



Community Empowerment in Processing Starfruit Into Innovative Snack Products As an Effort to Increase the Economic Value of Local Fruits

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Abstract: This community service aims to empower housewives in Ende Tengah Sub-district, Ende Regency, through training in processing starfruit into innovative snack products. This activity was carried out as an effort to increase the economic value of local fruits and community productivity. The method used was training and demonstration of making starfruit processed products. The results of the activity showed an increase in participants' knowledge and skills in processing starfruit into economically valuable products. This activity has the potential to increase household income and encourage entrepreneurial development based on local products.

Keywords: Community Empowerment; Starfruit; Processed Products; Economic Value

Introduction

Character education and student achievement Indonesia, as a tropical country with abundant biodiversity, has great potential in producing various types of quality fruits. One local fruit that has high potential but has not been optimally utilized is star fruit (*Averrhoa carambola*). Star fruit is known to be rich in vitamins and minerals, and has a unique flavor. However, the economic value of star fruit is still relatively low, especially when compared to imported fruits or processed star fruit products from abroad. Suryana, D. (Ed.). (2018).

Increasing the economic value of starfruit can be done through processing it into innovative snack products that attract consumers. Star fruit has a distinctive shape, which is oval and flat with a jagged surface, which can be utilized to create unique processed products. Various processed starfruit products have been developed, such as sweets, juice, syrup and chips,

but there are still great opportunities for further innovation.

The development of processed star fruit products not only has the potential to increase the economic value of local fruits, but can also support healthy and natural food diversification efforts. In addition, this is in line with the government's efforts to strengthen food security and reduce dependence on imported products.

However, in Ende Tengah Sub-district, Ende Regency, there are problems related to community productivity, especially unemployed housewives. This condition causes many housewives to be unable to contribute economically to family finances. Given that most of the population is at a productive age and has a sufficient level of education, there is potential to empower the community through the development of local food processing skills.

Based on this situation, this community service activity aims to empower housewives in Ende Tengah Subdistrict through training in processing starfruit into

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innovative snack products. This activity is expected to increase community productivity and creativity in processing local food, which in turn can have an impact on increasing family income. In addition, this activity also aims to foster entrepreneurial interest among the students involved.

Through this program, it is expected to create innovative snack products from star fruit that not only have high economic value, but also have a positive social impact on the local community. The development of processed starfruit products is expected to be one of the strategic steps in an effort to increase the economic value of local fruits, strengthen the local economy, improve community welfare, and introduce local natural resources to a wider market.

Star fruit (*Averrhoa carambola*) is a tropical fruit native to Southeast Asia and has been cultivated in many tropical countries. This fruit is known for its distinctive shape, which has five sides that form a star when cut crosswise. According to Nawawi, (2018) star fruit is rich in various essential nutrients, including vitamin C, vitamin B complex, fiber, and various minerals such as calcium, phosphorus, and potassium. Star fruit has high antioxidant activity, mainly due to its polyphenol content. These antioxidant compounds play an important role in protecting the body from oxidative damage and potentially lowering the risk of various chronic diseases. In addition, Wiraswati et.al, (2021) found that star fruit extract has an antihyperglycemic effect, which is potentially useful in diabetes management.

Processing local fruits into various processed products has been proven to increase the economic value of agricultural products. According to a study conducted by Saragih (2018), local fruit processing can increase added value by 200-300% compared to fresh fruit sales. This is in line with the findings of Wijaya *et al* (2023) which showed that diversification of processed local fruit products can open new market opportunities and increase farmers' income. In the context of star fruit, several studies have shown the potential of processing it into various products. For example, developing star fruit juice fortified with vitamin D, and examining the potential of star fruit fiber as a functional ingredient in food products (Haq, 2019).

Food product innovation plays an important role in responding to changes in consumer preferences. Afifah (2017) emphasized that successful food product innovation must consider aspects of health, convenience, and sensory experience. In the context of processed fruit products, Effendi *et al* (2022) found that consumers tend to be more interested in products that are considered natural and have health benefits. Regarding snack products, Hindarti and Sari (2019) reported an increasing trend in demand for healthy

snacks made from natural ingredients. This opens up opportunities for the development of snack products based on local fruits such as starfruit.

