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Determination of Cost of Sold Goods in Tapioca Factory of Cluster I and Cluster II in Lampung Province

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Abstract

The objective of the study is to find out the cost of goods manufactured (COGM) in tapioca factory cluster I and cluster II in Lampung Province. The methodology that has been used to know and find out the cost of goods manufactured is full costing method. The result of COGM in tapioca factory cluster I and cluster II by full costing method were different for each kilos. COGM by full costing in cluster I was Rp. 7.951,00 and in cluster II was RP. 8.089,00. Those difference occurred due to different capacity of the factory so that it affected the efficiency of production factors usage. Moreover, COGM of tapioca in cluster I and cluster II were still under the price market which is about RP. 10.710,42 for each kilo so that these tapioca factory is required to keep on doing sweet potato grinding.

Keywords: *cost of goods manufactured, factory capacity, full costing method, tapioca factory*

INTRODUCTION

Cassava is a food crop commodity that has a strategic role in the national economy, but there are obstacles in its management both at the farm level and its processing plant. Cassava farming income is related to the area of land and production yield, therefore the production costs incurred in the cassava production process are very important to know. Agro-industrial development can increase the added value and competitiveness of agricultural products. Agro-industry is an agricultural company that has a cycle starting from buying raw materials, processing raw materials into finished products, storing finished products, and selling the products that have been produced. One of the agro-industries made from cassava is tapioca factory. Tapioca factory is a cassava processing factory into tapioca which is used as raw material or additional material for the downstream industry (Kemenprin, 2016). The existence of tapioca factory causes cassava demand continues to increase, so the tapioca factory requires information on Cost of Production (HPP) used in making decisions to determine the selling price (Devananta et al., 2017).

The development of the business world is characterized by intense price competition, one of which is in the form of price competition. Companies engaged in the field of buying and selling will try as much as possible to get a profit by managing their business effectively and efficiently. Therefore, companies must know the COGS of a product to be sold. Production costs at companies can be in the form of procurement of raw materials, labor, and factory overhead costs (Macpal et al., 2014; Hertika, 2018). COGS reflect the true costs, so the cost grouping must be done appropriately, so that production fluctuations do not occur because of limited raw materials (Ariyanti et al., 2018).

Procurement of raw materials is very important for the sustainability of a company's production, with the availability of raw materials on a regular basis then production will run well. The raw material of the factory is very dependent on the production of farmers, so it is necessary to determine the selling price of the factory and farmers,that it can guarantee the sustainability of their business. Determination of the right COGS can minimize the risk of loss for the company (Manurung et al., 2014; Ariyanti et al., 2018). Production costs at the factory must be controlled to avoid wasteful costs (Devananta et al., 2017).

Errors in determining the cost of goods on a product will result in irregularities in the sale price (Manurung et al., 2014). Changes in prices that are very small or very large will cause a significant impact and changes to sales in a large enough quantity. Error in determining the selling price will make the company losing money because the specified selling price is too low. Therefore, the increasing competition in the industry requires a company to have the advantage to be able to carry out its business in a relatively long period of time and develop its business so that it becomes greater (Hertika, 2018). In addition, entrepreneurs realize that the potential in the market is very small because there are similar products produced by other factories. In order to remain competitive, the tapioca factory must determine the pricing that is considered reasonable by consumers by using the right calculation method from one period to the next. Based on the Ministry of Trade (2017), import tapioca prices are in the range of Rp 3,500.00 to Rp 4,365.37 per kilogram. Imported tapioca prices are cheaper than domestic tapioca flour prices of Rp. 5,250.00 per kilogram. The price difference causes downstream industries that use tapioca as the main raw material or additional material prefer to choose the imported tapioca.

