



Analysis of Value Added of Catfish Meatballs in Bandung Regency, West Java, Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This research aims to find out the value added obtained from the process of processing catfish into catfish meatballs. This research was conducted on August 2021 in Bandung Regency. The method used is the case study with the sampling technique in the form of purposive sampling. The type of data that primary data and secondary data uses with observation and interview techniques, the data is analyzed descriptively quantitatively to measure the overall value added component that can answer the purpose of the research. The analysis method used to calculate value added is using the Hayami's method. The results showed that the value added resulting from the processing of catfish meatballs creates an value added of 19,600 IDR/kilograms the ratio of value added to product value by 13% it means the price of catfish meatball increase 13% from the price of fresh catfish. It means, the value added of catfish meatball relatively still low. The strategic that used to increase the value added of catfish meatball i.e increasing in production, increasing in price, and decreasing in cost.

Keywords: *Processing; added value; Catfish meatballs.*

1. INTRODUCTION

Catfish is a fish that lives in public waters and is a fish that is economically valuable, and preferred by the public. Catfish has various advantages, including its rapid growth, has the ability to adapt to a high environment, tastes good and the nutritional content is quite high [1]. Fish meatballs are the utilization of fishery products that process fish products from ponds or farmers into processed products of high value and have a high content of animal protein, minerals and vitamins [2]. Catfish has a protein content of 22% to 46.6% in addition catfish also have a fat content of 20.8%, minerals 14.6% and water 6.81% [3].

Bandung Regency is a regency in West Java Province, Indonesia, as a result of the expansion of Bandung Regency, also has a location close to the city of Bandung which means it easy to access transportation [4]. The contribution of Gross Regional Domestic Product of Bandung Regency in 2017 was dominated by the processing industry sector which amounted to 67.37% [5]. The production of fishery processed products contributes as much as 10.5% to the total production of processed products in West Java [6]. One of the fishery productions cultivated in Bandung Regency is catfish (*Clarias* sp.). According to data from Department of Marine and Fisheries of West Java Province [7] total catfish production in West Java Province continued to increase from 2015 by 243,328.24 tons/year and in 2019 increased to 268,656.21 tons/year.

In processing activities will provide a value added result that needs to be researched. Processing is carried out with consideration of the durability of fresh fish in addition, with the processing is expected to add to the selling value of fishery products [8]. Value added is the difference between the value of the product and the cost of raw materials and other input costs. The value added method is one of the most important indicators resulting from a company's economic activity and reflects its economic strength [9]. The amount of value added obtained can show that catfish meatballs provide value added or not [10]. In addition, reviewing the value added of products can be a study material for relevant stakeholders in developing fisheries business and be an inspiration to review market and marketing aspects [11].

The catfish meatball processing activities in Nagreg District, Bandung Regency can increase

the value added of fish processing, but in the field it shows that the value added of fish meatball processing is still low. Therefore, the purpose of this study was to analyze the value added of catfish meatballs in Nagreg district, Bandung Regency.

2. METHODS

This research was conducted on August 2021 in the catfish meatball business "Mr. Ncun" in Nagreg District of Bandung Regency. The research methods used is a case study. Case studies have an understanding related to detailed research of a person or a social unit within a certain period of time [12]. The data collection method used was observation to describe the processing activities of catfish meatballs and interviews with the processors directly. Primary data obtained through sources or respondents directly from the source entrusted either through interviews, observations and discussions. Secondary data is obtained through various sources such as books, journals, scientific paper reports, The Marine and Fisheries Service of West Java Province, related institutions.

2.1 Sampling Technique

The sampling technique used is purposive sampling. Purposive sampling technique is a technique used to retrieve research source data with consideration, such as people who are considered to know or master the source of the data to make it easier for researchers to know the object or circumstances studied [13]. The determination of the sample is based on the criteria:

- 1) The processor of catfish meatballs lived in Bandung Regency
- 2) Located in Nagreg District of Bandung Regency.
- 3) The scale business Included Micro, Small and Medium Enterprises (MSMEs)
- 4) The business have been running for at least 5 years.
- 5) The respondent ready to be interviewed.

2.2 Data Analysis

The data analysis conducted in this study is descriptively quantitative, to measure the overall value added component of catfish meatball business in Nagreg District of Bandung Regency. Quantitative descriptive methods data that is pleasing to situations that occur systematically,

actually and accurately regarding facts and relationships between variables in order to get to the truth. In addition, quantitative methods aim to raise the facts of the state of variables and phenomena that occur today and present what they are [14].

