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# The Analysis of Smoked Fish *Katsuwonus pelamis* Feasibility in Bone Regency

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**ABSTRACT.** The purposes of this research are to analyze smoked *Katsuwonus pelamis* feasibility which involves operating costs, the income, the amount of profits, and to calculate Revenue Cost Ratio (R/C Ratio) of smoked *Katsuwonus pelamis* business. The research is held in 3 (three) villages in Tanete Riattang Timur Sub-district, Bone Regency. The implemented method is descriptive research using qualitative and quantitative approaches. Taken data is primary and secondary data using interview and observation methods. The test result of this feasibility indicates that smoked fish *Katsuwonus pelamis* business in Bone is decent to be implemented and developed. The required cost of small scale businesses Rp 951,500,- then the income amount is Rp 1,225,000,- in one production. One month profit can achieve Rp 6.837.500,- with R/C Ratio is 1.29. While the required cost of micro scale businesses is Rp 681.500,- then the income amount is Rp 875,000,- in one production. One month profit can achieve Rp 4.837.500,- with R/C Ratio is 1.28.

Keywords: Smoked fish, *Katsuwonus pelamis*, feasibility, R/C Ratio

## I. INTRODUCTION

The area that currently has a large number of fish processing businesses is Bone Regency with 76 processing groups consisting of 841 fish processors (Marine and Fisheries Service, Bone Regency, 2016). There are 6 (six) groups engaged in *Katsuwonus pelamis* fumigation. The raw material that is widely used in fish fumigation in Bone Regency is *Katsuwonus pelamis* fish, and a small portion uses Pari fish. The production of *Katsuwonus pelamis* smoked fish in Bone Regency is now one of the mainstay products of Bone Regency, popular with the community, market demand and selling prices that are quite high. The potential of pelamis *Katsuwonus* fish in Bone Regency is also quite large, it looks the number of production in 2016 reached 24,781.9 tons (DKP Data of South Sulawesi Province, 2017), while in 2015 in South Sulawesi Province produced 826.00 tons of smoked fish in 2015 (KKP, 2016).

The efforts of pelamis *Katsuwonus* fish curing in Bone district have been going on for a long time, the majority of fish processors have been running their business for more than 10 years. Seeing the considerable potential of the *Katsuwonus pelamis* fish in Bone Regency, this research is important and will be focused on groups engaged in the field of pelamis *Katsuwonus* fumigation. This is intended to analyze the extent to which the business is feasible when viewed from the profits and the ratio of income and costs. Because there is a study of Hapsari (2018) which states that, smoked fish is one of the feasible processing efforts to be developed because from the aspect of market demand is quite large, from the technical aspect there are no major problems that can disrupt the business, and from the financial aspect it is quite profitable. The Sumiratin (2018) study in Konawe also stated that fish fumigation was feasible and obtained substantial profits.

Furthermore, the question arises whether the fish fumigation business in Bone district is economically feasible or not. As the opinion of Nuralina (2009) which states that a business feasibility study is a review or analysis of whether an investment activity provides benefits or results if implemented. Many opportunities and opportunities that exist in business activities have demanded the need to assess the extent to which these activities and opportunities can provide benefits if the business is carried out. Therefore, in order to find out and analyze the feasibility of the business of pelamis *Katsuwonus* fumigation in Bone this research is important.

### Formulation of the Problem

The formulation of the problem in this study include the following:

1. What are the production costs incurred in the business of *Katsuwonus pelamis* fumigation?
2. What is the amount of income and profits received by *Katsuwonus pelamis* smoked fish processor?
3. Is the *Katsuwonus pelamis* smoked fish processing business worthy of development?

