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Comparative Analysis Of Intensive And Traditional Beef Cattle Business Income In East Oku District

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Abstract

Cattle farming is one of the resources to fulfill the need for food in the form of meat, which has high economic value and has many benefits in life. This research was conducted in East OKU District, precisely in Buay Madang Timur Subdistrict. The determination of the location was done intentionally (Purposive) with the consideration that Buay Madang Timur Subdistrict is the center of the cattle business in East OKU district and has the highest population and the largest number of breeders in the beef cattle business in South Sumatra Province. The research method used in this study was the case study method. According to Sriati (2014), the case study method is a research method used for the type of research where the research location chooses a special population (typical) compared to other research locations. Based on this study because the population was greater than 100 respondents, the authors took 25% of the population in the population, namely 35 respondents in the Research Sample of intensive beef cattle business and 34 samples of traditional beef cattle business. The methods of processing and analyzing data in this study were to answer the first problem formulation to compare income using income analysis, T-test, and Break Event Point. From the above research, the income of intensive cattle farming business amounted to Rp. 37. 965. 058, 53 / month while the traditional cattle farming business amounted to Rp. 33. 017. 401, 96 / month. semi-intensive cattle farming business income was greater than of traditional cattle farming business with a difference in income of Rp. 4. 945. 656, 57/month. Break-even

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Point analysis based on research for intensive farming of 3 heads and for traditional cattle farming of 2 heads, based on these results, beef cattle farming was feasible for both intensive and traditional farms. Based on the results of the t-test analysis in Table 4. 12 above obtained the results: at a confidence level of 95% and an error rate of 5% or a value of α = 0, 05 obtained that the t-count value = 15, 64 and the t-table value = 2, 018. The value of t-hit> t-table (15, 64 < 2, 018), indicated that Ha was accepted and Ho was rejected. The value of t-hit > t-table meant that there was a real (significant) difference between the average income of intensive and traditional cattle farming income in East OKU

Keywords: Cattle, Income, Comparative

INTRODUCTION

Cattle farming is one of the resources to fulfill the need for food in the form of meat, which has high economic value and has many benefits in life. South Sumatra is one of the provinces that is the center of cattle farming, this step is to increase the population from an average of 305,000 heads per year to 700,000 heads per year. Continuous insemination and fattening are the initial programs to achieve this goal. The big target is beef self-sufficiency by 2025. Currently, beef demand in South Sumatra is still supplied from other provinces, mainly from Lampung, from 125,000 tons of beef demand per year, only 80,000 tons are produced by itself, seeing this shortage the South Sumatra government made a gradual population program through two schemes, namely sustainable fattening and massive artificial insemination. The following is the amount of cattle production in South Sumatra:

Table 1. South Sumatra Beef Cattle Production in 2020-2022

Districts	Production (in Heads)		
	2020	2021	2022
OKU	8.500	9291	8.800
OKI	34.973	36.507	35.959
Muara Enim	16.196	16.719	16.899
Lahat	9.268	9.362	9.392
Musi Rawas	25.350	25.860	26.375
Musi Banyuasin	35.482	36.900	36.287

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Banyuasin	39.614	39.852	42.095
OKU Selatan	13.840	16.746	15.421
OKU Timur	**74.041**	**76.236**	**77.151**
Ogan Ilir	20.917	21.981	21.564
Empat Lawang	5.830	6.122	7.134
Pali	4339	4.412	4.450
Muratara	2.062	2.093	2.124
Palembang	4.321	4.325	4.898
Prabumulih	1.760	1.766	1.919
Pagaralam	3.789	3.809	5.537
Lubuk Linggau	1.154	1.177	1.120
Sumatera Selatan	301.436	313.185	317.125

Source: South Sumatra Livestock Service Office, 2023.