Tapioca factory located in Terusan Nyunyai District is cluster I and in Rumbia District is cluster II. Both companies have production capacity, capacity for raw materials, and provisions regarding the purchase price of cassava. Determination of the selling price based on the cost of production must be done precisely, carefully, and accurately (Hasyim, 2018). The cost of production is useful for determining the selling price of products, monitoring the realization of production costs, calculating the periodic profit and loss, determining the cost of goods and inventories of finished products in the process that will be presented in the balance sheet (Mulyadi, 2010). If the specified product price has benefited the farmer, the farmer will develop his farm. With the determination of product prices, it can be seen the income obtained by farmers from these farms. On the side of the tapioca factory, the determination of the cost of production is needed so that the factory can set a price standard for cassava farmers as a strategy to supply the main raw materials for the first and second clusters of tapioca factories. Based on the description above, how much is the COGS in cluster I and cluster II of tapioca factories in Lampung Province?

RESEARCH METHODOLOGY

Research sites. The research locations are in Terusan Nyunyai and Rumbia in Lampung Tengah for the reasons of: (1) Terusan Nyunyai has a big tapioca factory (cluster I), (2) Rumbia District has a small tapioca factory (cluster II).

Methods, Data Types, and Data Collection Techniques. In this study, the method used to analyze the cost of production is the full costing method. The type of data consists of primary data and secondary data. Primary data is data obtained from interviews or direct observations at tapioca factories in Cluster I in Terusan Nyunyai, Central Lampung, and tapioca factories in Cluster II in Rumbia, Central Lampung. Secondary data is data obtained from documents owned by related institutions / related agencies, reports, publications and other literature relating to this

research. Data collection techniques used research instruments including interviews (interviews), observation (direct observation), documentation, and questionnaires.

Data Analysis. Full costing analysis is a method of determining COGS that count all elements of production costs into COGS consisting of raw material costs, direct labor costs, and variable factory overhead costs, where fixed factory overhead costs plus non-production costs (costs marketing, administrative and general costs). Daljono (2011) and Mulyadi (2012) revealed that there are 2 (two) approaches to determine COGS:

1. ***Variable Costing*** is a method of determining production costs that only count variable production costs consisting of raw material costs, direct labor costs and variable factory overhead costs. COGS according to the variable costing method consists of:

a. Raw material costs	xx
b. Variable labor costs	xx
c. Variable factory overhead costs	xx
Cost of Goods Sold	**xx**

2. ***Full Costing*** is a method of determining production costs that count all elements of production costs into production costs, which consist of raw material costs, direct labor costs, variable factory overhead costs and fixed variable factory overhead costs. Thus, the cost of production according to the full costing method consists of the following cost elements:

a. Raw material costs	xx
b. Direct labor costs	xx
c. Variable factory overhead costs	xx
d. Fixed factory overhead costs	xx
Cost of Goods Sold	**xx**

In this study, the determination of COGS uses the full costing method by counting elements of production costs into production costs consisting of raw material costs, direct labor costs, fixed factory overhead costs and variable factory overhead costs. (Mandei et al., 2011; Reinaldo et al., 2011; Firdaus et al., 2012; Rochmayanto et al., 2013; Slat et al., 2013; Suryandari et al., 2015; Kurnia et al., 2016; Suryanto et al., 2016; Ariyanti et al., 2018).

RESULT AND DISCUSSION

COGS calculation method is carried out to determine the economic efficiency of tapioca agro-industry in Lampung Province in producing tapioca with the full costing method. The cost components needed in the calculation of COGS using the full costing method are raw material costs, direct labor costs and variable OFC (Overhead Factory Costs) consisting of fuel, supporting raw materials, expedition costs, maintenance and maintenance costs, fixed OFC (Overhead Factory Costs) consisting of depreciation of equipment and buildings, taxes, and land rent. The calculation of the full costing method in the tapioca factory of cluster I and cluster II can be seen in Table 1.

Table 1. Total costs in the full costing method of tapioca factory of cluster I and cluster II at Central Lampung Regency

