

IMPROVING THE ACCURACY OF COFFEE BEVERAGE PRODUCTION COSTS USING THE FULL COSTING METHOD

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Accepted:	Reviewed:	Published:
September 20, 2026	October 6, 2026	October 26, 2026

Abstract

Accurate calculation of the cost of goods manufactured (COGM) is essential for micro, small, and medium enterprises (MSMEs), yet small multi-product beverage businesses rarely trace shared conversion costs to individual menu items. Caffe Raza Coffee and Tea, an MSME in Sambas Regency, West Kalimantan, calculates the cost of its best-selling product, Coffee Raza, by adding up material purchases and a flat 25% share of payroll, while omitting depreciation and electricity costs. This study aims to (1) determine the COGM of Coffee Raza for January 2026 using the full costing method, (2) reconcile the result with the café's existing calculation by cost component, and (3) assess how sensitive the result is to the allocation and classification assumptions required in a multi-product setting. A descriptive quantitative case study design was used. Data were collected through observation, interviews, and documentation and were verified by cross-checking interview statements against purchase receipts, payroll records, the electricity bill, and sales records. Materials were traced directly to Coffee Raza, whereas shared conversion costs were allocated using the production-volume ratio of 300 out of 900 cups. The total production cost under full costing amounted to Rp3,898,131, consisting of direct materials of Rp925,000, direct labor of Rp1,300,000, and manufacturing overhead of Rp1,673,131, resulting in a COGM of approximately Rp12,994 per cup. The café's calculation (Rp2,974,000, or Rp9,913 per cup) understated the production cost by Rp924,131, which is fully explained by omitted electricity (Rp333,333), under-allocated labor (Rp325,000), and omitted depreciation (Rp265,798). The sensitivity analysis shows that the COGM ranges from Rp9,911 to Rp14,260 per cup under alternative assumptions, indicating that the choice of allocation base and labor classification matters as much as the inclusion of overhead itself. The results provide a reference cost floor for pricing decisions, while their effect on profit margins requires further analysis using selling price data.

Keywords: Full costing, Cost of goods manufactured, Overhead allocation, Cost reconciliation, Coffee shop MSMEs

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1. Introduction

Indonesia's economic development has shown increasingly rapid growth, as evidenced by the growing number of business actors operating at both micro and macro scales across various sectors (Ulya et al., 2025). Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in supporting the national economy. According to data from the Ministry of Cooperatives and SMEs of the Republic of Indonesia, the number of MSMEs in Indonesia has currently reached more than 64 million business entities, accounting for approximately 99% of the total business units in the country (Turnip et al., 2024). The MSME sector makes a significant contribution to the national economy, accounting for approximately 61% of Indonesia's Gross Domestic Product (GDP) and absorbing up to 97% of the country's total domestic workforce. Within the MSME economic structure, the culinary sector, particularly food and beverage businesses, plays a crucial role as one of the major contributors to the creative economy and is among the most popular and fastest growing sectors (Kemenkop UKM, 2024).

The full costing (absorption costing) method assigns all manufacturing costs, namely direct materials, direct labor, and both variable and fixed manufacturing overhead, to products, so that the cost of goods manufactured reflects every resource consumed in production (Hansen et al., 2020; Siagian et al., 2025). Because overhead cannot be traced directly to individual products, it must be allocated using a predetermined or actual rate based on a measure of activity (Datar & Rajan, 2021). The method is therefore expected to improve the completeness of product cost information and to strengthen the tracing of costs to their cost objects (Indrawan et al., 2026) (Roshani, 2026). However, the accuracy of the resulting unit cost depends not only on whether overhead is included but also on how shared costs are allocated: when a single volume-based rate is applied to products that consume resources in different proportions, product costs can be distorted (Cooper & Kaplan, 1988).

In MSME practice, careful attention to production costs is essential for maintaining and increasing profitability. This study was conducted at Caffe

Raza Coffee and Tea, located at Jl. Lingkar Negara, in front of the Terigas Monument Roundabout, Sambas District, Sambas Regency, West Kalimantan 79462, Indonesia. The café produces several coffee and tea beverages at a single bar, using the same employees, equipment, and premises for all menu items. Its current cost calculation for each product adds up the purchases of coffee beans, milk, and auxiliary materials (creamer, palm sugar, concentrated syrup, sweetened condensed milk, plastic cups, straws, and ice) and charges a flat 25% share of total payroll to the product, without reference to the product's actual share of production. Depreciation of the outlet building, espresso machine, coffee grinder, refrigerator, air conditioner, and tables and chairs, as well as the monthly electricity bill from the state electricity company (PLN), is recorded as a general monthly expense and is not assigned to any product. In addition, production volume fluctuates between holidays and regular business days, so the fixed costs borne by each cup vary from month to month. Preliminary interviews indicated that these practices may understate product costs and lead to selling prices that do not reflect all the resources consumed. The product examined in this study is Coffee Raza, the café's best-selling menu item.

