

Financial feasibility analysis of beef cattle fattening business in Balikpapan City

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Abstract

The objective of this research was to determine the financial feasibility of the beef cattle fattening business in Balikpapan City. The research was carried out by using a survey method in the North Balikpapan Sub-district of Balikpapan City. The respondents were determined based on purposive sampling and 40 respondents by considering the beef cattle ownership which has at least two heads of beef cattle with more than a one-year rearing period. Financial feasibility analysis used Break Event Point (BEP), Net Present Value (NPV), Benefit Cost Ratio (B/C Ratio), Internal Rate of Return (IRR), and Payback Period (PP). Based on the calculation, the BEP was IDR9.676.911; NPV(9.15%): IDR 1.017.779.514; NPV(14.15%): IDR952.403.118; B/C Ratio 2.7; IRR 87% and PP 0.37 year. According to the results, it could be concluded that the beef cattle business in the North Balikpapan Sub-district, Balikpapan City was feasible.

Key words: Financial feasibility; fattening; beef cattle; business

INTRODUCTION

Beef cattle is a potential commodity to be developed (Mayulu et al., 2010; Ayalew et al., 2018) on a large scale and business-oriented, thus giving benefit for local economic and social development (Liu et al., 2023). In fact, the beef cattle development policy in Indonesia is still oriented towards the community farming pattern (Mayulu et al., 2020), which is characterized by a relatively small business scale, acting as a side business (Sahala et al., 2016), not business-oriented, using simple technology, and family-based which results in low productivity and un-uniform products. Such conditions cause weak positioning value of the business and are likely to change very easily so its business development requires external support including capital, market creation, institutional system, and technology input (Mayulu, 2015). The dynamics that occur in the beef cattle business do not reduce the enthusiasm of animal husbandry farmers to continue developing their businesses.

The prospect of beef cattle business in the North Balikpapan Sub-district of Balikpapan City is quite big in line with the increasing trend of society in consuming processed meat, considering that beef cattle is the largest animal protein source which is very much needed by people (Mayulu et al., 2023). The beef cattle business especially in the fattening program needs big investments, thus it is necessary to carry out the investment feasibility of the business. The feasibility of the beef cattle fattening program can be determined through financial feasibility with parameters of Break Event Point (BEP), Net Present Value (NPV), Benefit Cost Ratio (B/C Ratio), Internal Rate of Return (IRR), and Payback Period (PP) (Zulfanita et al., 2009; Handayani et al., 2021). Business sustainability is a must; thus, this research was to determine the financial feasibility of the beef cattle fattening business in the North Balikpapan Sub-district of Balikpapan City.

METHOD

The research was conducted from December 2022 to January 2023 in Balikpapan City through a survey method with a purposive sampling approach. The survey location was designed to be carried out in the North Balikpapan Sub-District with criteria having farmers who reared beef cattle. The total respondents were 40 beef cattle farmers with criteria having at least two heads of beef cattle with a minimum maintenance (rearing) period was 1 year.

The primary data source was obtained from a structured interview using a questionnaire. Secondary data sources were obtained from the Animal Husbandry Agency, books, articles, and associated journals that related to the research. Data analysis on determining the feasibility of beef cattle fattening business in Balikpapan City used tables, correction, evaluation, and analysis by using financial analysis such as Break Event Point (BEP), Net Present Value (NPV), Benefit Cost Ratio (B/C Ratio), Internal Rate of Return (IRR) and Payback Period (PP).