### Research Purposes

The objectives of this study include the following:

1. Analyze the production costs incurred in the business of *Katsuwonus pelamis* fumigation.
2. Analyze the amount of income and profits received by *Katsuwonus pelamis* smoked fish processor
3. Analyzing the feasibility of *Katsuwonus pelamis* smoked fish processing business

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## II. RESEARCH METHODOLOGY

The research was conducted from October to December 2018 in 3 (three) villages namely Panyula, Lonrae, and Toro Villages. The three villages are located in Tanete Riattang Timur District, Bone Regency, South Sulawesi Province, Indonesia. The number of samples in this study was 32 people who were members of the *Katsuwonus pelamis* smoked fish processing group in Bone district. The type of research that will be carried out is descriptive research with qualitative and quantitative approaches. The data taken is primary data and secondary data. The methods used in data collection include interviews and observers. This study uses questionnaires as a tool in data collection.

### Data Analysis Method

Data analysis of this study uses formulas or business analysis calculations which include Total Production Costs, Total Revenue, Profit, and R / C Ratio. To find out the total cost of production can be calculated using a formula (La Ola, 2014):

$$TC = TFC + TVC$$

TC = Total Cost (Rp)

TVC = Total Variabel Cost (Rp)

TFC = Total Fixed Cost (Rp)

The income formula will be calculated using a formula (Rahardja, 2008):

$$TR = P.Q$$

P = Price of smoked fish (Rp. / Kg)

Q = Quantity = Amount of smoked fish (kg)

Profit formula according to Siang & Azis (2010), namely:

$$\pi = TR - TC$$

$\pi$  = Business profit (Rp)

TR = Total Revenue or Total Revenue (Rp)

TC = Total Cost or Total Cost (Rp)

According to Darsono (2008), to calculate R / C Ratio using the formula:

$$R/C = TR/TC$$

TR = Total revenue (Rp.)

TC = Total cost (total cost) (Rp)

with criteria:

R / C > 1: Profitable business

R / C = 1: Business break even

R / C < 1: Business loss

## III. RESULTS AND DISCUSSION

### Production Technology

*Katsuwonus pelamis* smoked fish processing technology in Bone district still uses traditional technology. Based on data obtained from respondents, 100% (32 people) are still using technology from generation to generation, no processors have switched to modern smoked fish processing technology by using smoke cabinets or using liquid smoke.

The equipment used in traditional fumigation still uses a simply smoked furnace, made of brick structures measuring 1-meter x 1.5 meters x 0.5 meters, at the top of which is given a buffer iron as a place for preparing *Katsuwonus pelamis* fish raw material to be smoked.

The process of producing smoked fish using *Katsuwonus pelamis* fish as the raw material was obtained by processors from several sources, namely, from fishermen who landed fish in Panyula, Bajoe, and some processors obtained raw materials from Sinjai district. The transportation system of raw materials from fishermen to processors through land transportation by car, and in the process of transportation using styrofoam and given ice cubes as cooling material. This is done to maintain the quality of raw materials to remain good during the transportation process until it reaches the hands of the fish processor. In addition, in obtaining raw materials, processors tend not to experience difficulties in guaranteeing availability and sustainability, because each fish processor already has a fisherman subscription as a raw material supplier. Thus, raw materials from suppliers are directly delivered to the place of each processor.

The production process with traditional fumigation is done quite simply. The steps of the Pelamis Katsuwonus fish fogging production process are as follows:

- Preparation of raw materials, pelamis Katsuwonus fish that have been received from fishermen prepared by washing using 2-3 times clean water.
- Next weeding, the fish are weeded by cutting off the head, removing the gills and the contents of the stomach. At this stage also the fish is fillet (cut into small pieces).
- Small cut fish/fillets are then washed again using clean water and stored in a storage basin and ready to smoked.
- Fumigation, carried out by arranging pieces of fish in the prepared smoked furnace. Fuel in the fumigation process uses coconut shell. The fumigation process lasts 2-4 hours. During the fumigation process, fish are turned backward to ensure that the fish is cooked evenly on the entire surface of the meat.
- After the fumigation process, the fish is then accommodated in the basket for the cooling process. The fish is cooled in open space and then stored. Smoked fish, usually sold on the same day (for production processors in the early hours) and sold the next day (for production processors in the morning). Processors in Bone have not done the packaging well on the product unless it will be sold outside the area.

