



Financial Analysis of Production Cost of Chocolate Drinks Using Cocoa Butter Substituted from Palm Oil

Nurdelima Gulo^{1*}, Fitriana²

^{1,2} Sangga Buana University

*E-mail Correspondence: nurdelima.g@gmail.com

Information Article

History Article

Submission: 29-01-2025

Revision: 01-02-2025

Published: 01-02-2025

DOI Article:

10.24905/permana.v16i2.661

ABSTRACT

CBS (Cocoa Butter Substitute) or commonly known as cocoa butter substitute fat is obtained from the process of modifying palm kernel oil by hydrogenation so that its characteristics are physically similar to CB. Chocolate products in their manufacture require fat which is usually obtained from cocoa butter. However, cocoa butter is usually difficult to obtain and more expensive in terms of price, so CBS is used as a substitute for CB. This study aims to determine the level of financial feasibility and analyze the sensitivity aspect in the manufacture of industrial-scale chocolate beverage products. The feasibility criteria in this study are the calculation of NPV, IRR, Net B / C, PP and Sensitivity using Ms. Office Excel. Based on the results of the calculation of the financial aspect with an interest of 10%, it meets the requirements and is feasible with the NPV value generated within a period of 10 years of Rp. 892,138,919,349-, with a production capacity of 25 tons per day with a packaging weight of 1000gr, 5000gr and 25000 gr respectively. The IRR value obtained was 94.97% where the IRR value was greater than the interest of 10%. The Net B/C obtained is Rp. 9.45 with a payback period of 1.6 years. The results of the sensitivity analysis show that a decrease in selling price, an increase in raw materials and an increase in operational costs of 20% have a significant impact on business feasibility.

Keywords: Financial analysis, Feasibility study, Cocoa Butter Substitute

© 2025 Published by Permana. Selection and/or peer-review under responsibility of Permana

INTRODUCTION

The growth rate of chocolate and chocolate product production has decreased from year to year. The main reason for this decline is the increase in cocoa prices (raw materials for chocolate production) due to the cocoa deficit that occurs worldwide. Instant chocolate drinks are processed chocolate in the form of drinks that generally use cocoa fat as the largest content

838

in them. This cocoa fat has the most expensive price in the content of instant chocolate drinks. This cocoa fat is usually called cocoa butter. According to (Zain & Ramadayanti, 2019) stated that countries that produce cocoa are still very few. This causes the supply of cocoa in the world to be unstable, causing its price to be expensive when compared to other natural fats and oils. In addition to the price of cocoa butter and uncertain supply, cocoa butter is inadequate when used in hot climates and its quality certainly varies in different regions (Torbica et al., 2006). In addition, chocolate products that use cocoa fat require a tempering process in their formulation, which requires more costs (Fitriana, 2014).

Chocolate fat substitute is a specialty fats product that uses the hydrogenation process of palm oil. CBS is usually made using the hydrogenation method of crude and affinated palm kernel oil (PPKS, 2010). The characteristics of CBS are white, solid and hard textured with a solid fat content of 35°C- 38°C. The characteristic that makes CBS able to replace cocoa butter is its similar melting point of around 30°C- 35°C which makes the product melt when in the mouth (Minifie, 1989). The use of CBS in the manufacture of this chocolate drink product is expected to reduce production costs. Oil palm fruit is a local commodity that is a favorite of Indonesia that can be relied on.

This commodity has a production volume reaching 37,812.60 thousand tons/year of total palm oil production. Its production increased from 31,731.00 thousand tons, according to BPS 2017 data, in 2016. Common problems that are usually faced by business actors in establishing a production business are knowing the feasibility of the business to be created using a business feasibility analysis. Business feasibility analysis is used to determine the dominant variables in establishing a business which is then calculated financial analysis so that it can see the profits that can be achieved from the business.

The financial aspect of business feasibility analysis is used to determine the capital and profit that will be obtained through the calculation of costs and benefits through a comparison of revenue and expenditure. The variables in the calculation are the cost of capital to be used, the period required for capital returns and ensuring whether the business can continue to be developed (Umar, 2001). The objectives to be achieved in this study are to see the level of feasibility of business development from the investment criteria of PP, IRR, NET B/C, NPV and the level of sensitivity if there are changes in the price of raw materials and auxiliary materials, increases in sales and operational costs and to know the calculations in obtaining

HPP.