Break Even Point

Break Even Point (BEP) is divided into two forms, i.e.: BEP on an IDR basis (based on price) (Husnan and Muhammad, 2005; Murti et al., 2021) and on a unit basis (based on production). Break Even Point can be calculated by using the following equation (Gray et al., 2005; Soekardono, 2009):

BEP on an IDR basis

$$\text{BEP (IDR)} = \frac{\text{fix cost}}{1 - \frac{\text{total variable cost}}{\text{total sales}}}$$

BEP on a unit basis (heads of cattle)

$$\text{BEP (unit)} = \frac{\text{fix cost}}{\text{price per unit} - \text{variable cost per unit}}$$

Net Present Value

Net Present Value is a method used to calculate an interest rate that equates the present value of an investment with the present value of net cash receipts in the future. Net Present Value can be calculated using the following formula (Soekardono, 2009; Sulyanto, 2010):

$$NPV = \sum_{t=1}^n \frac{Bt - Ct}{(1+i)^t}$$

Remarks:

Bt = benefit at time-t
 Ct = cost at time-t
 i = discount rate
 n = number of periods of time or economic life cycle

The investment acceptance criteria are:

Net Present Value > 0 = the investment can benefit farmers and be feasible
 Net Present Value < 0 = The investment is unable to benefit farmers and is not feasible

Benefit Cost Ratio

Benefit Cost Ratio is a comparison between the benefit value and the cost value, the BCR can be calculated using the following formula (Soekardono, 2009; Lestari et al., 2015; Handayanta et al., 2016; Sudarmono and Sugeng, 2017):

$$BCR = \frac{\text{total benefit}}{\text{total cost}}$$

$$BCR = \sum_{t=1}^n \frac{Bt(1+i)^t}{Ct(1+i)^t}$$

Remarks:

Bt = benefit at year-t
 Ct = cost at year-t
 i = discount rate
 n = number of periods of time or economic life cycle

The investment acceptance criteria based on BCR is:

BCR > 1 = the business is feasible (acceptable)
 BCR < 1 = the business is not feasible (rejected)
 BCR = 1 = capital return equals to cost incurred

Internal Rate of Return

Internal Rate of Return (IRR) is an interest rate that will make the NPV value = 0 or which can make BCR = 1. Internal Rate Return can be calculated using the following formula (Soekardono, 2009):

$$IRR = i' + \frac{NPV'}{NPV' - NPV''} (i'' - i')$$

Remarks:

i' = the highest discount rate
 i'' = the lowest discount rate
 NPV' = positive NPV
 NPV'' = negative NPV

The investment acceptance criteria based on IRR are:

IRR > current interest rate = feasible
 IRR < current interest rate = not feasible

Payback Period

Payback Period is a method used to calculate how long it takes to return the investment money from the annual cash inflow generated from the investment. The payback period can be calculated using the following formula (Suliyanto, 2010):

$$\text{Payback Period} = \frac{I}{ab}$$

Remark:

I = the investment amount
 ab = net benefit generated from the investment annually

The investment acceptance criteria based on PP are:

PP < = Feasible
 PP_{minimum}
 PP > = not feasible
 PP_{minimum}

RESULT AND DISCUSSION

The Characteristics of North Balikpapan Sub-district of Balikpapan City

North Balikpapan Sub-district is in Balikpapan City with an area of 138.24 km², divided into six villages (Rapak, Batu Ampar, Gunung Samarinda, Gunung Samarinda Baru, Graha Indah and Karang Joang) (Table 1) which consisted of population 175.440 people.

Table 1.
 Area of North Balikpapan Sub-district based on Villages

Village	Area (km ²)	Percentage (%)
Muara Rapak	3.53	2.67
Gunung Samarinda	2.70	2.04
Gunung Samarinda Baru	3.04	7.89
Batu Ampar	10.55	7.89
Graha Indah	19.25	14.57
Karang Joang	93.09	70.44
Total	132.17	100.00

The livestock population in North Balikpapan Sub-district in 2023 reached 1.721.816 heads (Table 2), which comprised of three commodities i.e., ruminants (cattle, buffalo, goat, sheep), poultry (chickens and ducks), and monogastric (horse and pigs).

Table 2.
 Livestock Population in North Balikpapan Sub-district

Commodity	Number (head)
Beef cattle	369
Buffalo	3
Horse	30
Goat	260
Sheep	65
Pig	312
Native chicken	15.916
Layer chicken	106.900
Broiler chicken	120.000
Duck	440
Total	1.721.816

The Characteristics of Respondents

The respondent in this research was the animal husbandry farmers who carried out beef cattle fattening business in the North Balikpapan Sub-district of Balikpapan City, either their own ownership or profit sharing (gaduhan). The characteristics of respondents covered: age, education level, and breeding experience (Table 3).

