

## **Marketing Prospects of Omega-3 Thornless Milkfish Agribusiness**

**Andi Rusdi Walinono<sup>1</sup>, Rahmayati<sup>2</sup>**

<sup>1,2</sup> Fisheries Agribusiness Study Program, Business Department  
Pangkajene Islands State Agricultural Polytechnic

### **Abstract**

*Milkfish is a significant fish species in meeting fish consumption needs, with a production volume exceeding 158,321 tonnes in 1989. However, the presence of thorns limits its consumption in certain regions. To overcome this, a technique of processing spine-free milkfish has been developed through special treatment and cultivation in floating net cages along coastal concessions, showing promising market prospects in marine fisheries agribusiness. Compared to soft-boned milkfish products like presto milkfish, thornless Omega-3 milkfish demonstrates a 75% increase in added value, with a price increase from Rp 15,000/kg to Rp 27,500/kg, and processing costs of Rp 2,000/kg, resulting in a value increase of Rp 10,500/kg or 70%. This research aims to determine the supply and sales growth of spine-free Omega-3 milkfish and their impact on future profitability. The findings reveal that CV.Dinar Bali successfully meets the market demand for spine-free Omega-3 milkfish, with sales having a significant influence on profitability, indicating prospective opportunities for future development.*

**Key words:** Bonless milkfish, production volume, processing technique, floating net cages, market prospects.

### **INTRODUCTION**

One of the reliable sectors for national economic growth is the fisheries sector. Its growth continues to show positive numbers and surpasses the growth of other sectors in Indonesia (Anwarudin et al., 2023; Mastuti et al., 2022). With the projected population reaching 240 million people by 2010, it is recommended by the National Food Security Agency that fish consumption will reach 25 kg per capita per year. Milkfish, with a production volume of over 158,321 tons in 1989, is one of the commodities that play a significant role in meeting fish consumption in Indonesia (Oktopura et al., 2020; Tran et al., 2017). Milkfish is a high-nutrition fish consumed domestically with high demand

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(Arisa et al., 2020). Its distribution areas include the waters of the East Coast of Sumatra, North Java, Kalimantan, Sulawesi, Maluku, Papua, and Nusa Tenggara, including Bali (Berawi et al., 2017). Milkfish farming, as a coastal marine commodity, has been practiced since 1400 in brackish water ponds in Java (Rimmer et al., 2013). The advancing processing technology of milkfish has stimulated the development of milkfish farming (Kasmi et al., 2023; Primyastanto, 2014). Milkfish presto, for example, is a popular processed ready-to-eat product enjoyed by Indonesians and has even entered foreign markets (Julianti, 2014; Winarsih et al., 2011). Although milkfish has a high consumption preference in some areas, its consumption preference is significantly low in other regions due to its many bones. Therefore, the role of processing that can create bone-free milkfish for comfortable consumption becomes essential.

Among various forms of milkfish processing such as milkfish fillet, milkfish presto, smoked milkfish, and milkfish satay, they have penetrated supermarket chains and other franchises. Additionally, the development of processed milkfish products can be done by deboning the fish, known as Spine-Free Milkfish, which is rich in Omega-3 nutrition (Andi Abriana, 2017). This production comes from aquaculture in floating net cages (KJA) within the company's coastal concession area. Compared to milkfish presto (soft-boned), Spine-Free Milkfish (with bones removed through special treatment) has a promising market development prospect in the context of marine fisheries agro-industry (Asriany et al., 2018). It can achieve a value-added gain of 75%, increasing the price from Rp. 15,000/kg for whole fresh milkfish to Rp. 27,500/kg for bone-free fresh milkfish, with processing costs of Rp. 2,000/kg. This represents an increase in value-added of Rp. 10,500/kg or 70%.

Based on the aforementioned background, the research problem is formulated as follows:

In some regions, consumers of milkfish, particularly in Java, with middle to upper-income levels, have a high preference for consumption. However, due to the abundant bones in milkfish, one of the processed products, known as milkfish presto, which is produced from pond aquaculture, has been able to increase the consumption preference for processed milkfish. However, consumers generally consider the price of milkfish presto to be relatively high. One form of milkfish processing with potential for future development is spine-free milkfish, which is produced through KJA (floating net cages) aquaculture.

One aspect of the spine-free Omega-3 milkfish agribusiness that needs to be studied is the marketing aspect since the spine-free Omega-3 milkfish commodity has not

been widely pursued by entrepreneurs, with CV.Dinar being the only company producing this commodity.

