products poses another challenge. Collaboration with local government and marketing institutions needs to be facilitated to ensure that products can reach consumers effectively (Bolango & Gorontalo, 2024).

## 2. RESEARCH METHOD

### Participatory Approach

This method actively involves the community at every stage of the diversification process. Their engagement not only enhances skills but also fosters a sense of ownership over the produced products (Andriani et al., 2024).

### Training and Workshops

#### Training Needs Assessment:

Conduct preliminary surveys to identify the knowledge and skills needed by the community regarding okara processing.

#### Content Delivery:

Organize training sessions on techniques for processing okara into soft tempe and tempe yeast. The training materials will cover:

- a) Fermentation processes
- b) Techniques for making soft tempe
- c) Production of tempe yeast

#### Hands-on Practice:

After the content delivery, participants will practice the techniques learned under the guidance of experts.

#### **Okara Collection**

##### **Collaboration with Tofu Producers:**

Build partnerships with local tofu producers to ensure a sufficient supply of okara.

##### **Collection and Storage:**

Schedule okara collection and ensure it is stored properly to prevent spoilage.

#### **Processing**

##### **Production of Soft Tempe:**

1. Ingredient Preparation: Process okara by adding other ingredients such as soybeans and spices.
2. Fermentation: Use tempe yeast for the fermentation process lasting 24-48 hours.

##### **Production of Tempe Yeast:**

1. Waste Removal: Separate okara from waste and unusable materials.
2. Fermentation Process: Process okara into yeast through appropriate fermentation techniques.

#### **Evaluation and Monitoring**

##### **Product Quality Assessment:**

Conduct trials to evaluate the quality of the produced soft tempe and tempe yeast. Assessments will include:

- a) Taste
- b) Texture
- c) Nutritional quality

##### **Community Feedback:**

Gather feedback from the community regarding the produced products for future improvements.

#### **Marketing and Distribution**

##### **Marketing Strategies:**

Develop effective marketing strategies, including the use of social media and local markets to introduce the products.

##### **Collaboration with Retailers:**

Establish partnerships with local retailers to expand product reach.

#### **Documentation and Reporting**

##### **Data Collection:**

Document all processes from training to marketing for the final report.

##### **Report Compilation:**

Prepare a report that includes results, challenges faced, and recommendations for similar activities in the future. By implementing this method, it is hoped that the residents of Teluk Sentosa Village will successfully diversify okara into soft tempe and tempe yeast, thereby enhancing their welfare and knowledge in resource management.

### **3. FINDINGS AND DISCUSSION**

#### **Processing Okara**

The okara produced has a relatively high protein content, reaching about 20%. The processing begins with washing the okara to remove any residual soy milk. After thorough washing, the okara is mixed with additional ingredients such as rice flour and yeast, then formed into a soft tempeh dough. The fermentation process occurs for 24 to 48 hours at room temperature, allowing the microbial culture to develop effectively. The result of this fermentation is soft tempeh, which is rich in protein and possesses a distinctive texture and flavor, ready to be marketed and enjoyed by the community as a healthy food alternative.

#### **Characteristics of Soft Tempe**

The produced soft tempeh has a soft texture and a distinctive flavor. Analysis results show that the soft tempeh contains 18% protein, 5% fat, and 35% carbohydrates. Additionally, soft tempeh is rich in fiber and vitamin B. Organoleptic testing indicates that the majority of respondents appreciate the taste and texture of this soft tempeh.

### Tempe Yeast

The tempe yeast produced from okara demonstrates good fermentation activity. This yeast can be used as a starter for the production of regular tempeh. Analysis indicates that the tempeh yeast has a high spore content, making it effective in the soybean fermentation process. This yeast also has the potential to accelerate the fermentation process, resulting in higher-quality tempeh.

### Discussion

#### Training and Socialization

The socialization session was attended by around 50 village residents, including tofu producers and housewives. During this session, the community was informed about the nutritional value of soft tempeh and the process of making tempe yeast. Practical training was conducted hands-on, where participants were taught the steps for processing okara.



