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# Profitability Analysis of Beef Cattle Fattening Businesses

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**Abstract**. This research aimed to investigate the profitability of beef cattle fattening businesses in Balikpapan City, Indonesia. To determine the research location, a thorough survey was conducted, and 40 farmers were selected as respondents using a purposive sampling method. The inclusion criteria were ownership of at least 2 beef cattle with a rearing period of over 1 year, engagement in fattening businesses, and proximity to the research area. The data obtained were analyzed through a series of tabulation, correction, and evaluation using profitability analysis which included Net Profit Margin (NPM) and Gross Profit Margin (GPM). Profitability analysis showed that NPM was 54.72% and GPM was 67.33%. Based on the results, it was concluded that beef cattle fattening businesses in the North Balikpapan Sub-district were economically viable and had the potential for sustainable development.

**Keywords**. Profitability, Net Profit Margin, Gross Profit Margin, Cattle Fattening.

## 1. Introduction

Beef cattle businesses are crucial livestock sectors providing meat in Indonesia, significantly contributing to local economic and social development over the past decade [1-5], the population of beef cattle in the country reached 18,610,148 heads[6] with an average growth rate of 3.52%/year[7] and 1,343 heads in East Kalimantan Province, particularly Balikpapan City[8]. The livestock sectors have experienced dynamic changes due to the rapid demand for meat and processed products[9-11]. These changes are caused by population growth, improved nutritional awareness, increased community welfare, rising income, the expansion of the meat processing industry, and the expansionary mode of the national economy[12-14]. Beef cattle contribute to welfare through various avenues, firstly by generating income and in-kind revenue from the sale of live cattle and processed products[3],[15]. Secondly, it serves as an investment and security because livestock sales provide an immediate cash inflow to address unforeseen financial instability, and thirdly livestock ownership can be used as collateral for legal loans (credits)[15]. Consequently, ensuring the sustainability of businesses is an essential target farmers should actively pursue.

The maximization of profit is the main objective of every beef cattle fattening business for long-term and sustainable performance. Profitability is the ability to generate profit and is crucial for the

BUSINESS & MANAGEMENT

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continuity of businesses. Furthermore, it is an essential parameter for the effectiveness of businesses that yield dividends (profit-oriented beef cattle fattening businesses). The significant impact of profit significantly influences future achievements of businesses, such as economic and social development, technology, employment opportunities, and technical progress[15]. In the context of a free-market economy, beef cattle fattening businesses should strive to maximize profit to excel and thrive. These businesses often face challenges in achieving expected profit due to increasing competition and inefficiencies. Consequently, profitability analysis is required to understand the financial performance of businesses, specifically in the North Balikpapan Sub-district, Balikpapan City, East Kalimantan Province.

## 2. Methodology

This research was conducted in the North Balikpapan Sub-district, Balikpapan City, East Kalimantan Province, from December 2022 to January 2023, using a survey method through purposive sampling. The survey location was intentionally selected due to the presence of beef cattle farmers meeting the criteria as respondents. Based on the inclusion criteria, 40 farmers were selected as respondents by considering ownership of at least 2 beef cattle with a rearing period of over 1 year. Primary data were obtained through structured interviews using questionnaires. Meanwhile, secondary data was collected from the Department of Livestock, Sub-district Office, Central Statistics Agency, and literature review, books, articles, and journals with information closely related to the research. The data obtained were analyzed through a series of tabulations, corrections, and evaluations using profitability analysis. This included Net Profit Margin (NPM) and Gross Profit Margin (GPM) to determine the profitability of beef cattle fattening businesses.

2.1 Income

Income is the difference between revenue and total cost incurred in a specific period. Furthermore, it is obtained by subtracting production cost from the total revenue of beef cattle fattening businesses and expressed in IDR/yr[16-17] as calculated using the following formula:

$$I = TR - TC \quad (1)$$

Description:

I : Income

TR : Total revenue

TC : Total cost

### 2.2 Net Profit Margin

Net Profit Margin can be calculated using the following formula [18]:

$$NPM = \frac{Net\ Profit}{Sales} \times 100\% \quad (2)$$

2.3 Gross Profit Margin

Gross Profit Margin can be calculated using the following formula [18-19]:

$$GPM = \frac{Gross\ Profit}{Sales} \times 100\% \quad (3)$$

## 3. Results and Discussion

### 3.1 Characteristics of North Balikpapan Sub-district

North Balikpapan is a sub-district in Balikpapan City, East Kalimantan Province, situated astronomically between 1.20'-1.22' South Latitude and 116.8'-117' East Longitude, covering an area of 138.24 km$^2$. This sub-district is divided into 6 villages, namely Rapak, Batu Ampar, Gunung Samarinda, Gunung Samarinda Baru, Graha Indah, and Karang Joang. The topography is relatively flat with some hilly areas, characterized by a tropical climate with rainfall in the year. The population in the North Balikpapan Sub-district reaches 183,444 individuals, consisting of 93,555 males and 89,889 females[20]. The total population working as farmers is 2,094 individuals, showing favorable prospects for farming business development. Furthermore, the livestock population in 2023 reached 1,721,816

BUSINESS & MANAGEMENT

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heads, distributed across 3 categories, including ruminants (cattle, buffalo, goats, and sheep), poultry (chickens and ducks), and monogastric animals (horses and pigs).

**Table 1.** Livestock Population

| No. | Livestock Types | Number (heads) |
|---|---|---|
| 1. | Beef cattle | 369 |
| 2. | Buffalo | 3 |
| 3. | Horses | 30 |
| 4. | Goats | 260 |
| 5. | Sheep | 65 |
| 6. | Pigs | 312 |
| 7. | Native chickens | 15,916 |
| 8. | Layer chickens | 106,900 |
| 19. | Broiler chickens | 120,000 |
| 10. | Ducks | 440 |
| | Total | 1,721,816 |

Source:[20] ᶜCentral Statistics Agency, 2023.

### 3.2 Characteristics of Respondents

Respondents are farmers engaged in beef cattle fattening businesses in North Balikpapan Sub-district, as sole owners or through profit-sharing arrangements (*gaduhan*). Furthermore, the socio-economic characteristics, that were used as research data sources, included age, education level, farming experience, and the number of family members, as shown in Table 2.

**Table 2.** Socio-Economic Characteristics of Respondents

| Socio-Economic Characteristics | Frequency (Individuals) | Percentage (%) |
|---|---|---|
| **Age (Years)** | | |
| 15-64 | 33 | 82.5 |
| >64 | 7 | 17.5 |
| **Education Level** | | |
| No school | 4 | 10.0 |
| Elementary School | 19 | 47.5 |
| Junior High School | 7 | 17.5 |
| Senior High School | 8 | 20.0 |
| University | 2 | 5.0 |
| **Farming Experience (Years)** | | |
| 2-11 | 31 | 77.5 |
| 12-21 | 7 | 17.5 |
| 22-31 | 2 | 5.0 |
| **Number of Family Members (Individuals)** | | |
| 1-3 | 15 | 37.5 |
| 4-6 | 22 | 55.0 |
| >6 | 3 | 7.5 |

On average, the majority of respondents 33 (82%) fall in the age range of 15-64 years, as shown in Table 2. This age range shows that respondents are in productive working years and capable of effectively running businesses to achieve profit[15],[21]. Furthermore, there is potential for empowerment in developing businesses, as age influences capabilities, work ethic, decision-making skills[212-23], understanding, and adoption of the latest innovations and technologies in the livestock sectors[24-25]. Based on the results, the majority of respondents, comprising 19 (47.5%) have a relatively low level of formal education, completing only Elementary School. However, this is balanced by extensive farming experience ranging from 2 to 31 years, showing that beef cattle fattening businesses continue to operate successfully and generate profit. The results suggest that formal education level is not a primary measure of success in farming businesses. Furthermore, it does not hinder farmers

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from gaining valuable experience through hands-on activities such as rearing and cultivating livestock or learning from others[26].

The majority of respondents 31 (77.5%) have farming experience ranging from 2 to 11 years. Farming experience correlates with the success of operating the businesses, indirectly influencing decision-making accuracy, specifically in the production process[16],[22]. Farmers with extensive experience tend to quickly analyze situations, apply innovations, and make prompt decisions to address and provide solutions to arising issues[27]. This experience makes farmers more independent and skillful in managing businesses to achieve optimal production[23],[28].

Optimal production in beef cattle fattening businesses can be pursued through the effective performance of human resources, such as labor. In smallholder farming businesses, labor is synonymous with the involvement of family members, including wives, children, siblings, and inlaws. The majority of respondents 22 (55%) have 4 to 6 family members, as this number directly influences the availability of labor[27]. Therefore, it is expected that greater involvement of family members in beef cattle fattening businesses correlates with lower labor costs, higher productivity, and maximum profit.

