

# Comparative Analysis of Production Price Calculation (HPP) Using Activity Based Costing (ABC) and Full Costing (FC) Methods at Tahu Putra Kember Factory

Lastrı Yulianti<sup>1</sup>, Uus Mohammad Darul Fadli<sup>1\*</sup>, Ery Rosmawati<sup>1</sup>

<sup>1</sup> Program Studi Manajemen, Fakultas Ekonomi dan Bisnis,  
Universitas Buana Perjuangan Karawang, Jln. HS Ronggowaluyo Telukjambe Timur,  
Karawang, 41361, INDONESIA

\*Corresponding Author: [uus.fadli@ubpkarawang.ac.id](mailto:uus.fadli@ubpkarawang.ac.id)

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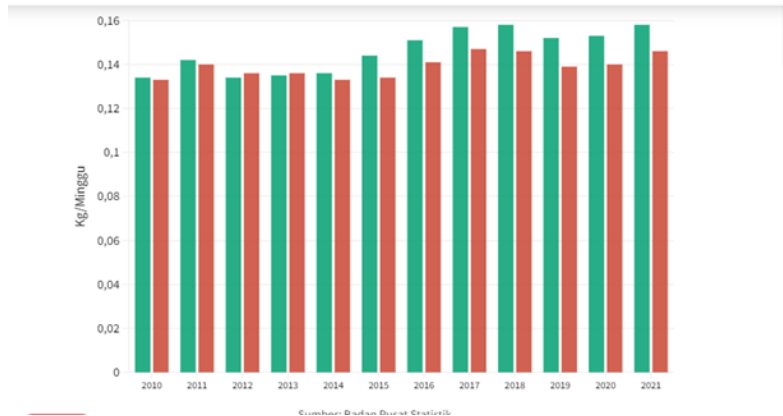
Cost of Goods Manufactured, Activity Based Costing, Full Costing, and Tofu Factory.

## Abstract

This study was conducted to assess and compare production costing approaches, namely activity-based costing and full costing, in setting product selling prices to avoid errors in setting selling prices that can arise in the company environment. This research method applies a comparative descriptive approach at Mr. Rahmat's Putra Kembar Tofu Factory. Using a purposive sampling technique, this study collected data on raw material costs, direct labor costs, and factory overhead costs. Data collection was done through interviews, observation, and documentation. The results showed that the cost of goods produced per piece of white tofu, when calculated using the activity-based costing method, amounted to Rp287, while the full costing method amounted to Rp319. For yellow tofu, the cost of production per piece with the activity-based costing method is Rp250, while the full costing method is Rp265. Thus, the activity-based costing method considers overhead costs based on activities in the production process, while the full costing method considers all production costs. As a result, the activity-based costing method proved to be more profitable, with a significant comparison.

## 1. Introduction

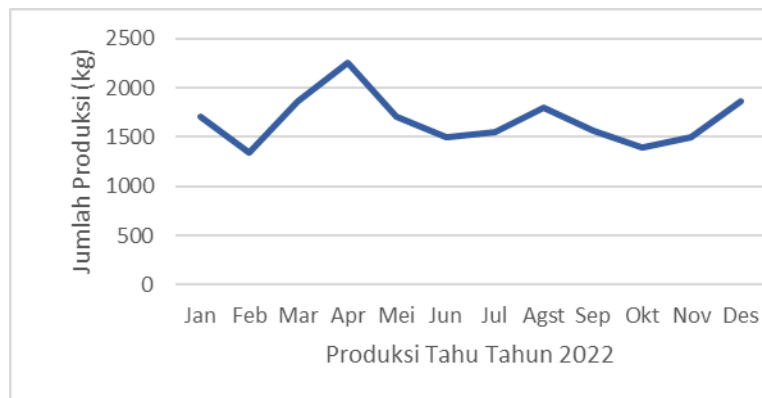
As a result of using soy as the main ingredient, tofu has become a very popular food in Indonesia. This indicates that the small and medium-scale industry is experiencing rapid growth. In 2021, per capita tofu consumption was 0.158 kg per week, up 3.27% from 0.153 kg per week in 2020. As shown in the following graph: (Karnadi, 2022).