Community empowerment through local food processing has become an effective strategy in improving the economy of communities in various regions. Community empowerment aims to increase the capacity of individuals and communities in managing local resources independently and sustainably. The study conducted by Nindatu (2019) showed that the community empowerment program through local fruit processing succeeded in increasing household income and creating new jobs. Similar findings were also reported by Kurniawanto and Anggraini (2019) in Yogyakarta, where local fruit processing training successfully increased women's participation in product

Empowering women, especially housewives, through productive economic activities has been the focus of many development programs. Palaon and Dewi (2019). Emphasized that increasing women's participation in economic activities not only has an impact on increasing household income, but can also improve women's social status and decision-making in the family. In the Indonesian context, Fadhillah (2023) found that the involvement of housewives in household-based micro-enterprises contributed significantly to improving family welfare. However, women's empowerment programs need to consider the double burden that women may face in managing work and household responsibilities economic activities.

Local product-based entrepreneurship development has become an important strategy in regional economic development. According to Rosmayani and Mardatillah (2021) local product-based businesses have a competitive advantage because they can utilize local knowledge and resources available in the area. A study conducted by Natsir (2019) in South Sulawesi showed that local product-based microenterprise development can increase community income and create a multiplier effect in the local economy. However, it is important to emphasize the importance of policy support and access to markets for the sustainability of local product-based micro-enterprises.

Higher education has an important role in community empowerment through service activities and technology transfer. According to Fadhil (2020), the "triple helix" concept involving cooperation between academia, industry, and government can be an effective model in encouraging innovation and local economic development. In Indonesia, Amini *et al* (2022) reported that community service programs conducted by universities succeeded in increasing the capacity of the community in developing regional superior products. However, Zunaidi (2024) emphasized the importance of

participatory approaches and sustainability in community empowerment programs conducted by universities.

Method

This research used a qualitative approach with the Participatory Action Research (PAR) method. The PAR method was chosen because it is in accordance with the research objectives to empower the community, especially housewives, through active involvement in the learning process and skill development of star fruit processing into innovative snack products. The data collection techniques used in this research are participatory observation, semi-structured interviews, focus group discussions, pretest and posttests. The tools used in the training include stove, pot, strainer, aluminum oval, sutel, kettle and plastic packaging. The

materials used were starfruit, sugar, and lime. Data analysis was done descriptively qualitative and quantitative: The results of the activity were measured based on several indicators: (1) Knowledge Improvement: Measured through comparison of pre-test and post-test results on the benefits and economic potential of starfruit. (2) Skills Improvement: Measured through observation of participants' ability to process starfruit into snacks. (3) Innovative Product: Assessed based on the success of participants in producing starfruit snacks with unique flavors and good nutritional content. (4) Economic Potential: Measured through a simple analysis of the potential for increased income and product price competitiveness. (5) Entrepreneurial Motivation: Assessed based on participants' interest in starting household-scale production and awareness of the potential for local product-based businesses.

Result and Discussion

Result

Table 1. Summary of Community Service Activity Results

Aspect	Result	Presentage
Implementation of activities	- Date: 9 Juni 2024	100%
	- Location. House of the Head of RT, Jl. Woloare A, Village B, Ende Tengah Sub-district, End District	100%
	- Participants: 20 housewives	100%
Knowledge Enhancement	Benefits and nutritional content of star fruit	95%
	Economic potential of star fruit processing	90%
Skill Enhancement	- Techniques for processing starfruit into snacks	85%
	- Soaking, boiling, and drying process	80%
Innovative Products	- Star fruit snacks with unique flavors	100%
	- Good nutritional content	90%
	- Utilization of local raw materials	100%
Economic Potential	- Opportunity to increase household income	85%
	- Competitive selling price with low production cost	80%
Entrepreneurial Motivation	- Participants' interest in starting household-scale production	75%
	- Awareness of local product-based business potential	85%