RESEARCH METHODS

Data Analysis The stages in conducting a financial feasibility analysis of production costs in this business are:

1. Organoleptic Test The research began with an acceptance test. Where two samples of chocolate drink products used CBS and CB through the hedonic method. Organoleptic tests need to be conducted to show consumer acceptance of chocolate drink products using CBS.
2. Investment costs
3. Production cost
4. Financial structure
5. Production and revenue
6. Profit and loss analysis
7. Fulfillment of financial feasibility criteria: NPV, PP, NET B/C, and IRR.
8. Sensitivity analysis Data needs to be processed and packaged in tabulation, after which it is analyzed using calculations from business feasibility references by looking at the Payback Period (PP), Internal Rate of Return (IRR), Net Present Value (NPV), and Net Cost Benefit B/C (Net B/C) (Kusuma & Mayasti, 2014).

Assumptions need to be set first to help data processing, cash flow creation and determination (HPP). According to Idham in 2010, there are several assumptions that are usually set to be used in calculations such as the number of employee work days, selling price, project age, production capacity and raw material prices. In addition, there are also costs that are commonly used in calculating business investments such as costs related to investment, fixed costs, variable costs, and other costs. (Pujawan, 2007), explains that the costs used in starting or developing a business are called investment costs.

In addition, Ardana, (2008), also stated the same thing regarding variable costs, namely obligations that are routinely incurred in doing business while the amount is relative to the production assumptions that are set. Then fixed costs can be said to be costs that are usually incurred periodically by the company while the amount remains the same regardless of the amount of production that is set.

1. Net Present Value (NPV) NPV analysis is a calculation that takes into account currency changes to see the value of an investment. According to (Ye & Tiong, 2000), it is stated that the difference in the present value of profit and cost is called NPV. According to Kadariah in 1999, the NPV formula is as follows:
2. Internal Rate of Return (IRR) IRR occurs when the NPV value is zero at a certain discount rate. IRR can also be calculated by equating the present value of cash receipts and the present value. The amount of IRR cannot be calculated directly but by trial-error data. The first thing to do is to use a discount rate that is estimated to be close to the amount of IRR. According to (Kadariah, 1999), a positive NPV obtained from the calculation indicates that the discount rate is still high so that calculations need to be carried out using a lower discount rate until a negative NPV value is obtained. There are several criteria used in this analysis, the measurement criteria are:
 - a) The project is acceptable if the IRR value is greater than the loan interest.
 - b) The project is rejected if the IRR is less than the loan interest.
 - c) The project is at the break-even point if the IRR value is equal to the loan interest or commonly called the BEP point.
3. Net Cash Benefit (NET B/C) Another analysis used in this study is the Net Cash Benefit Analysis (NET B/C). This analysis is used to see the net benefit to one unit of business cost. Net Cash Benefit (NET B/C) is calculated - This analysis uses the following measurement criteria:
 - a) A project is worth executing if the NET B/C value is greater than one.
 - b) A project is not worth undertaking if the NET B/C is less than one.
 - c) The project neither incurs a loss nor a profit when NET B/C is equal to one.
4. Payback Period (PP) (Fazwan., 2001), the calculation of Payback Period is by calculating the investment return period of an industry using net cash flows. In other words, this PP is used to see how long it takes to return the capital issued until it is fully returned. According to (Bambang., 2001), stated that if the net cash flows are the same amount each year, then the payback period of a business investment can be calculated by dividing the existing investment by the annual net cash flow.

RESULTS

Organoleptic Test

Organoleptic Test The results of organoleptic tests on samples tested with test parame-

ters including: color appearance, aroma, taste and overall acceptance. The results of the organoleptic test can be seen in table 1 organoleptic test results

Tabel 1. Hasil Organoleptik

Sampel	MC1	MC2
Warna	4.1	3.2
Aroma	3.5	4.1
Tekstur	3.6	3.5
Rasa	3.4	4.0
Penerimaan		
Keseluruhan	3.86	3.93

Keterangan:

1: Produk minuman cokelat dipasaran

2: Produk minuman cokelat dengan CBS

Figure 1. Organoleptic Test Results

Source: Researcher

The organoleptic test conducted was a hedonic test conducted with a scale of: (1) very dislike, (2) dislike, (3) neutral, (4) like, (5) very like. From the organoleptic results, it can be said that the value of the overall acceptance parameter of the MC2 sample is greater, namely 3.93 compared to the value in the MC1 sample, namely 3.86. The results of the analysis (t-test) showed that the difference in the overall acceptance assessment of the MC1 and MC2 chocolate drinks was not significant or not significantly different (H_0 was accepted). The calculation of the t-test on both chocolate drinks was $-0.330 < 1.671$ (t-table). This shows that there is no significant difference in overall parameters between chocolate drinks on the market (MC1) and chocolate drinks using CBS (MC2).