Description	Unit	Cluster I		Cluster II	
		Full Costing Method	Contribution (%)	Full Costing Method	Contribution(%)
Cost of Main Raw Materials					
Amount	Kg	13.196.083		3.196.709	
Value of Main Raw Materials	**Rp.**	**18.347.469.454**	**65,61**	**4.095.546.471**	**70,74**
Labor costs					
a. Permanent Employees	Rp.	537.500.000	1,92	115.500.000	1,99
b. Daily Labor	Rp.	59.610.000	0,21	9.585.000	0,17
c. Unloading Wholesale Labor	Rp.	92.372.583	0,33	19.180.253	0,33
d.Shovel Wholesale Labor	Rp.	94.776.021	0,34	19.715.572	0,34
e.Oven Wholesale Labor	Rp.	91.448.116	0,33	18.609.791	0,32
Total Labor Costs	**Rp.**	**875.706.720**	**3,13**	**182.590.616**	**3,15**
Factory Operating Costs					
Fixed OFC					
a. Depreciation of tools and buildings	Rp.	749.009.259	2,68	128.633.333	2,22
b. Taxes	Rp.	3.425.930.380	12,25	632.753.784	10,93
c. Land lease (200 ha)	Rp.	800.000.000	2,86	27.000.000	0,47
Total of Fixed OFC		**4.974.939.639**	**17,79**	**788.387.118**	**13,62**
Variable of OFC					
a. Fuel	Rp.	2.032.196.833	7,27	421.850.790	7,29
b. Supporting Raw Materials					
- Sack Supporting Materials	Rp.	126.534.557	0,45	21.637.000	0,37
- Production Support Materials	Rp.	36.395.161	0,13	9.366.000	0,16
c. Expedition cost	Rp.	1.231.032.334	4,40	251.411.120	4,34
d. Care and maintenance costs	Rp.	341.820.000	1,22	19.129.333	0,33
Total of OFC Variable	**Rp.**	**3.767.978.887**	**13,47**	**723.394.243**	**12,49**
Total of COGS	**Rp.**	**27.966.094.701**	**100,00**	**5.789.918.448**	**100,00**
Production	**Kg**	**3.517.235**		**715.761**	
COGS/Unit	**Rp.**	**7.951**		**8.089**	

Source: Primary data (processed, figures rounded), 2019

Table 1 show that the costs using the full costing method differ in cluster I and cluster II. The difference is seen in the capacity of the factory in producing tapioca such as cluster I raw materials to be produced at 13,196,083 kg while cluster II at 3,196,709 kg. Raw materials to be produced will have an impact on the costs that will be used in the production process. Tapioca production costs using the variable costing method consists of the cost of raw materials, direct

labor costs and variable operational costs consisting of fuel, supporting raw materials, expedition costs, maintenance and maintenance costs. Production costs using the full costing method consist of raw material costs, direct labor costs and variable operational costs (fuel, supporting raw materials, expedition costs, care and maintenance costs) and fixed operational costs (equipment and building depreciation costs, tax costs, land lease).

Cassava raw material costs are the most costs incurred by tapioca factories with a contribution of 65.61% for cluster I and 70.74% for cluster II. In line with research by Yesi and Natalia (2018), the highest cost of cassava raw material in tapioca production costs is 67.05%. In addition, research by Yhonita et al (2013) stated that the cost of cassava raw materials is mostly spent at 88.86%. Therefore, raw materials are the most important factor in the sustainability of an agro-industry. The raw materials used in the production process require careful subscription, so that the products produced have good quality that they can provide benefits for the company (Agustyawati, 2018). Advances in technology have made it possible to change paradigms in the manufacture of products (Nagarajan et al., 2018). The cost of raw materials is direct material which forms an inseparable part of the finished product (Suryadi, 2018). The optimal purchase price of raw materials is used to produce changes in the final product in its feasibility range (Moheb-Alizadeh and Handfield, 2018).

The least costs incurred by tapioca factories are labor costs with a contribution of 3.13% for cluster I and 3.15% for cluster II. Although labor costs are the least incurred, labor costs are a determinant of the operation of an industry. According to Horngren et al. (2005), direct manufacturing labor costs include compensation for all manufacturing labor that can be traced to cost objects in an economical way. In the distribution of labor costs in cluster I and cluster II, there are similarities in the distribution of labor such as the largest labor costs, namely the cost of permanent employees of Rp. 537,500,000 with a percentage of 1.92% in cluster I and Rp. 115,500,000 with a percentage of 1.99% in Cluster II. The lowest labor costs are daily labor costs of Rp. 59,610,000 with a percentage of 0.21% in cluster I and Rp. 9,585,000 with a percentage of 0.17% in cluster II. In the production process, direct labor costs are incurred to pay for workers who have a role in the production process. Direct labor costs are the costs of permanent employees at the factory (Hetika and Sari, 2019). In addition to direct labor costs, there are wholesale labor costs such as unloading, shovel and oven wholesale. Those labors will be much needed if the amount of main raw materials processed has large quantities. Therefore, the total labor costs incurred for the tapioca production process is Rp. 875,706,720 in cluster I and Rp. 182,590,616 in cluster II.