**Fig. 1** Central Bureau of Statistics (2022)

Any business that is established usually faces fierce competition. Therefore, entrepreneurs can improve their business performance to produce high-quality products and have competitive prices. This is necessary for the business to survive in fierce competition. Entrepreneurs are also expected to manage production costs efficiently without reducing product value or volume so that costs can be distributed optimally (Puji Mahardika & Lantang, 2021).

In Indonesia, small businesses (SMEs) are the most popular type of business. However, the boundaries for small businesses still vary. Tofu business is one of the most developed microbusinesses in Indonesia. In Wargasetra Village, Karawang Regency, Mr. Rahmat owns a tofu factory. The demand for tofu is huge as the marketing of this tofu factory includes traders in the Loji market and traveling vegetable vendors, as shown by the graph of the production amount in 2022:



**Fig. 2** Total Soybean Production of Putra Kembar Tofu Factory 2022

Figure 2 above shows that the average soybean requirement for Putra Kembar tofu production is 1,668 kg of soybeans.

From the results of interviews related to the estimation of the calculation of Cost of Goods Produced (COGS) in the Putra Kembar Tofu Producer Environment, the data confirms that the business entity only determines the evaluation of the components of raw material costs, direct wage costs, and factory overhead costs. This limitation resulted from the emphasis on the cost factors of chaff and electricity without considering other aspects of overhead. The increase in raw material consumption and the need for more clarity regarding determining COGS pose additional challenges that affect the selling price-setting strategy.

Failure to estimate production costs can result in negative impacts such as financial losses or loss of overall profit potential in the business realm. Three approaches can be applied in estimating the Cost of Goods Manufactured (COGS), namely Full Costing (FC), Variable Costing (VC), and Activity Costing (ABC). In the FC approach, all costs, including those that are constant and variable, are calculated and included in the calculation. In the VC approach, only variable production costs are considered when determining COGS and Cost of Goods Sold. On the other hand, in the ABC method, only variable production costs are included in the calculation of the Cost of Goods Sold. In contrast, fixed costs are attributed based on the activities performed.

Sari & Wahab (2021) researched the calculation of COGS using the FC method. They found that the company's calculation with the FC method differed because it needed to calculate additional production costs during the production process. Fitriani *et al.* (2020) researched the calculation of COGS using the ABC method

and found differences in product COGS due to factory overhead costs consumed during each production process. The study Puji Mahardika & Lantang (2021) analyzed the determination of COGS using the ABC method. It was found that the ABC method is considered more appropriate than the traditional method because the factory overhead costs correspond to the cost triggers.

This study aims to analyze the calculation of COGS at the Putra Kembar tofu factory using the ABC and FC methods and identify the comparison of the calculation results.

## 2. Theory Review

### 2.1 Financial Management

According to Lailatus Sa'adah (2020: 2), financial management can be considered a structured method for managing all financial activities related to corporate entities. This includes planning, evaluating, and controlling all financial activities. Another definition from Bayu Prabowo *et al.* (2022) states that financial Management involves raising funds and effectively utilizing them to maximize shareholder wealth. By summarizing some of these definitions, financial management includes all efforts to ensure company money's effective and efficient use.

### 2.2 Cost of Goods Manufactured (COGS)

The concept of Cost of Goods Manufactured (COGS) is a cumulation of sacrifices made by a business entity in order to produce goods or services, as has been confirmed by various studies put forward by experts (Lestari, 2022). The definition of COGS summarizes all costs and expenses incurred to produce a good or service ready for sale or use. Factors covered by the concept of COGS include raw material costs, labor costs, and overhead costs incurred in the production process (Fadli & Rizka ramayanti, 2020). In its calculation, COGS also considers the cost of goods completed during a certain period. Through an in-depth review of the definitions provided by experts, it can be concluded that COGS is a cost estimate that forms the basis for determining the selling price of a product. A clear understanding of the concept of COGS allows business management to make more targeted decisions in developing optimal pricing and resource allocation strategies.

The advantages of the Cost of Goods Manufactured (COGS) method include (a) determining the selling rate of an item, (b) monitoring production expenditures, (c) evaluating profits or losses within a certain period, and (d) determining the cost of finished product inventory and goods in the production process documented in the financial statements (Fitriani *et al.*, 2020).

