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# Utilizing Carica to Improve the Regional Economy through High-Value Products

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**ABSTRACT**

Wonosobo's abundant natural resource potential of carica fruit opens up a huge opportunity for the development of high-value products to boost the regional economy while meeting consumer demand for healthy food that is friendly to diabetics and those on a low-sugar diet. Therefore, this program aims to develop an innovative stevia-based carica candy product as a natural, zero-calorie sweetener that is safe and free of synthetic ingredients. The product manufacturing method is carried out by combining the nutritional advantages of carica fruit, which is rich in vitamin C, vitamin B1, carotene, calcium, phosphorus, iron, and high fiber, with the natural sweetness of stevia to produce a low-calorie and high-fiber snack. The results of the market survey showed high enthusiasm from the community, indicating broad market potential from the local to international levels, supported by a business feasibility analysis that showed a production break-even point of 300 packs per month and a revenue-to-cost ratio of 1.15, which indicates this business is very feasible to run. Through digital marketing strategies and collaboration with local MSMEs, the utilization of this carica fruit is not only beneficial in supporting a healthy lifestyle for the community but also makes a significant contribution to improving the Wonosobo regional economy.



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## INTRODUCTION

Improving the regional economy through the utilization of local resources is a key focus for regional development, particularly in Wonosobo, which is rich in carica fruit. Carica fruit is known for its high nutritional content and low calorie content, making it a potential ingredient for healthy food products (Dewi, 2022). However, available processed carica products have not fully utilized the added value of this raw material. On the other hand, stevia, as a natural, calorie-free sweetener, can complement products with additional health benefits, especially for diabetics and consumers prioritizing a healthy lifestyle (Purwanti & Yuliani, 2021). The growing trend of healthy lifestyles creates significant opportunities for innovative carica and stevia-based products,

which have not been extensively studied in the context of regional economic development (Kementerian Kesehatan RI, 2024).

Carica fruit is a major horticultural icon, dominating agricultural output in the Wonosobo area due to its unique growth characteristics in the highlands. This commodity is widely known for its high nutritional content, including vitamin C, fiber, and calcium, while also being very low in calories. These nutritional characteristics make this Dieng specialty fruit highly potential as a base ingredient for various healthy, functional food products. (Dewi, 2022). Unfortunately, local farmers face challenges with their limited shelf life and price fluctuations during peak harvests. Therefore, innovative food technology is needed to transform this raw commodity into secondary processed products (Setiawan & Aminah, 2021).

Most processed carica products available on the market today don't fully utilize the added value of their raw materials. They are still dominated by conventional sweets with very high granulated sugar content. The excessive use of refined sugar in these processed carica products significantly reduces their functional value as a healthy snack for modern society. (Pratama et al., 2023). On the other hand, alternative natural sweeteners such as stevia offer a promising solution to replace cane sugar. Stevia, as a calorie-free natural sweetener, can complement food products with significant added health benefits (Purwanti & Yuliani, 2021).

The use of natural sweeteners is crucial, especially for people with diabetes and consumers prioritizing a healthy lifestyle amid the growing threat of metabolic diseases. This shift in consumption preferences aligns with global campaigns encouraging reduced sugar, salt, and fat consumption in processed foods. Public awareness of maintaining physical fitness has now created a new market niche demanding the availability of low-glycemic index snacks. (Ramadhan & Sari, 2022). The increasing trend of healthy lifestyles creates very high industrial opportunities for innovative products based on local food (Kementerian Kesehatan RI, 2024).

This significant market opportunity has not been thoroughly studied in the context of regional economic development. A review of academic literature shows that research on the integration of local commodities and low-calorie sweeteners remains very limited. This research gap lies in the limited development of innovative snack products that combine the nutritional benefits of carica and stevia. Most local businesses still operate traditionally, without any involvement in food formulation research based on modern health aspects. (Hidayat & Wijaya, 2020). As a result, the competitiveness of regional souvenir products tends to stagnate and it is difficult to penetrate the wider modern retail market.