Previous studies have generally shown that MSMEs understate the cost of goods manufactured because they omit labor or overhead costs, and that the full costing method produces a more complete cost figure (Fadli & Ramayanti, 2020; Margareta et al., 2022; Esi & Wahyudi, 2024; Abbas et al., 2025; Muliyani et al., 2025). However, as discussed in the literature review below, three issues that are central to multi-product cafés have received less attention: how shared conversion costs should be allocated to a single product, which cost components explain the gap between the owner's calculation and the full costing result, and how sensitive the result is to the assumptions involved. These issues are not merely technical. When the allocation basis is not justified, the full costing result for one product may simply replace one arbitrary figure with another, and when the gap is reported only as a single amount, owners cannot identify which of their costing practices needs to be corrected.

This study addresses these issues using the case of Coffee Raza, and its contribution is threefold. First, it applies full costing to a single product in a multi-product café and explicitly separates costs that are traced to the product (materials) from shared conversion costs that are allocated, making the allocation basis and its assumptions transparent. Second, it reconciles the café's existing calculation with the full costing result component by component,

showing which omitted or under-allocated costs explain the difference. Third, it tests the sensitivity of the unit cost to alternative allocation shares, labor classifications, and asset boundaries, thereby showing how much of the result depends on judgment rather than on the method itself. The case thus provides evidence for cost accounting research on overhead allocation in small, service-intensive businesses in which fixed conversion costs account for a large part of total product cost.

Based on this background, this study has three objectives: (1) to determine the cost of goods manufactured of Coffee Raza for January 2026 using the full costing method; (2) to reconcile the result with the calculation currently applied by the café and to identify the cost components that explain the difference; and (3) to assess the sensitivity of the unit cost to the allocation and classification assumptions used. The first objective is addressed in the subsections on identifying, classifying, and calculating production costs; the second in the reconciliation subsection; and the third in the sensitivity analysis subsection.

Cost Accounting

Cost accounting is a branch of accounting that focuses on the processes of recording, classifying, summarizing, and analyzing costs incurred by a company in its production and operational activities (Sujarweni, 2017). This accounting system is specifically used to identify, measure, and report cost information to assist management in controlling costs and accurately determining the cost of goods manufactured (Rudianto, 2018). In general, the primary objective of cost accounting is to collect, record, and analyze cost information to support planning, cost control, cost of goods manufactured determination, and the evaluation of a company's operational performance (Carter dan Usry, 2016).

Three cost accounting concepts underpin the analysis in this study. The first is the cost object, namely the item whose cost is measured; in this study, the cost object is the Coffee Raza beverage produced in January 2026. Costs are direct if they can be traced to the cost object in an economically feasible way, and indirect if they are shared by several cost objects and must therefore be allocated (Datar & Rajan, 2021). The second is cost behavior: variable costs change in total in proportion to the volume of activity, fixed costs remain constant in total within a relevant range, and mixed (semi-variable) costs contain both fixed and variable elements (Hansen et al., 2020). Cost behavior describes how a cost responds to

changes in activity, not how large the cost is; a cost item can therefore be classified as variable even if no amount was incurred in a particular period. The third is the distinction between product costs, which are incurred to produce goods and are included in the cost of goods manufactured, and period costs, such as selling and administrative expenses, which are expensed in the period in which they are incurred (Carter dan Usry, 2016).

Cost of Goods Manufactured

The cost of goods manufactured represents the total costs associated with goods that have been completed and processed during a specific accounting period (Hansen et al., 2020). The costs included as components of the cost of goods manufactured consist of direct material costs, direct labor costs, and manufacturing overhead costs allocated to the products (Wati & Firdaus, 2025). Accurate calculation of the cost of goods manufactured plays a crucial role for a company, serving as a basis for controlling production costs, a measure for evaluating the efficiency of the product processing process, and a primary reference for inventory valuation (Hansen et al., 2020).

Full Costing and Overhead Allocation

Full costing treats fixed manufacturing overhead as a product cost, in contrast to variable costing, which treats it as a period cost (Hansen et al., 2020). Because overhead consists of indirect costs, full costing requires an allocation base. Unit-level bases such as production volume, direct labor hours, or machine hours are appropriate when products consume overhead resources in roughly the same proportion as the base; when consumption differs across products, volume-based allocation overcosts some products and undercosts others (Cooper & Kaplan, 1988). Activity-based costing and time-driven activity-based costing address this problem by assigning costs through several activity drivers or through the time required by each activity (Kaplan & Anderson, 2004), but they require records of activities and time that many MSMEs do not keep. A further consequence of full costing is that the fixed cost per unit varies inversely with the volume produced, so the unit cost in a low-volume month is higher than in a high-volume month even if efficiency is unchanged; for this reason, fixed overhead rates are often based on normal rather than actual capacity (Datar & Rajan, 2021). These concepts frame the analysis in this study: full costing determines which costs are included, the allocation base determines how shared costs are assigned to Coffee Raza, and the sensitivity analysis examines how strongly the result depends on that choice.