Based on Table 1. 1 above, the largest beef cattle production in South Sumatra is in the districts of East OKU, Banyuasin, Musi Banyuasin, Musi Rawas, Ogan Ilir and OKI, so these six districts will be formed into beef cattle farming centers. East OKU district has the highest production among other districts with a total production of 77. 151 head or contributed 24, 32% of the total cattle population in South Sumatra Province. Based on this, it is expected that the existence of beef cattle farming in East OKU Regency, especially those in rural areas, can provide many benefits such as contributing to the national/regional meat supply which can ultimately reduce the beef import quota. The following is the population of beef cattle in East OKU District in 2022:

Table 2. Beef Cattle Population in OKU Timur District, 2023

Sub Districts	Total Population
Martapura	1.651
Bunga Mayang	2.381
Jayapura	496
BP. Peliung	4.689
Buay Madang	4.330
Buay Madang Timur	**8.650**
BP. Bangsa Raja	2.294
Madang Suku II	2.084

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Madang Suku III	1.343
Madang Suku I	5.872
Belitang Madang Raya	5.778
Belitang	5.957
Belitang Jaya	3.841
Belitang III	4.750
Belitang II	4.241
Belitang Mulya	3.968
Semendawai Suku III	8.132
Semendawai Timur	4.865
Cempaka	550
Semendawai Barat	368

Source: Fisheries and Livestock Service Office of OKU Timur District, 2023

Based on Table 2, the largest population is in East OKU District, namely Buay Madang Timur Sub District(11, 21%), Semendawai Suku III (10, 54%), Belitang (7, 72), Madang Suku I (7, 61), Belitang Madang Raya (7, 49%), Semendawai Timur (6, 31%) and BP. Peliung (6, 08%). The livestock sector in Kabupaten Ogan Komering Ulu Timur is developing well, both for large livestock, small livestock, and poultry. Unfortunately, livestock businesses in this district are still small-scale (household businesses), and are even considered as side businesses. Until now, no large-scale livestock companies have invested or operated in this District. One of the efforts to increase cattle procurement both in quantity and quality is through intensive cattle rearing (feedlot). In this system, bulls are kept in certain pens, not employed but only fed with optimal nutritional value to increase body weight and maximum cow health. With this system, cattle gain weight more steadily, the meat produced will be softer although the fat content becomes slightly thicker, the meat quality is very good and the selling price is high. Buay Madang Timur, Semendawai Suku III, Belitang, Madang Suku I, Belitang Madang Raya, Semendawai Timur and BP. Peliung are some of the cattle production centers in East OKU district that have good prospects for development. The condition of beef cattle farming in the Martapura Sub-district area, with a large livestock population, should be an opportunity to increase income.

Cattle business in the form of farming is one of the businesses managed by farmers with a relatively limited economic role. Beef cattle rearing is carried out as a branch of

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business in the farming system with cattle rearing in Eastern OKU District ranging from 1 to 5 cattle per farmer. Beef cattle farming is one type of business carried out by some people in East OKU District in Buay Madang Timur, Semendawai Suku III, Belitang, Madang Suku I, Belitang Madang Raya, Semendawai Timur and BP. Peliung. However, it cannot be denied that beef cattle rearing in OKU Timur is not the main activity of smallholder farming. In addition, farmers' resources and business management skills are still limited.

Beef cattle business system is a business system consisting of components that are interrelated to beef cattle raising. Farmers choose to cultivate cattle with several objectives. For farmers, beef cattle serve as asource of income, animal protein, and labor and fertilizer. Another function is as a seed producer and savings. The maintenance system implemented by farmers is inseparable from how the conditions of differences in business characteristics, these conditions include the scale of ownership, selection of cattle breeds, cattle maintenance systems and total income and maintenance include reproductive management, feeding or drinking, semi-intensive maintenance (sometimes cattle are released or looking for their own land), cage sanitation, cattle sanitation, and disease control. The maintenance system concerns the amount of revenue earned by farmers and the costs incurred by each farmer are different so that it will affect the income earned by each farmer.

From this, it is necessary to identify the analysis of the characteristics and income of the livestock business of beef cattle breeders so that later it will determine the amount of income that will be received byfarmers. There are two beef cattle rearing systems in Eastern OKU, namely intensive and traditional rearing systems. The traditional system is where all activities are carried out in the same pasture while the semi-intensive system is where cattle are raised for fattening by grazing and feed is provided by the farmer (Susilorini, 2008). Currently, many farmers prefer to switch to intensive cattle farming because intensive farming is one of the efforts to increase beef procurement both in quantity and quality by raising cattle intensively (feedlot). In this system, bulls are kept in certain pens, not employed but only fed with optimal nutritional value to increase body weight and maximum cow health. With this system, the weight of the cattle is more stable, the meat produced will be softer although the fat content becomes slightly thicker, the quality of the meat is very good and the selling price is high (Abidin, 2002). In the traditional rearing system, farmers only feed straw and sometimes grass without concentrates and other supplements that can accelerate growth, and the length of rearing is 1 to 2 years. So it is estimated that semi-intensive beef cattle farming is more profitable.