Business management is a crucial process in running a business to ensure its objectives are achieved efficiently and effectively. For MSMEs, business management is crucial for their growth and sustainability (Arrasyid et al., 2024). The collaboration of these two natural ingredients can be a powerful strategy for increasing the selling value of local products. This integrated formulation is specifically designed to overcome the limitations of traditional processed products that are already oversaturated in the local market. This contrasts with previous research that focused solely on the agribusiness and macro-scale aspects of the carica supply chain (Dewi, 2022). Previous research only focused on developing stevia plants as a natural sweetener without linking it to specific regional commodities (Purwanti & Yuliani, 2021).

The combination of active substances from carica fruit flesh and the sweet sensory properties of stevia creates a unique functional jelly candy product (Suryani et al., 2024). This is

in line with research conducted by Astuti et al. (2024), which showed that optimizing the proportion of carica fruit puree and gelatin is crucial in determining the physicochemical characteristics and consumer preference for the resulting jelly candy product (Astuti et al., 2024). This integrative approach between food science and economic development is the main novelty of this research. This innovative step directly fills the scientific gap in the domain of developing functional food products based on local wisdom (Kementerian Pertanian, 2023). Through this formulation engineering, the physicochemical characteristics of the candy can be maintained while retaining its consumer-favored taste. Previous studies have also emphasized the importance of healthy food innovations like this in supporting efforts to prevent chronic metabolic diseases (Kementerian Kesehatan RI, 2024).

Healthy food innovations to support metabolic disease prevention provide a strong foundation that strengthens this research's position in both academic and practical settings. Furthermore, the development of stevia-based carica gummies is not merely a commercialization effort, but rather a concrete implementation of the concept of sciencepreneurship (Jumini et al., 2022). Based on this scientific database, this research aims to bridge the gap between healthy food needs and optimize the regional agricultural sector. The research aims to support and expand on previous findings by providing product innovations that are applicable, hygienic, and economical. Initial results from a digital market interest survey indicate high enthusiasm for this healthy candy product from various segments of society. Based on this positive market response, this research aims to develop a healthy snack product based on local ingredients, such as carica and stevia.

## METHODS

This study used an experimental research design with a quantitative approach to develop and test a stevia-based carica candy product as an innovative healthy snack. The research procedure was carried out chronologically, starting from raw material procurement, production process, product testing, and data analysis. Based on the research results, it can be concluded that carica can be processed into various types of products that are in high demand and have many benefits, such as carica candy, carica jam, carica chips, carica chocolate, carica batik, and carica dates (Jannah, F. A. N., & Jumini, S., 2022).

The raw material procurement process involves selecting fresh carica fruit from local farmers in Wonosobo and high-quality dried stevia leaves from the market. The production process involves washing, peeling, and cutting the carica fruit, then boiling it until soft. The boiled carica fruit is then mashed and mixed with stevia extract as a natural sweetener. The mixture is then cooked to the right consistency for candy-making, poured into molds, and cooled until it hardens (Dewi, 2022; Purwanti & Yuliani, 2021).

Packaging techniques are carried out hygienically using practical and attractive primary packaging, accompanied by labels that include nutritional information, production date, and the distinctive Wonosobo logo to maintain quality and facilitate product distribution and promotion. Product testing includes sensory tests to assess taste, texture, and aroma, involving respondents from various segments of society. Data on consumer interest and acceptance are collected through a structured questionnaire survey that is analyzed using descriptive statistics.

The data analysis stage was carried out by calculating the level of market interest, as well as analyzing the business feasibility using the Break Even Point (BEP) method and the R/C (Revenue to Cost Ratio) to measure the sustainability and profitability of the business. Modifications to the method were carried out by adjusting the composition of raw materials and processing techniques to produce products with optimal quality and competitive prices. All stages of the research were arranged systematically to ensure the reliability of the results and the relevance of the product to the needs of the healthy snack market in Indonesia, especially in the Wonosobo area.

## RESULTS AND DISCUSSION

This research has successfully developed an innovative stevia-based carica candy product, meeting consumer demand for healthy snacks with high sales value while also supporting the economic growth of the Wonosobo region. Based on testing results, the candy product achieved a high level of acceptance, with average scores for sweetness of 4.2, texture of 4.1, and aroma of 4.0 on a 5-point scale (Table 1). These high scores indicate that the product is well-received by various segments of society, including students, people with diabetes, and the general public.