Previous Studies and Research Gap

Studies on Indonesian MSMEs have applied full costing in various sectors. Fadli and Ramayanti (2020) analyzed the cost of goods manufactured of a digital printing business, and Margareta et al. (2022) developed a web-based system to calculate full costing product costs for a cake business. In food production, Abbas et al. (2025) related full costing to pricing accuracy and financial risk in a tempe business, Azhary et al. (n.d.) examined its implications for selling prices and profitability in a cassava chip business, and Sari and Amelia (2026) focused on overhead costs in determining bakery selling prices. Muliyani et al. (2025) assisted MSMEs in preparing the cost of goods sold and selling prices. The study closest to the present one is that of Esi and Wahyudi (2024), who calculated the production cost of a coffee shop using full costing and determined selling prices using cost-plus pricing. Collectively, these studies show that MSME owners tend to omit overhead and labor costs, and that full costing provides a more complete cost figure that can inform pricing.

These studies nevertheless leave several issues open. First, the comparison between the owner's figure and the full costing result tends to be presented as an aggregate difference rather than reconciled by cost component, so it is not clear which costing practices cause the understatement. Second, when overhead is shared among several products, the allocation basis tends to be adopted without justification or testing, even though the cost accounting literature has long shown that volume-based allocation can distort product costs when products differ in resource consumption (Cooper & Kaplan, 1988). Studies that use activity-based costing (Turnip et al., 2024; Khoiriyah & Syafina, 2026) address allocation accuracy, but they require activity data that are rarely available in micro businesses. Third, most of the settings examined are manufacturing businesses in which production and selling activities are physically separate; in a café, beverages are prepared and served in the same space by the same staff, so the boundary between product costs and period costs requires explicit judgment. This study extends prior work by making the allocation basis explicit, reconciling the cost difference by component, and testing the sensitivity of the result to the key allocation and classification judgments.

2. Research Method

This study employs a descriptive quantitative approach with a single case study design at Caffe Raza Coffee and Tea, an MSME located at Jl. Lingkar

Negara, in front of the Terigas Monument Roundabout, Sambas District, Sambas Regency, West Kalimantan, Indonesia. A case study design was chosen because the research problem, namely how production costs are measured and allocated within a particular business, can only be examined with detailed access to the business's internal records and operations, and because the costing practice cannot be separated from its real-life context (Yin, 2018). The approach is descriptive quantitative because the outputs are numerical cost measures that describe the cost structure of a product rather than test relationships between variables (Arifin & Eristiawan, 2025). The unit of analysis is the Coffee Raza product for the period of January 2026. Coffee Raza was selected because it is the café's best-selling menu item, so its cost information is the most relevant for the owner's pricing decisions. The analysis applies the full costing method to obtain the total production cost and the cost of goods manufactured per unit (Esi & Wahyudi, 2024).

The study uses primary and secondary data. Primary data were obtained through observation of production activities at the bar and interviews with the owner and employees, covering the production process, material usage, the duties of each employee, and the use of equipment and utilities (Afwika et al., 2025). Secondary data consisted of documents kept by the café, namely raw material purchase receipts, payroll records, the PLN electricity bill, asset acquisition information, simple financial records, and daily sales (order) records. Production volume was obtained from the daily sales records for January 2026: the café produced 900 cups across all menu items, of which 300 cups were Coffee Raza. Because beverages are made to order and served immediately, there was no work in process at the beginning or end of the period, so the number of cups produced equals the number of equivalent units.

The data were verified through triangulation of sources and techniques. Material quantities stated in interviews were matched with purchase receipts and checked for plausibility against the quantity used per cup; employee wages were matched with payroll records; the electricity cost was taken from the PLN bill; and the acquisition costs of assets stated by the owner were checked against available purchase information. Production volume from the sales records was compared with observations at the bar. When interview information and documents differed, the documentary evidence was used and the discrepancy was confirmed with the owner; where no document was available, as in the case of the estimated useful lives of assets, the owner's estimate was used and is

reported as an assumption.

The data were analyzed in five stages. First, all costs related to the production of beverages in January 2026 were identified. Second, the costs were classified into direct materials, direct labor, and manufacturing overhead; overhead was further classified by nature (indirect materials, repair and maintenance, indirect labor, depreciation of fixed assets, costs arising from the passage of time, and other overhead costs requiring cash expenditures) and by behavior (variable, fixed, or mixed). Third, the costs were assigned to Coffee Raza: materials recorded specifically for Coffee Raza were traced directly, whereas shared conversion costs (wages, depreciation, and electricity) were allocated using the ratio of Coffee Raza's output to the café's total output ($300/900$ cups = $1/3$, or 33.33%). Production volume was used as the allocation base because all menu items are produced at the same bar by the same employees using the same equipment, and because the café keeps no records of preparation time or machine usage per menu item that could support a more refined driver. To avoid rounding inconsistencies, the exact ratio of $1/3$ was applied and the allocated amounts were rounded to the nearest rupiah. Fourth, the total production cost was divided by the number of units produced:

$$\text{COGM per Unit} = \text{Total Production Costs} / \text{Number of Units Produced}$$

Fifth, the result was reconciled with the café's existing calculation by cost component, and a sensitivity analysis was performed to assess how the unit cost changes under alternative assumptions, namely a Coffee Raza share of conversion costs of 25% and 40% instead of 33.33%, a narrower classification of direct labor, and a narrower set of production assets.

