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Financial Feasibility Analysis of Chocolate Spread with Coconut Ingredients as Agroindustrial Product

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Article Info	Abstract
	Chocolate spread is a type of paste which is mostly spread on breads and pastries. This research was conducted by calculating financial feasibility of chocolate spread with addition of coconut flour and coconut sugar produced by Yayasan Suren for Indonesia. The aim of this research is to observe the financial feasibility of chocolate spread with addition of coconut flour and coconut sugar in order to obtain its development strategy on production management and marketing. The results showed BEP value of 16659,4; PBP (year) value of 1,9; NPV value of 20389635,9; IRR value of 1526% and B/C ratio of 1,05. Therefore, based on financial feasibility analysis, this business is feasible to execute. Furthermore, based on sensitivity analysis using four scenarios, this business is not feasible to execute while undergoes increasing of price of raw material as big as 4% and decreasing of selling price as big as 3%. Based on those scenario, NPV value of this business was Rp-194.353.160,28 (<0); followed by value of IRR, Net B/C, payback period and BEP were 10,94%; 1,00; 7,88 and 155.020,62 respectively.

Introduction

Indonesia is the world's third largest cocoa producer after Ivory Coast and Ghana. However, the further processing of cocoa in Indonesia is still not being maximized yet due to the common practice of selling of dried cocoa beans or dried fermented cocoa beans (Rifin, 2013). Therefore, it is necessary for conducting further processing of cocoa product, such as by producing chocolate spread. Chocolate spread is a product which commonly applied on various breads and pastries. The advantages of this products are evenly spreadable on material's surface, formed as paste on room temperature and it has similar properties as chocolate in aroma, flavour and appearance. This product has composition such as chocolate paste, vegetable oil, milk, sweetener, cocoa powder, stabilizer, emulsifier, antioxidant and additional flavours (Jeyarani et al., 2013; Manzocco et al., 2014; Shakerardekani et al., 2013).

Chocolate spread has a good prospect to develop. This is supported by increasing of consumption of bread load and sweet bread in Indonesia which was 2,3 gram/capita/day in 2013 to be 3,17 gram/capita/day in 2017 (Hariyanto et al., 2018). Chocolate spread could be produced by adding Indonesian taste such as by combining coconut flour and coconut sugar on its formulation. Coconut flour is rich in nutrition and source of good fiber (Gunathilake & Yalegama, 2009). Whereas coconut sugar has a low glisemic index (about 35-40)(Crane, 2015).

Similar study regarding financial feasibility analysis of processed chocolate has been previously taken. It was reported that cocoa plants production development in Central Sulawesi tends to increase in the last 5 years from 2010 to 2014. Production in 2010 amounted to 138.306 tonnes and reached 208.485 tonnes in 2014. This production increasing should contribute an

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important role in economic activity of chocolate business. Twins chocolate home industry in Palu has contributed as Small and Medium Enterprises (SMEs) which process cocoa into chocolate snack with a variety of flavors since 2015. Based on financial feasibility calculation criteria on Home industry Twins Chocolate, which having Payback Period (PP) for 2 years and 2 months showed that during these investment period the industry is feasible because the payback period was less than the economic life of 3 years (Abrar et al., 2018).

Suren for Indonesia is a foundation which is located in Jember Regency. This foundation is concentrating in agribusiness and fisheries fields since 2019. They currently developing various products of agricultures and fisheries, while one of them is chocolate spread with coconut ingredients. However, this product is not examining yet regarding its prospect dan sustainability. The previous study conducted by Abrar et al, (2018) has becoming reference for author to analyse the financial feasibility of processed chocolate that is chocolate spread with coconut ingredients. Currently the information regarding agroindustry development of chocolate spread with coconut ingredients are not available yet. Therefore, it is necessary to examine the development of chocolate spread with coconut ingredients which explaining its benefit in order to commersialise this product broadly. This research aimed to analyse financial feasibility of chocolate spread with coconut ingredients therefore the prospect, development strategy, production and marketing management could be conceived in the future.

Methods

This research was quantitative descriptive by using primary data and secondary data. Primary data was obtained by observation and questionnaire. While secondary data was obtained from various literatures. Data analysis method used was analysis of financial feasibility. Feasibility study is a exploration method from a business idea regarding a business which could be feasible or not feasible to execute (Kurniawati, 2014). There are various methods in financial analysis, such as Net Present Value (NPV), Net Benefit Cost Ratio (Net B/C), Internal Rate of Return (IRR), Break Even Point (BEP), Payback Period (PBP) and sensitivity analysis (Alnasser et al., 2014; Kusuma et al., 2017; Shively & Galopin, 2014; Susilowati & Kurniati, 2018; Yassin & Derar, 2014; Žižlavský, 2014).