Basically, fumigation of fish using the latest technological innovations can help and facilitate the production of smoked fish, and save time. For example, the use of fumigation space, its use is simpler because it does not need to process the smoked product back and forth, it is simply arranged neatly in the fumigation cupboard and smoked with the specified time. In contrast to the technology used by current processors where the production process must be routinely controlled in a few minutes. For example fumigation technology with an automation system can save more time, as research conducted by Setyawan (2018), in the process of automatic smoking with a certain temperature and time effect on the level of fish dryness and moisture content, the use of appropriate technology, especially the use of automatic fuming can reduce time production from 6 hours to 2 hours. Solechan's findings (2017), revealed that the use of 250 pieces of fish smoked cabinets can increase production by 117%, maturity time by 30 minutes at a temperature of 100oC, and save wood fuel by 33.3%. However, due to the consideration of the effectiveness and volume of the smoking cabinets provided by the government, it is still relatively small, the community still survives with the old technology.

On the other hand, the technology of using liquid smoke is also quite potential to be used in the fumigation process, besides that the use of liquid smoke can also minimize the dangers of chemicals contained in smoked fish that are smoked with traditional methods because this liquid smoke has gone through a purification process. Utilization of liquid smoke for the manufacture of smoked fish has the opportunity to replace traditional smoked fish products (by direct fumigation) which allows for the presence of substances that are harmful to health such as tar and polyaromatic hydrocarbon compounds (Agustina, 2014). However, the use of liquid smoke can bring new problems to processors, namely increasing production costs and the possibility of difficult to obtain liquid smoke to meet the needs of liquid smoke processors in Bone district.

#### Business Feasibility Analysis

Business feasibility analysis is one of the factors that can be used as a benchmark for whether a business is worth developing or not. In this study, the analysis was made in 2 (two) analyzes based on the scale of processing business obtained at the study site. The scale of the business includes Small-Scale Enterprises whose sales turnover is above 300 million rupiah and micro-scale businesses whose sales turnover is between 50-300 million rupiahs. Business analysis calculations can be seen in Table 1 and Table 2. Based on the results of business analysis from showing that the total cost required by small-scale businesses in a day (once production) with raw materials of 35 kg of raw materials is Rp. 951,500,-. Meanwhile, small scale businesses with raw materials of 25 kg require a production cost of Rp. 681.000,-. While for one production, small-scale processors can get an income of Rp. 1,225,000,- obtained from the sale of 350 slices with an average selling price of Rp. 3,500 / Slice. Meanwhile, the scale of micro-enterprises gets an income of Rp. 875,000, - from the sale of 250 slices with an average selling price of Rp. 3,500, - / slice. At a glance, it appears that the margin between income and expenditure for a single day's production is quite large.

The calculation shows that the profit obtained by small-scale processors in one production is Rp. 273,500, - / day and the estimated profit earned every month if the average number of production days is 25 days, then the business profit of Rp. 6,837,500, - / month. Meanwhile, processors with micro-scale businesses get daily profits of Rp. 193,500, - and monthly profits of Rp. 4,837,500, -. The profits are quite large for a business, and this also shows that smoked fish processing businesses can help increase family income. Furthermore, women's empowerment in the fisheries sector has had a positive impact, women can help improve the family's economy and not merely rely on family income from their husbands.

One of the business feasibility analyzes conducted is calculating the Revenue Cost Ratio (R / C Ratio), showing the results of 1.29, meaning that every time you spend 1 rupiah, the processor will get an income of 1.29 rupiah for the small-scale business. Meanwhile, micro-scale businesses show R / C Ratio of 1.28. Thus, the value of R / C ratio > 1 indicates that the business of *Katsuwonus pelamis* fish is feasible to be carried out and developed. The direction of the development of skipjack smoked fish processing business can be directed at increasing production or production capacity by increasing the scale of business to increase revenue. By increasing the scale of business and production capacity, later it can absorb labor in the context of community empowerment, especially those who are still in their productive age.