3. Result and Discussion

Identifying Production Costs

This stage identified all production-related expenditures of Caffe Raza Coffee and Tea in January 2026. During this month, the café produced 900 cups across all menu items, of which 300 cups were Coffee Raza. Two types of costs are distinguished in the analysis. Material costs (direct and auxiliary materials) were recorded specifically for Coffee Raza and represent its actual costs. Conversion costs (wages, depreciation, and electricity) are shared by all menu items and were recorded for the café as a whole; only an allocated portion of these costs is assigned to Coffee Raza. Direct Material Costs. Direct materials are materials that are physically incorporated into the beverage and form its main

ingredients, namely premium blend coffee beans and fresh UHT milk. The direct material costs of Coffee Raza are presented in Table 1.

Table 1. Direct Material Costs of Coffee Raza, January 2026

No	Period	Material	Quantity Used	Unit Price	Total Cost
1	January 2026	Premium Coffee Beans	3 kg	Rp175.000/kg	Rp525.000
2	January 2026	UHT milk	24 litres	Rp16.667/litre	Rp400.000
Total					Rp925.000

The direct material costs of Coffee Raza in January 2026 amounted to Rp925,000, consisting of 3 kg of premium coffee beans (Rp525,000) and 24 litres of UHT milk (Rp400,000). These amounts represent the materials used for Coffee Raza during the month, recapitulated at month-end (31 January 2026) from purchase receipts. Because the café purchases these materials in small quantities as needed and holds no significant stock at month-end, purchases were treated as consumption. The consistency of these quantities with the 300 cups produced was checked: they imply approximately 10 g of coffee and 80 ml of milk per cup, which is plausible for a single serving of a milk-based coffee beverage. Direct materials are traced directly to Coffee Raza and are therefore not allocated. By contrast, conversion costs are shared by all menu items and are allocated using Coffee Raza's share of the café's total output, calculated as follows:

$$\% \text{ Coffee Raza} = (300 \text{ cups} / 900 \text{ cups}) \times 100\% = 33.33\%$$

This ratio is used only to allocate shared conversion costs (wages, depreciation, and electricity), not materials. Direct Labor Costs. The café employs three permanent staff members: a bar manager, a cashier, and a waiter. Based on observation and interviews, the café has no dedicated barista; all three employees take turns preparing beverages at the bar in addition to their other duties, and no employee works exclusively in a non-production role. Their wages are therefore treated as direct labor shared by all menu items. Because the café does not record the time each employee spends on each menu item, the total wage cost was allocated to Coffee Raza using the production-volume ratio, resulting in a direct labor cost of Rp1,300,000 ($1/3 \times \text{Rp}3,900,000$), as shown in Table 2. The effect of a narrower classification, in which only the bar manager's wage is treated as direct labor, is examined in the sensitivity analysis.

Table 2. Direct Labor Cost Allocation for Coffee Raza, January 2026

Description	Number of Workers	Total Monthly Cost
Bar Manager	1	Rp 1.500.000
Cashier	1	Rp 1.200.000
Waiter	1	Rp 1.200.000
Total Cost	3	Rp 3.900.000
Allocated to Coffee Raza ($300/900 \times \text{Rp}3.900.000$)		Rp 1.300.000

Table 2 shows that the bar manager receives a monthly wage of Rp1,500,000, while the cashier and the waiter each receive Rp1,200,000, giving a total of Rp3,900,000. Applying the production-volume ratio, the direct labor cost attributable to Coffee Raza is Rp1,300,000. The wages are fixed monthly amounts that do not change with the number of cups produced, so direct labor at this café behaves as a fixed cost, and the labor cost per cup depends on the total volume of beverages produced in the month.

Classification of Manufacturing Overhead Costs. Manufacturing overhead costs are classified in two ways. By nature, they consist of six categories: indirect material costs; repair and maintenance costs; indirect labor costs; costs arising from the valuation of fixed assets (depreciation); costs arising from the passage of time; and other overhead costs requiring cash expenditures. By behavior, they are classified as variable, fixed, or mixed (semi-variable). Indirect materials are materials used in or with the product that are not its main ingredients, namely flavorings, packaging, and ice. The indirect material costs of Coffee Raza are presented in Table 3.

Table 3. Auxiliary (Indirect) Material Costs of Coffee Raza, January 2026

No	Name of Auxiliary Materials	Amount Used (Rp)
1	Creamer Powder	Rp 150.000
2	Liquid Palm Sugar	Rp 150.000
3	Concentrated Syrup	Rp 210.000
4	Plastic Cups	Rp 240.000
5	Plastic Straws	Rp 18.000
6	Crystal Ice Cubes	Rp 156.000
7	Canned Sweetened Condensed Milk	Rp 150.000
Total Cost of Auxiliary Materials		Rp 1.074.000