Net Present Value (NPV)

Net Present Value (NPV) describes comparison between PV of proceed and capital outlays during investation period. Difference between both PV values is known as net present value (NPV). The formula to count NPV is.

$$NPV = \frac{PV\ of\ proceed\ 1}{(1 + r)} + \frac{PV\ of\ proceed\ 2}{(1 + r)^2} + \cdots + \frac{PV\ of\ proceed\ N}{(1 + r)^n} - Investation$$

Net Benefit Cost Ratio (Net B/C)

Net Benefit Cost Ratio used for observing how big the benefit toward cost and investation in order to obtain advantage. Net Benefit Cost Ratio is comparison between positive NPV and negative NPV. The calculation of Net Benefit Cost Ratio is.

$$Net\ \frac{B}{C}\ Ratio = \frac{\sum_{t=0}^{t=n}(NPV)\ (+)}{\sum_{t=0}^{t=n}(NPV)\ (-)}$$

Net Benefit Cost Ratio describes comparison level of benefit of cost spent from a project. Project is feasible to execute if value of Net B/C is greater than 1 or in other words the project is profitable.

Internal Rate of Return (IRR)

Internal Rate of Return is an instrument to measure return level of result. The formula to calculate IRR is

$$IRR = i_1 + \frac{NPV_1}{NPV_1 - NPV_2} x(i_2 - i_1)$$

Note:

i_1 = Interest rate 1 (discount rate level which resulting NPV1)

i_2 = Interest rate 2 (discount rate level which resulting NPV2)

NPV_1 = Net present value 1

NPV_2 = Net present value 2

Break Even Point (BEP)

Analysis of Break-Even Point (BEP) used for learning the relationship among fixed cost, variable cost, income rate on various operational level and production volume. There are three methods in calculating BEP.

Break Even Point (BEP) for Production

$$BEP \text{ } for \text{ } Production = \frac{FC}{P - AVC}$$

Note:

FC = Fixed Cost

AVC = Average Variable Cost

P = Price of Product

Break Even Point (BEP) for Price

$$BEP \text{ } for \text{ } Price = \frac{TC}{Y}$$

Note

TC = Total Cost

Y = Production

Break Even Point (BEP) in unit of rupiah selling

$$BEP \text{ in Rupiah (Rp)} = \frac{FC}{1 - \frac{TVC}{TR}}$$

Note

TC = Total Cost

TVC = Total Variable Cost

TR = Total Revenue

Payback Period (PBP)

Payback period is an assessment technique toward period of investment return of project or business. This calculation could be viewed from calculation of net cash obtained every year. Calculation model in counting period of investment return is.

$$PP = \frac{Investation}{Net \text{ } cash \text{ } per \text{ } year} x \text{ } 1 \text{ } year$$

Sensitivity Analysis

Sensitivity analysis is an analysis used for observing the influence that will occur due to alteration of condition. Alteration on business activity could be caused by for main factors that are change of selling cost of product, delay of business execution, increasing of cost and change of production volume. Sensitivity analysis finds several replacement value on component of cost and benefit which are still fulfil the minimum criteria of investment feasibility or NPV value maximum is equal to zero, IRR value is equal to interest rate and Net B/C ratio equal to 1.

Results and Discussion

Capital is important in a business. Capital will help to carry out a business activity so that the business can run smoothly (Coleman, 2007). In this business, the required capital was Rp. 13,000,000, with details of 80% of which was self-capital and 20% was bank loans. Discount rate (MARR) of 14% with a bank loan interest of 6%.

In simple terms costs are anything that reduces a goal or anything that reduces national income and directly reduces the amount and final service. In a business, project costs are needed, namely the costs incurred in order to get future income. These project costs generally include investment costs and operational costs. Investment costs are costs incurred from before the project is implemented until the project starts running. Meanwhile, operational costs are costs that are routinely incurred from a production process (Aničić & Aničić, 2019; Pogorelov et al., 2018).

This business has a cost identification consisting of purchasing facilities and infrastructure (investment), raw and supporting materials, production processes, and marketing. This business cost includes all costs incurred during the economic life, which is 5 years. These costs include investment costs, operating costs, revenues and company revenues.

