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# Local Food Optimization through Mustard Nugget Processing Innovation Based on Economic Empowerment of Ledokombo Village Community

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## ARTICLE INFO

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## ABSTRACT

Ledokombo Village is situated in a highland area, and most of its residents are farmers. One of the primary commodities cultivated is mustard greens (sawi). However, simultaneous harvesting often leads to oversupply, causing the price of mustard greens to drop significantly. To address this issue, there is a need for solutions to enhance the selling price of mustard greens through processing into other products. In response to this potential, students from the Collaborative KKN Posko 195 initiated a training program for making Frozen Food Sawi Nuggets for the community, mainly targeting the mothers who are cadres of the posyandu (integrated health service post) in Ledokombo Village. This activity was conducted from August 10 to August 15, 2024, at the KKN Posko 195, with the following objectives: to increase the absorption of mustard greens, to provide the community with an understanding of processed mustard green products, and to enhance motivation in creative economics. The training covered various stages, from ingredient preparation to processing, concluding with a socialization session held at the village hall. Participants showed high enthusiasm throughout the training, and the outcome of this activity was an increased understanding of processed mustard greens as Frozen Food Nuggets. This initiative improved the absorption of mustard greens and encouraged the consumption of processed vegetable products. The positive impacts included the enhancement of micro, small, and medium enterprises (MSMEs), a reduction in stunting, and the strengthening of food security in Ledokombo Village.

## 1. Introduction

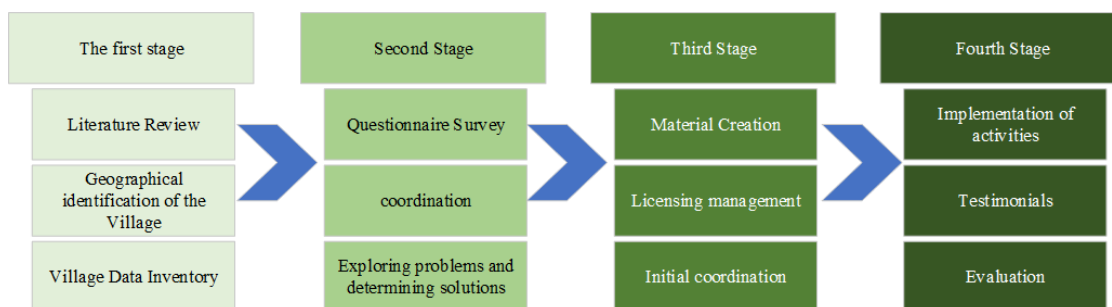
Ledokombo Village is located in Ledokombo Sub-district, Jember Regency, East Java. Geographically, the village is located at an altitude of 370 masl and has an area of 6.7 km<sup>2</sup>. Due to its location in the highlands, the people of Ledokombo have various livelihoods, including farmers, planters, and breeders (Azzahra *et al.*, 2022). The majority of Ledokombo people work as farmers. Crops commonly grown by residents are corn, chili, rice, papaya, tobacco, and mustard greens. One of the agricultural commodities of the Ledokombo village community is mustard greens. According to (Siregar *et al.*, 2023), mustard greens have characteristics that are easy to grow in various places, both in the highlands and lowlands. The nutritional content of mustard plants includes calories, fat, protein, calcium, carbohydrates, fiber, phosphorus, iron, and various vitamins (Gole *et al.*, 2019). This plant is an antioxidant that prevents cancer because it has glucosinolate compounds (Agustin, 2019). The planting process is also relatively easy and fairly simple. Because it is easy to cultivate, mustard greens can thrive in various regions (Alifah *et al.*, 2019), especially in Ledokombo Village. Elevation and cool climate make mustard greens develop very well and flower quickly (Hidayati *et al.*, 2020).

The cultivation of mustard greens in Ledokombo village did not have a good impact on the farmers, but it was quite the opposite. The demand for mustard has increased, encouraging mustard farmers to expand their land. As a result, there is a problem of a surge in mustard production that exceeds the capacity in the market. This condition causes the selling price of mustard to decrease. Based on these problems, students of KKN - Collaborative Posko 195 have an innovation, which is making frozen food with nugget mustard. This community service activity aims to increase the usability of local food security and introduce product innovation for the community. We named this activity program the mustard nugget training activity (GETWI). This activity aims to provide training to posyandu cadres on the processing of mustard greens into frozen food. This initiative simultaneously impacts other aspects, such as enhancing local food security by effectively absorbing excess harvests. The economic impact includes the innovation of processed mustard green products, which have a better selling value and can positively contribute to the community's income. Another positive effect is the increased interest among children in consuming vegetables in different forms.