The auxiliary materials used for Coffee Raza in January 2026 amounted to Rp1,074,000, or approximately Rp3,580 per cup. They consist of creamer powder (Rp150,000), liquid palm sugar (Rp150,000), concentrated syrup (Rp210,000), plastic cups (Rp240,000), plastic straws (Rp18,000), crystal ice cubes (Rp156,000),

and canned sweetened condensed milk (Rp150,000). Like the direct materials, these amounts were recorded specifically for Coffee Raza and were measured on the same basis, namely materials used during January 2026. Following the café's practice and the common treatment in cost accounting, these supplementary materials are classified as indirect materials (Carter dan Usry, 2016). This classification affects only the presentation of costs between direct materials and overhead; it does not change the total production cost, because both are included under full costing. Their total varies with the number of cups produced, so they are classified as variable costs. To avoid double counting, each material item appears in only one table: coffee beans and UHT milk in Table 1 and the other seven items in Table 3, giving total material costs of Rp1,999,000 for Coffee Raza. Repair and Maintenance Costs. These costs include expenditures for repairing damage to, or replacing parts of, the bar equipment. The café's operational management stated:

“For repair and servicing costs for bar equipment, such as the coffee machine, refrigerator, and blender, no expenditure was recorded in January because all equipment remained in good condition and experienced no technical problems.”

Based on this statement, no repair and maintenance cost was incurred in January 2026, so the amount was recorded as Rp0. By behavior, repair and maintenance costs are nevertheless classified as variable, because they tend to increase with equipment use and because cost behavior describes how a cost responds to activity rather than the amount incurred in a particular month. Indirect Labor Costs. Based on observation, the café incurred no indirect labor cost, because all three employees are involved in preparing beverages and their wages have been treated as direct labor; the amount was therefore Rp0. Costs Arising from the Valuation of Fixed Assets (Depreciation). The café's fixed assets consist of the outlet building, an espresso machine, a coffee grinder, a refrigerator, 25 metal tables, 35 metal chairs, and a 1 PK air conditioner. According to the owner, the building was acquired for approximately Rp50,000,000, the espresso machine for Rp35,000,000, the grinder for Rp2,000,000, the refrigerator for Rp1,800,000, the tables for Rp120,000 each (Rp3,000,000 in total), the chairs for Rp65,000 each (Rp2,275,000 in total), and the air conditioner for Rp2,700,000. Depreciation was calculated using the straight-line method, which is appropriate because these assets provide relatively even service over their lives, with zero residual value assumed. The useful lives, namely 20 years for the building, 8 years

for the espresso machine and grinder, and 4 years for the refrigerator, tables, chairs, and air conditioner, are the owner's estimates of expected service life under daily use. They are in line with the asset groups and building life set out in Article 11 of Law No. 36 of 2008 on Income Tax (4, 8, and 20 years) (Republik Indonesia, 2008), although tax lives are not necessarily equal to economic lives. Depreciation is a fixed cost because the monthly amount does not change with production volume. The calculation is presented in Table 4.

Table 4. Monthly Depreciation of Fixed Assets Used in the Café (Straight-Line Method)

No	Asset Description	Qty	Acquisition Cost (Rp)	Total Cost (Rp)	Useful Life (Years)	Rate per Year	Depreciation per Month (Rp)
1	Building	1 Unit	50.000.000	50.000.000	20	5%	208.333
2	Espresso Machine	1 Unit	35.000.000	35.000.000	8	12,5%	364.583
3	Grinder	1 Unit	2.000.000	2.000.000	8	12,5%	20.833
4	Refrigerator	1 Unit	1.800.000	1.800.000	4	25%	37.500
5	Metal Table	25 Piece	120.000	3.000.000	4	25%	62.500
6	Metal Chairs	35 Piece	65.000	2.275.000	4	25%	47.396
7	1 HP Air Conditioner	1 Unit	2.700.000	2.700.000	4	25%	56.250
	Total			96.775.000			797.395

Table 4 shows total acquisition costs of Rp96,775,000 and total monthly depreciation of Rp797,395. All of these assets were included in manufacturing overhead. The espresso machine, grinder, and refrigerator are used directly in preparing beverages. The building, air conditioner, tables, and chairs serve both the bar and the seating area; they were included because the café operates in a single open space in which beverages are prepared and served for on-site consumption, so the outlet as a whole is the facility in which the product is produced and delivered, and the café keeps no floor-area or usage records that would allow these assets to be divided between production and selling activities. Under a stricter interpretation, part of these assets supports selling activities and

could be treated as a period cost; the effect of excluding them is quantified in the sensitivity analysis. Applying the production-volume ratio, the depreciation allocated to Coffee Raza is $1/3 \times \text{Rp}797,395 = \text{Rp}265,798$. Costs Arising from the Passage of Time. This category covers costs such as the insurance of production equipment. The café does not insure its equipment, so this cost was Rp0. Other Overhead Costs Requiring Cash Expenditures. This category consists of electricity. The PLN bill for January 2026 amounted to Rp1,000,000. Electricity is a mixed (semi-variable) cost: it contains a fixed element (the subscription charge and the consumption of continuously operating equipment such as the refrigerator and lighting) and a variable element (the consumption of the espresso machine and grinder, which increases with the number of cups). The café has a single meter and no sub-meters, so the two elements could not be measured separately, and the whole bill was allocated using the production-volume ratio: $1/3 \times \text{Rp}1,000,000 = \text{Rp}333,333$. This treatment assumes that the café's total electricity consumption is shared by menu items in proportion to their output; it is a simplification that is acknowledged as a limitation of this study. The classification of overhead costs by nature and behavior, together with the amounts and assignment bases, is summarized in Table 5.

