

## Break Event Point Analysis of Layer Farming Company (A Case Study in Koka Village, Minahasa Regency, Indonesia)

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**Abstract.** *The purpose of this research is to analyze fixed and variable costs, income, and revenues, and to review the Break-Even Point in layer farming company. In detail, the research employed a case study method in the layer farming company of UD. Prima Unggas Farm, located in Koka Village, Tombulu District, Minahasa Regency, North Sulawesi, Indonesia in July 2023. Total fixed costs expensed by layer farming company of UD. Prima Unggas Farm during one production period was IDR 1,963,497,000; total variable costs were IDR 11,997,307,500. Furthermore, UD. Prima Unggas Farm produced eggs in one period as of 10,087,492 eggs and reached the break-even point when producing 2,349,594 eggs, and income for one production period was IDR 19,999,932,400. Hence, UD. Prima Unggas Farm achieved the break-even point in its revenue at IDR 4,907,093,385.*

**Keywords:** *layer, revenue, egg production, Break-Even Point*

### INTRODUCTION

In Indonesia, the development of livestock has a promising prospect in the future. This is due to the large population. As a result, the demand for livestock products, such as meat, eggs, and milk, will increase mathematically. One of the sub-sectors of livestock that plays a significant role in providing animal protein is the poultry sector (Widyantara and Ardani, 2017). The purpose of the laying farming company is to produce and market eggs in a better method, to maintain and develop business sustainability, to improve welfare, to reduce the unemployment rate or to open employment opportunities for others, and to satisfy the need for eggs to fulfill the population's nutrition (Ratno, 2020).

The layer farming of UD. Prima Unggas Farm is a layer farming company owned by Mr. Wijaya Abdul Halim, located in Koka Village, Tombulu District, Minahasa Regency. This layer farming company has been operating since 2014. The initial number of layers was 7,000 layers and continuously grew in 2016 by 15,000 layers, 21,000 layers in 2018 until 2023 by 29,133 layers. The consumer demand for the layer farming company is 30,000 eggs daily. However, this demand can only be satisfied by around 70%, such as 21,000 eggs daily. This gap between production and demand is a market opportunity for UD. Prima Unggas Farm to increase its production. These problems become the background of the researcher in analyzing UD. Prima Unggas Farm. The layer

farming at UD. Prima Unggas Farm is assumed to have been above the Break Even Point, so the company is reluctant to increase production.

## RESEARCH METHOD

This research employed a case study method on UD. Prima Unggas Farm, located in Koka Village, Tombulu District, Minahasa Regency through interviews and direct observation using a questionnaire in July 2023. The cost data used in this research was data for 1 production period, during 2020-2022. The data collected included:

1. Fixed costs were the costs of cages, warehouses, generators, water pump machines, electrical installations, and equipment, calculated using a depreciation approach, and the costs of DOC, labor, leased vehicle, and leased land were measured in IDR per period.
2. Variable costs were operational costs in the production process, such as the costs of feed, vaccines, medicines, and electricity fees measured in IDR units per period.
3. Revenue was derived from the sale of eggs, culled layers, and feces, which were measured in IDR per period.

The data obtained in this research was analyzed using a descriptive analysis approach and economic analysis. Descriptive analysis was to describe or explain the general conditions of UD. Prima Unggas Farm and production factors that supported UD. Prima Unggas Farm. In detail, economic analysis analyzed costs, income, revenue, and the break-even point.

To calculate the Break Even Point, two calculation formulas were used, which were BEP for the number of eggs and BEP for the amount of IDR (Suratiah, 2015) with the following formula:

- (1) The Break-Even Point in the calculated number of eggs, was as follows:

$$\text{BEP(egg)} = \frac{\text{Total Fixed Costs}}{\text{Selling Price} - \frac{\text{Variable costs}}{\text{Total Production}}}$$

- (2) The Break-Even Point in the calculation amount of revenue, was as follows:

$$\text{BEP(revenue)} = \frac{\text{Total Fixed Costs}}{1 - \frac{\text{Variable Costs}}{\text{Total Income}}}$$

**Table 1. Production Cost in UD. Prima Unggas Farm**

Details	Amount (IDR)	Percentage %
<b>Fixed Costs</b>		
-Depreciation of battery cage	20,000,000	0.14
-Depreciation of DOC and pullet warehouses	50,000,000	0.36
-Depreciation of battery cage equipment	148,440,000	1.06
-Depreciation of DOC and pullet warehouse equipment	16,360,000	0.12
-Depreciation of feed warehouse	66,666,667	0.48
-Depreciation of egg warehouse	33,333,333	0.24
-Depreciation of feed warehouse equipment	360,000	0.00
-Depreciation of egg warehouse equipment	336,310,000	2.41
-Depreciation of water pump and equipment	3,372,000	0.02
-Leased vehicle	72,000,000	0.52
-Leased land	10,000,000	0.07
-Electrical installation	45,000,000	0.32
-Labor	951,655,000	6.82
<b>Variable Costs</b>		
DOC	210,000,000	1.50
Feed		
1. Pre-starter	183,837,500	1.32
2. Starter	526,750,000	3.77
3. Grower	834,750,000	5.98
4. Layer	10,320,870,000	73.93
Medicine and vaccine	107,100,000	0.77
Electrical	24,000,000	0.17
<b>Total costs</b>	<b>13,960,804,500</b>	<b>100</b>

