An Added Value of Chili Processing Results in Providing Contribution for SMEs

Titis Surya Maha Rianti[1*] and Arief Joko Saputro[1]

[1] Department of Agribusiness, Faculty of Agriculture, University of Islam Malang st. MT. Haryono 193 Malang Indonesia
rianti.titis@unisma.ac.id

Abstract. Chilli processing SMEs in Indonesia are currently diverse and developing various derivative products. One of the chilli processing products produced by SMEs is bottled chilli sauce. Processing of chilli commodities can support an increase in the volume of imports of processed chilli products and can increase the added value of an SME. This study aims to determine the added value of chilli processing into bottled chilli sauce at various raw material price levels. The research location was chosen purposively at Silvana Food SMEs. The method used to determine the level of added value in SMEs in this study uses the Hayami method. The results show that high added value occurs when the price of cayenne pepper and red chilli is normal, namely cayenne pepper (Rp. 25,000) and red chilli (Rp. 20,000). At this price level, 50% added value is added to processing packaged chilli sauce. The simulation results of raw material prices for cayenne pepper and red chilli at different price levels provide different values. To maintain income stability and added value, SMEs must partner with farmers to obtain constant raw material prices.

Keywords: Added Value, Chili Processing, SMEs.

1 Introduction

The food crops and horticulture sub-sector is one of the sub-sectors in agriculture. There are several sub-sectors in the agricultural sub-sector, including the plantation, livestock, forestry, and fisheries sub-sectors. Types of horticultural crops include fruits, vegetables, and ornamental plants. The existence of these plants is fundamental because the human body needs various types of substances. The content of these substances includes vitamins, minerals, and dietary fiber. Some examples of horticultural plant commodities are vegetables, such as tomatoes, eggplants, cucumbers, and chilies [1].

One type of vegetable that is exceptionally strategic and has a relatively high economic value is chili. Chili (Capsicum annum L.) has reasonably high adaptability. This plant can be cultivated in various locations, such as highlands and lowlands. In Indonesia, the chili commodity land area reaches 187,955 ha with a total production of 1.51 tons and a total consumption of 7.8 tons per ha [2]. According to the results of the National Socio-Economic Survey (SUSENAS), the types of chili consumption in Indonesia consist of red chilies, green chilies, and cayenne peppers. Chili consumption

per capita per year is relatively stable, with a growth rate of 0.44% per year [3]. The majority of people use chili as a food flavoring ingredient. In addition, chili companies are used as raw materials for the food industry, such as instant noodle companies and chili sauce companies [4].

Chili commodities contribute to inflation, and price increases can increase inflation [5]. Chili production is not evenly distributed throughout the year because chili productivity depends on the season. In the rainy season, chili production decreases, but the price offered increases. In the dry season, chili production increases but causes chili prices to fall [6]. Production in the dry season results in losses because sometimes chilies still have yet to be sold out and will experience decay over time [7]. Prices can be stable if supply and demand balance [8]. Processing to extend the shelf life of a chili product, such as dried chili, chili powder, and chili sauce, can be done to minimize losses [9].

An SME is considered capable of increasing the income of agribusiness actors, encouraging the creation of new industries, and supporting national development [10]. Agro-industrial development is needed to be able to support development in the economic sector and realize people's welfare [11]. Indonesian people are considered relatively low in knowledge and ability to process a product. Most of the exported agricultural commodities are raw materials, with percentages reaching 71% - 75%. That shows that only 25% - 29% of agricultural products are exported in the processed form [12].

Chili processing SMEs in Indonesia are currently diverse and developing various derivative products. One of the chili processing products produced by SMEs is bottled chili sauce. Sambal bottle is a processed product derived from good quality and fresh chili. Usually, in the processing of chili sauce, the majority of the types of chili used are red chili and cayenne pepper. That is because this processing can maximize the utilization of chilies to obtain added value to chili commodities [13]. This chili sauce is included in finished processed products ready to be consumed as a food companion.