OFC used is stillOFC that does not change in the range of changes in the volume of certain activities, while a variable OFC is a OFC that changes in the proportional to the change of activity volume (Abidin and Yulianti, 2015). OFC remains the same in two different clusters, the difference is seen from the land lease in Cluster I while Cluster II has no land lease. Cluster I has a larger production capacity compared to Cluster II. Due to the large capacity, the factory or industry requires a large land area with a land lease of Rp. 800,000,000. Tax issued in Cluster I is Rp. 3,425,930,380 and for Cluster II in the amount of Rp. 632,753,784. The tax is issued based on the size of the industry.

Variable of OFC consists of fuel costs, supporting raw material costs, expedition costs, and care and maintenance costs. The amount of the cost depends on the capacity of the production capacity. The need for cassava in Cluster I was 13,196,083 kg to producing tapioca as much as 3,517,235 kg with a percentage of 26%, and Cluster II as much as 3,196,709 kg to producing tapioca as much as 715,761 kg with a percentage of 22%. In line with research

(Amilia and Choiron, 2017; Wulan and Suryoko, 2019), it is stated that the total cassava raw material will produce tapioca by 22%.

In producing tapioca, the OFC variable much needed is in the form of fuel costs and expedition costs. The fuel costs required in Cluster I are Rp. 2,032,196,833 and Cluster II as much as Rp. 421,850,790. In the tapioca industry, the use of fuel in the two clusters is different. The fuel in Cluster I is diesel and ethanol gas (cow manure gas) and Cluster II is diesel and reservoir. The cost of the expedition used in Cluster I was Rp. 1,231,032,334 and Cluster II as much as Rp. 251,411,120. The results of cassava processing are tapioca flour which is then packaged according to the characteristics of each cluster. The packaging used is adjusted to the tastes of the industrial consumers. After packaging, the next stage is tapioca shipping. The amount of the expedition fee depends on the number of shipments of goods and the purpose of the order. Consumer from the two clusters has been partially regular that making it easier for the tapioca industry in marketing.

COGS used to determine the selling price. According to Hansen and Mowen (2012), COGS reflects the total cost of goods completed during the period. Acquisition of COGS by the variable costing per kilogram method in tapioca agro-industry Cluster I and Cluster II are different. COGS with variable costing in Cluster I is Rp. 7,951.00 which is obtained by dividing the total COGS of IDR 27,966,094,701 with a total production of 3,517,235 kilograms and Cluster II of IDR 8,089.00 obtained by dividing the total COGS of Rp 5,789,918,448 with a total production of 715,761 kilograms. Tapioca COGS in Cluster I and Cluster II are still under the market price of Rp. 10,710.42 / kg, so the tapioca factory is still operating.

Research by Yhonita, et al. (2013) showed that the cost of tapioca production is Rp. 4,362.86, with a total production of 54,600 kilograms. Sealin, according to research by Wulan and Suryoko (2019), showed that tapioca COGS of Rp. 6,692.00 with a total production of 322,575 kilograms. Then according to research Oktaviani (2015), stated that the cost of tapioca production is Rp. 5,600.00 with a total production of 1,785,000 kilograms. The difference in COGS with the full costing method can be seen from the large factory capacity, production costs and regional topography that it can affect the cost of production. This, is because the production factors used is more efficient. The industry must be aware of competitor prices (Faith and Edwin, 2014). According to Laisa (2013), who stated that if the prevailing selling price is above the COGS, it will provide a profit and can be taken into consideration in determining the selling prices. In addition, Setiadi (2014), stated that if the results of the calculation of COGS using the full costing method are smaller than the predetermined standard selling price, it will provide benefits and can be used as a basis for determining further selling prices.