Nuggets, generally made from chicken, have been widely developed by producing various variations such as fish nuggets, meat nuggets, and tofu nuggets (Hartono, 2020). Nuggets, which are fast food, also have weaknesses. One of the weaknesses is the reasonably low fiber content, so innovation is carried out by adding vegetables in its manufacture to increase the fiber content (Rasyid *et al.*, 2020). The addition of vegetables is expected to increase fiber content because vegetables are one of the sources of food fiber, which is proven to have an important role in maintaining a healthy body (Fikri *et al.*, 2024). Indonesia produces local foodstuffs with good nutritional potential and bioactive components. However, it has not been utilized optimally due to limited public knowledge of the benefits of local food in terms of nutrition and health (Wati *et al.*, 2022). The innovation of making mustard nuggets carried out by KKN-Collaborative Posko-195 Ledokombo students was expected to increase the economic value and contribute to good nutrition for the community.

## 2. Methods

Community Service is a collaborative community service programme held in Ledokombo Village, Ledokombo Sub-district, Jember Regency, from 10-15 August 2024. The participants comprised 20 people from the village officials and Posyandu cadres of Ledokombo village. This community service carries the theme 'The Advantages of Mustard in Protecting Eyes from Cell Damage and Minimising the Existence of Wasted Mustard in Ledokombo Village' with the target of mustard farmers and the community in Ledokombo Village. The method of implementing this activity is by providing training in directly making frozen food nuggets of mustard greens, which is carried out in several stages.



**Figure 1. methods**

The first stage is the preparation stage, which focuses on conducting a literature review. In this stage, relevant references, such as journals, books, and scientific articles, are collected and analyzed to support the mustard green nugget production project.

The second stage is the implementation phase of mapping, surveys, and distributing questionnaires involving village officials and a sample of residents. This activity is conducted to collect accurate and in-depth data regarding the current conditions in the field, including the potential resources available, the level of mustard green production, and the issues faced by the community.

The third stage is submitting a project proposal and collaborating with the relevant village officials regarding the activities to be carried out. In this stage, the organizing team prepares a detailed proposal that includes the planned activities, the objectives to be achieved, and the expected benefits for the community. The proposal is then submitted to the village officials for approval and support through cooperation. This coordination covers several important aspects: participants: Determining who will be involved in this activity, particularly housewives, who are the main target for the training.

The fourth stage is the training activity phase, held at the Ledokombo Village Hall. Participants are volunteer housewives willing to join. During this stage, practical training on mustard green nugget production is conducted. Participants will learn various aspects, including processing techniques, hygiene standards, and product packaging.

### **3. Results and Discussion**

#### **a. Identifying the Problem**

Based on the survey conducted, it was concluded that Ledokombo Village is a significant producer of mustard greens. However, the community has not been able to manage this potential effectively. Therefore, Posko 195 agreed to utilize mustard greens as the main object in activities aimed at enhancing community empowerment based on local potential.

#### **b. Coordination with Community Members and Village Officials**

After the students from KKN-Kolaboratif 195 agreed on the main program to create processed Frozen Food Mustard Green Nuggets, they coordinated with several community members and village officials to organize a training session on making these frozen food nuggets.

#### **c. Training Activity**

The training activity was conducted after coordinating with village officials. It was attended by several mothers who are posyandu cadres from the KKN 195 Posko. The following is a sequence of events during the training: Introduction and Objectives welcoming participants and explaining the objectives of the training. Theory and Demonstration providing theoretical knowledge about mustard greens and demonstrating the processing techniques. Hands-On Practice allowing participants to practice making the frozen food nuggets under supervision.

#### d. Socialization

After the training was deemed sufficient, the KKN 195 students planned to conduct a socialization event at the Ledokombo Village Hall. This event was attended by other posyandu cadres and village officials to share the knowledge and promote the new product.

#### e. Evaluation

This stage involved assessing the training and socialization activities. A panel evaluated the effectiveness of the training on making frozen food nuggets and the overall impact of the socialization efforts. With the following recipe details:

##### *Stages of the Training Activity*

The recipe and ingredients for making frozen food mustard nugget are listed in table 1. As well as the ingredients and equipment used as in figure 2.

**Tabel 1.** Recipe frozen food nugget sawi

Main ingredients and seasoning	Coating Materials
250-300 g mustard greens	1 tbsp wheat flour
120g white tofu	5 tbsp water
7 tbsp triangular flour/ wheat flour	½ tsp chicken stock powder
4 tbsp cornflour	150g breadcrumbs
1 chicken egg	1 tbsp wheat flour
3 cloves shallots	
4 cloves garlic	
1 packet chicken stock powder	
½ packet ground pepper	
½ tbsp salt	
85g thinly sliced mustard leaves	

#### a. Procedure

- 1) Crush the tofu until smooth
- 2) Add flour and cornflour into the tofu mixture and stir evenly.
- 3) Add the beaten egg into the flour mixture.
- 4) Cut the mustard greens into small pieces then add the shallots and garlic in a blender with 1 tbsp water
- 5) then chop the smaller mustard leaves again for the dough mixture
- 6) After mixing evenly, add salt, chicken stock powder, and pepper into the batter.
- 7) Then make the batter smooth and prepare a stainless bowl or banana leaf for steaming.
- 8) Steam the batter for 120 minutes



**Figure 2.** Training on Making Mustard NuggetProducts

Figure 2 shows the process of making mustard green nuggets during practical activities. This activity includes the process of making nuggets and mixing the ingredients. The socialization of GETWI (Nugget Sawi) making was held for 1 day at the KKN Ledokombo 195 post in Ledokombo village, Ledokombo sub-district. The activity was carried out in the following sequence:

*Executor*

The team implementing the service activities consists of Field Supervisors and Collaborative KKN 195 students. This activity is carried out to provide training in making frozen food and education about the dangerous effects caused by foods that are classified as frozen food. because these foods are currently very popular with children, especially children who don't like vegetables.