Table 3.
 Respondents Characteristic.

Characteristic	Number (n)	Percentage (%)
Age (Year)		
15-64	33	82.5
>64	7	17.5
Education Level		
No-school	4	10.0
Elementary school (SD)	19	47.5
Junior high school (SMP)	7	17.5
Senior high school (SLTA)	8	20.0
University	2	5.0
Rearing Experience (Year)		
2-11	31	77,5
12-21	7	17,5
22-31	2	5,0

The average age of respondents in North Balikpapan Sub-district, Balikpapan City, was in the productive age, range from 15-64 years, with 33 respondents or 82% (Table 3). Age that is classified as productive allows farmers to be able to run their businesses effectively (Otoluwa et al., 2016) and has the potential to be empowered in developing their business (Sahala et al., 2016) because age influences capability, and ability to work (work ethic), thinking, making decisions (Mayulu et al., 2020; Tyapradana and Azizah, 2022), understanding or adopting the latest innovations and technologies (Mayulu et al., 2023). The success of managing a business is also influenced by the level of education, and it indicates the quality of the animal husbandry farmers (Abdullah and Mustabi, 2020), because the higher level of formal education and knowledge, enables them to understand and manage their business better (Fauziyah et al., 2015). Based on the research results, it was obtained that most of the respondents had formal elementary school education, reaching 19 respondents (47.5%). The respondents' formal education was relatively low, but they had two to 31 years of rearing experience. This relatively low formal education can be compensated by years of rearing experience so that farmers can manage a beef cattle fattening business and able to generate income reaching IDR 583.618.468/year. This phenomenon indicates that the level of education is not the main standard for success in running a livestock business and does not become a constraint for farmers raising beef cattle because farmers are able to gain a lot of experience (as a form of learning) while maintaining and/or cultivating or learning from other people's experiences in raising livestock (Taek et al., 2021).

Respondents' experience in raising livestock provides knowledge and skills in running their business (Mayulu et al., 2020) as well as accuracy in decision-making in the production process (Sahala et al., 2016). Farmers who have longer breeding experience will be quicker in analyzing and implementing innovations as well as making farmers more independent and skilled in managing their business, making it easier to make decisions and being able to quickly identify problems that exist in their livestock business (Purnomo et al., 2017) including the use of source of capital so that optimal production can be achieved (Tyapradana and Azizah, 2022; Yusuf et al., 2021). Most respondents in North Balikpapan Sub-district, Balikpapan City (30 respondents or 75%) had 1-10 heads (Table 4) and this number was classified as a small-scale business. The number of beef cattle kept also determines the amount of income earned by the farmer. The more cattle kept, the higher the farmer's opportunity to earn greater income. Beef cattle ownership based on characteristics is presented in Illustration 1.

Table 4.
 Beef Cattle Ownership in North Balikpapan Sub-district

Number of Beef Cattle (head)	Respondent	Percentage (%)
1-10	30	75.0
11-20	5	12.5
21-30	4	10.0
> 30	1	2.5
Total	40	100.0