2.3 Hayami's Methods

The value added analysis in this study was calculated using the Hayami's methods which aims to determine productivity, output value, added value, profit and return of services to the processing workforce in one production [15]. Below is a table of value added calculation procedures with the Hayami's methods:

The value added index criteria are [16]:

1. If Value added > 0, it means that catfish processing efforts provide added value (positive).
2. If Value added < 0, it means that catfish processing efforts do not provide added value (negative).

Value added level according to [17]:

- 1) Low value added ratio if it has a percentage < 15 percent
- 2) Medium value added ratio if it has a percentage of 15 - 40 percent

- 3) High value added ratio if it has a percentage > 40 percent

3. RESULTS AND DISCUSSION

3.1 Technical and Economical Performance

3.1.1 Pre-Production Of Catfish Meatballs Processing

Catfish meatballs processing through several stages with the aim to produce better fish meatballs. In this activity of making catfish meatballs, there are 3 processors who were interviewed and carried out the production process. The initial stage that must be done in processing activities is to prepare the tools and materials to be used. The process of making fish meatballs still uses traditional methods because it has not used meatball printing tools. The tools and materials used are from the nearest market and the Cicalengka market. Tools that must be prepared in the production process are food processor, grinder, pan, steamer, stove, skimmer, knife, cutting board, freezer, plastic basin, and scales. The ingredients to be used are garlic, nutmeg, salt, flavoring, sugar, pepper, cornstarch, tapioca flour, and ice cubes. If the tools and materials are ready, then the process of making catfish meatballs can be carried out.

Table 1. Hayami's Methods

VARIABLE	SCORE
I. Output, Input And Price	
1. Output (kilograms/process)	A
2. Input (kilograms /process)	B
3. Labor (People/proses)	C
4. Conversion Factor	$D = A/B$
5. Labor Coefficient (DWP/ kilograms)	$E = C/B$
6. Output Price (IDR)	F
7. Labor Wages (IDR/DWP)	G
II. Revenue and Profit	
8. Price of Raw Materials (IDR/ kilograms)	H
9. Contribution of Other Inputs (IDR/ kilograms)	I
10. Value of Output (IDR/ kilograms)	$J = D \times F$
11. a. Value Added (IDR/ kilograms)	$K = J - H - I$
b. Value Added Ratio (%)	$L(\%) = (K/J) \times 100\%$
12. a. Labor Income (IDR/ kilograms)	$M = E \times G$
b. Labor Share (%)	$N(\%) = (M/K) \times 100\%$
13. a. Profit (IDR/ kilograms)	$O = K - M$
b. Profit Ratio (%)	$P(\%) = (O/K) \times 100\%$
III. Feedback to the Owner of the Factors of Production	
14. Margin (IDR/ kilograms)	$Q = J - H$
a. Labor Income (%)	$R(\%) = (M/Q) \times 100\%$
b. Other Input Contributions (%)	$S(\%) = (I/Q) \times 100\%$
c. Entrepreneur's profit (%)	$T(\%) = (O/Q) \times 100\%$

3.1.2 Catfish Meatballs Processing

The process of making fish meatballs starts from the softening of meat that aims to extract proteins that dissolve in salt into micro particles. Catfish in the form of fillet meat sourced from fish fillet partners in Nagreg District as much as 10 kilograms is crushed using grinders. In addition, this softening process needs to add ice as much as 20% of the weight of the dough or meat.

After the fish meat is ground, the dough is made by adding spices sourced from Cicalengka Market such as one kilogram of garlic, nutmeg 50 grams, Salt and flavorings as much as 250 grams, 500 grams sugar, the addition of pepper as much as 100 grams. Then the addition of tapioca flour as much as one kilogram and 500 grams cornstarch. The components that make up fish balls consist of fillers and binders. The filler that is commonly used in fish balls is tapioca flour. The ingredients are mashed together with crushed meat that has been ground little by little until the dough is well mixed using a food processor and added a little water to produce a more chewy dough because one of the parameters determining the quality of fish balls is the level of elasticity.

After the dough is mixed evenly, the next step is the process of printing dough in the form of balls. The formation of dough is done by hand with the help of a spoon and a knife. The dough is formed and then weighed to be the same size and shape using digital scales. After that, the balls of meatballs are ready to be boiled.

In the cooking process, meatballs that are ready to be boiled are put in a pot containing boiling water. The meatballs are inserted one by one into the pan generally boiling meatballs for 15 minutes until cooked which is characterized by meatballs floating on the surface of the water. Then the meatballs are lined using skimmer and put into a plastic basin.