1. Based on the above considerations, the main research problems in this study are formulated as follows:
2. The extent to which the supply of spine-free Omega-3 milkfish meets the market demand.

The impact of the sales growth of spine-free Omega-3 milkfish on the company's future profitability.

## **LITERATURE ANALYSIS AND METHODOLOGY**

### **Research Area and Timeframe**

This research was conducted in Singaraja, Bali, specifically at CV.Dinar. The selection of this location was based on the consideration that CV.Dinar is one of the emerging fisheries industries. The research was carried out from December 2022 to February 2023.

### **Data Types and Sources**

The data required for this research consist of:

1. Primary Data, which were obtained directly in the field through observation and interviews with respondents. The types of data collected were:
  - a. Company Profit/Loss Data
  - b. Sales Data of Spine-free Omega-3 Milkfish at Distributors
  - c. Production Data of Spine-free Omega-3 Milkfish
2. Secondary Data, which were obtained from offices or companies closely related to the required primary data.

### **Data Collection Technique**

Data collection was conducted through a survey method with the aim of gathering the necessary secondary data, supplemented with existing questionnaires.

### **Analysis Method**

Based on the research hypotheses, hypothesis testing was conducted as follows:

- a. Hypothesis Testing (1). To determine the demand of distributors for spine-free Omega-3 milkfish in meeting market needs, descriptive analysis was used. This analysis is a technique that presents the research data in tabular form.

- d. Hypothesis Testing (2). To determine the impact of sales on the level of profitability, regression analysis was employed (Chatterjee & Hadi, 2006)."

$$Y = a + bX$$

Where

Y = Profit

a, b = Regression coefficients

X = Sales

Furthermore, the method used to estimate the model is based on the principle of minimizing errors. Therefore, the accuracy of the estimation is determined by the standard error. The standard error is formulated as follows:

$$Se = \sqrt{\frac{\sum Y^2 - a \sum Y - b \sum XY}{n - 2}}$$

Meanwhile, to test the hypothesis whether the sales growth of spine-free Omega-3 milkfish affects the company's profitability, the t-distribution test is used, as follows:

$$t_{hit} = \frac{b}{Sb}$$

Where:

b = slope of the regression line.

$$Sb = Se \sqrt{\frac{1}{\sum x^2 - [\sum x^2/n]}}$$

where:

Se = standard error of estimation.

## RESEARCH AND RESULTS

### Prospects Of Spine-Free Omega-3 Milkfish Development

While milkfish is highly popular among consumers in several regions, there are also areas where people are hesitant to consume it due to its abundant thorns. This has led to a shift in consumer preference towards other fish species. Therefore, the role of milkfish processing carried out by CV. Dinar in providing a comfortable and thorn-free consumption experience becomes crucial.

In the Philippines, one milkfish producer can produce fresh milkfish at a rate of 50 tons per week, with a harvest size of 3 fish/kg after a 175-day rearing period (Saparinto, 2014). They employ around 300 workers per day for processing spine-free milkfish, with

a productivity rate of 50-100 fish/day (depending on expertise), and the processing cost is 6 pesos per fish. Their products are exported to Bahrain, Hong Kong, Japan, Los Angeles, San Francisco, and New York.

The market for spine-free Omega-3 milkfish products from CV. Dinar is currently limited to Bali, Jakarta, and Bogor. The Jakarta market alone requires approximately 150-300 kg per week. Apart from being boneless and convenient for consumption, this processed fish product is rich in Omega-3, which can help alleviate conditions related to narrowed blood vessels and bones. Additionally, DHA plays a vital role in the brain development of children, making it highly beneficial for their growth and development. Karyadi (1995) emphasized that DHA contributes to the formation of 14 million brain cells (70% of brain mass consists of fat) during the critical period before birth and up to 18 months of a child's growth. Therefore, it is crucial to ensure that both the mother and infant receive adequate nutrition, including essential omega-3 and omega-6 fatty acids, during this critical period.

The development of spine-free Omega-3 milkfish products can create an integrated agribusiness venture that encompasses activities such as breeding, nursery operations, cultivation, post-harvest, processing, marketing, and distribution. This comprehensive supply chain can provide significant marketing margins and multiple benefits, aligning with consumer preferences in terms of quality, cost, delivery, and service (QCDS).