The processing of chili commodities can support an increase in the volume of imported chili products. From 2000-2015, the volume of imported processed chili products increased to 8.94% per year [3]. In addition, the processing of chili commodities can increase the added value of an SME. Value added is adding value to a product after processing, which will produce a higher value than before processing. The purpose of added value analysis is to determine the level of added value contained in processed agricultural products. Profits in an agro-industry can be determined by reducing the total profit from one kilogram of processed raw materials and the costs incurred by the agro-industry in one production process [14]. The added value of chili processing SMEs can be identified using the added value analysis of the Hayami method.

Based on the potential possessed, the processing of chili commodities will provide added value to a product. Therefore, this study aims to determine the added value of chili processing into the packaged bottled sauce at various raw material price levels. It is hoped that this research can provide an innovation in the development of processing of agricultural products to increase added value and profits in SMEs.

2   Methods

This study analyzes added value to determine the level of added value in processed agricultural products in SMEs. The location for this research was chosen purposively, namely in Silvana Food chili processing SMEs. The data collection method was carried out by interviewing the key speaker, the Owner of Silvana Food, using a questionnaire. The questionnaire contains the identity of the SMEs and the situation or situation in chili processing SMEs. The primary data that becomes the variables analyzed include production capacity, the number of raw materials used, labor, labor wages, product output prices, raw material prices, and other input prices. Secondary data was obtained from several references or literature, including journals, supporting books, and BPS publications.

This study used the quantitative approach to determine the level of added value in chili-processing SMEs using the Hayami method. Analysis of added value can be determined using the Hayami method through equation [15]:

Value added=f(K,B,T,U,H,h,L)

Where:

K = Production capacity

B = Amount of raw materials used

T = Labor Involved

U = Labor wages

H = Product output price

h = Price of raw materials

L = Prices of other inputs

3   Result and Discussion

3.1   Profile of Silvana Food SMEs

Silvana Food is one of the SMEs that processes horticultural agricultural commodities into various packaged sauces branded "Numani." This Sambel Boran is inspired by the typical Lamongan food, "Boran Rice". The idea of creating packaged Sambel Boran arose because Nasi Boranan food was rare or non-existent in other areas. With the creation of sambel boran in the form of packaging, it is hoped that it can relieve the homesickness of Lamongan residents who migrate to other areas and be used as typical Lamongan souvenirs apart from Wingko and Milkfish Brains. Silvana Food produces various types of packaged sambal. There are six sambal variants: Boran Sambal, Onion Sambal, Plow Sambal, Anchovy Sambal, Klotok Fish Sambal, and Tuna Sambal. In addition to various kinds of chili sauce, they produce various snacks such as rolled gapit, jeber gapit, and amplang.
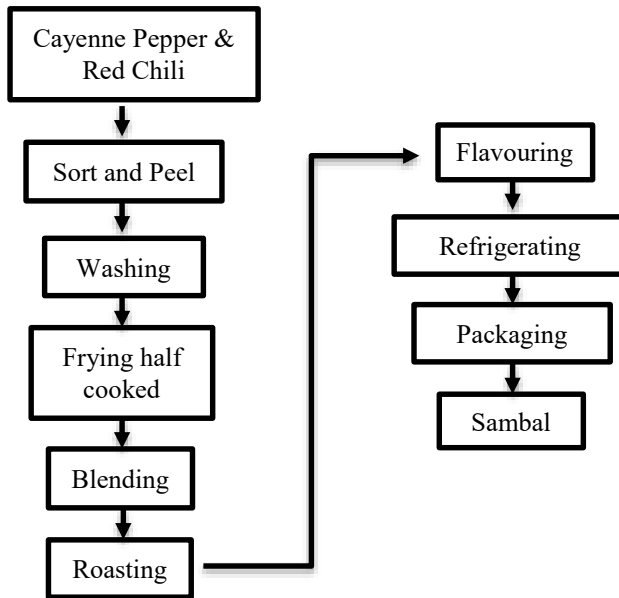
3.2   Processing Procedure

Fig. 1. Chili Processing Procedure

The recipe for the ingredients used in making packaged boran sauce requires ingredients, including the primary raw materials: cayenne pepper and red chili. Other ingredients include shallots, garlic, various spices (pecans, galangal, ginger, turmeric, kencur, coriander, and cumin), cooking oil, sugar, and salt.