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Based on this background, the researcher intends to conduct a study entitled "Comparative Analysis of Intensive and Traditional Beef Cattle Business Income in East OKU District".

RESEARCH METHOD

The research method used in this research is the case study method. According to Sriati (2014), the case study method is a research method used for the type of research where the research location chooses a special population (typical) compared to other research locations.

RESULTS AND ANALYSIS

The data analysis processed in the research is primary and secondary data. Primary data is used for income analysis and income comparison (Comparative). Secondary data was used to see data on beef cattle breeders in East OKU District, while to answer the first problem of the study used income analysis and to answer the second problem formulation used comparative analysis as follows:

Revenue

To answer the formulation of the problem in the first part of this study, namely analyzing how much income beef cattle farmers in East Ogan Komering Ulu Regency. By calculating the income received by farmers by doing the following calculations (Soekartawi, 1995):

$$Y = TR - TC$$
$$TR = P \times Q$$
$$TC = TFC + TVC$$

Where :

Y: Income (Rp/Yr)
TR: Total Revenue (Rp/Yr)
TC: Total Cost (Rp/Yr)
Q: Quantity
P: Price (Rp/Amount)
TFC: Total Fixed Cost (Rp/Yr)

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TVC: Total Variabel Cost (Rp/Yr)

Break-Even Point

To address the problem formulation of comparing the income from semi-intensive and traditional beef cattle farming in East OKU Regency, a t-test was conducted as follows: (Simanjuntak, 2020).

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Explanation:
x1: mean of sample 1
x2: mean of sample 2
n1: number of samples in sample 1
n2: number of samples in sample 2
s1: standard deviation of sample 1
s2: standard deviation of sample 2

The calculated t-value is then compared with the critical t-value from the t-distribution table, based on the degrees of freedom (df) and the chosen significance level. The decision rule for the two-sample t-test to determine whether there is a difference in the means of the two groups being tested is as follows: compare the calculated t-value with the table t-value.

- If the calculated t-value > table t-value, then H0 is rejected.
- If the calculated t-value < table t-value, then H0 is accepted.

Break-Even Point (BEP)

According to Riyanto (2013), the BEP can be calculated using the following formulas:

$$\text{BEP (in units of product)} = \frac{\text{Fix cost}}{\text{Selling price per unit – Variable cost per unit}}$$

$$\text{BEP (in Rupiah)} = \frac{\text{Biaya tetap}}{\text{1−Variable cost/sales volume}}$$

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Explanation

1. If the BEP production value is > than the number of units currently being produced, the business is considered viable.
2. If the BEP production value is < than the number of units currently being produced, the business is considered not viable.

Research results showed that to analyze income in cattle farming, it is necessary to first understand the production costs (fixed and variable costs) as well as the number of cattle sold and the revenue from the cattle farming business. Production costs are the expenses incurred by the cattle farm in a single production cycle to obtain the main product for sale, enabling the farm to make a profit. The production costs of cattle farming illustrate the amount of production input and expenses incurred during the production process, consisting of fixed and variable costs. The number of cattle considered is for the production of 2 to 4 cattle each month, owned by a sample cattle farmer.

The expenses incurred by a sample intensive cattle farmer can be seen in the following table:

Table 3. Average Production Costs of Intensive Cattle Farming in East OKU District, 2024

No	Production Cost (Rp/Month)	Average Cost (Rp/Production)
1	Fixed Costs	
	Depreciation Costs of Equipment	339.941,47
	Truck Rental Costs	1.000.000,00
	Total Average Costs	1.339.941,474
2	Variable Costs	
	Concentrate Feed + Forage	1.457.142,86
	Vaccines	106.714,29
	Vitamins and Medicine	728.571,43
	Electricity and Water	500.000,00
	Labor	1.614.285,71

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	Total Average Costs	4.409.285,71
	Average Production Costs	5.749.227,19

Source: Primary Data (processed), 2024

Based on the table above, the fixed costs in cattle farming consist of equipment depreciation costs, including the depreciation of the barn, and truck rental costs. Fixed costs are the result of summing up the equipment depreciation and truck rental costs. According to Table 4.8, it can be seen that the average fixed costs incurred by farmers in managing cattle farms for one month include equipment depreciation costs of Rp 339,941.47 and average truck rental costs of Rp 1,000,000.00, with a total average fixed cost of Rp 1,339,941.474 per month. The cattle pens are built either near residential areas or the owner's house so that farmers can more easily monitor their livestock business. For farms located far from the owner's house, hired labor is usually employed or family labor is rotated. The size of each pen is adjusted to the number of livestock owned by each farmer. Semi-intensive cattle farmers usually have one to two pens, meaning farmers separate the pens. This separation aims to ensure that the feeding and drinking of the cattle are regular and evenly distributed.