### 2.3 Elements of Cost of Goods Manufactured

The elements of the Cost of Goods Produced (COGS) process can be described in detail as follows: (a) The first factor taken into account in the context of COGS is the cost of raw materials. These raw materials are the main component that affects the calculation of the total product cost. These raw materials are generally stored in warehouses after purchasing from various sources, such as local suppliers, imports, or the company's internal processing results. According to Pelawi *et al.* (2023), the Cost of Raw Materials includes all costs associated with preparing raw materials into a form ready for the production process, including the purchase price from the supplier or the value recorded in the purchase document. (b) The second aspect taken into account is direct labor costs. These costs refer to payments made to workers within a certain time frame, such as daily, weekly, or monthly, and are directly attributable to a specific job or order. In the study by Pelawi *et al.* (2023), direct labor costs were identified as one of the main elements in calculating total production costs in the context of COGS. (c) Factory overhead costs reinforce the dimension of the breadth of the spectrum of expenses that cannot be precisely identified immediately and precisely, encompassing elements such as insurance coverage, materials driving activities, and depreciation of infrastructure. As part of the cost framework associated with production in general, overhead is a factory economic factor considered an indirect cost element from the perspective of direct expenditure on raw materials and labor (Pelawi *et al.*, 2023).

### 2.4 Activity Based Costing (ABC)

According to research conducted by the Indonesian Institute of Accountants (IAI) in 2019, ABC (Activity-Based Costing) is explained as a costing approach that focuses on the activities involved in the production process of a product. This approach involves in-depth identification and analysis of the costs associated with each activity, which are then linked to the products produced (Puji Mahardika & Lantang, 2021). The definition of ABC is also presented by Fitriani *et al.* (2020) as an activity-oriented costing system within the company. By referring to

these various explanations, ABC is a cost calculation methodology that emphasizes the company's tasks or activities in producing goods or services.

Fitriani *et al.* (2020) describe several advantages contained in the application of the ABC Method, including (a) finding imperfections in the production process, both at the departmental, product, and activity-specific levels; (b) improving decision-making accuracy due to more detailed cost estimates; and (c) assisting in cost monitoring at the individual and departmental levels.

### 2.5 Full Costing (FC)

Fadli & Rizka ramayanti, (2020) states that Full Costing (FC) is a cost analysis approach that summarizes all components of production costs, including fixed and variable cost elements, which are then accumulated in determining the cost of goods. Similarly, according to Helny Melynda Astriani Meroekh (2018), FC shows a method that considers all aspects of production costs, including raw material costs, labor costs, and factory overhead costs that can fluctuate, as well as those that are constant. With the conceptual framework outlined, It can be inferred that FC is a comprehensive cost analysis approach, which involves accumulating all production costs, including both fixed and variable, to determine the cost of goods.

Budiyanto (2022) stated that FC has two advantages: displaying total overhead costs by detailing two types of overhead costs, namely fixed and variable, and postponing overhead costs until the product is sold in the market. However, FC also has a weakness: the selling price tends to be higher than the variable overhead cost method because FC assumes consumers are more willi+ng to buy products with prices that match their desired value.

### 3. Framework of Thought

Companies calculate the cost of raw materials, labor, and other costs when calculating COGS but do not always consider all expenses involved in the production process. Two common methods used to calculate COGS are ABC and FC. These two methods assign each cost to each product, making it easier for management to make decisions about selling prices and compare the effectiveness of the two methods in calculating COGS. This research summarizes its framework based on the results of the discussion.