In Fig. 1, the processing of boran sauce is as follows: the ingredients to be used are sorted and peeled, peeled, and drained. The ingredients are half-cooked to remove the water content because the packaged sambal should not contain any water. After frying, the ingredients are blended to make them smooth with cooking oil. The delicate ingredients are roasted/sautéed for 3-4 hours, after which they are finished adding sugar, salt, and flavorings. Try the chili sauce; if it is enough, the stove can be turned off. The finished chili is cooled for 10-12 hours, after which it is put into bottles. Finally, the sticker on the packaging and seal is installed.

3.3   Added Value Generated at Various Chili Price Levels

Value added is the additional value obtained from processing raw materials into finished or semi-finished materials. Economically, increasing the added value of a product can be done in four ways: form utility, place utility, time, and position [16]. Silvana Food SMEs are now involved in the business of various packaging sauces, as previously presented. The primary raw material in the manufacture of chili sauce is cayenne pepper, which produces a spicy taste. As the primary raw material for various chili sambal products, sometimes the price of cayenne pepper is volatile.

Processing of boran sambal requires Rp. 25,000 for raw materials in the form of cayenne pepper with contributions of Rp. 360,600 for other inputs, which include large

chilies, shallots, garlic, candlenuts, galangal, turmeric, kencur, coriander, cumin, oil, and salt. The selling price offered is IDR 25,000/unit of boran sambal. In one production run, Silvana Food SMEs can produce 62 units of boran sauce with a raw material input requirement of 2 kg of cayenne pepper. The number of workers required to process this boran sauce is three people. The required conversion factor is 31 units of chili sauce, which shows that every 1 kg of cayenne pepper produces 31 units of chili sauce. The labor coefficient obtained is 1.5, meaning that labor use in the Silvana Food SMEs is classified as efficient. That is because the raw material needed in large quantities is 2 kg of cayenne pepper, resulting in a relatively small labor coefficient value. The more raw materials are used in processing a product, the value of the resulting labor coefficient has a smaller value [17]. The average wage for each worker earns IDR 25,000 for one production.

Analysis of the added value of processing cayenne pepper into boran sauce in this study, various price simulations will be presented. The results of the analysis of the various price simulations in question are presented as follows:

Simulation 1; Rawit Chili prices and Red Chili prices are Regular.

The price of Cayenne Pepper in Lamongan usually is around IDR 25,000. In simulation 1, it is assumed that the price of cayenne pepper is average, and the price for red chili is also standard (Rp. 20,000). Based on Table 1, the added value obtained at Silvana food SMEs, assuming the regular price of cayenne pepper and red chili is IDR 20,000, the added value obtained is IDR 389,400 with a ratio of 50%. That shows that Silvana Food SMEs is included in the high category. SMEs with a value-added ratio of >40% are included in the high category [18].

The value-added of sambal boran also generated from labor income or compensation of IDR 37,500 or 10%. The added value contribution of chili processing to Silvana Food SMEs, namely the profit obtained for every 1 kg of cayenne pepper processed into 31 units of sambal boran, is IDR 351,900 or with a profit rate of 45%. The total margin from production factor fees is IDR 750,000 for every 1 kg of cayenne pepper processed into boran sauce. In the total margin, there is 5% of labor income and 48% contribution of other inputs.

Simulation 2; the price of Cayenne Pepper is medium, and Red Chili is regular.

The increase in the price of cayenne pepper will certainly affect the level of profit and added value generated by the SMEs. In this second simulation, it is assumed that the price of Cayenne Pepper will increase to Rp. 60,000, but the price of Red Chili will not increase too. Based on Table 1, the added value obtained by Silvana Food SMEs, with this assumption, is IDR 354,400, with a ratio of 46%. Silvana Food SMEs are included in the high category,> 40% [18]. The selling price is fixed at IDR 25,000/unit of boran sambal.

In the added value generated from sambal boran, IDR 37,500 of labor income or a labor reward of 11%. %. The value-added contribution of chili processing to Silvana Food SMEs obtained a profit of IDR 316,900 or a profit rate of 41%. The total margin from production factor fees is IDR 715,000, with 50% contribution from other inputs.