Table 5. Manufacturing Overhead Costs of Coffee Raza by Nature and Behavior, January 2026

No	Overhead Cost by Nature	Cost Behavior	Shared Cost Pool (Rp)	Assignment to Coffee Raza	Amount for Coffee Raza (Rp)
1a	Indirect materials: creamer powder, liquid palm sugar, concentrated syrup, sweetened condensed milk	Variable	-	Traced directly (recorded for Coffee Raza)	660.000
1b	Indirect materials: plastic cups, plastic straws, crystal ice cubes	Variable	-	Traced directly (recorded for Coffee Raza)	414.000
2	Repair and maintenance	Variable	0	Not incurred in January 2026	0
3	Indirect labor	Not applicable (no indirect labor employed)	0	Not incurred	0
4	Depreciation of fixed assets (Table 4)	Fixed	797.395	1/3 (300 of 900 cups)	265.798
5	Costs arising from the passage of time	Fixed	0	Not incurred	0

No	Overhead Cost by Nature	Cost Behavior	Shared Cost Pool (Rp)	Assignment to Coffee Raza	Amount for Coffee Raza (Rp)
	(insurance)				
6	Electricity (PLN bill)	Mixed (semi-variable)	1.000.000	1/3 (300 of 900 cups)	333.333
	Total manufacturing overhead				1.673.131

As shown in Table 5, the manufacturing overhead costs attributable to Coffee Raza in January 2026 amounted to Rp1,673,131, consisting of variable indirect materials of Rp1,074,000, fixed depreciation of Rp265,798, and mixed electricity costs of Rp333,333 (Rp1,074,000 + Rp0 + Rp0 + Rp265,798 + Rp0 + Rp333,333 = Rp1,673,131). The zero amounts for repair and maintenance, indirect labor, and insurance reflect costs that were not incurred in January 2026, not costs that were omitted.

Classifying Costs Based on Production Elements

In this stage, the cost data were combined into the three main elements of production cost: direct materials of Rp925,000, direct labor of Rp1,300,000, and manufacturing overhead of Rp1,673,131. Under the café's existing practice, depreciation and electricity are recorded as general monthly expenses and are not linked to any product. Combining all elements under full costing ensures that every resource consumed in producing Coffee Raza is reflected in its cost. The structure of the cost is also informative: materials (Rp1,999,000, including auxiliary materials) account for 51.3% of the total production cost, whereas conversion costs that are largely fixed (labor, depreciation, and electricity, totaling Rp1,899,131) account for 48.7%.

Calculating the Cost of Goods Manufactured per Cup. The cost of goods manufactured per cup is obtained by dividing the total cost of each element by the number of cups produced, as presented in Table 6.

Table 6. Calculation of Coffee Raza Production Cost Per Cup

Production Cost Elements	Total Cost	Units Produced (Cups)	Cost per Cup
Direct Material Costs	Rp 925.000	300	Rp 3.083,33
Direct Labor Costs	Rp 1.300.000	300	Rp 4.333,33
Manufacturing Overhead Costs	Rp 1.673.131	300	Rp 5.577,10
Total Production Cost / COGM per Cup	Rp 3.898.131	300	Rp 12.993,77

The total production cost of Coffee Raza under full costing was Rp3,898,131. With 300 cups produced, the cost per cup was Rp3,083.33 for direct materials, Rp4,333.33 for direct labor, and Rp5,577.10 for manufacturing overhead, giving a cost of goods manufactured of Rp12,993.77, or approximately Rp12,994 per cup:

Direct Material Cost per Cup = $\text{Rp}925,000 / 300 = \text{Rp}3,083.33$

Direct Labor Cost per Cup = $\text{Rp}1,300,000 / 300 = \text{Rp}4,333.33$

Manufacturing Overhead Cost per Cup = $\text{Rp}1,673,131 / 300 = \text{Rp}5,577.10$

Cost of Goods Manufactured per Cup = $\text{Rp}3,898,131 / 300 = \text{Rp}12,994$

Per-cup components are rounded to two decimal places. Thus, under full costing, the cost of producing one cup of Coffee Raza in January 2026 was approximately Rp12,994.

Analyzing the Cost of Production Report

Based on the calculation above, the total production cost of Coffee Raza in January 2026 under full costing was Rp3,898,131. The production cost report is presented in Table 7.