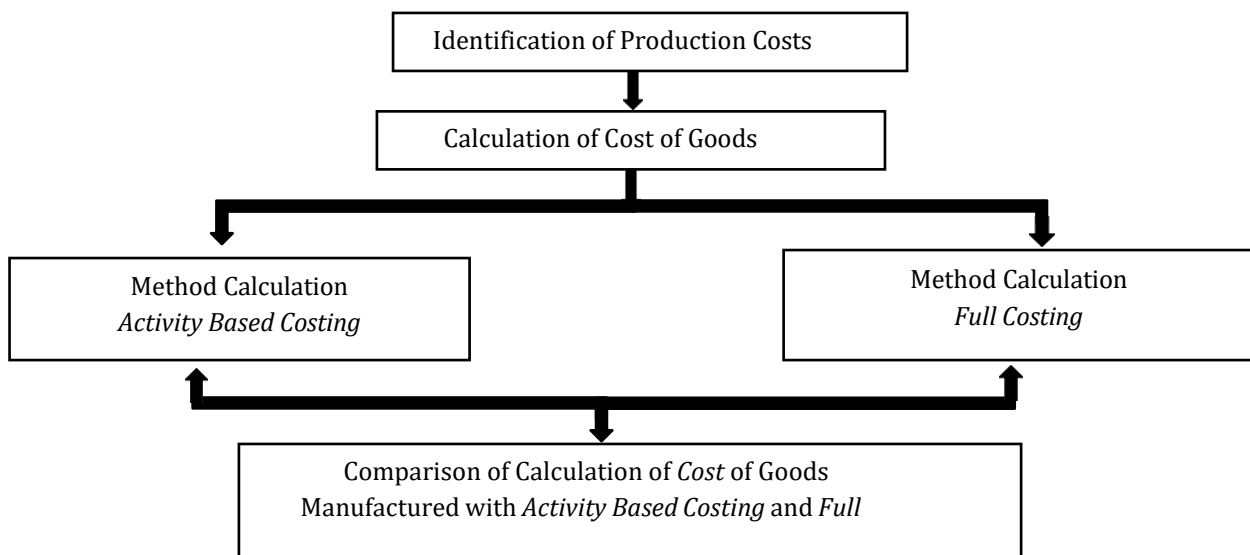


Fig. 3 Framework

### 4. Research Methods

This study adopts a comparative descriptive approach to explore comparisons and similarities. The ABC and FC approaches have been applied to determine the cost of goods produced (COGS) of white and yellow tofu at the Putra Kembar Tofu Factory, owned by Pak Rahmat, located at Kp. Waru RT/RW 001/001 Ds. Wargasetra Kec. Tegalwaru, Karawang Regency. Data on raw materials, direct labor, and factory overhead costs were collected through purposive sampling. The main data sources were observation, documentation, and interviews. Data analysis was conducted by prioritizing numerical representations to formulate conclusions from this research, which guarantees the validity and significance of the results obtained.

## 5. Results and Discussion

### 5.1 Company Profile

Mr. Rahmat's tofu factory is a food processing business that uses soybeans as its main raw material. This tofu factory was founded by Mr. Rahmat in 2010. The location is at Kp. Waru RT / RW 001 / 2001 Ds. Wargasetra Kec. Tegalwaru, Kab. Karawang. Mr. Rahmat initially worked in a tofu factory in Cikampek, but he quit and got an offer to work on a project near his house. However, he wanted to build his tofu factory because there was no factory around the area, and he saw a great opportunity to establish a tofu factory.

In 2010, Mr. Rahmat started his tofu business by naming it the Putra Kembar Tofu Factory because he has twin sons, Dika and Diki. The factory produces white tofu and yellow tofu. For now, Mr. Rahmat has two workers who work from 13.00 - 19.00 WIB.

### 5.2 Calculation of COGS by Company

Material Expenses, Direct Wages, and Plant Expenses are an aggregation of all expenses incurred in the production stage, as stated in the interaction with the relevant business person in charge. This tofu production unit produces various products in the form of white tofu and yellow tofu. In October 2023, the factory was able to produce 49,104 pieces of white tofu from 620 kg of soybeans and 75,888 pieces of yellow tofu from 930 kg of soybeans, reflecting achievements in production capacity and efficient use of raw materials.

**Table 1** Raw Materials of Putra Kembar Tofu Factory for October 2023

Description	Raw Materials	Price (Rp)	Quantity/Month	Cost/Month (Rp)
White Tofu	Soybeans	14.000	620 kg	8.680.000
	Salt	15.000	31 kg	465.000
	Vinegar	2.000	310 packs	620.000
Total				9.765.000
Yellow Tofu	Soybeans	14.000	930 kg	13.020.000
	Salt	15.000	31 kg	465.000
	Vinegar	2.000	310 packs	620.000
	Turmeric	4.000	31 kg	124.000
<b>Total</b>				<b>14.229.000</b>

Due to the larger production of yellow tofu and the additional cost of turmeric raw materials, there is a difference in raw material costs between white and yellow tofu, as shown in Table 1.

**Table 2** Labor Cost of Putra Kembar Tofu Factory October 2023 Period

Description	Details	Salary per week (IDR)	Salary Per Month (IDR)
Employee salary	2 people	800.000	3.200.000

In the white and yellow tofu production process, the labor cost per employee is IDR 1,600,000, as shown in Table 2.