Investment costs in this business include investment costs for equipment and machinery as well as investment costs for facilities. These costs are incurred when the business will start. Details of investment costs are shown in table 1.1 below. The operational costs in this business are costs that must be incurred regularly per year for 5 years. The costs incurred include fixed costs and variable costs. Variable costs in this business include the cost of raw and supporting materials. Meanwhile, fixed costs include indirect wages, depreciation and maintenance costs. Detailed operational costs can be seen in table 1.2.

The fixed costs of this business consist of components of indirect labor wages, depreciation, and maintenance. This business does not use direct labor but uses its own power during the production life of 5 years. In this business, depreciation costs and maintenance costs are required. Depreciation costs are costs that state the amount of depreciation of the equipment each year so that a certain amount is required as equipment maintenance costs so that depreciation of the equipment does not hamper the production process. Variable costs which increase every year will affect the total operational cost which also increases from the first year to the fifth year.

Table 1. Investment Costs for Chocolate Spread with Additional Coconut Components

No.	Description	Volume	Unit	Unit Price	Price
1	Saucepan	1	pcs	300000	300000
2	Bowl	5	pcs	20000	100000
3	Spatula	4	pcs	60000	240000
4	Digital scale	1	pcs	170000	170000

5	Glass jar	20	pcs	20000	400000
6	Spoon	1	lusin	40000	40000
7	Airtight jar	12	pcs	35000	420000
8	Two burner stove	1	pcs	300000	300000
	Total (Rp)				1970000

Source: Primary Data, 2021

In this business, it is assumed that the production cost per unit is Rp 13,435.6 per 150 grams of chocolate spread. The production cost for 20 units will cost Rp. 268,712. The selling price for 20 units is Rp 390,000. The total profit earned from the sale of this product was Rp 121,288.

In the cash flow analysis below, sales from the first to fifth years are constant, namely Rp. 107,640,000. The total investment in year zero is Rp 197,000. Variable costs incurred per year are not made constant because we consider market conditions to be unstable, that is, it is estimated that the price of goods will continue to increase in the market, this will result in an increase in operating costs per year. This will result in a decrease in income in this business which is assumed to be Rp 56,000 per year.

Table 2. Operating Costs of Chocolate Spread with Additional Coconut Components

No	Descriptiom	1st Year	2nd Year	3rd Year	4th year	5th year
I.	Variable Cost	Rp/year	Rp/year	Rp/year	Rp/year	Rp/year
1	Raw materials	27410880	27460880	27510880	27560880	27610880
2	Supporting materials	70200000	70206000	70212000	70218000	70224000
Total Variable Cost		**97610880**	**97666880**	**97722880**	**97778880**	**97834880**
II.	Fixed Cost					
1	Labor salary	2760000	2760000	2760000	2760000	2760000
2	Depreciation	516600	516600	516600	516600	516600
3	Maintenance	30000	30000	30000	30000	30000
Total Fixed Cost		**3306600**	**3306600**	**3306600**	**3306600**	**3306600**
Total Operational Cost		100917480	100973480	101029480	101085480	101141480

Source: Primary Data, 2021

Table 3. Analysis of the Cash Flow of the Chocolate Spread Business with the Addition of Coconut Components

No.	Parameter	Year 0	1st Year	2nd Year	3rd Year	4th Year	5th Year
	Sales						
1	Product		107640000	107640000	107640000	107640000	107640000
	Total Sales		107640000	107640000	107640000	107640000	107640000
	Investment						
2	Tools and Machines	1970000					

	Total Investation	1970000				
	Operational Cost		100917480	100973480	101029480	101085480	101141480
3	Fixed Cost		3306600	3306600	3306600	3306600	3306600
4	Variable Cost		97610880	97666880	97722880	97778880	97834880
	Surplus (Deficit)	-1970000	6722520	6666520	6610520	6554520	6498520

Source: Primary Data, 2021

The initial capital for this business is IDR 13,000,000. Then after the calculation is done, the profit percentage is 45%. Gross profit, namely profit that has not been deducted by the amount of interest on the loan instalment, is IDR 6,722,520 per year. Variable costs that have increased cause changes in cost of goods, namely the cost of production has increased per year.