The last stage is the process of packaging the product, the packaging process is carried out when the fish meatballs have cooled. The packaging of catfish meatballs used is modern, namely using plastic zip lock packaging with a size of 12x20 cm as much as 500 pieces. If it is packed, fish meatballs will be put in the freezer so that the product can last a long time and stay fresh.

3.1.3 Marketing of Catfish Meatballs

Marketing catfish meatballs that have been packaged will be marketed to consumers who are generally regular customers or to the surrounding community, sold through social media and there are also those who will resell the product (reseller). This product is sold for 68,000 IDR/ kg and will be distinguished by the price for sale to resellers. This product always participate in activities regarding the processing of fishery products from the Ministry and related agencies so that this product is widely known.

3.1.4 Variable Cost of Catfish Meatballs

Based on the Table 2. total cost of equipment incurred by the catfish meatball processing in Nagreg District of Bandung Regency amounted to 4,990,000 IDR/production process. The highest cost is used for freezers for 2,500,000 IDR and the lowest costs incurred for the purchase of cutting boards amount to 10,000 IDR. In one month, there were 16 production processes. From the results of the study showed that the cost of raw materials incurred by catfish meatball processors amounted to 80,000 IDR/ production. The equipment for making catfish meatballs was purchased by entrepreneurs since the beginning of the business and some of these tools have been replaced with new tools, this indicates that the equipment used is experiencing depreciation.

The catfish meatballs processing is carried out 16 times a month and 192 times per year. Based on the Table 3. with the output produced every time the production of 22 kilograms of catfish meatballs from the input of 10 kilograms of fresh catfish fillet. The results obtained in this study, fresh fillet catfish meat as much as 10 kilograms can produce catfish meatballs as much as 22 kilograms sold for 68,000 IDR/ kilograms. The workforce in this study are workers who are directly involved in the production process of processing catfish meatballs. The wage system carried out by entrepreneurs uses a daily system, with the number of working hours per day is six hours. Wage is given after the work is completed, which is 50,000 IDR.

3.2 Value Added Analysis of Catfish Meatballs

Processing fresh catfish into meatballs causes value added. Value added is the addition of the value of a commodity because of the functional

inputs treated in the commodity in question. The magnitude is influenced by two factors, namely technical factors consisting of production capacity, application of technology, product quality, quantity of raw materials and inputs as well as market factors that include the selling price of output, raw material prices, other input values and labor wages [18]. Calculation of the value added of meatballs from fresh catfish raw materials is used to find out how much value added is contained in one kilogram of catfish processed into meatballs in one production.

From the results of this study there are 10 kilograms of catfish raw materials in one production with the price range of catfish raw materials that have been in fillets of 50,000 IDR/kilograms and every month the price of fillet catfish is not the same. In one production will produce fish meatball products as much as 22 kilograms. The daily range of work lasts for 4 times a week with a total workforce of 3 people who come from inside or outside the family.

The conversion factor is a comparison between the results obtained with many raw materials used and is worth 2.2. That is, for every one kg of catfish processed will be obtained 2.2 kilograms of fish meatballs. Compared to the results [19] has a conversion factor of 4.63, where the conversion factor in this study is smaller because the conversion factor is determined by output. So the more output obtained by input, the conversion factor obtained will be greater, because considering the number of conversion factors obtained, the greater the value added of a product.

The labor coefficient is obtained from the division of the total number of working days for one production/process with the amount of raw materials used for one production/process. The calculation results obtained a labor coefficient of 0.30. This means that in each labor force one working day is able to process raw materials as much as 0.30kg with an average wage of 15,000 IDR/kilograms of raw materials. While the share of labor is the ratio between direct labor income with added value which is worth 76.53%.

The price of catfish meatball products in its marketing is 68,000 IDR/kilograms. The price of raw materials of the product amounted to 50,000 IDR/kilograms. Another input donation is the total distribution of other input contributions by the amount of raw materials used. Other input contributions to each processing of catfish

meatballs have different values depending on the small number of other components used during the production process. Components in the calculation of other input contributions in the processing of fish meatballs consist of supporting materials and shrinkage of equipment.

