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Healthy Mocaf-Porang Noodle Projection: A Case Study Of Porang Farmers' Processing In Sukoharjo

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Abstract

Value-added food products with health benefits are gaining popularity. One such product is food made from porang. This research aims to analyze the business feasibility and financial projection of healthy mocaf-porang noodles produced by Sahabat Petani Porang Sukoharjo (SPPS) in Sukoharjo Regency. Data collecting methods included observation, interviews, and Focus Group Discussions (FGD) with SPPS's leader and administration. Business feasibility was assessed using the Net Present Value (NPV) and Payback Period (PP) techniques, with a 10% discount rate used over a 5-year project duration. The results showed that the entire monthly production cost was IDR 528,836 for 100 pieces of noodles, with a unit production cost of IDR 5,288. Selling the product for IDR 7,000 per unit resulted in a profit of IDR 1,711 per unit (32% margin). Financial predictions showed a positive NPV of IDR 1,745,000 (NPV > 0) with a payback period of 1.96 years. In conclusion, the healthy mocaf-porang noodle project is highly feasible to be implemented and developed as a strategic effort to support local food diversification and national food security.

Keywords: Food Diversification, Mocaf, Net Present Value, Payback Period, Porang

INTRODUCTION

Food is a priority need that is important to fulfill. Food is not only a basic right but also supports survival (Saputro and Fidayani, 2020). The dependence of the Indonesian people on Mocaf has made the government intensify food diversification using local food ingredients (Saputro & Fidayani, 2020 ; Saputro et al., 2021). Food diversification is an effort to encourage

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people to consume various types of carbohydrate-producing foods other than rice. An important reason for food diversification is to reduce national dependence on rice imports (Dewati et al, 2025). Food diversification can be achieved by replacing staple foods with other staple foods. One of them is tubers that have the potential to replace rice as a staple food. Groups of tubers that have the potential to be developed are cassava (cassava), sweet potatoes, potatoes, gadung, uwi, taro/suweg, porang, ganyong, arrowroot. Tubers are alternative food sources that contain carbohydrates, protein, fiber, vitamins and minerals. Cassava and sweet potatoes are foods that are easy to find and easy to cultivate (Kadiri, 2021). Cassava, commonly known as cassava, is the third largest carbohydrate producer after Mocaf (a type of cassava flour) and corn, especially in Indonesia. Cassava can be developed and processed into flour, including gaplek flour and mocaf flour. Mocaf, or Modified Cassava Flour, is a flour product made from modified cassava. Modification of cassava into mocaf is carried out through fermentation with lactic acid bacteria. The fermentation process changes the characteristics of the flour, making it suitable for use as a raw material for various food products (DPKP, 2021).

The use of mocaf flour is mainly in substitute products to replace or reduce the use of wheat flour. Some processed products from mocaf flour that have been widely researched include: Mocaf bread, biscuits, cookies and noodles (Asmoro, 2021). Processing cassava into mocaf flour can be an alternative for developing snack products and various other processed products (Jassin, 2018). Based on this, there is great potential for mocaf flour processing and mocaf business opportunities can still be developed.

In addition to cassava, which is processed into mocaf (a type of fermented soybean cake), there are also porang tubers that have the potential to be used in processed foods. In recent years, porang has become an alternative crop with potential as an export commodity (porang tubers). Porang was originally a forest plant and has since developed into a typical cultivated crop for farmers in open fields. Porang tubers contain numerous health benefits due to their glucomannan content (Yanuarti, 2017).

Porang is a type of plant that can adapt to various environmental conditions. Porang is an agricultural product with high economic potential. On a 1 hectare area of porang plants, 6,000 plants can be planted. The results of cultivating porang on a 1 hectare area produce more than 20 tons. This is what makes porang plants profitable in terms of production and economy (Ramdanasari, & Suharti, 2015). Product diversification is important to do so that porang is not only sold as a fresh food ingredient (Tamrin, 2015). Porang has very high added value with a variety of processed products. Noodles, Mocaf, glucomannan flour and capsule wrappers are products

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that can be produced from porang. In addition, porang is also used in the cosmetics industry. Added value like this allows porang to penetrate the export market share.

Cassava processed into mocaf (rice flour) and porang processed into glucomannan flour have the potential to be developed into healthy porang-mocaf noodles, a nutritious, gluten-free, and healthy food. This is a step towards optimizing agricultural products to create added value. Optimizing the value of agricultural products is necessary to maximize the development of agro-industry-based agricultural products (Dewati et al., 2025).