Some previous studies also found that the processing of smoked fish is feasible and potential to be developed. The smoked fish processing study in Morotai conducted by Sofiati (2018), found that smoked fish processing businesses were able to obtain a profit of Rp. 8,085,600 / month with an R / C ratio of 2. Hapsari (2018), research at Konawe found that the profits of smoked fish business could reach Rp 6,116,911 / month with R / C Ratio 1.5.

**Table 1. Small Scale Business Analysis**

Number	Description	Unit	Volume	Price (Rp)	Amount (Rp)
<b>A Investment Costs</b>					
1	Smoked Furnace	1	Unit	1,500,000	1,500,000
2	Equipment	1	Set	300,000	300,000
3	Scales	1	Unit	200,000	200,000
<b>TOTAL A</b>					<b>2,000,000</b>
<b>B Variable Costs</b>					
1	<i>Katsuwonus pelamis</i>	35	kg	20,000	700,000
2	Labor	5	Person	35,000	175,000
3	Electricity	1	Package	10,000	10,000
4	Transportation	1	Package	50,000	50,000
5	Rent / levies	1	Package	10,000	10,000
<b>TOTAL B</b>					<b>945,000</b>
<b>C Fixed cost</b>					
1	Furnace Depreciation				2,600
2	Equipment Depreciation				2,700
3	Scales Depreciation				1,200
<b>TOTAL C</b>					<b>6,500</b>
<b>TOTAL PRODUCTION COSTS B + C</b>					<b>951,500</b>
<b>Income</b>					
	Smoke Fish Products	350	Slice	3,500	<b>1,225,000</b>
<b>Profit (Income - Total Production Cost)</b>					
	Daily				<b>273,500</b>
	Monthly	25	day	273,500	<b>6,837,500</b>
<b>R/C Ratio</b>					<b>1.29</b>

**Table 2. Micro Scale Business Analysis**

Number	Description	Unit	Volume	Price (Rp)	Amount (Rp)
<b>A Investment Costs</b>					
1	Smoked Furnace	1	Unit	1,500,000	1,500,000
2	Equipment	1	Set	300,000	300,000
3	Scales	1	Unit	200,000	200,000
<b>TOTAL A</b>					<b>2,000,000</b>
<b>B Variable Costs</b>					
1	<i>Katsuwonus pelamis</i>	25	kg	20,000	500,000
2	Labor	3	Person	35,000	105,000
3	Electricity	1	Package	10,000	10,000
4	Transportation	1	Package	50,000	50,000
5	Rent / levies	1	Package	10,000	10,000
<b>TOTAL B</b>					<b>675,000</b>
<b>C Fixed cost</b>					
1	Furnace Depreciation				2,600
2	Equipment Depreciation				2,700
3	Scales Depreciation				1,200
<b>TOTAL C</b>					<b>6,500</b>
<b>TOTAL PRODUCTION COSTS B + C</b>					<b>681,500</b>
<b>Income</b>					
	Smoke Fish Products	250	Slice	3,500	<b>875,000</b>
<b>Profit (Income - Total Production Cost)</b>					
	Daily				<b>193,500</b>
	Monthly	25	Day	193,500	<b>4,837,500</b>
<b>R/C Ratio</b>					<b>1.28</b>

#### IV. CONCLUSION

Costs for one production are Rp. 951,000 (small business scale) and Rp. 681,500, - (micro scale business). Small business income of Rp. 1,225,000 per production and micro business in the amount of Rp. 875,000. The benefits obtained by small businesses within a month can reach Rp. 6,837,500, - and the micro business gets a profit of Rp. 4,837,500, - so that it can be said that this business is profitable. When the R / C Ratio is 1.29 on a small scale and on a micro scale, R / C ratio is 1.28. it means that *Katsuwonus pelamis* smoked fish processing business in Bone is feasible to be implemented and developed.

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