The value added of processing catfish into catfish meatballs is 19,600 IDR/kilograms of raw materials. This figure represents the difference between the value of the product and the price of raw materials and contributions from other inputs. The amount of value added of the product is obtained from several factors including the cost of other input contributions in addition to the cost of raw materials. The ratio of value added to product value is 13%. Value added indicates a value that is not too large. This is due to the price of raw materials and the contribution of other inputs. Based on research conducted by [20], the value added ratio obtained is 43.03%, this shows that the value added of fish balls is still low. This is based on the criteria if the value added ratio is > 50% then the value added is greater than the output value and the value added is classified as high, if the value added ratio is 50%, then the resulting value is smaller than the output value and the value added is low. The difference in value added and the ratio of value added in this study with research conducted by [20] is because it is influenced by the product, the price of raw materials and the contribution of other inputs used in the production process. This value can be increased again by reducing input costs, increasing the amount of raw materials, and improving the quality of catfish meatballs.

Direct labor income is the result of multiplication between the labor coefficient and the average wage which is worth 15,000 IDR/kilograms of raw materials. While the labor share is the ratio between direct labor income with added value which is also worth 76.53%.

The profit obtained from the process of processing catfish meatballs amounted to 4,600 IDR/kilograms of raw materials. This figure is derived from the value added minus the benefits to the workforce and the level of sustainability which is 23%. So that by knowing this, the processor can know the benefits obtained from the processing of catfish meatballs. The existence of this difference because it is determined by the value added and income of the workforce, the greater the value added created and the smaller the income from the workforce, the greater the profit obtained.

Table 2. Investment Cost of Catfish Meatballs

NO	Investment Cost Componen	Unit (Unit)	Volume	Unit Price (IDR/Unit)	Total Cost (IDR)
1	Food processor	Piece	1	850,000	850,000
2	Grinder	Piece	1	500,000	500,000
3	Pot	Piece	2	135,000	270,000
4	Steamer	Piece	1	125,000	125,000
5	Stove	Piece	2	150,000	300,000
6	Drain/skimmer	Piece	1	15,000	15,000
7	Knife	Piece	3	20,000	60,000
8	Cutting board	Piece	1	10,000	10,000
9	Freezer	Piece	1	2,500,000	2,500,000
10	Plastic basin	Piece	3	20,000	60,000
11	Scales	Piece	1	300,000	300,000
SUBTOTAL					4,990,000

Table 3. Variable Cost of Catfish Meatballs

NO	Variable Cost Component	Unit (Unit)	Volume	Unit Price (IDR/Unit)	Total Cost (IDR)
1	Catfish	Kilogram	10	50,000	500,000
2	Packagig material	Piece	500	1,000	500,000
3	Fuel	Tube	2	16,000	32,000
4	Employee salary	People	1	50,000	50,000
5	Spice	Kilogram	4	20,000	80,000
SUBTOTAL					1,162,000

Table 4. Value Added Fish Meatball

No	Variable	Score
I. Output, Input And Price		
1	output (kilograms /process)	22
2	Input (kilograms /process)	10
3	Labor (People/proses)	3
4	Conversion Factor	2.2
5	Labor Coefficient (DWP/kilograms)	0.300000
6	Output Price (IDR)	68,000
7	Labor Wages (IDR/DWP)	50,000
II Revenue and Profit		
8	Price of Raw Materials (IDR/kilograms)	50,000
9	Contribution of Other Inputs (IDR/kilograms)	80,000
10	Value of Output (IDR/kilograms)	149,600
11	a. Value Added (IDR/kilograms)	19,600
	b. Value Added Ratio (%)	13
12	a. Labor Income (IDR/kilograms)	15,000
	b. Labor Share (%)	76.531
13	a. Profit (IDR/kilograms)	4,600
	b. Profit Ratio (%)	23
III Feedback to the Owner of the Factors of Production		
14	Margin (IDR/kilograms)	99,600
	a. Labor Income (%)	15.060
	b. Other Input Contributions (%)	80
	c. Entrepreneur's profit (%)	5

The results of this value added analysis can also show the margin of catfish raw materials to catfish meatballs distributed to direct labor income, other input contributions, and profits.

This margin is the difference between the value of the product and the price of catfish raw materials per kilograms processing of 1 kilograms of catfish into meatballs obtained a margin of 99,600 IDR. Distributed for each factor of labor, namely direct labor income of 15,06%, contribution of other inputs 80%, and profits of 5%. The margin shared for contribution of other inputs is the largest share when compared to the income and profits of direct labor.

Based on the analysis, the value added obtained from catfish meatball processing activities amounted to 19,600 IDR/kilograms with a value added ratio to product value of 13% and a profit of 4,600 IDR/kilograms with a profit rate of 23%. The value is different in the research conducted by [21], where the value added obtained amounted to 36,200 IDR/kilograms with a value added ratio of 40.22% and a difference of 89%. This low value added is due to the price of raw materials for fillet catfish meat and expensive supporting materials and cheap meatball prices. The value added generated from processing fresh catfish into catfish meatballs in catfish balls is still low.