Simulation 3; the price of Cayenne Pepper is high, and Red Chili is regular.

In this third simulation, the price of cayenne pepper increases to Rp. 120,000, but the regular red chili price is Rp. 20,000. The selling price offered is IDR 25,000/unit of boran sauce. Table 1 shows the added value obtained at Silvana Food SMEs, where it is assumed that the price of cayenne pepper increases to Rp. That shows that the Silvana Food SMEs is included in the medium category. SMEs with a 15-40% value-added ratio is included in the medium category [19].

Labor income of IDR 37,500 labor income, or a labor benefit of 13%. The profit obtained as a contribution to the added value of Silvana Food is IDR 256,900 or with a profit rate of 33%. The total margin from production factor fees is IDR 655,000 for every 1 kg of cayenne pepper processed into boran sambal. In the total margin, there is 55% contribution of other inputs.

Table 1. Price Simulation Results on Boran Sambal Processing

No	Variable	Price Simulation Results				
		1	2	3	4	5
Output, Input, Price						
1	Output/total production (unit)	62	62	62	62	62
2	Raw material input(kg)	2	2	2	2	2
3	Labor input (HOK)	3	3	3	3	3
4	Conversion factor (unit/kg body weight)	31	31	31	31	31
5	Labor coefficient (HOK/kg RM)	1,5	1,5	1,5	1,5	1,5
6	Product price (IDR/unit)	25.000	25.000	25.000	25.000	25.000
7	Average labor wage per person (IDR/HOK)	25.000	25.000	25.000	25.000	25.000
Revenue and Profits						
8	Raw material (RM) input prices (IDR/kg BB)	25.000	60.000	120.000	60.000	120,000
9	Contribution of other inputs (IDR/kg BW)	360.600	360.600	360.600	450.600	636.600
10	Product value (IDR/kg RM)	775.000	775.000	775.000	775.000	775.000
11	a. Value added (IDR/kg RM)	389.400	354.400	294.400	264.400	18.400
	b. Value added ratio (%)	50%	46%	38%	34%	2%
12	a. Labor income (IDR/unit)	37.500	37.500	37.500	37.500	37.500
	b. Labor benefits (%)	10%	11%	13%	14%	204%
13	a. Profit (IDR/unit)	351.900	316.900	256.900	226.900	-19.100
	b. Profit rate (%)	45%	41%	33%	29%	-2%
Remuneration for Production Factors						
14	Marjin	750.000	715.000	655.000	715.000	655.000
	a. Labor income (%)	5%	5%	6%	5%	6%
	b. Contribution of other inputs (%)	48%	50%	55%	63%	97%
	c. Company profit (%)	47%	44%	39%	32%	-3%

Source: Primary data processed (2022)

Simulation 4; the price of Cayenne Pepper is medium, and the price of Red Chili is medium.

The fourth simulation assumes that an increase also follows the price of Cayenne Pepper in Red Chili. In this simulation, the price of cayenne pepper becomes Rp.

60,000, and the price of Red Chili is IDR 50,000. Based on the price simulation, Sambal boran processing requires IDR 60,000 for raw materials in the form of cayenne pepper, with another input contribution of IDR 450,600. The selling price offered is IDR 25,000/unit of boran sambal. Based on Table 1, the added value obtained is IDR 264,400, with a ratio of 34%. An SME has a 15-40% value-added ratio, so it is included in the medium category [19].

Labor income of IDR 37,500, labor income, and 14% employee benefits. The added value contribution for SMEs is the profit earned in IDR 226,900, or with a profit rate of 29%. The total margin obtained from production factor fees is IDR 715,000. In the total margin, there is 5% of labor income and a contribution of other inputs of 63%.

Simulation 5; The price of cayenne pepper and red chili is high.