The potential use of mocaf flour and porang glucomannan separately in gluten-free food formulations has been extensively researched, but there are still few studies investigating the mechanical synergy between the elasticity of mocaf fermentation and the water-holding capacity of porang tuber glucomannan in producing noodle texture characteristics similar to wheat flour (Marta et al., 2025). Furthermore, the majority of previous literature focuses on laboratory-scale physicochemical and sensory optimization (Khasanah et al., 2022), but it is still difficult to find studies that specifically integrate the downstreaming of these local food products with financial feasibility projections and payback periods at the regional level for Small and Medium Enterprises (SMEs). Therefore, this study aims to fill this gap by examining the business feasibility and projecting the economic sustainability of the mocaf-porang composite healthy noodle product in the real field. This study aims to determine the projection of healthy mocaf-porang noodles as an effort to achieve local food-based food security.

RESEARCH METHOD

This research was conducted at SPPS purposively with the consideration that SPPS is the only UKM that processes porang in Sukoharjo Regency and has the potential to be developed. Data collection techniques through observation, interviews, and Focus Group Discussions (FGD). The research instrument was through a questionnaire. Respondents in this study were: (a) 1 head of SPPS; (b) 2 SPPS administrators. This study uses a business feasibility calculation method to determine the projection of healthy mocaf-porang noodles. The things taken into account include: (a) calculating costs, (b) calculating sales assumptions, (c) calculating NPV and Payback period. NPV is used to calculate the difference between the present value of cash inflows and the present value of cash outflows in a certain time period. Payback Period is used to calculate the time period required to recoup the initial investment expenditure using net cash inflows. This study uses a business feasibility calculation method to determine the projection of healthy mocaf-porang noodles. The mathematical analysis taken into account includes (Nugroho, 2023):

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a. Calculation of Production Costs and Profits

$$TC = TFC + TVC$$

Description:
TC = Total Cost
TFC = Total Fixed Cost
TVC = Total Variable Cost + Labor Cost

b. Net Present Value (NPV)

$$NPV = \sum_{t=1}^{5} \frac{CF_t}{(1+r)^t} - I_o$$

Description:
CF_t = Net cash inflow (annual profit) in year-t
r = Discount rate per year (10% or 0.10)
t = Time period (year 1 to year 5)
I_0 = Initial Investment
Decision criteria: If NPV > 0, then the investment/business is considered feasible to run.

c. Payback Period (PP)

$$\text{Payback Period} = I_0/CF_{year}$$

Description:
I_0 = Initial Investment;
CF_{year}= Cash Flow/Net Profit per Year

RESULT AND DISCUSSION

Healthy mocaf-porang noodles consist of a mixture of mocaf flour, rice flour, and glucomannan flour as a binder. These noodles are an innovation made from porang glucomannan flour, a flagship product of Sahabat Petani Porang Sukoharjo (SPPS). Initially, SPPS only sold porang, but later produced porang glucomannan flour that has passed laboratory tests with oxalic acid content below the threshold, making it safe for use in food. The following is a calculation of the profit per unit of Mocaf Porang Noodles.

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Table 1. Calculation of Profit Per Unit of Porang Mocaf Noodles

Information	Item	Mark
Fixed Costs	IDR	19,178
Variable Costs	IDR	459,658
Labor costs	IDR	50,000
Total Production Cost	IDR	528,836
Monthly Production	Pcs	100
Production Cost Per Unit	IDR	5,288
Selling Price Per Unit	IDR	7,000
Profit Per Unit	IDR	1,711
Profit Percentage	Percent	32

Source: Processed primary data (2026)

Based on table 1, the total production cost of Mocaf porang noodles reaches IDR 528,836 in each ongoing production process. This total cost is divided into three parts, namely fixed costs, variable costs and labor costs. Fixed costs of IDR 19,178 Mocafal from the depreciation value of equipment used in producing Mocaf porang noodles such as noodle molds, steamers, *deep fryers* and *sealers* . Variable costs used in the Mocaf porang noodle production process consist of the cost of raw materials and auxiliary materials which, when added together, produce detailed expenses of IDR 459,658. Details of raw materials used in the Mocaf porang noodle production process consist of Mocaf flour, mocaf flour, egg flour, tapioca flour, turmeric powder, water, glucomannan and cooking oil. Meanwhile, auxiliary materials used in the production of Mocaf porang noodles consist of electricity, gas and packaging. In a single production process, SPPS is capable of producing 100 pieces of Mocaf porang noodles, so that the production cost per unit reaches IDR 5,288. Sales of these Mocaf porang noodles are planned to be launched at a price of IDR 7,000 per piece, resulting in a profit of IDR 1,711 per product sold, equivalent to a percentage of 32%. This indicates that the sales that SPPS can make will generate a good profit.

This means that SPPS sales will make a good profit. The 32% profit margin and low unit production price are consistent with Yusuf (2021) research on local food-based processing enterprises, in which local flour substitution has been proven to reduce reliance on imported components (wheat) while preserving operational variable cost efficiency. This significant profit figure at the MSME level is possible because the use of local composite flour has a high revenue-to-cost ratio (R/C Ratio), which, according to Hutabarat (2018), indicates that the local food-based

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noodle industry has strong profit margin resilience in the face of fluctuations in supporting costs.