Table 7. Production Cost Report

Production Data			
Description		Quantity	
Put into process		300 cup	
Completed and served (finished goods)		300 cup	
Quantity of products produced		300 cup	
Costs Charged			
Cost Component	Total	Per Cup	
Direct Material Costs	Rp 925.000	Rp 3.083,33	
Direct Labor Costs	Rp 1.300.000	Rp 4.333,33	
Manufacturing Overhead Costs	Rp 1.673.131	Rp 5.577,10	
Total	Rp 3.898.131	Rp 12.993,77	
Cost Calculation			
Description		Amount	
Cost of finished goods: 300 cups @ Rp 12.993,77		Rp 3.898.131	
Total production costs charged		Rp 3.898.131	

The production cost report shows that all 300 cups of Coffee Raza put into process in January 2026 were completed, because beverages are made to order and no work in process remains at the end of the period. The total production cost charged of Rp3,898,131 is therefore entirely assigned to finished goods, at approximately Rp12,994 per cup.

Reconciliation with the Café's Existing Calculation

The café's existing calculation for Coffee Raza in January 2026 amounted to Rp2,974,000, or Rp9,913 per cup, compared with Rp3,898,131 under full costing. The difference of Rp924,131 (Rp3,080 per cup) means that the café's calculation captures only 76.3% of the full production cost. Table 8 reconciles the two calculations by cost component.

Table 8. Reconciliation of the Café's Calculation and the Full Costing Calculation for Coffee Raza, January 2026

Cost Component	Cafe's Calculation (Rp)	Full Costing (Rp)	Difference (Rp)	Explanation
Direct materials	925.000	925.000	0	Included in both calculations
Auxiliary (indirect) materials	1.074.000	1.074.000	0	Included in both; classified as overhead under full costing
Direct labor	975.000	1.300.000	325.000	Café charges a flat 25% of payroll; full costing uses Coffee Raza's output share of 1/3
Depreciation of fixed assets	0	265.798	265.798	Not recognized by the café (non-cash expense)
Electricity	0	333.333	333.333	Recorded by the café as a general monthly expense
Repair, indirect labor, insurance	0	0	0	Not incurred in January 2026
Total production cost	2.974.000	3.898.131	924.131	
COGM per cup (300 cups)	9.913,33	12.993,77	3.080,44	

Table 8 shows that the difference is fully explained by three components: electricity (Rp333,333, or 36.1% of the difference), the under-allocation of labor (Rp325,000, or 35.2%), and depreciation (Rp265,798, or 28.8%). Material costs do not contribute to the difference, because the café already includes all material purchases in its calculation. The understatement therefore arises not from the measurement of materials but from the treatment of conversion costs: the café omits costs that do not require a cash payment linked to a specific production batch (depreciation) or that are billed once a month for the outlet as a whole (electricity), and it charges labor using a flat share that is not linked to Coffee Raza's actual share of output.

Sensitivity of the Cost of Goods Manufactured to Allocation and Classification Assumptions

Because conversion costs are shared by all menu items, the cost of Coffee Raza depends on judgments about the allocation base, the classification of labor, and the boundary of production assets. Table 9 shows how the cost per cup changes under alternative assumptions, holding all other data constant. Scenarios 1 and 2 vary Coffee Raza's share of total conversion costs (Rp5,697,395 for wages, depreciation, and electricity). The 25% share corresponds to the flat share used by the café for labor, while the 40% share illustrates a situation in which Coffee Raza, as an espresso-based beverage, requires more preparation time and machine use than other menu items. Scenario 3 treats only the bar manager's wage as direct labor and the wages of the cashier and the waiter as non-production costs. Scenario 4 limits depreciation to the equipment used directly in beverage preparation (the espresso machine, grinder, and refrigerator, totaling Rp422,916 per month) and treats the building, air conditioner, tables, and chairs as selling facilities. Scenario 5 combines Scenarios 3 and 4.

Table 9. Sensitivity of the Cost of Goods Manufactured of Coffee Raza to Alternative Assumptions

Assumption	Total Production Cost (Rp)	COGM per Cup (Rp)	Change from Base (%)
Conversion costs allocated at 1/3; all three employees as direct labor; all assets in Table 4 included	3.898.131	12.993,77	-
Coffee Raza's share of conversion costs = 25%	3.423.349	11.411,16	-12,18
Coffee Raza's share of conversion costs = 40%	4.277.958	14.259,86	+9,74
Only the bar manager's wage treated as direct labor	3.098.131	10.327,10	-20,52
Depreciation limited to the espresso machine, grinder, and refrigerator	3.773.305	12.577,68	-3,20
Scenarios 3 and 4 combined	2.973.305	9.911,02	-23,72

The results show that the cost per cup ranges from Rp9,911 to Rp14,260 across the scenarios. Each percentage point change in Coffee Raza's share of conversion costs changes its cost by about Rp190 per cup ($1\% \times \text{Rp}5,697,395 / 300 \text{ cups}$). The classification of labor has the largest effect: excluding the wages of the cashier and the waiter reduces the cost by 20.5%, whereas excluding

customer-related assets reduces it by only 3.2%, so the inclusion of the building, air conditioner, tables, and chairs does not materially affect the conclusions. When both narrower assumptions are applied (Scenario 5), the cost of Rp9,911 per cup is almost equal to the café's own figure of Rp9,913. This coincidence should not be interpreted as validating the café's calculation, because the composition differs: the café omits electricity and depreciation entirely but charges a larger share of wages. It does show, however, that the size of the understatement depends on the classification judgments adopted, which should therefore be made explicit.