**Table 3** Factory Overhead Costs of Putra Kembar Tofu for October 2023

Description	Details (Rp)	Quantity Per Month	Cost Per Month (Rp)
Husk Cost	3000/sack	465 sacks	1.395.000
Electricity Cost			500.000
<b>Total</b>			<b>1.895.000</b>

In Table 3, the factory overhead costs according to the company for white tofu and yellow tofu are the same.

**Table 4** Calculation of Cost of Goods Manufactured by the Company Production Period in October 2023

Description	White Tofu (Rp)	Yellow Tofu (Rp)
Raw material cost	9.765.000	14.229.000
Direct labor costs	3.200.000	3.200.000
Factory overhead costs	1.895.000	1.895.000
Total production cost	14.860.000	19.324.000
Number of units	49.104	75.888
COGS/unit	302	254

Table 4 above shows that the company's COGS calculation results are Rp. 302/piece for 49,104 pieces of white tofu and Rp. 254/piece for 75,888 pieces of yellow tofu, only considering the cost of husks and electricity in factory overhead costs during production.

### 5.3 COGS Calculation Using ABC Method

The ABC method calculates resource costs into object costs based on activities.

**First Stage:**

1. Identifying activities: Various activities are divided into groups with clear interpretations and correspond to manageable parts of the production process to produce products. These groups are organized by unit and facility activities.
2. Determining costs by activity

**Table 5** Factory Overhead Costs Categorized by Activity

Cost Elements	Activity Level	Cost (Rp)	Cost Driver
Filter cloth	Unit	195.000	Number of units
Molded fabric	Unit	120.000	Number of units
Chaff (fuel)	Unit	1.395.000	Total kg
Electricity	Unit	500.000	KWH
Phone	Unit	150.000	Number of units
Office stationery (ATK)	Unit	15.000	Number of units
Machine maintenance	Batch	16.666,67	Machine working hours
Machine depreciation	Unit	347.486,33	Number of units

(1) Unit-level activity represents the number of product units produced, similar to the unit-level activity cost accumulated for each unit produced. The unit-level cost components include diverse aspects, such as electricity consumption, telephone charges, office equipment, machinery depreciation, materials for filtration, molded cloth, and fuel for machinery. (2) Activities at the batch level involve costs related to the maintenance of collective machines collectively.

3. Cost drivers

The cost drivers of activity-based manufacturing overhead costs are as follows:

**Table 6** Determining Cost Drivers

Description	White Tofu	Yellow Tofu	Total
Number of units	49.104	75.888	124.992
Soybean quantity (Kg)	20	30	50
Total KWH	369,5	369,5	739
Number of machine hours	155	186	341

The causal correlation between activity levels and the overall transformation of costs, or changes in factory overhead costs arising from specific trigger factors, have been identified as cost drivers. These drivers include unit volume, kilogram mass, electrical energy consumption (KWH), and duration of machine operation.

4. Determine the cost pool.

The following is a table for determining cost pools:

**Table 7** *Determining Cost Pools*

Cost pools	Type of BOP	Cost driver
Pool 1	Filter cloth cost	Production unit
	Cost of molded fabric	Production unit
	Telephone charges	Production unit
	Stationery Cost	Production unit
	Machine depreciation cost	Production unit
Pool 2	Husk cost	Kg
Pool 3	Electricity cost	KWH
Pool 4	Machine maintenance cost	Machine working hours

Various costs such as filter cloth, printed cloth, telephone, stationery, and machine depreciation costs have one base load and are included in cost pool 1 and other overhead costs.

#### 5. Calculating pool rate

**Table 8** *Calculation of Factory Overhead Cost Rates for Tofu Products*

Cost Pools	Unit Level Activity	
	Factory Overhead Costs	Amount (Rp)
Pool 1	Filter cloth cost	195.000
	Cost of molded fabric	120.000
	Telephone charges	150.000
	Stationery Cost	15.000
	Machine depreciation cost	347.486,33
Total		827.486,33
Number of production units		124.992
Pool rate 1		6,6
Pool 2	Husk cost	1.395.000
		Total kg
Pool rate 2		27.900
Pool 3	Electricity Cost	500.000
		Number of kWh
Pool rate 3		676,6
Pool 4	Machine maintenance cost	16.666,67
		Number of machine hours
Pool rate 4		48,9

The cost rate is calculated to evaluate its effect on factory overhead costs. In this process, the total cost of each cost pool is summed up, and then the overall cost is divided by the cost driver. After completing the first stage of calculating COGS using the ABC method, the second stage is to find the factory overhead charge.