*Instructor*

Provide an understanding to residents of Ledokombo about the technique of making nuggets derived from natural ingredients such as mustard greens which contain various vitamins and minerals. In 56 grams of raw mustard greens contain: Calories: 15, Protein: 2 grams, Fat: less than 1 gram, Carbohydrates: 3 grams, Fiber: 2 grams, Sugar: 1 gram, Vitamin A: 9% of daily requirement, Vitamin B6 (pyridoxine): 6% of daily requirement, Vitamin C: 44% of daily requirement, Vitamin E: 8% of daily requirement, Vitamin K: 120% of daily requirement, Copper: 10% of daily requirement.



**Figure 3.** socialization activities and delivery of activity results

Figure 3 is a picture of socialization, testimonials and delivery of the results of activities with village officials and training participants. Mustard nugget products can last for 1 day if outside of room temperature and can last for approximately 2 weeks if placed in room temperature. In the initial capital, making mustard nuggets requires around Rp. 30,000 and obtaining around 10 pcs, which in 1 pcs contains 4 pieces of mustard nuggets with medium cuts.

Mustard nugget products can last for 1 day if outside of room temperature and can last for approximately 2 weeks if placed in room temperature. In the initial capital, making mustard nuggets requires around Rp. 30,000 and obtaining around 10 pcs, which in 1 pcs contains 4 pieces of mustard nuggets with medium cuts.

### Evaluation Stage

Testimonials and assessments from panelists at the socialization and training activities for making frozen food mustard nuggets are listed in Table 2.

**Table 2.** Testimonials and panelist assessments of frozen food products mustard nugget

Panels	Color	Texture	Aroma	Taste
Rohma	2	3	3	2
Siti	3	3	2	3
Luluk	3	3	2	4
Fida	2	2	3	4
Fiva	2	2	3	2
Fifir	2	3	3	2
Matus	3	3	2	3
Sofi	3	3	2	4
Titis	2	2	3	4
Tuna	2	2	3	2
Tina	3	3	4	2
Tani	2	3	2	3
Dina	3	2	2	3
Dini	3	2	3	3
Luna	2	2	3	4
Lina	2	3	2	3
Wardah	2	3	3	3
Fani	3	3	4	3
Aini	2	3	2	2
Faiza	2	2	3	4
<b>Avarage</b>	2,4	2,6	2,7	3

really don't like it: 0, do not like 2, like 3, really like : 4



The table above shows the assessment obtained from the panelists; in the color section the panelists on average gave the highest score of 2 because they did not really like the color of the nuggets. In the texture section, the panelists gave an average score of 3 because the texture was soft, dense, and slightly chewy so the panelists liked it. In the aroma section, the panelists gave an average score of 3 because the aroma of the nuggets is not too strong, so people who don't like vegetables can like it. In the taste section, the panelists gave an average score of 3 because the mustard nuggets made have the right and comfortable taste.

## Output

The training of mustard nuggets production to representatives of posyandu cadre members is expected to empower other posyandu cadre members, PKK mothers, and mothers of Ledokombo Village residents. The training in making mustard nuggets is also expected to overcome the losses of mustard farmers during the harvest period with low mustard prices so that the mustard harvest is not wasted.

Mustard nuggets that contain raw materials in the form of wheat flour, eggs, tofu, and mustard greens can make mustard greens nuggets products have complete nutritional value because they contain carbohydrates, fiber, vitamin A, animal protein, and vegetable protein (Faidah *et al.*, 2024).



**a**



**b**

**Figure 4.** a) Final Product of Mustard Nuggets; b) Documentation of Completed Activities

Figure 4 is a picture of the results of the training product. Mustard greens, packaged in a more attractive form, will increase the economic value and increase the consumption power of toddlers. Figure b shows training participants and village officials who supported the activity.

## 4. Conclusions

The initiative to develop frozen food nuggets from mustard greens in Ledokombo Village is a significant step in increasing community empowerment through the use of local agricultural resources. By identifying the abundant potential, namely mustard greens, and discussions with local residents and village officials. Direct training session activities not only promote food innovation but also provide a way to improve the community's economy. The successful implementation of the training and subsequent socialization activities showed a positive response from the participants, especially posyandu cadres. This involvement fosters a sense of community involvement and encourages the application of new skills that can lead to improved food processing activities. Furthermore, the evaluation stage will provide insight into the effectiveness of the training, thereby allowing for continuous improvement in future programs. Overall, this project provides an example of how local potential can be harnessed to create sustainable economic opportunities while promoting healthier food choices in the community.

## 5. Acknowledgment

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