### **Demand Analysis Of Spine-Free Omega-3 Milkfish**

The analysis of demand for spine-free Omega-3 milkfish at CV. Dinar, Bali is one way to assess the equilibrium between the supply and demand of spine-free Omega-3 milkfish.

According to the law of demand, consumers act rationally by increasing their purchases when prices decrease and reducing their purchases when prices increase. On the other hand, according to the law of supply, producers act rationally by increasing their sales when prices rise and decreasing their sales when prices fall.

Based on these principles, in order for buying and selling to occur in the market, producers will strive to maintain profitable prices, while consumers desire prices that do not disadvantage them. The analysis of demand for spine-free Omega-3 milkfish is presented as follows:

**Table 1: Quantity of Supply and Demand for Spine-Free Omega-3 Milkfish, 2003.**

| Month     | Supply (Kg) | Demand (Kg) | Supply-Demand Ratio ( % ) | Excess Supply |       | Excess Demand |   |
|-----------|-------------|-------------|---------------------------|---------------|-------|---------------|---|
|           |             |             |                           | kg            | %     | kg            | % |
| January   | 155.04      | 110.85      | 1.40                      | 44.19         | 39.86 |               |   |
| February  | 200.90      | 195.10      | 1.03                      | 5.80          | 2.97  |               |   |
| March     | 206.15      | 196.70      | 1.05                      | 9.45          | 4.80  |               |   |
| April     | 377.15      | 220.95      | 1.71                      |               |       |               |   |
| May       | 347.22      | 337.45      | 1.03                      |               |       |               |   |
| June      | 351.62      | 340.40      | 1.03                      |               |       |               |   |
| July      | 469.01      | 344.95      | 1.36                      |               |       |               |   |
| August    | 446.34      | 349.31      | 1.28                      |               |       |               |   |
| September | 367.05      | 356.62      | 1.29                      |               |       |               |   |
| October   | 229.34      | 366.25      | 0.63                      |               |       |               |   |
| November  | 420.91      | 499.40      | 0.84                      |               |       |               |   |
| December  | 659.98      | 682.31      | 0.97                      |               |       |               |   |
| Total     | 4,230.71    | 4,000.28    | 13.62                     |               |       |               |   |
| Average   | 352.56      | 333.36      | 1.135                     |               |       |               |   |

Source: CV. Dinar Singaraja-Bali, 2003

The above Table 3 shows that the demand for Spine-Free Omega-3 Milkfish at CV. Dinar, Bali experienced an increase every month. Throughout the year 2003, the average supply per month was 352.56 kg, while the average demand for Spine-Free Omega-3 Milkfish was 333.36 kg, or approximately 1.135%.

Looking at the comparison between the supply and demand quantities during 2003, in January, the supply-demand ratio was 1.40%, while in February, May, and June, it was 1.03%, with respective supplies of 200.90 kg, 195.10 kg, and 347.22 kg, and respective demands of 337.22 kg, 351.62 kg, and 340.40 kg.

The highest supply-demand ratio occurred in April, reaching 1.715%, while the lowest ratio occurred in December, amounting to 0.97%. Although the supply quantities in October, November, and December 2003 were smaller than the demand for Spine-Free Omega-3 Milkfish, with ratios of 0.63%, 0.84%, and 0.975%, respectively, the average supply-demand ratio for the year 2003 was significant at 1.135%. This indicates that the demand for Spine-Free Omega-3 Milkfish during 2003 was able to meet the market needs.

**Realization And Analysis Of Sales, Operating Expenses, And Profit Increase In 2003****1. Sales Realization, Operating Expenses, and Profit Acquisition.**

Sales realization refers to the income received by the seller from the payment for goods purchased by consumers. Profit is determined by calculating and comparing the total sales revenue with the total expenses. Profit is the difference between the total sales revenue obtained and the total expenses incurred. Profit reaches its maximum when the difference between the two is maximized. When analyzing a company's business to maximize its profit, two factors should be considered: the production costs incurred by the company and the sales revenue from the goods produced by the company.

For the purpose of analyzing the marketing development of Spine-Free Omega-3 Milkfish at CV. Dinar, Bali, the total sales realization and total operating expenses incurred by the company are presented in the following table.