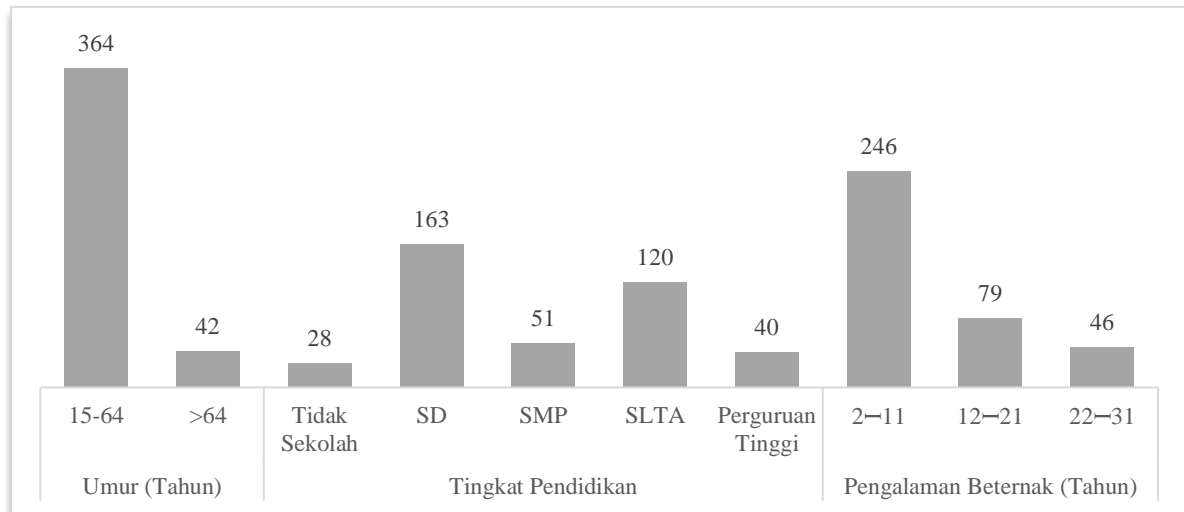


Figure 1.
 Number of Beef Cattle based on Farmers' Characteristics

The Characteristics of Beef Cattle Business

The beef cattle business in the North Balikpapan Sub-district was dominated by fattening. The cattle breeds kept include Balinese, Simmental, Limousin, Brahman, and Ongol cattle, with a fattening period (length of maintenance) was 3 to 9 months. The method for fattening beef cattle based on the length of fattening time was a medium fattening category, which is around 4-8 months (Mayulu, 2021). Feeding was carried out at an intensity of 2-3 times a day and the feed given was in the form of forage, concentrate, and other additional feeds (such as bran, green bean skin, soybean skin, cassava skin, banana skin, salt), but the feeding was done traditionally (not paying attention to nutritional content of feed and requirements of beef cattle).

The maintenance patterns were intensive (95.0%) and semi-intensive (5%). Intensive maintenance was carried out by keeping cattle continuously in a cage, all feed needs were provided by the farmers, and the cattle were kept in the cage almost all the time and were treated more regularly. Meanwhile, semi-intensive maintenance was carried out by allowing cows to be grazed freely on pasture during the day and at night the cattle were penned. Most of the cage construction was built using simple materials (generally made of wood or bamboo with a zinc roof) or semi-permanent and some farmers used cement-based materials for the cage walls and floors and asbestos for roofs.

Financial Feasibility Analysis for Beef Cattle Fattening in North Balikpapan Sub-district of Balikpapan City

Financial analysis in livestock businesses consists of projections of income and costs during the business period. This analysis was carried out to determine the figure of income, costs, ability to repay credit, and business feasibility conditions from a financial aspect (Mayulu, 2020) to determine the amount of investment costs, working capital, and the level of return on investment from the business being run. Analysis of the financial feasibility of beef cattle fattening businesses in the North Balikpapan Sub-district was carried out based on the BEP, BCR, PP, NPV, IRR, and PP criteria. The assumptions used in the financial analysis used a discount rate (current bank interest) of 9.15% and it was estimated that there would be an increase in interest rates, increasing to 14.15% (an increase of five basis points).

Table 5.