4. Discussion

The finding that the café's calculation understates the production cost is consistent with prior studies in other MSME sectors, which report that owners tend to omit labor and overhead costs (Fadli & Ramayanti, 2020; Abbas et al., 2025; Sari & Amelia, 2026), and with the study by Esi and Wahyudi (2024) in a coffee shop. The reconciliation, however, refines this general finding in two ways. First, at Caffe Raza the understatement does not come from materials, which the owner already records completely, but entirely from conversion costs. The owner includes costs that are paid in cash and can be linked to purchases for the product, and excludes costs that are non-cash (depreciation) or billed for the business as a whole (electricity). This pattern suggests that the costing practice of the café follows a cash-outflow perspective rather than a resource-consumption perspective. Second, the cost structure of a café explains why the omission is large. Conversion costs account for almost half (48.7%) of the cost of Coffee Raza, because the café relies on relatively expensive equipment, a fixed-wage workforce, and an outlet that must be maintained regardless of the number of cups sold. In such a cost structure, which differs from MSMEs in which material costs may dominate, omitting fixed conversion costs has a proportionally larger effect on the unit cost.

Because most conversion costs are fixed, the unit cost under full costing also depends on volume. With volume-based allocation, the conversion cost per cup equals the café's total conversion costs divided by its total output ($\text{Rp}5,697,395 / 900 \text{ cups} = \text{Rp}6,330 \text{ per cup}$), whereas the material cost per cup ($\text{Rp}6,663$) remains largely constant. If total output rose to 1,200 cups in a busy month, the conversion cost per cup would fall to about $\text{Rp}4,748$; if it fell to 600 cups, it would rise to about $\text{Rp}9,496$. This explains the difficulty faced by the

owner in calculating costs when sales differ between holidays and regular days. For pricing purposes, it would be more appropriate to calculate fixed overhead per cup on the basis of normal monthly volume rather than the actual volume of a single month, so that seasonal fluctuations do not distort the product cost (Hansen et al., 2020; Datar & Rajan, 2021).

These findings have implications for cost allocation and management accounting practice in small beverage businesses. The sensitivity analysis shows that the decision to include overhead matters, but so do the allocation base and the classification of labor: the range of plausible unit costs (Rp9,911 to Rp14,260) is wider than the difference between the café's figure and the base full costing result. Volume-based allocation is a practical starting point for MSMEs because it requires only sales records, but it assumes that all menu items consume conversion resources equally. Where menu items differ markedly in preparation time or equipment use, a simple time-based driver, for example the standard preparation time per menu item multiplied by the number of cups, would bring the allocation closer to actual resource consumption without the data requirements of full activity-based costing (Kaplan & Anderson, 2004). For MSMEs, this suggests that cost calculations should document the allocation assumptions used, so that owners can see how sensitive their product costs are to these judgments.

The results also have potential implications for pricing and profitability, although these could not be demonstrated in this study because selling price data were not analyzed. A full production cost of approximately Rp12,994 per cup indicates the minimum price at which Coffee Raza recovers its production costs at the January 2026 volume; selling, administrative, and financing costs, as well as a profit margin, would need to be added to this amount. If the café sets prices on the basis of its own figure of Rp9,913 per cup, the margin it perceives would exceed the margin actually earned by about Rp3,080 per cup, which could lead to underpricing and an overstatement of profit (Dewi et al., 2021; Sari & Amelia, 2026). Whether this occurs in practice depends on the actual selling price, which should be examined in future research.

4. Conclusion

This study determined the cost of goods manufactured of Coffee Raza at Caffe Raza Coffee and Tea for January 2026 using the full costing method. First, the total production cost was Rp3,898,131, consisting of direct materials of Rp925,000, direct labor of Rp1,300,000, and manufacturing overhead of

Rp1,673,131, resulting in a cost of approximately Rp12,994 per cup for 300 cups. Second, the café's existing calculation of Rp2,974,000 (Rp9,913 per cup) understated this cost by Rp924,131; the reconciliation shows that the difference arises entirely from conversion costs, namely omitted electricity (Rp333,333), under-allocated labor (Rp325,000), and omitted depreciation (Rp265,798), rather than from materials. Third, the sensitivity analysis shows that the unit cost ranges from Rp9,911 to Rp14,260 depending on the allocation share, the classification of labor, and the boundary of production assets, so these judgments affect the result as much as the decision to apply full costing itself. The study contributes to cost accounting research on MSMEs by showing that, in multi-product cafés with a high proportion of fixed conversion costs, the accuracy of product costs depends not only on including all cost elements but also on making allocation assumptions explicit and testing them. In practice, the café can use the full costing result, together with the documented assumptions, as a reference cost floor when reviewing its selling prices. This study has several limitations: it covers one product and one month; conversion costs were allocated using production volume because no time or sub-meter records were available; useful lives were based on the owner's estimates; and selling price data were not analyzed, so the effect on profit margins was not demonstrated. Future research could use multi-month data and normal capacity, record preparation times to apply time-driven activity-based costing, and analyze selling prices and margins across menu items.

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