**Table 2: Sales Realization of Spine-Free Omega-3 Milkfish, Operating Expenses, and Profit Acquisition, 2003, Spine-Free Omega-3 Milkfish at CV. DINAR, 2003**

| Month     | Total Sales (Rp) | Total Operating Expenses (Rp) | Profit (Rp) |
|-----------|------------------|-------------------------------|-------------|
| January   | 3,048,375        | 2,190,562                     | 857,813     |
| February  | 5,365,250        | 3,855,469                     | 1,509,781   |
| March     | 5,409,250        | 3,887,087                     | 1,522,163   |
| April     | 6,076,125        | 4,366,303                     | 1,709,822   |
| May       | 9,279,875        | 6,668,518                     | 2,611,357   |
| June      | 9,361,000        | 6,726,815                     | 2,634,185   |
| July      | 9,486,125        | 6,816,729                     | 2,669,396   |
| August    | 9,606,025        | 6,902,890                     | 2,703,135   |
| September | 9,807,050        | 7,047,346                     | 2,759,704   |
| October   | 10,071,875       | 7,237,649                     | 2,834,226   |
| November  | 13,733,500       | 9,868,893                     | 3,864,607   |
| December  | 18,763,250       | 13,483,271                    | 5,279,979   |
| Total     | 110,007,700      | 79,051,532                    | 30,956,168  |

Source: CV. Dinar, Singaraja - Bali, 2003

From Table 4 presented above, it can be observed that the sales of Spine-Free Omega-3 Milkfish experienced an increase during the year 2003, amounting to Rp.

110,007,700. However, this increase was not significant due to the substantial operating expenses of Rp. 79,051,532, resulting in a total profit/gain of only Rp. 30,956,168.

## 2. Regression Analysis: Sales Increase of Spine-Free Omega-3 Milkfish and Profit Acquisition

The business prospects of a venture are always based on the demand for its products. The magnitude of demand serves as a determinant of the selling price and also sets the limits for potential production growth.

**Table 3. Regression Calculation of Sales Increase of Spine-Free Omega-3 Milkfish and Profit Acquisition, 2004-2008, CV. DINAR**

| Year    | Estimated Total Sales<br>(Rp million)<br>(X) | Profit Expectation<br>(Rp million)<br>(Y) | (XY)   | (X <sup>2</sup> ) | (Y <sup>2</sup> ) |
|---------|----------------------------------------------|-------------------------------------------|--------|-------------------|-------------------|
| 2004    | 125                                          | 37.4                                      | 4,675  | 15,625            | 1,399             |
| 2005    | 150                                          | 43.8                                      | 6,570  | 22,500            | 1,918             |
| 2006    | 175                                          | 50.2                                      | 8,785  | 30,625            | 2,520             |
| 2007    | 200                                          | 56.6                                      | 11,320 | 40,000            | 3,204             |
| 2008    | 225                                          | 63                                        | 14,175 | 50,625            | 3,969             |
| Total   | 875                                          | 251                                       | 45,525 | 159,375           | 13,010            |
| Average | 175                                          | 50.2                                      | 9,105  | 31,875            | 2,602             |

Source: Compiled from Table 3

Based on the data calculated in Table 5 above, to test the hypothesis - whether the growth of Spine-Free Omega-3 Milkfish sales affects the company's profit level, we start by finding the coefficients b and a. Thus, the regression equation is obtained as follows:

$$Y = 5,4 + 0,256X$$

Since t-value (77.5758) > t-critical (2.3534),  $H_0$  is rejected. This means that there is a significant (95%) relationship between the sales variable and the profit earnings, indicating that the projected sales of Spine-Free Omega-3 Milkfish are increasing. Thus, it can be said that the Spine-Free Omega-3 Milkfish product of CV.Dinar Bali has business opportunities for development and can generate greater profits for the company.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

Based on the research findings, the following conclusions can be drawn:

1. The supply of Spine-Free Omega-3 Milkfish conducted by CV.Dinar Bali can meet the market demand in 2003, with an average demand of 333.36 kg and an average supply of 352.56 kg.
2. Based on the analysis and hypothesis testing, it is proven that the sales of Spine-Free Omega-3 Milkfish affect the company's profit earnings, indicating that the Spine-Free Omega-3 Milkfish fishery business of CV.Dinar Bali has prospects for future development.

### Recommendations

Based on the conclusions, the following research recommendations are suggested:

1. To increase the sales of Spine-Free Omega-3 Milkfish, it is advisable to develop promotional strategies aimed at attracting consumer interest and loyalty to the product by highlighting the various advantages of Spine-Free Omega-3 Milkfish.
2. To increase the company's profit earnings, it is recommended to reduce the operational production costs, such as replacing expensive artificial feed with natural feed alternatives.

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