4. CONCLUSION

The value added created from catfish meatball processing activities creates of 19,600 IDR/kilograms with a value added ratio to product value of 13% and a profit of 4,600 IDR/kilograms with a profit rate of 23%. The catfish meatball business can provide value added and benefits for business owners, although the value obtained is low. To increase the value added and profit in processing catfish into catfish meatballs, that is by efficiently managing the production costs used.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Suyanto, SR. Catfish farming. Jakarta: Self-help spreader. Schneider OV, Sereti, MAM, Machiels EH, Eding, and JAJ Verreth. The potential of producing heterotrophic bacteria biomass on aquaculture waste. *Water Research*; 2006.
2. Wibowo, Singgih. Making Fish Meatballs and Meatballs. Self-help spreader. Jakarta. 2003.

3. Adebayo I, Fapohunda O, Ajibade A. Evaluation of nutritional quality of *clarias gariepinus* from selected fish farms in Nigeria. *Am. J. Food Sci. Nutr.* 2016;3(4).
4. Istanah. Benefits of Business Program to Increase Prosperous Family Income (UPPKS) for Business Groups in West Bandung Regency. Thesis. University of Education Indonesia. 2021.
5. Bandung District Planning and Development Agency. Bandung Regency in Numbers. Bandung Regency. Soreang; 2017.
6. Department of Marine and Fisheries of West Java Province. UPI Micro Small Statistical Data Recap. Bandung. 2021.
7. Department of Marine and Fisheries of West Java Province. UPI Micro Small Statistical Data Recap. Bandung; 2021.
8. Damayanti H, O. Business Feasibility of The Household Scale Pindang Fish Industry In Pati Regency. *Journal of R&D.* 2016;12(1).
9. Caruntu C, Lapadusi ML. Methods used in determining the value added used in the assessment of the company's real economic power. *Annals of the University of Petroşani, Economics.* 2021;12(1):33-48.
10. Aji VP, Yudhistira R, Sutopo W. Analysis of the added value of lemuru fish processing using the Hayami method. *Scientific Journal of Industrial Engineering.* 2018;17(1).
11. Nasriani, Susaniati W. Analysis of The Added Value of Nike Fish Processed Products in Gorontalo City. *Proceedings of the National Seminar on Wetland Environment.* 2018;3(1):50-52.
12. Yin RK. Case Study Research: Design and Method (4rd ed.). California: Sage Publications, Inc. 2009.
13. Sugiyono. Quantitative, Qualitative, and R&D. Bandung Research Methods: Alfabeta, CV. 2017.
14. Wulandari AT. Physical and Organoleptic Qualities of Preserved Beef Meatballs with *Lactobacillus* Spp. 1A5 Antimicrobial Substrate at Thesis Room Temperature Storage. Bogor: Department of Livestock Production and Processing, Faculty of Agriculture, Bogor Agricultural Institute; 2009.
15. Uswatun Hasanah, Mayshuri, Djuwari. The Value Added Analysis of Sale Pisang Agroindustry in Kebumen Regency. *Journal of Agricultural Science.* 2015; 18(3):141–149.

16. Hayami Y, Kawagoe T, Morooka Y, Siregar M. Agricultural Marketing and Processing in Upland Java. A Perspective from a Sunda Village. Bogor: The CPGRT Centre. Bogor; 1987.
17. Hubeis M. Towards Professional Small Industries in the Era of Globalization through The Empowerment of Industrial Management. Scientific Oration Professor Of Permanent Science of Industrial Management. Faculty of Agricultural Technology. Bogor Agricultural Institute; 1997.
18. Soekartawi. Agribusiness Theory and Its Application. King Grafindo Persada. Jakarta; 1999.
19. Suprpto. Processing process and added value of mackerel meatballs. Journal; 2014.
20. Farlinda, Sarini Y, Irdam R. Analysis of Added Value and Business Benefits of Tuna Meatballs in West Kendari Subdistrict (Case Study of Nur Light Business Group). Journal of Socio-Economic Fisheries. 2018;3(3).
21. Ariyanto T, Bathara L, Hamid H. Analysis of Added Value and Marketing of Processed Catfish (*Clarias* Sp.) Products in Hangtuh Village, Perhentian Raja District, Kampar Regency, Riau Province; 2015.

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