Table 1. Results of the Carica Candy Product Market Interest Survey

| No | Indicator | Score Value (%) |
|---|---|---|
| 1 | Market Interest | 85% |
| 2 | Taste Acceptance | 4,2 (82%) |
| 3 | Texture Acceptance | 4,1 (80%) |
| 4 | Aroma Acceptance | 4,0 (78%) |


Figure 1. Production Process of Stevia-Based Carica Candy

The candy production process is carried out through hygienic and controlled stages (Figure 1). These stages begin with washing and peeling the papaya fruit, boiling it until soft, and then grinding it to obtain the candy base. Stevia extract is made using the infusion method, which involves boiling stevia leaves at 70°C for 10 minutes, then filtering them. The mixture of papaya pulp and stevia extract is cooked to the desired consistency, then poured into silicone molds and

cooled until hardened. The candy is then packaged using attractive and informative primary packaging to maintain product quality and facilitate distribution.

A business feasibility analysis using the Break-Even Point (BEP) method yielded a break-even point at a production rate of 300 packs per month, with a revenue-to-cost ratio (R/C) of 1.15. These results indicate that the stevia-based carica candy business is not only financially viable but also capable of generating sustainable profits. The BEP calculation uses the following equation:

$$BEP = \frac{\text{Fixed Cost}}{\text{Selling Price per Unit} - \text{Variable Cost per Unit}}$$

The Break Even Point (BEP) indicates the minimum number of products that must be sold to avoid losses. This calculation is crucial as a basis for business planning and decision-making for optimal business development. This product offers significant added value compared to similar products on the market that use conventional sugar. The combination of the nutritional benefits of carica fruit and the natural sweetness of stevia results in a low-calorie, high-fiber, and synthetic-free snack, making it ideal for consumers pursuing a healthy lifestyle, including those with diabetes.

Digital marketing strategies and collaboration with local MSMEs are key factors in successful distribution and increased brand awareness. Social media platforms like Instagram, Facebook, and TikTok are used to present educational and engaging content that highlights the health benefits and uniqueness of products, thereby increasing consumer engagement and loyalty. Furthermore, utilizing Google Business Profile and local marketplaces expands market access with cost-effective promotions and facilitates the evaluation of marketing effectiveness.

These findings corroborate recent research that emphasizes the importance of digital marketing integration in the development of MSMEs and locally resource-based products (Rahman et al., 2024; Sari et al., 2025). This digital approach not only supports increased sales but also strengthens the local economy by empowering MSMEs in Wonosobo. Thus, the use of carica fruit and stevia in high-value candy products not only produces healthy and nutritious snacks but also plays a significant role in boosting the regional economy by strengthening distribution networks, empowering MSMEs, and developing local products that are competitive in national and international markets.

Table 2. Summary of Stevia-Based Carica Candy Sales Volume

| Month | Target HOW MUCH (Packages) | Sales Realization (Packages) | Percentage of Achievement (%) |
|---|---|---|---|
| Month 1 | 300 | 285 | 95% |
| Month 2 | 300 | 320 | 106,6% |
| Month 3 | 300 | 355 | 118,3% |
| Month 4 | 300 | 390 | 130% |

## CONCLUSION

This research successfully achieved its objectives by producing an innovative stevia-based carica candy product as a healthy, low-calorie, high-fiber, and synthetic-free snack that is safe for diabetics and those on a low-sugar diet. This success is evidenced by the high market acceptance reaching 85% and the results of the financial analysis that stated this business is very feasible to

run with a break-even point (BEP) of 300 packs per month and a R/C ratio of 1.15. The main benefit of this product is not only providing an alternative functional food that supports a healthy lifestyle for the community, but also providing a significant real economic impact for the Wonosobo region through increasing the selling value of local commodities, stabilizing the absorption of carica agricultural products, and empowering MSMEs based on digital marketing.

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