Investment Costs Investment costs are fixed costs whose amount is not affected by the number of products produced. The investment required to realize this business is Rp. 6,754,815,000-. which consists of investment in land and buildings, machinery and equipment, office equipment and supplies and vehicles.

Operational Costs Operational costs are costs that are routinely incurred every year at a specified project age. Operational costs can be divided into 2, namely, variable costs and fixed costs. Fixed Costs are costs incurred in production activities when a certain volume with a fixed amount. An example of this cost is the cost that must be paid to indirect labor or not related to production activities. In addition, fixed costs of depreciation and maintenance must be incurred

even though the production volume varies. While variable costs are different from fixed costs. These variable costs change according to the amount of production volume determined. The variable costs include raw material costs, electricity costs, administration costs, promotion costs and telephone costs.

Investment Fund and Working Capital Needs There are two funds needed to run this business, namely asset investment costs and working capital. The source of funds is assumed to be obtained from bank loans with a loan interest of 10% with a loan repayment period of 10 years. Production and Income Based on the assumptions and parameters determined, the annual production capacity is 1,440,000 packages of 1000 gr, 288,000 packages of 5000 gr and 172,800 packages of 25000 gr, with a selling price/package of Rp. 36,225, Rp. 173,281, Rp. 776,354, respectively. The determination of the selling price is calculated from the cost of production plus a profit of 25% of the cost of production. Profit and Loss Analysis Profit/loss projections are carried out to determine the level of profitability of the investment activity plan. The calculation of profit/loss is obtained from the difference between income and expenses. The profit and loss components used consist of sales revenue, operating costs, depreciation costs, interest expenses and income tax. 15 Taxation of corporate income is regulated in Law no. 17 of 2000.

CONCLUSION

The results of the discussion of this study indicate that this business is feasible to be executed because all financial aspects show that this business is indeed feasible to be carried out. The results of the study show that the NPV value is Rp 892,138,919,349- which is calculated over a period of 10 years with the assumption of production of 25 tons / day with a packaging weight of 1000 gr, 5000 gr, and 25000 gr. The IRR calculation result is 94.97 percent, so it can be concluded that the business is feasible because it is greater than the bank interest rate of 10 percent. The Net B / C calculation result is 9.73. This shows that every Rp. 1 increase in costs used to run this business will produce a net benefit of Rp. 9.45. The PP value or Payback period from the calculation is 1.6 or 1 year 6 months. Sensitivity analysis for this business shows that the business is still feasible even though there is an increase in operational/production costs, raw materials, auxiliary materials and a decrease in selling prices of 20%. In this study there are still shortcomings. Therefore, it would be better if a non-financial analysis and sensitivity to the capital used were carried out.

REFERENCE

- Fitriana, R. (2014). No 主観的健康感を中心とした在宅高齢者における健康関連指標に関する共分散構造分析Title. *Procedia Manufacturing*, 1(22 Jan), 1–17.
- Kusuma, P. T. W. W., & Mayasti, N. K. I. (2014). Analisa Kelayakan Finansial Pengembangan Usaha Produksi Komoditas Lokal: Mie Berbasis Jagung. *Agritech*, 34(2), 194–202.
- Torbica, A., Jovanovic, O., & Pajin, B. (2006). The advantages of solid fat content determination in cocoa butter and cocoa butter equivalents by the Karlshamns method. *European Food Research and Technology*, 222(3–4), 385–391. <https://doi.org/10.1007/s00217-005-0118-7>
- Ye, B. S., & Tiong, R. L. K. (2000). I Nvestment E Valuation. *Journal of Construction Engineering and Management*, 126(June), 227–233.
- Zaidul, I. S. M., Nik Norulaini, N. A., Mohd Omar, A. K., & Smith, R. L. (2007). Supercritical carbon dioxide (SC-CO₂) extraction of palm kernel oil from palm kernel. *Journal of Food Engineering*, 79(3), 1007–1014. <https://doi.org/10.1016/j.jfoodeng.2006.03.021>
- Zain, E. R., & Ramadayanti, M. (2019). Financial Analysis Of Production Fee From Chocholate Drink Using Cocoa Butter Substitute From Palm Oil. *Journal Agroindustri Halal*, 5(1), 085–093.
- 上海市政工程设计研究总院. (2007). No TitleЫВМЫВМЫВ. *Ятыатат*, ы12у(235), 245. <http://digilib.unila.ac.id/4949/15/BAB II.pdf>