### 3.3 Characteristics of Beef Cattle Fattening Businesses

Beef cattle fattening businesses in North Balikpapan mainly include a fattening program with a rearing period ranging from 3 to 9 months, with medium-term fattening[29].

The majority of respondents 33 (82.5%) engage in beef cattle fattening as the main business with an ownership scale ranging from 1 to 10 heads, as shown in Table 3. Cattle breeds reared include Bali cattle, Simmental, Limousin, Brahman, and Ongole Grade. The feed provided consists of forage, concentrate, and supplementary feed such as bran, green bean skin, soybean skin, cassava skin, banana skin, and salt, with a feeding frequency of 2-3 times a day. However, the feeding is performed traditionally, without considering the nutritional content and beef cattle requirement.

The applied management includes intensive (95.0%) and semi-intensive (5%) systems. Intensive rearing is the continuous confinement of cattle in pens and all feed needs are provided by farmers. Meanwhile, the semi-intensive system is the grazing of cattle during the day in the pasture to search for forage) and penning back at night. The majority of pen constructions are made using simple materials usually wood or bamboo with a zinc roof, a semi-permanent structure, while some farmers use cement for walls and floors, with asbestos for the roof.

**Table 3.** Characteristics of Beef Cattle Fattening Businesses

| Business Pattern | Frequency (Individuals) | Percentage (%) |
|---|---|---|
| **Beef Cattle Ownership Scale (heads)** | | |
| 1-10 | 30 | 75.0 |
| 11-20 | 5 | 12.5 |
| 21-30 | 4 | 10.0 |
| >30 | 1 | 2.5 |
| **Business Status** | | |
| Main Business | 33 | 82.5 |
| Side Business | 7 | 17.5 |
| **Rearing Management** | | |
| Intensive | 38 | 95 |
| Semi-Intensive | 5 | 5 |

### 3.4 Cash Flow of Beef Cattle Fattening Businesses

Table 4 shows the average production cost, revenue, and income, as the main components in determining profitability of beef cattle fattening businesses in North Balikpapan.

**Table 4.** Average Production Cost, Revenue, and Income of Beef Cattle Fattening Businesses

| Description | Total (IDR/yr) |
|---|---|
| **Production cost** | |
| **Fixed cost** | |
| Pens depreciation | 5,527,851 |

*Technium Business and Management (TBM)*
*Vol. 8, pp.25-33 (2024)*
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*www.techniumscience.com*

| | | |
|---|---|---|
| Equipment depreciation | 1,245,987 | |
| **Variable Cost** | | |
| Seed | 16,759,582 | |
| Feed | 159,295,200 | |
| Labor | 29,351,912 | |
| Medicine | 3,506,000 | |
| Electricity and water | 645,000 | |
| **Total Production Cost** | | 216,331,532 |
| **Revenue** | | |
| Cattle sales | 592,387,500 | |
| Feces (fertilizer) sales | 207,562,500 | |
| **Total Revenue** | | 799,950,000 |
| **Income** | | 583,618,468 |
| Tax 25% | | 145,904,617 |
| **Net Income** | | 437,713,851 |

The production cost components in beef cattle fattening businesses include expenses related to building pens, buying equipment, purchasing seed, feed, labor, medicine, water, and electricity. This cost is further categorized into variable and fixed, consisting of pens and equipment depreciation. Depreciation cost is calculated based on the average decrease in value using the straight-line method with the purchase price divided by the period of use in units of time (economic life). As shown in Table 3, the average distribution of fixed cost incurred by farmers is calculated through the average use of production cost during 1 year of rearing, reaching IDR 5,527,851/year. The equipment used to support businesses includes a shovel, sickle, hoe, bucket, drum, hose, scratcher, broom, plow, tank, grass sprayer, water pump, grass cutter, and chopper machine (livestock feed chopper). The average depreciation cost of pen equipment is IDR 1,245,987/year, which is calculated based on the benefit value or useful life for 1 year.

The variable cost components consist of seed, feed, labor, medicine, water, and electricity costs. The distribution of variable costs incurred by farmers is calculated from the average use of production costs for 1 year. Meanwhile, seed cost is the expense incurred by farmers to purchase beef cattle seeds. Based on the analysis, the average acquisition cost regarding the seeds of beef cattle fattening businesses is approximately IDR 16,759,582/head. The interviews with respondents show an increase in seed prices compared to the previous year, attributed to limited availability in the region as well as the impact of foot and mouth disease (FMD) causing cattle death.