Table 4. Projection of Profit and Loss

No.	Description	1st Year	2nd Year	3rd Year	4th Year	5th Year
1	Sales	107640000	107640000	107640000	107640000	107640000
2	Expenditure					
	a. Operational Cost	100917480	100973480	101029480	101085480	101141480
	b. Principal Instalment	2600000	0	0	0	0
	c. Bank Interest	84500	0	0	0	0
	Total	103601980	100973480	101029480	101085480	101141480
3	Net Profit	4038020	6666520	6610520	6554520	6498520

Source: Primary Data, 2021

Profit was obtained by subtracting sales from the expense component. In this business, the expenditure component includes operational costs, principal instalments and loan interest. Loan payments are only made in 1 year in the first year, so there are no loan instalment payments in the second to fifth years. The net profit obtained in the first year experienced a reduction in loan instalment costs so that the net profit obtained from the first year to the second year increased by Rp. 2,628,500 while the net profit from the second year to the fifth year experienced a constant decline of Rp. 56,000 per year.

In the feasibility study analysis, a comparison between income, expenses and net profit was obtained with a discount factor of 14%. Then, it can be obtained the calculation of the Net Present Value (NPV) which has decreased from the second to the fifth year. NPV has constituent components, namely Present Value Benefit (PVB) and Present Value Cost (PVC). Discount factor is a component that determines the amount of NPV per year. The discount factor value is adjusted to the MARR set by the central bank. The greater the MARR value, the greater the discount factor value. The greater the PV (C) value, the smaller the NPV value. The total NPV from year 0 to year 5 is Rp 20389635.9.

Table 5. Business Feasibility Study Analysis

Year	Revenue	Cost	Net Benefit	DF 14%	NPV	PV (B)	PV (C)
0	0	1970000	1970000,00	1,00	1970000	0	1970000

1	107640000	103601980	4038020,00	0,88	3542122,81	94421052,6	90878929,82
2	107640000	100973480	6666520,00	0,77	5129670,67	82825484,8	77695814,1
3	107640000	101029480	6610520,00	0,67	4461912,71	72653934	68192021,3
4	107640000	101085480	6554520,00	0,59	3880802,02	63731521,1	59850719,04
5	107640000	101141480	6498520,00	0,52	3375127,65	55904843	52529715,38
Total	538200000	507831900	30368100		20389635,9	369536835	349147199,6

Source: Primary Data, 2021

The conclusions of the feasibility analysis study of chocolate spread with additional coconut-based components are shown in Table 1.6. Based on this analysis, this business is feasible to run with a BEP value of 16659.44; PBP (year) of 1.93; NPV of Rp 20389635.9; IRR of 1526%; and a B / C ratio of 1.058. Break Even Point (BEP), which is total cost equal to total revenue. The resulting payback period shows a value (less than) <5 years, in accordance with the specified time period of 5 years. A positive NPV indicates that net cash receipts are more than the costs incurred. IRR value (greater)> loan interest (6%). The value of B / C ratio is> 1, which means that cash in flows is the same as cash out flows.

Table 6. Conclusion of the Feasibility Analysis Study

No.	Parameter	Value	Description
1	BEP	16659,4354	
2	PBP (th)	1,93379864	Business is
3	NPV	20389635,9	Feasible to
4	IRR	1526%	Execute
5	B/C ratio	1,05839839	

Source: Primary Data, 2021

Sensitivity Analysis

This research uses sensitivity analysis in the form of switching value analysis which shows the variation of components, either due to an increase in raw material prices or a decrease in selling prices. Gittinger (1986) states that a variation in the sensitivity analysis is a switching value, this switching value is a calculation to measure the maximum change. The fundamental difference between the sensitivity analysis that is usually carried out with the switching value is that in the sensitivity analysis the magnitude of the change is known empirically (Lili, 2016). The sensitivity analysis is carried out using four scenarios, namely 1) an increase in raw material prices by 3%, 2) an increase in raw material prices by 4%, 3) an increase in raw material prices by 4% and a decrease in selling prices by 3%, and 4) an increase in prices. raw materials by 1% and decrease in selling prices by 5%.