The calculation of profit value would be better if it is continued with the calculation of *net present value* . This calculation is an important study to assess whether the business being undertaken is worth investing in by carefully calculating the difference between the present value of future cash inflows and outflows. This calculation will provide a broader picture of whether the business being undertaken has good value-added prospects in this case meaning positive or vice versa (negative). The assumption that must be had in calculating net present value is the initial investment value where this value is obtained from the sum of the value of the production equipment used in processing Mocaf porang noodles. The initial investment is obtained at IDR 4,024,000 by adding the price of the noodle printer (IDR 2,000,000), steamer (IDR 350,000), deep fryer (IDR 800,000), and sealer (IDR 874,000). The projected life of the Mocaf porang noodle processing activity is assumed to be five years in accordance with the average use of the equipment used during the production process. The net profit generated can be seen in Table 1 at IDR 171,000 with the approach that the production period is once a month so that the net profit per year is IDR 2,052,000. The standard discount rate for small businesses in Indonesia is 10% per year so that the NPV calculation can be seen mathematically below.

$$NPV = \sum_{t=1}^{5} \frac{CF_t}{(1+r)^t} - I_o$$

$$= \left(\frac{2.052.000}{1.1} + \frac{2.052.000}{1.1^2} + \frac{2.052.000}{1.1^3} + \frac{2.052.000}{1.1^4} + \frac{2.052.000}{1.1^5}\right) - 4.024.000$$

$$= Rp\ 5.769.000 - 3.024.000$$

$$= Rp\ 1.745.000$$

The NPV of IDR 1,745,000 is positive, meaning NPV > 0. This indicates that the Mocaf porang noodle project is feasible to continue. However, it is important for business owners to understand that increasing production capacity is crucial to increasing the NPV. Increased production capacity will also increase profits, along with increased sales. IDR 3,754,696 has a positive net present value (NPV), or NPV > 0. This means that the Mocaf porang noodle project can or will be continued. The positive finding on the NPV indicator is consistent with research conducted by Yudiastuti (2025) and Dewi et al. (2019), who found that diversifying tuber derivative products into ready-to-consume processed products such as noodles produces a

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prospective and positive present value of net cash flow for the medium to long-term investment horizon. This financial feasibility demonstrates that combining mocaf and porang glucomannan is not only better for function and health because it is gluten-free (Rosida, 2018), but it also ensures increased economic value in the small-scale agro-industrial ecosystem.

However, another important consideration is the cost of raw materials. A partnership agreement with raw material suppliers is a crucial strategic step to lock in prices and maintain controlled profits. In addition to the NPV calculation, another crucial factor to consider is the payback period. This is a key component in providing an overview of the time it takes for net cash inflows from a particular business investment to recoup the initial capital outlay. The payback period calculation also assesses whether a business is feasible to continue, comparing it to how quickly it recovers its initial investment. This calculation indicates that a shorter time period is better. The payback period calculation for Mocaf porang noodles can be seen in the following calculation:

$$Payback\ Period = \frac{\mathrm{I}_0}{\mathrm{CF}_{year}}$$
$$= \frac{4.024.000}{2.052.000}$$
$$= 1{,}96\ Year$$

Based on the calculations above, the payback period for Mocaf porang noodles is 1.96 years. This indicates that it takes less than two years to recoup the initial investment. Compared to other food businesses, a two-year payback period is considered satisfactory. To accelerate the return on investment, efforts are needed to increase profits, which can be achieved by increasing sales. This can be accompanied by more targeted promotions. Food businesses like Mocaf porang noodles, which have a segmented market, require specific marketing strategies aimed directly at end-users or clustered marketing targeting specific communities. According to the calculation, the payback period for Mocaf porang noodles is 1.96 years. This return on investment in less than two years is considered extremely rapid for a food processing sector cluster centered on a local farming community. According to a food agribusiness feasibility study conducted by Puspitasari and Dwiastuti (2018) and Dewi et al (2019), the safe return on investment for processing equipment in the MSME sector is between 2 and 3 years. As a result, SPPS's 1.96-year timeframe reveals that the company's capital turnover rate is highly efficient, reducing the risk of future cash flow volatility.

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CONCLUSSION

Based on the analysis, the healthy mocaf-porang noodles are gluten-free, with a profit percentage of 32% and are feasible to operate based on the NPV value. Production of these noodles requires approximately 1.96 years to recoup the initial investment. SPPS managers should gradually raise monthly output amounts to maximize NPV. Furthermore, partnerships or contractual agreements with raw material suppliers (cassava/mocaf and porang) are required to ensure stable raw material prices and manage future variable costs. Furthermore, given the distinct characteristics of this healthy noodle product (gluten-free and high-fiber), managers should employ clustering marketing techniques that directly target end-users or health-conscious communities, dieters, and gluten-intolerant consumers.

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