#### Second Stage:

Overhead charged = group cost rate x unit cost driver used

**Table 9** *BOP Charges with ABC*

Activity Level	Cost Driver	Loading Process	White Tofu (Rp)	Yellow Tofu (Rp)	Amount (Rp)
<b>Unit</b>	Product unit	6,6 x 49.104	324.086,4		824.947,2
		6,6 x 75.888		500.860,8	
	Kg	27.900 x 20	558.000		1.395.000
		27.900 x 30		837.000	
	KWH	676,6 x 369,5	250.003,7		500.007,4
676,6 x 369,5			250.003,7		
<b>Batch</b>	Working hours	48,9 x 155	7.579,5		16.674,9



	48,9 x 186	9.095,4	
<b>Total BOP</b>	1.139.669,6	1.596.959,9	2.736.629,5

In calculating the Cost of Goods Manufactured (COGS) for Tofu products, the Activity-Based Costing (ABC) method has been applied to estimate factory overhead costs comprehensively. This approach involves identifying and allocating overhead costs into various *cost pools* that correspond to the operational activities of the factory. Each cost pool is multiplied by each product's relevant cost driver factor. The calculation framework outlined in the following table provides a clear overview of the process.

**Table 10** Calculation of COGS using the ABC Method for the period in October 2023

Description	White Tofu (Rp)	Yellow Tofu (Rp)
Raw material cost	9.765.000	14.229.000
Direct labor costs	3.200.000	3.200.000
Factory overhead costs	1.139.669,6	1.596.959,9
Total production cost	14.104.669,6	19.025.959,9
Number of units	49.104	75.888
COGS/unit	287	250

Based on the data listed in Table 10 above, it is found that the cost of production (COGS) for white tofu reaches Rp287 per piece, while the COGS for yellow tofu is Rp250 per piece. Determining factory overhead costs is done by referring to the factory overhead cost allocation process that has gone through two stages of the Activity-Based Costing (ABC) methodology.

### 5.4 Calculation of COGS Using the FC Method

Data collected from interviews with the company about calculating COGS shows that the company does not consider some costs, such as depreciation costs, production equipment, and maintenance costs. All costs must be considered in the FC method to produce an accurate selling price. However, direct labor costs and raw material costs are the same.

**Table 11** Variable Factory Overhead Costs

Description	Price	Quantity Per Month	Cost Per Month
Chaff	3.000	465 sacks	1.395.000
Filter Cloth	65.000	3 fabrics	195.000
Molded Fabric	30.000	4 fabrics	120.000
Electricity			500.000
Phone			150.000
Office Stationery			15.000
<b>Total</b>			<b>2.375.000</b>

Table 11 shows that the factory overhead cost of the variable FC method considers costs that the company does not account for during the production process. Factory fixed overhead costs include the maintenance and upkeep of production equipment and machinery depreciation. As shown in the following table:

**Table 12** Production Equipment Maintenance and Maintenance Costs

Description	Cost (Rp)
Messing Giling	200.000

Since the production equipment does not break down every month, Table 12 shows that the maintenance and upkeep cost is Rp200,000 annually. Maintenance is considered an unexpected cost.



**Table 13** Calculation of Equipment Depreciation Cost of Putra Kembar Tofu Factory

Description	Price/Unit	Number of Units	Total Acquisition Price	Economic Life (months)	Depreciation Cost/Month
Tofu mold	150.000	4	600.000	14	42.857,14
Plastic bucket	5.000	4	20.000	9	2.222,22
Drum barrel	200.000	3	600.000	55	10.909,09
Wok	500.000	2	1.000.000	11	90.909,09
Tango	1.500.000	1	1.500.000	80	18.750
Knife	50.000	2	100.000	5	20.000
Mistar tofu	150.000	2	300.000	35	8.571,43
Ebeg (mold)	15.000	4	60.000	10	6.000
Tub	35.000	4	140.000	11	12.727,27
Bakul/wakeup	5.000	1	5.000	3	1.666,67
Hose	10.000	1	10.000	7	1.428,57
Boots	100.000	2	200.000	18	11.111,11
Container box	80.000	1	80.000	13	6.153,85
Plastic apron	10.000	2	20.000	2	10.000
Bucket (UK. 25 kg)	20.000	9	180.000	28	6.428,57
<b>Total Equipment Depreciation Cost</b>					<b>251.734,81</b>

The company can use the straight-line method to calculate monthly depreciation costs for each type of production equipment used.