For the fifth simulation, it is assumed that an increase also follows the price of Cayenne Pepper in Red Chili. In this simulation, the price of cayenne pepper becomes Rp. 120,000, and the price of Red Chili is IDR 112,000. The analysis results from the fifth simulation show that the processing of boran sambal requires IDR 120,000 raw materials in the form of cayenne pepper, with another input contribution of Rp. 636,600. Based on Table 1, the added value obtained by Silvana Food SMEs on the assumption that the price of cayenne pepper is IDR 120,000 and the price of red chili is IDR 112,000, so the added value obtained is IDR 18,400 with a ratio of 2%. That shows that the added value of Silvana Food SMEs is in a low category. According to an SMEs that has a value-added ratio of <15%, it is included in the low category [20]. In the added value generated from sambel boran, there is IDR 37,500 in labor income or a labor reward of 204%. The profit earned by Silvana Food SMEs is -Rp 19,100 or with a profit rate of -2%. The total margin from production factor fees is IDR 655,000 for every 1 kg of cayenne pepper processed into boran sambal. From total margin, the contribution of other inputs of 97%, and the profit earned reaches -3% or -Rp 19,100.

Based on the analysis of various price simulations, it can be concluded that the simulation of the price of raw materials in the processing of boran sambal, which has a high added value, is the simulation of the price of cayenne pepper and red chili under normal circumstances. The price level of regular cayenne pepper of IDR 25,000, and red chili of IDR 20,000, which can generate added value in the processing of chili sauce by 50%. The higher the price of raw materials in the processing of boran sambal, the lower the added value generated, assuming a constant selling price of boran sambal is IDR 25,000/unit.

The income contribution and share of labor benefits at each chili price are also shown in Table 1 above. The share of labor benefits at the price of raw materials and products sold is typically 10% or an average of IDR 37,500/unit. An increase in the price of raw materials in the processing of boran sambal will increase the share of labor rewards. The simulation of raw material prices in processing value-added products also shows that the profit level generated at regular cayenne pepper and red chili prices is 45%. The higher the price of chili raw materials at a constant selling price, the lower the profit generated.

The existence of high-added value can impact the development of an agro-industry in the future. To support the increase in added value and development in an agro-industry,

it pays more attention to product quality, ease of obtaining it, technology during the processing process, and product marketing [21].

4 Conclusion

High added value occurs when the price of cayenne pepper and red chili is regular. Namely, the regular price of cayenne pepper is IDR 25,000, and red chili is IDR 20,000. These conditions can produce added value in the processing of boran sambal by 50%. Based on the simulation results of raw material prices for cayenne pepper and red chili, different price levels with constant selling prices will provide different added value.

Changes in raw material prices significantly impact the income and added value of a product produced by MSMEs. Many small industries refrain from selling when raw material prices rise because of the dilemma of raising prices, but with the risk that no one will buy their products. SME partnerships with farmers can increase partner farmers' income compared to those who form partnerships with collectors and wholesale traders [22]. The solution or recommendation is that SMEs need to partner with farmers to get constant prices for raw materials, especially cayenne pepper and red chili, to maintain income stability and the added value obtained. In addition, the government can facilitate inter-industry meetings so that they can partner by initiating partnership programs between industry players