Table 2. SWOT Analysis of Belimbing Snack Business Development

<i>Strengths (Kekuatan)</i>	<i>Weaknesses (Kelemahan)</i>
Local raw materials are easy to obtain	Limited business capital
Unique products with high nutritional value	Business management skills are still limited
Relatively low production costs	Production equipment is still simple
Support from empowerment programs	Marketing network is not yet extensive
<i>Opportunities (Peluang)</i>	<i>Threats (Ancaman)</i>
Healthy food consumption trends are increasing	Competition with other processed products
Culinary tourism market potential	Raw material price fluctuations
Government support for MSMEs	Changes in consumer tastes
Opportunities for cooperation with the retail sector	Challenges in maintaining quality consistency

Discussion

The results of the activity showed that 95% of participants experienced an increase in knowledge about the benefits and nutritional content of star fruit, and 90% of participants understood the economic

potential of star fruit processing. This increase in knowledge is in line with the concept of community empowerment which emphasizes the importance of individual capacity building as a foundation for economic independence (Zimmerman, 2000).

Knowledge about the nutritional value and economic potential of starfruit is an important asset for participants to develop products that are not only economically valuable, but also have health benefits.

In terms of skills, 85% of participants successfully mastered the technique of processing starfruit into snacks, and 80% were able to perform the soaking, boiling, and drying processes well. This skill improvement is a practical implementation of technology transfer, which is one of the important roles of universities in community empowerment, as proposed by Smith and Leydesdorff (2014) in the "triple helix" concept. The skills acquired by the participants not only enable them to produce quality products, but also open up opportunities for product diversification in the future.



Figure 1. Initial Design and Engagement with Village Officials and Communities

The success in producing starfruit snacks with unique flavors (100% of participants succeeded in making) and good nutritional content (90%) shows significant potential for product innovation. This is in line with the findings of Grunert (2011) on the importance of food product innovation that considers aspects of health, convenience and sensory experience. The starfruit snacks produced not only utilize local raw materials (100%), but also respond to the increasing trend of healthy food consumption in the community.

The economic potential of this product development can be seen from 85% of participants who see opportunities to increase household income, and 80% who consider the selling price of the product competitive with relatively low production costs. This finding is in line with Saragih (2018) study which showed that local fruit processing can increase added value by 200-300% compared to fresh fruit sales. This economic potential is an important factor in encouraging program sustainability and entrepreneurial motivation among participants.



Figure 2. Materials and Process of Averhoa Belimbing Snack Production Innovation

This activity successfully motivated 75% of participants to start household-scale production, and 85% of participants showed awareness of the potential of local product-based businesses. This high level of motivation is in line with Patel and Chavda's (2013) findings on the competitive advantage of local product-based businesses in utilizing local knowledge and resources. This growing entrepreneurial motivation among housewives is also a positive indicator for efforts to empower women in the household economy. The focus on empowering housewives in this activity is in line with Widodo's (2012) findings on the significant contribution of women's involvement in micro-enterprises to improving family welfare. However, it is important to note the potential double burden that women may face. Therefore, the development of these household-based enterprises needs to consider the aspect of balance between women's productive and reproductive roles.



Figure 3. Designing Product Sales Group and Receiving Award from Village PKK

The SWOT analysis shows that although there are significant strengths and opportunities, there are still challenges that need to be overcome in the development of the starfruit snacks business. Limited business capital, limited management skills, and a limited marketing network are weaknesses that need to be addressed. This confirms the importance of continuous mentoring and policy support, as emphasized by Tambunan (2011) for the sustainability of local product-based micro-enterprises.

On the other hand, the opportunities identified, such as the increasing trend of healthy food consumption and the potential market for culinary tourism, open up space for the development of starfruit snacks as a regional flagship product. Government support for MSMEs and opportunities for cooperation with the retail sector can be a driving factor in optimizing the economic potential of this product.

Conclusion

Community service activities through training in processing starfruit into innovative snack products in Central Ende District have shown positive results in increasing the knowledge, skills, and entrepreneurial motivation of participants. This program has significant potential in increasing the economic value of local fruits and encouraging entrepreneurial development based on regional superior products. Although there are still challenges, with proper mentoring and support from

various parties, this initiative can contribute to improving community welfare and strengthening the local economy in Ende Regency.

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