**Table 14** Calculation of Machine Depreciation Cost of Putra Kembar Tofu Factory

Description	Price/Unit	Number of Units	Total Acquisition Price	Economic Life (months)	Depreciation Cost/Month
Milling machine	1.900.000	1	1.900.000	27	70.370,37
Water machine	575.000	1	575.000	21	27.380,95
<b>Total Machine Depreciation Cost</b>					<b>95.751,52</b>

This shows that milling and water machines are included in the machine depreciation costs, with a total cost of IDR 95,751.52.

**Table 15** Calculation of COGS using the FC Method for the production period in October 2023

Description	White Tofu	Yellow Tofu
Raw Material Cost	<b>9.765.000</b>	<b>14.229.000</b>
Direct Labor Costs	<b>3.200.000</b>	<b>3.200.000</b>
Factory Overhead Costs		
1. Variable Factory Overhead Cost	2.375.000	2.375.000
2. Fixed Factory Overhead Costs		
- Equipment Depreciation Cost	251.734,81	251.734,81
- Machine Depreciation Expense	95.751,52	95.751,52
- Production Equipment Maintenance and Maintenance Costs	16.666,67	16.666,67
Total Fixed Factory Overhead Costs	364.153	364.153
Total Factory Overhead Cost	2.739.153	2.739.153
Total Production Cost	15.704.153	20.168.153
Number of Production Units	49.104	75.888
Cost of Goods Manufactured/Unit	319	265

The calculation results shown in Table 15 show that the COGS for 49,104 white tofu is Rp319/piece, and for 75,888 yellow tofu is Rp265/piece, considering fixed and variable factory overhead costs. The cost of maintenance and care of production equipment amounted to Rp16,666.67, resulting from Rp200,000/year divided by 12 months.

**Table 16** Comparison of White Tofu COGS calculations according to the Company, ABC, and FC at Putra Kembar Tofu Factory for October 2023.

Cost Type	Company	ABC	Full Costing
Raw Material Cost	9.765.000	9.765.000	9.765.000
Direct Labor Costs	3.200.000	3.200.000	3.200.000
Factory Overhead Costs	1.895.000	1.139.669,6	2.739.153
Total Production Cost	14.860.000	14.104.669,6	15.704.153
Number of Production Units	49.104	49.104	49.104
Cost of Goods Manufactured/Unit	302	287	319
Tofu Factory Selling Price/unit	400	400	400
Difference	98	113	81

Table 16 shows the differences in factory overhead costing between the company, ABC, and FC, resulting in variations in the cost of goods manufactured. The data shows that from the total production of 49,104 pieces of white tofu in October 2023, the company calculated the COGS at Rp302/piece, while ABC recorded the COGS at Rp287/piece and FC at Rp319/piece. The analysis shows that the FC method generates the highest COGS, while ABC generates the lowest COGS. Therefore, tofu factory owners who choose the FC method may face smaller profits, while using the ABC method may result in greater profits. Thus, selecting the method of calculating factory overhead costs will significantly affect the company's profitability. The research analysis conducted by Risna Dwi Haryanti (2022) highlights the differences in factory overhead costs between products as an important factor in determining the method of calculating the Cost of Goods Manufactured (COGS). In this context, the Activity-Based Costing (ABC) method emerged as an approach that provided lower COGS estimates than the traditional method. In contrast, research by Marisyah (2022) confirms that the imperfection of the company's overall calculation of factory overhead costs supports the suitability of the Full Costing (FC) method in calculating COGS, which results in a more accurate evaluation compared to the company's chosen approach. From previous research conducted by Yakies and Teguh (2021), it can be seen that the comparison between the FC and Variable Costing (VC) methods in the calculation of COGS reveals the superiority of the FC method in considering all costs involved in the production process, in contrast to the VC method which only takes into account variable costs. Within this framework, the importance of adopting a method that comprehensively takes into account factory overhead costs in the estimation of COGS becomes clear, indicating that the choice of COGS calculation method is not solely a technical decision but also reflects an effective cost management strategy in the context of the manufacturing industry.