In production costs, there are variable costs, which are costs that are used up in one use. The average variable costs in cattle farming production per farmer include feed costs, consisting of concentrate feed and forage averaging Rp 1,457,142.86, vaccines averaging Rp 106,714.29, vitamins and medicine averaging Rp 728,571.43, electricity and water averaging Rp 500,000.00, and labor costing Rp 1,614,285.71. Therefore, the production costs of beef cattle farming, which illustrate the amount of production input and expenses incurred during the production process, with an average number of cattle ranging from 2-4, amount to an average of Rp 5,749,227.19 per month.

Table 4. Average Production Costs of Traditional Cattle Farming in East OKU Regency, 2024

No	Production Cost (Rp/Month)	Average Cost (Rp/Production)
1	Fixed Costs	
	Depreciation Costs of Equipment	87.990,20

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	Truck Rental Costs	400.000,00
	Total Average Costs	487.990,20
2	Variable Costs	
	Concentrate Feed	529.411,76
	Total Average Costs	529.411,76
	Average Production Costs	1.017.401,96

Source: Primary Data (processed), 2024

Based on the research results, the average production costs in traditional cattle farming are lower, with average fixed costs of Rp 487,990.20 and average variable costs of Rp 529,411.76 per month. In traditional farming, farmers do not use labor because to save costs. The labor item in cattle farming is not extensive because the cattle are released near dams or grassy areas near dams. Farmers do this due to limited capital and land for cattle farming, which is considered reasonable because farmers can still profit from cattle farming, even if they are only raised in basic pens. Simple equipment is also used.

The income received by cattle farmers is the difference between revenue and production costs per month. The amount of average income received by cattle farmers depends on the revenue and production costs incurred by cattle farmers. There is a difference in income between semi-intensive and traditional cattle farming, which can be seen in Table 5 below.

Table 5. Average Income of Intensive and Traditional Cattle Farming in East OKU Regency, 2024

No		Average (Rp/Month)
1	Intensive	
	Revenue	43.714.285,72
	Production Costs	5.749.227,19
	Total Income	37.965.058,53
2	Traditional	
	Revenue	32.000.000,00
	Production Costs	1.017.401,96

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	Total Income	33.017.401,96

Source: Primary Data (processed), 2024

Based on the research results, intensive cattle farming in East OKU District has a revenue of Rp. 43,714,285.72 with production costs of Rp. 5,749,227.19, which is quite high. This is due to intensive farming practices using modern technology, which enables farmers to maximize the growth and performance of their livestock. Intensive farming, especially in closed-house systems, where feed and water are automated, tends to result in heavier cattle compared to those raised in traditional farming. As a result, the income from intensive farming is Rp. 37,965,058.53. According to Wahyudi et al. (2023), semi-intensive cattle farming is generally a traditional practice passed down through generations. Experience gained from upbringing and the surrounding environment plays a crucial role in the success of the business. In contrast, traditional cattle farming generates a monthly revenue of Rp. 32,000,000.00 with an average production cost of Rp. 1,017,401.96, indicating lower production costs compared to intensive farming. Therefore, the average income is Rp. 33,017,401.96 per month. This is because traditional cattle farming entails minimal expenses for feed and water, as the cattle often forage for themselves.