References

1. Supriyono. (2007). Kajian Biologi dan Agronomi Karabenguk (Mucuna pruriens (L.) DC.) sebagai Tanaman Pangan dan Penutup Tanah. UGM Yogyakarta.
2. BPS. (2020). Produksi Tanaman Sayuran 2020. Badan Pusat Statistik. https://www.bps.go.id
3. Kementan. (2016). Outlook Komoditas Pertanian Sub Sektor Hortikultura. Pusat Data dan Sistem Informasi Pertanian, Kementerian Pertanian.
4. Yopie, S., Chris, S., & Imam, P. (2016). Pengembangan Agribisnis Cabai Berkelanjutan di Kota Ternate. Balai Besar Pengkajian dan Pengembangan Teknologi Pertanian, 141–150.
5. Marpaung B, Siregar H, Anggraeni L. Analysis of El Niño Impact and the Price of Food Commodities on Inflation. Jurnal Ekonomi Indonesia. 2019;8(1):21–35. doi:10.52813/jei.v8i1.11
6. Iswari, K., & Srimaryanti. (2014). Pengaruh Giberlin dan Jenis Kemasan untuk Menekan Susut Cabai Kopay Selama Pengangkutan Jarak Jauh. Jurnal Pasca Panen, 11 (2), 89–100.
7. Maryam, J., Kadirman, & Ratnawaty, F. (2019). Uji Kualitas Bubuk Cabai Rawit (Capsicum frutescens) Berdasarkan Berat Tumpukan dan Lama Pengeringan Menggunakan Cabinet Dryer. Jurnal Pendidikan Teknologi Pertanian, 5(1), 98–107.
8. Rachmaniah M, Suroso AI, Syukur M, Hermadi I. (2022). Supply and Demand Model for a Chili Enterprise System Using a Simultaneous Equations System.
9. Direktorat Pengolahan Hasil & Pertanian. (2009). Standar Prosedur Operasional (SPO) Pengolahan Cabe. Direktorat Pengolahan Hasil Pertanian Direktorat Jenderal Pengolahan dan Pemasaran Hasil Pertanian Departemen Pertanian.
10. Turniasih, I., & Nia, K. D. (2007). Peranan Sektor Agroindustri dalam Pembangunan Nasional. Jurnal Geografi GEA, 7 (2), 1–8.

11. Intan, S. A. (2018). Analisis Nilai Tambah dan Strategi Pengembangan Strategi Olahan Bawang Merah UD. Dua Putri Sholehah di Kabupaten Probolinggo. Program Studi Agribisnis, Fakultas Pertanian, Univesitas Jember.

12. Saptoningsih. (2012). Nilai Tambah dari Olahan Bawang Merah. BBPP Lembang Publishing.

13. Kementan. (2020). Pengolahan Cabai Merah. Balai Pengkajian Teknologi Pertanian Kalimantan Selatan Balai Besar Pengkajian dan Pengembangan Teknologi Pertanian Badan Penelitian dan Pengembangan Pertanian.

14. Soejono, D. (2011). Strategi Pengembangan Agribisnis dan Agroindustri Sub Sektor Tanaman Pangan di Kabupaten Situbondo. J-SEP, 5 (3), 54–60.

15. Marimin, D., Feifi, S., Martini, R., Astuti, Suharijito, & S, H. (2010). Added Value and Performance Analysis of Edamame Soybean Suppy Chain. A Case Study. OSCM, 3 (3), 8–14.

16. Elisabeth, D., A., A. (2015). Added Value Improvement of Taro and Sweet Potato Commodities by Doing Snack Processing Activity. Procedia Food Science. doi: 10.1016/j.profoo.2015.01.029

17. Mutmaini, H., Abdul, H. A. Y., & Jajat, S. (2015). Analisis Nilai Tambah Agroindustri Kripik Ubi di Kota Pontianak. Jurnal Social Economic of Agriculture, 4(2).

18. Arianti, Y. S., & Waluyati, L. R. (2019). Analisis Nilai Tambah dan Strategi Pengembanagan Agroindustri Gula Merah di Kabupaten Madiun. 3(2), 256–266.

19. Lubis, W. W., Sihombing, L., & Salmiah. (2013). Analisis Nilai Tambah Usaha Pengolahan Gula Aren di Desa Suka Maju Kecamatan Sibolangit Kabupaten Deli Serdang. Journal on Social Economic of Agriculture and Agribusiness, 2(4), 1–15.

20. Anggraeni, N., & Subari, S. (2020). Pendapatan dan Nilai Tambah Pengolahan Ubi Jalar Ungu di UD. Ganesha Kecamatan Pacet Kabupaten Mojokerto. Agriscience, 1(2), 429–447.

21. Wulandari, S., & Alouw, J. C. (2021). Designing business models for rural agroindustry to increase the added value of coconut. IOP Conference Series: Earth and Environmental Science, 807(2), 0–9.

22. Zulkarnain, Hakim L, Wardhana M., Y. (2021.) Alternative based farmer model for increasing red chili production in Bener Meriah, Aceh. IOP Conf Ser Earth Environ Sci. 644(1). doi:10.1088/1755-1315/644/1/012050