**Table 17** Comparison of Calculation of Yellow Tofu COGS according to the Company, ABC, and FC at Putra Kembar Tofu Factory for October 2023

Cost Type	Company	ABC	Full Costing
Raw Material Cost	14.229.000	14.229.000	14.229.000
Direct Labor Costs	3.200.000	3.200.000	3.200.000
Factory Overhead Costs	1.895.000	1.596.959,9	2.739.153
Total Production Cost	19.324.000	19.025.959,9	20.168.153
Number of Production Units	75.888	75.888	75.888
Cost of Goods Manufactured/Unit	254	250	265
Tofu Factory Selling Price/unit	400	400	400
Difference	146	150	135

Table 17 shows that the company's analysis results include the calculation of factory overhead costs for yellow tofu processing in October 2023. The findings reveal significant differences in the assignment of factory overhead costs between the approaches used by the company, ABC, and FC. As a result, there is a considerable difference in the estimated cost of production. During the period, the production of yellow tofu reached 75,888 pieces. The company calculated the Cost of Goods Manufactured (COGS) at Rp254 per piece, while the ABC approach resulted in a COGS of Rp250 per piece, and the FC approach resulted in a COGS of Rp265 per piece. The analysis concluded that the FC method produced the highest HPP estimate, while the ABC approach produced a lower estimate. Using the ABC approach can result in lower production costs for tofu factory owners while using the FC approach tends to increase production costs. In a study conducted by Risna Dwi Haryanti (2022), it was highlighted that the variability of factory overhead costs between certain products causes differences in the calculation of COGS between the ABC

method and the traditional method. On the other hand, the findings of Marisya, (2022) highlighted the company's shortcomings in accommodating all factory overhead costs thoroughly, resulting in superior performance using the Full Costing (FC) based COGS method than the method used by the company. The results of a recent study by Yakies and Teguh (2021) confirm that the calculation of COGS using the FC method shows a more significant value compared to the Variable Costing (VC) method because the FC method can accommodate all cost components in the production process, while the VC method only considers variable costs. Thus, a deeper understanding of the cost structure and the company's needs in managing factory overhead costs is crucial in determining the optimal COGS calculation method.

## 6. Conclusion and Implications

### 6.1 conclusion

The calculation of the cost of goods manufactured (COGS) by applying the company's methodology, Activity-based costing (ABC), and full costing (FC) shows significant differences. The ABC and FC approaches are considered more thorough because they detail all costs incurred during the production stages. At the same time, the company's methodology tends to need to be more detailed in estimating factory overhead costs.

All expenses related to the production process are included in the Cost of Goods Manufactured (COGS) calculation according to the ABC approach in two phases. In the initial phase, the activities involved are identified, costs are calculated based on these activities, cost drivers are identified, and cost pools are formed. In the next phase, the rates of each cost pool are applied to the products produced. On the other hand, the Full Costing (FC) method calculates COGS by covering all costs incurred during the production process, including raw material costs, direct labor costs, and fixed and variable factory overhead costs.

Analysis of a company's Cost of Goods Manufactured (COGS) using the Activity-Based Costing (ABC) and Full Costing (FC) approaches shows significant divergence. The ABC approach provides a lower price estimate, which is inversely proportional to the FC approach, which tends to produce a higher price estimate.

### 6.2 Implications

This research only analyzes the COGS of the Putra Kembar Tofu Factory because the company needs to know what needs to be learned about the cost of goods manufactured appropriately. Therefore, it is recommended that future research expand the scope to apply it to other contexts to understand the accurate calculation of the cost of goods produced and obtain more data.

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## Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

## Author Contribution

*The authors confirm contribution to the paper as follows: **study conception and design:** Lastri Yulianti, Uus Mohammad Darul Fadli, Ery Rosmawati; **data collection:** Lastri Yulianti, Ery Rosmawati; **analysis and interpretation of results:** Lastri Yulianti, Uus Mohammad Darul Fadli, Ery Rosmawati; **draft manuscript preparation:** Lastri Yulianti, Ery Rosmawati. All authors reviewed the results and approved the final version of the manuscript.*

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