Source: (Author's Documentation, 2024)

**Figure 1. Soft Tempeh Products**

### Processing

After the training, several community groups began producing soft tempeh and tempeh yeast. The processing starts with washing the okara, mixing it with rice flour and yeast, and then fermenting it for 24 to 48 hours. The resulting soft tempeh has a soft texture and a distinctive aroma. The tempeh yeast produced also demonstrates good fermentation activity.

### Community Income

Once the products were successfully produced, the community actively began marketing soft tempeh and tempeh yeast. Some groups formed partnerships with local traders to sell these products, thereby expanding their market reach. Sales results showed a significant increase in income, indicating that these efforts were highly effective. Within three months of completing the training, the average community income increased by up to 30%. This success not only provided economic benefits but also



fostered a spirit of collaboration among community members, who became more committed to developing their businesses and improving their overall quality of life.

### **Economic Benefits**

The diversification of okara into soft tempeh and tempeh yeast has positively impacted the community's economy. By maximizing the utilization of available resources, the community can create value-added products that not only reduce waste but also enhance their income. This process helps create new business opportunities, providing broader economic benefits. The additional income generated is significant for families in the village, especially in facing the rising cost of living. Thus, this initiative contributes to community welfare while simultaneously supporting environmental sustainability.

### **Skill Enhancement**

This activity provides opportunities for the residents of Teluk Sentosa Village to acquire new skills. In the training sessions, participants learned techniques for making soft tempeh and tempeh yeast, as well as gaining knowledge about effectively managing small businesses. With these skills, they are expected to feel more confident in running their enterprises. Additionally, the training encourages them to explore other business opportunities, such as developing new products or improving distribution channels. With the knowledge and skills gained, the community is anticipated to enhance their welfare and contribute more effectively to the village's economy.



**Source:** (Author's Documentation, 2024)

**Figure 2. Product Socialization at the Village Office**

### **Improvement of Community Nutrition**

This activity provides valuable opportunities for the residents of Teluk Sentosa Village to acquire beneficial new skills. In the training sessions, participants not only learn the techniques for making soft tempeh and tempeh yeast but also gain in-depth knowledge about effective small business management. With these skills, they are expected to feel more confident in running their enterprises.

Additionally, this training encourages the community to explore other business opportunities, such as developing new products or expanding distribution channels. With the knowledge and skills acquired, it is hoped that they can improve their welfare and contribute more effectively to the village's economy.



Source: (Author's Documentation, 2024)

Figure 3. Product Socialization at the Village Office

### Waste Reduction

The processing of okara into high-value products in Teluk Sentosa Village also contributes to waste reduction. Previously, okara was often discarded without meaningful use. With this program, such waste can be minimized, resulting in positive environmental impacts. The community of Teluk Sentosa Village has become more aware of the importance of sustainable resource management. Furthermore, they have learned how to creatively and productively utilize waste, which not only reduces pollution but also enhances local economic potential through products made from previously discarded okara.

### Challenges and Recommendations

Despite the numerous benefits gained, the community of Teluk Sentosa Village faces several challenges in developing their businesses. One of the main challenges is the lack of knowledge about effective product marketing. Therefore, there is a need for further training focused on marketing strategies and product packaging to help them become more competitive in the market. Additionally, support from the government in the form of financial assistance or market access is crucial to strengthen the sustainability of these businesses. With the right training and support, it is hoped that the community of Teluk Sentosa can enhance their skills and achieve success in their enterprises.

## 4. CONCLUSION

Community service through the diversification of okara into soft tempeh and tempeh yeast in Teluk Sentosa Village has successfully increased income, skills, and nutritional awareness among the community. With proper management, this program not only provides economic benefits but also contributes to environmental sustainability. It is hoped that these activities can continue and develop, thereby improving the overall quality of life for the community. The diversification of okara into soft tempeh and tempeh yeast in Teluk Sentosa Village demonstrates significant potential both economically and environmentally. With the enhancement of community knowledge and skills, it is anticipated that these products can be produced sustainably. This initiative serves as a foundation for further development in the utilization of existing local raw materials.

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