Feed cost constitutes the highest operational expenditure (80% of the total variable cost), covering forage, concentrate, supplementary feed, and fuel for vehicles. Based on calculations, the average total feed cost is IDR 159,295,200/year, with an approximate provision of 208,080 kg/farmer/year, or an average of 10,817 kg/head/year. This provision is made in fresh form without considering the dry matter content and the body weight of beef cattle. This cost can be reduced by formulating high-nutrient feed based on cheap, abundantly available local ingredients, thereby assisting in improving the performance of beef cattle fattening[2][30]. Labor cost is calculated based on the prevailing wage in the research location, which is IDR 12,993/hour. The average labor cost for beef cattle fattening businesses is IDR 29,351,912/year, which is attributed to the average work time of 4 hours/day spent on feed searching. In comparison, labor costs are lower because beef cattle fattening businesses use labor in feed provision, particularly in obtaining forage.

The average medicine cost for beef cattle fattening businesses is IDR 3,506,000/year. Generally, medicines are provided by animal health officers, but some farmers independently procure the medicinal needs. In this research, respondents often engage in the services of veterinarians, and animal health officers, including extension workers for treatment, vitamin administration, etc. The cost incurred by farmers depends on the expenses for medicinal needs, veterinarians, animal health officers, and extension workers. The average cost of electricity and water is IDR 645,000/year. Water is essential for drinking, bathing cattle, cleaning pens, and the surrounding environment comes from various sources,

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*www.techniumscience.com*

including wells, rivers, ponds, and rainwater. Electricity is used for lighting pens through lamps and machines to channel water from the source to the pen.

The revenue of beef cattle fattening businesses in North Balikpapan Sub-district is obtained from the sales of beef cattle and the processed feces are turned into fertilizer with a total of IDR 799,950,000/year. The average production cost is IDR 216,331,532/year, resulting in an income of IDR 538,618,468/year, and net income after a 25% income tax, of IDR 473,713,851/year.

### 3.5 Profitability Analysis

Profitability is crucial for the long-term sustainability of businesses. Consequently, continual efforts should be directed toward its improvement, as higher profitability ensures the longevity of businesses[31]. Achieved profitability reflects the effective use of resources[15] due to the influence of various factors such as labor[32], cattle breeds[33], feed quality related to weight gain[2], and medicine cost[34]. According to[2], profitability increases with decreasing variable costs, particularly feed, labor, and medicine, with a high number of fattened cattle. Furthermore, profitability is the primary objective of any business, including beef cattle fattening, and is determined by calculating gross and net profit margins with operational efficiency[15]. Farmers have the opportunity to achieve high profits by maximizing resources and adopting innovation, and technology in businesses. In this research, profitability analysis of beef cattle is conducted using several ratio calculations, including NPM and GPM[19], resulting in a 25% income tax rate[35].

Net profit margin is a ratio used to measure the ability of businesses to obtain net profit at a certain sales level[36-37]. Furthermore, it is a measure of business profitability from sales after considering all costs, revenue, and tax[38]. Based on calculations, the NPM value for beef cattle fattening businesses is 54.72%, as shown in Table 5. This value shows a high percentage of profit obtained by businesses, including in the high profitability category. A high NPM value shows a good capability to generate net profit [38-39].

**Table 5.** Profitability Analysis of Beef Cattle Fattening Businesses

| Analysis Type | Value (%) |
|---|---|
| Net Profit Margin | 54.72 |
| Gross Profit Margin | 67.33 |

Gross profit margin is the ability of businesses to generate profit to cover fixed costs and other operating expenses[34][37]. The GPM ratio is a comparison between the gross profit obtained and the level of sales achieved[40]. Based on the calculations, the GPM value for beef cattle fattening businesses is 67.33%. This value shows the percentage of net profit after tax obtained by these businesses, including those in the high profitability category. A higher ratio shows that businesses are performing well, and the ability to generate profits is increasing[36][39].

## 4. Conclusion

In conclusion, this research showed the crucial role of profitability in determining the long-term sustainability of businesses. Based on the results, beef cattle fattening businesses in the North Balikpapan Sub-district had a net income of IDR 473,713,851/month. Profitability based on NPM and GPM was 54.72% and 67.33%, respectively, showing that these businesses were viable for further development. The results showed a significant potential for enhancing profitability by effectively managing existing resources, specifically in improving feed quality and minimizing healthcare costs.

BUSINESS & MANAGEMENT

*Technium Business and Management (TBM)*
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