The Average of Economic Parameters of Beef Cattle Fattening Business in North Balikpapan Sub-district

Parameter	Amount (IDR/year)	
Production Cost		
Fix Cost		
Cage depreciation	5.527.851	
Equipment depreciation	1.245.987	
Variable Cost		
Breeds	16.759.582	
Feed	159.295.200	

Parameter	Amount (IDR/year)
Workers	29.351.912
Medicine	3.506.000
Electric and water	645.000
Production Total Cost	216.331.532
Revenue	
Cattle sales	592.387.500
Feces (manure) sales	207.562.500
Total Revenue	799.950.000
Income (before tax)	583.618.468
Tax 25%	145.904.617
Net income	437.713.851

Revenue from the beef cattle fattening business was generated from the sale of beef cattle and feces which were processed into manure as a by-product (Table 5). Production costs for beef cattle fattening businesses in North Balikpapan Sub-district, Balikpapan City included depreciation costs for cages and equipment, costs for breeds, feed, labor, medicines as well as water and electricity costs. The average production cost of a beef cattle fattening business in North Balikpapan Sub-district, Balikpapan City was IDR 216.331.532/year. The income from the beef cattle fattening business in North Balikpapan Sub-district, Balikpapan City was IDR 538.618.468/year. Net income obtained based on income tax 25% was IDR 437.713.851/year (Table 5).

Table 6.
 Feasibility Analysis of Beef Cattle Fattening in North Balikpapan Sub-district

Criteria	Amount
Break Even Point	IDR 9.676.911
Benefit Cost Ratio	3.7
Payback Period	0.37
Net Present Value (NPV1 (9.15%))	IDR 1.017.779.514
Net Present Value (NPV2 (14.15%))	IDR 952.403.118
Internal Rate Return	87%
Sales per unit	IDR 27.520.906

Break Even Point is a method used to estimate the minimum number of business units capable of producing and selling products so that the farmers do not experience losses or profit = IDR 0, which means that sales results were equal to production costs so that expenses were equal to income. The BEP calculation result based on sales per unit (IDR) was IDR 9.676.911, at this value the business was at the break-even point. Benefit Cost Ratio is a comparison between the benefit value and the cost value. The results of the BCR analysis of the beef cattle fattening business in North Balikpapan Sub-district, Balikpapan City, obtained a value of 3.7, so it was proven that the BCR value was > 1, this value indicated that the beef cattle fattening business in North Balikpapan Sub-district, Balikpapan City, was profitable and worth running. The increasing value of BCR means an increase in profit and the business is more feasible (Khafsah et al., 2018; Mayulu et al., 2020).

Based on the calculation, the beef cattle fattening business in North Balikpapan Sub-district, Balikpapan City had the NPV1 value (calculation of the current bank interest value) of 9.15% which showed positive results reaching IDR 1.017.779.514. It was estimated that there would be an increase in interest rates (a five-point increase in the basis) to 14.15%, and the NPV2 value would be IDR 952.403.118. Considering the five basis point changes of current rate NPV1 9.15% to NPV2 14.15%, it resulted in 1,07. Based on the value, the NPV value was > 0, which indicated that the investment in the beef cattle fattening business in the North Balikpapan Sub-district of Balikpapan City was feasible and could give benefit to breeders.

The IRR value obtained based on calculation for the beef cattle fattening business in North Balikpapan Sub-district was 87%, which showed that the beef cattle fattening business was feasible to run up to the highest interest rate of 14.15% because IRR > 0. The return on investment was greater than the applicable interest rates. A business is considered worth running if the IRR value > Social Discount Rate, whereas if the IRR value < Social Discount Rate then the business is not worth running.

The PP calculation resulted in a value of 0.37 years, this result indicated that the period of time for funds invested in the beef cattle fattening business could be returned within a period of around four months. The period needed to return the invested funds is directly proportional, that is, the investment risk is lower if the returning period of investment is faster. The calculation results based on investment feasibility criteria show that the business is feasible to run and getting more feasible if the returning period of investment getting shorter (Khafsah et al., 2018).

CONCLUSION

The beef cattle fattening business in North Balikpapan Sub-district, Balikpapan City, produced an average income of IDR 538.618.468.-/year. Based on the results of the financial feasibility analysis, the BEP criteria was obtained at IDR 9.676.911; NPV(9.15%) IDR 1.017.779.514; NPV(14.15%) IDR 952.403.118; B/C Ratio 2.7; IRR 87% and PP 0.37 years. Based on the results, it could be concluded that the beef cattle fattening business in North Balikpapan Sub-district, Balikpapan City was worthy for development.

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