CONCLUSION

The conclusion in this study is the characteristics of tapioca factories consist of 2 (two) clusters, Cluster I and Cluster II. The tapioca factory Cluster I is a large capacity industry while Cluster II is a medium capacity industry. Tapioca COGS using the full costing method per kilogram in the tapioca factory Cluster I and Cluster II are different. COGS with full costing in Cluster I is Rp. 7,951.00 and for Cluster II is Rp. 8089.00. The difference is due to the different plant capacities, so that it will affect the efficient use of production factors. Tapioca COGS in Cluster I and Cluster II are still under the market price of Rp. 10,710.42 / kg, so the tapioca factory is still operating.

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BIBLIOGRAPHY

1. Abidin, Z., & Yulianti. (2015). Penerapan Activity Based Costing Untuk Menentukan Harga Pokok Produksi Pada PT. Gunung Gahapi Sakti Adalah Perhitungan Harga Pokok Produksi Dengan Sistem Tradisional PT. Gunung Gahapi Sakti Medan. *Jurnal Akuntansi dan Bisnis*, 1(2), 83-97.
2. Agustyawati, D. (2018). Penerapan Metode Harga Pokok Proses Dalam Penentuan Harga Jual Produksi Kasur Pda Usaha Kasur Membali Jaya di Kota Baubau. *Jurnal Ilmiah Akuntansi Manajemen*, 1(2), 35-43.
3. Ariyanti, I., Sumantri B., Sriyoto, &Sumartono E. (2018). Analisis Harga Pokok Produksi (HPP) dan Break Point (BEP) Produksi Crude Palm Oil (CPO) Pada PT. Sandari Indah Lestari. *Jurnal Ilmu Peranian AGRIC*, 30(1), 1-14.
4. Devananta, W.A., Linawati, & Kurniawan A. (2017). Analisis Biaya Dalam Menentukan Harga Pokok Produksi Gula Pada Asosiasi Petani Tebu Rakyat (APTR) Astanu Tahun 2016. *Simki-Economic*, 1(7), 1-14.
5. Daljono. (2011). *Akuntansi Biaya*. Edisi Ketiga. Semarang: Badan Penerbit Universitas
6. Diponegoro
7. Faith, D.O., & Edwin A.M. (2014). A Review of the Effect of Pricing Strategies on the Purchase of Consumer Goods. *International Journal of Research in Management, Science & Technology*, 2(2), 88-102. https://ssrn.com/abstract=3122351.
8. Firdaus D.W. (2012). *Akuntansi Biaya*. Edisi 1. Yogyakarta: Graha Ilmu. GAPKI, 2014.*Industri Minyak Sawit IndonesiaMenuju 100 Tahun NKRI: MembangunKemandirian Ekonomi, Energi, danPangan Secara Berkelanjutan*. Bogor.
9. Kurnia, G.S. & Hasibuan, M.S. (2016). AnalisisPerhitungan HPP Menentukan HargaPenjualan Yang Terbaik Untuk UKM.*Jurnal Teknovasi*, 3 (2), 10-16.
10. Hasyim, R. (2018). Analisis Penentuan Harga Pokok produksi dan Harga Jual dengan Menggunakan Metode Full Costing Pada Home Industry Khoiriyah di Taman Sari, Singaraja. *Jurnal Pendidikan Ekonomi Undiksha*, 10(1), 65-75.
11. Hansen, & Mowen. (2012). *AkuntansiManajerial*. Edisi Kedelapan. Jakarta: Salemba Empat.
12. Hetika, S.Y.P. (2019). Analisis Penentuan Harga Pokok Produksi Untuk Menentukan Harga Jual Pada UMKM Kota Tegal. *Jurnal MONEX*, 8(1), 303 -314.
13. Hertika, M. (2018). Analisis Perhitungan Harga Pokok Produksi Keripik Singkong Pada Home Industri Binangkit. Prosiding Festival Riset Ilmiah Manajemen & Akuntansi, 1116-1122, ISSN 2614-6681.
14. Horngren, Charles T., Srikant M.D., & Foster, G. (2005). *Akuntansi BiayaPenekanan Manajerial*. Jakarta: PT. INDEKS Kelompok GRAMEDIA.
15. Laisa, D.D., W.D. Sayekti, & A. Nugraha. (2013). Analisis Harga Pokok Produksi dan Strategi Pengembangan Industri Pengolahan Ikan Teri Nasi Kering di Pulau Pasaran Kecamatan Teluk Betung Barat Kota Bandar Lampung. *JIIA*,1(2), pp. 111-117.