Break-Even Point (BEP) is the point at which total revenue and total costs are equal, resulting in neither profit nor loss for a company. BEP analysis examines the relationship between costs, volume, and profit, providing insight into short-term profit planning based on the variability of sales income or costs relative to activity volume. BEP is used to assess whether a business is experiencing neither profit nor loss, also known as the break-even point (Emmawati, 2007). The BEP values for semi-intensive and traditional cattle farming can be seen in the following table:

Table 6. *Break-Even Point (BEP)* of Intensive and Traditional Cattle Farming in East OKU District, 2024

No		Average (Rp/Month)
1	Intensive	
	Fixed Costs	1.339.941,474
	Variable Costs	4.409.285,71
	Total Production	2
	Break Even Point (BEP)	3

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2	Traditional	
	Fixed Costs	487.990,20
	Variable Costs	1.017.401,96
	Total Production	2
	Break Even Point (BEP)	2

Source: Primary Data (processed), 2024

Based on Table 6, after the process of analyzing the break-even point using mathematical approaches based on the received data for intensive and traditional cattle farming, the results show that the break-even point for intensive cattle farming is 3, which is greater than the production quantity, and for traditional cattle farming, it is 2, which is also greater than the production quantity or at the break-even point. To reach the break-even point in sales revenue for intensive cattle farming, it must be able to sell its products equivalent to Rp 4,409,285 or more. Similarly, to avoid losses, intensive and traditional cattle farming must be able to sell 2.23 and 3.47 tons, respectively.

To determine if there is a significant difference between the income of intensive and traditional cattle farming in East OKU District, an independent t-test analysis is conducted. The independent t-test is a comparative test to determine if there is a significant difference in means between two independent groups with interval/ratio scale data. The two independent groups here refer to two groups that are not paired, meaning the data sources are from different subjects. In this case, the two independent groups are the income of intensive cattle farming and the income of traditional cattle farming.

Based on the analysis, the average income of intensive cattle farming is Rp 37,965,058.53 per month, while the average income of traditional cattle farming is Rp 33,017,401.96 per month. The income of intensive cattle farming is greater than that of traditional cattle farming, with a difference of Rp 4,945,656.57 per month.

Table 7. Results of Independent t-test for the Difference in Average Income of Intensive and Traditional Cattle Farming in East OKU District, 2024.

Description	Value
$\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2}$	3.029.734.774.413
$(\frac{1}{n_1}+\frac{1}{n_2})$	0,067

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$\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2}(\frac{1}{n_1}+\frac{1}{n_2})$	301.992.318.292
$\sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2}(\frac{1}{n_1}+\frac{1}{n_2})}$	379.458
t- $\frac{\bar{X}1-\bar{X}2}{\sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2}(\frac{1}{n_1}+\frac{1}{n_2})}}$	15,64
t-table	2,018

Based on the results of the t-test analysis in Table 4.12 above, with a confidence level of 95% and a significance level of 5% (α = 0.05), the calculated t-value is 15.64, while the critical t-value is 2.018. Since the calculated t-value exceeds the critical t-value (15.64 > 2.018), it shows that Ho is rejected and Ha is accepted. This indicates that there is a significant difference in the average income between intensive and traditional cattle farming in East OKU. These findings are consistent with the research conducted by Rahayu et al. (2020), which suggests that semi-intensive farming significantly affects the increase in cattle body weight compared to traditional systems. The advantage of traditional farming lies in easier feed provision, while its weakness lies in the difficulty of achieving the desired body weight target. On the other hand, intensive farming can minimize feed costs due to additional grazing opportunities, but it faces challenges in feed control, health, and maintaining desired body weight.

Additionally, the study by Sundari, A. S. Rejeki, and H. Triatmaja (2009) indicates that the average income of intensive farming, with a break-even point (BEP) of 0.94 animal units (AU) per year, and traditional farming with a BEP of 0.56 AU per year. The profitability of intensive cattle farming is 46.3%, while traditional farming is 29.9%. In conclusion, both intensive and traditional cattle farming businesses are considered viable

CONCLUSION

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

1. The study indicates that the income from intensive cattle farming amounts to Rp. 37,965,058.53 per month, while traditional cattle farming generates Rp. 33,017,401.96 per month. Therefore, the income from semi-intensive cattle

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farming is higher than that of traditional cattle farming by Rp. 4,945,656.57 per month.

2. The Break Even Point (BEP) analysis based on the research suggests that for intensive cattle farming, the optimal number of heads is 3, while for traditional cattle farming, it is 2. Thus, both intensive and traditional cattle farming businesses are considered viable options.
3. The t-test analysis results from Table 4.12 indicate that at a confidence level of 95% and a significance level of 5% (α = 0.05), the calculated t-value is 15.64, while the critical t-value is 2.018. Since the calculated t-value exceeds the critical t-value (15.64 > 2.018), we reject the null hypothesis (Ho) and accept the alternative hypothesis (Ha). This implies that there is a significant difference in the average income between intensive and traditional cattle farming in East OKU.

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