Table 7. Sensitivity Analysis

Parameter	Investation Criteria				
	NPV	IRR	Net B/C	Payback Period	BEP
3% Increase in Raw Material	1.134.965.335,92	28,81%	1,03	6,26	9.917,33
4% Increase in Raw Material	871.718.067,50	25,22%	1,02	6,56	10.210,57
4% increase in raw materials and 3% decrease in selling prices	-194.353.160,28	10,94%	1,00	7,88	155.020,62

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1% increase in raw materials and 5% decrease in selling prices	472.170.388,40	19,52%	1,01	7,89	150.495,76

Source: Primary Data, 2021

Based on the results of the sensitivity analysis in scenario 3, namely an increase in raw material prices by 4% and a decrease in selling prices by 3% indicates that this business is not feasible because it will cause losses. In this scenario, the NPV value is Rp -194,353,160.28, namely (<0); IRR of 10.94%; Net B / C of 1.00; payback period of 7.88 and BEP of 155.020.62.

Development and Marketing Strategy

The chocolate spread with coconut ingredients product needs further development in order to be accepted based on customers preference. Moreover, product development is taking important consideration while the product being sold in market. This strategy can help producers to attain a successful new product and to position product as source for competitive advantage (Owens & Cooper, 2001). For example, consumers based on their generations showing different behaviour and judgment when deciding to buy certain products. When focusing on millenial consumers, producers must taking consideration on the image and packaging of products, brands and prices, since these points are valued as determinant of quality and social status. Meanwhile, consumers of Generation Y taking concern on health related products, such as food without preservative, pasteurization and reduction of unfavorable ingredients for health. By understanding consumer preferences, the developed product potentially fulfil expectations and needs of consumers. In other hand by abandoning consumer preferences, developed products will be less likely responded or even ignored by consumers. These consumers voices can be utilised for management when mapping product development area prioritised (Purba et al., 2018).

In this study, the development strategy of product was not observed yet. A method to investigate development strategy of chocolate spread with coconut ingredient is Quality Function Deployment. Quality function deployment is a method initially developed in Japan in the late 1960s and early 1970s which provides a tool to translate voice of consumers, consumers expectation or consumers needs into a suitable technical requirements for each level of product development and production (Chan & Wu, 2002; Erdil & Arani, 2019). Although the development strategy of product was not investigated yet, this strategy could be studied for the future research.

Marketing strategy is the logic of marketing used by company to create value of customer and reach profitability customer relationship (Rustandi Kartawinata et al., 2015). Marketing will determine success in each organisation. Many strategies could be implemented in marketing, however the goal of marketing is to promote products or services of organisations by raising pleasure of consumers. Marketing mix is the operational part of marketing. There are four basic marketing mix consist of price, place or distribution, product, and promotion (4Ps). Marketing mix is the combination of different marketing decision variables, strategies, and tactics used by the organisation management to market its goods and services. Marketing mix may reinforce satisfaction level of consumers (Thabit & Raewf, 2018). The implementation of marketing mix could be done both online and offline, since combining both method may encourage selling achievement target of any organisations (Sari, 2017).

Product is the goods and services offered by organisation. Product is the main element of marketing mix. Price is value charged for any product and sevices. Fixing price of product required consideration of many factors such as need of a product, cost involved, consumer's

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ability to pay, government restrictions, prices charged by competitors for comparable products, etc. can control this process. Pricing provide a serious effect because it has impact on the necessity for the product and profitability of the organization. Regarding the place, seller must choose whether to sell directly to consumers or through distributors. It is important for seller to set the product ready at city's market that consist of persons and distributions. Promotion is one of the forceful elements in marketing mix. Promotion helps merchants and sales force to effectively show products to customers and encourages them to buy (Thabit & Raewf, 2018).

Practical Implication of Study

This study will give information regarding the possibility of gaining success when a business executing project of chocolate spread with coconut ingredients. Application of feasibility analysis is important in order to prevent any failure during operation of certain business project. Based on this study, the business of chocolate spread with coconut ingredients is feasible to be conducted because it is fulfilling the minimum value criteria of method for measuring financial feasibility of a business.

Conclusion

The results of the financial feasibility analysis of the chocolate spread with coconut ingredients showed a BEP value of 16659.4; PBP value (th) of 1.9; NPV value of 20389635.9; the IRR value is 1526% and the B / C ratio is 1.05. So based on the results of the financial feasibility analysis, this business is feasible to run. Then, based on the results of the analysis of the sensitivity analysis using four scenarios, this business is not feasible to run if it experiences an increase in raw material prices by 4% and a decrease in selling prices by 3%. In this scenario, the NPV value is Rp -194,353,160.28, namely (<0); IRR of 10.94%; Net B / C of 1.00; payback period of 7.88 and BEP of 155.020.62.

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