16. Macpal, B., Morasa, J., &Tirayoh, V. (2014). Analisis Perhitungan Harga Pokok Penjualan Barang Produksi pada Jepara Meubel di Kota Bitung. *Jurnal EMBA*, 2(3), 1495-1503
17. Mandei, Julian, R., & Katiandagho,T. (2011).Penentuan Harga Pokok Berasdi Kecamatan Kotamobagu TimurKota Kotamobagu. *Jurnal ASE*, 7(2), 15-21.
18. Manurung, Y., Darus, HM. M.B., &Ayu, S.F. (2014). Analsis Harga Jual Bibit Melalui Penetapan Harga Pokok Produksi Bibit Kol (Brassica oleracea cv. capitata) (Studi Kasus : PT. Horti Jaya Lestari Kebun SMIK Kabupaten Karo)
19. Mulyadi. (2010). *Akuntansi Biaya*, Edisi Kelima, Cetakan Ketujuh. Yogyakarta : Akademi Manajemen. Perusahaan YKPN.
20. Mulyadi. (2012). *Akuntansi Biaya*. Edisi Kelima. Yogyakarta: Sekolah Tinggi Ilmu Manajemen YKPN.
21. Moheb-Alizadeh, H., & Handfield, R. (2018). The Impact of Raw Materials Price Volatility on Cost of Goods Sold (COGS) for Product Manufacturing. *IEEE Transactions on Engineering Management, 65(3), 460–473.* doi:10.1109/tem.2018.2796447.
22. Nagarajan, H. P. N., Raman, A. S., & Haapala, K. R. (2018). *A*Sustainability Assessment Framework for Dynamic Cloud-based Distributed Manufacturing. *Procedia CIRP, 69, 136–141.* doi:10.1016/j.procir.2017.11.120.
23. Reinaldo, G., Edgard, C., & Roberto, K. (2012). Determining the 'Plus' in CostPlusPricing:ATime-BasedManagementApproach.. *Journal of Applied Management Accounting Research*. 10(1), 1-15.
24. Rochmayanto, Yanto, & Limbong, A. (2013). Penentuan Harga PokokProduksi Hutan Rakyat Kayu Pulp diKabupaten Kuantan Singingi, Riau.*Jurnal Penelitian Hutan Tanaman*, 10(2), 73 – 83.
25. Setiadi, Pradana, Saerang, D.P.E., & Runtu, T. (2014). Perhitungan Harga Pokok Produksi dalam Penentuan Harga Jual pada CV. Minahasa Mantap Perkasa. *Jurnal Berkala Ilmiah Efisiensi*, 14(2), 70-80.
26. Slat, Henri, A. (2013). Analisis Harga Pokok Produk Dengan Metode Full Costing dan Penentuan Harga Jual. *Jurnal Emba*. 1(3), 110-117.
27. Suryandari, Komang, N., Satriawan I.K., & Hartiati, A. (2015). PerhitunganHarga Pokok Produksi Keripik Salakdan Keripik Nangkaro industri KelompokTaniAdiGunaHarapanKarangasemBali.*Jurnal Rekayasa dan Manajemen Agroindustri,* 3(3), 113 - 122
28. Suryanto, Dony, & Sumartono, E. (2016).Analisis Finansial Usaha KerambaJaring Apung di Perusahaan PerseoranganDobro.*JurnalAGRISEP*.15(1), 1-14.
29. Suryadi. (2018). Analsis Harga Pokok Produksi Dengan Pendekatan Activity Based Costing Pada UKM Randusari di Banjarrejo Kabupaten Lampung Timur. *Jurnal Derivatif*, 12(2), 76-86.