## RESULT AND DISCUSSION

### Fixed Cost

Fixed costs in the layer farming of UD. Prima Unggas Farm was cage costs, DOC-pullet cage equipment costs, layer cage equipment, warehouse, egg warehouse equipment, feed warehouse equipment, water pump and equipment, leased vehicle, leased land, electrical equipment, DOC purchasing, and labor. Table 1 depicts that the total fixed costs incurred on the layer farming of UD. Prima Unggas Farm was IDR 1,963,497,000. Further, depreciation costs were calculated based on acquisition cost divided by economic life cycle; the leased vehicle was calculated based on daily basis use, which was IDR 100,000/day. Vehicles were used at UD. Prima Unggas Farm to transport feed from the

warehouse to the cage and deliver eggs from the cage to the egg warehouse. The leased land was annually calculated according to the prevailing price at the research site, which was IDR 5,000,000/year. Then, the labor costs were categorized as fixed costs because the amount of costs incurred monthly was the same or constant within one production period or 102 weeks.

### Variable Cost

The calculation results describe that the total variable costs in the layer farming of UD Prima Unggas Farm was IDR 11,997,307,500 during one production period, depicted in Table 1. The highest cost was the cost of feed during the laying period, which was 86.03%. Feed costs were the largest cost component, reaching 60-70% of the total production costs of poultry (Sjofjan *et al.*, 2016).

### Income of Layer Farming in UD. Prima Unggas Farm

The income of UD Prima Unggas Farm was gained from the multiplication results of the number of production obtained by the selling price. The number of production was the result obtained from the sale of eggs, culled layers, and feces. Meanwhile, the selling price was the value or price of production. According to Dewanti and Sihombing (2012), income was calculated only in cash received by farmers from sales proceeds.

**Table 2. Income of UD. Prima Unggas Farm**

Selling	Price (IDR)	Volume	Income (IDR)	Percentage(%)
Small eggs	1,600	84,721(eggs)	135,553,600	0.65
Medium eggs	1,800	6,801,171(eggs)	12,242,107,800	58.69
Super eggs	2,300	2,636.490(eggs)	6,063,927,000	29.07
Jumbo eggs	2,400	565,110 (eggs)	1,558,344,000	7.47
Culled layers	45,000	18,989 (layers)	854,505,000	4.10
Feces	2,000	2.190 (kg)	4,380,000	0.02
Total			20,858,817,400	100

Table 2 depicts the total income from UD Prima Unggas Farm. The results were obtained from the sale of eggs (small eggs, medium eggs, super eggs, and jumbo eggs), culled layers, and feces, in one production period. The largest income was derived from the sale of medium-sized eggs at 58.69%, and the smallest income was obtained from the sale of feces at only 0.02%. Thus, the research was contradicted with the research of

Afrianto (2022), due to the difference in the number of the raised livestock, the price of eggs, and the number of egg production, which affected revenue.

### Revenue of Layer Farming Business in UD. Prima Unggas Farm

Revenue was the difference between total income and total costs. The calculation results demonstrate the total revenue of UD. Prima Unggas Farm was IDR 20,858,817,400, and the production costs incurred by the layer farming of UD Prima Unggas Farm was IDR 13,960,804,500. Hence, the business revenue of the layer farming of UD. Prima Unggas Farm as per the production period for 102 weeks was IDR 6,898,012,900. The calculation of this research was by Asnawi (2013), stating that the revenue of layer farming is the difference between total revenue and total production costs incurred.

### Break Event Point Analysis of UD. Prima Unggas Farm

Break Even Point (BEP) was a technique to find out at what production volume in a business, in this case, the laying farming business, did not experience losses and did not earn profit. It was closely related to production efficiency in a business so that it could produce optimal products from the minimum production volume that had to be attempted. BEP production volume could be the minimum number of livestock that had to be maintained or the number of eggs that had to be produced.

**Table 3. Break-Even Point Analysis of UD. Prima Unggas Farm**

Details	Unit	Total
Fixed cost	IDR	1,963,497,000
Average selling price	IDR/egg	2,025
Variable cost	IDR	11,997,307,500
Total production	Egg	10,087,492
Total revenue	IDR	19,999,932,400
BEP of egg		2,349,594
BEP of revenue		4,907,093,385

Table 3 shows that egg production in UD. Prima Unggas Farm during one period had 10,087,492 eggs, and UD. Prima Unggas Farm reached the break-even point by producing 2,349,594 eggs and receiving an income of IDR 4,907,093,385. This result was different from research conducted by Winowoda *et al.*, (2020), concluding that BEP is

achieved when egg production is 1,129,389 eggs. This difference was because the break-even point was influenced by several factors, including selling price, fixed costs, and variable costs incurred by different farms.

The calculation results of the break-even point in the farming company of UD. Prima Unggas Farm can be depicted in the following graphic in Figure 1.

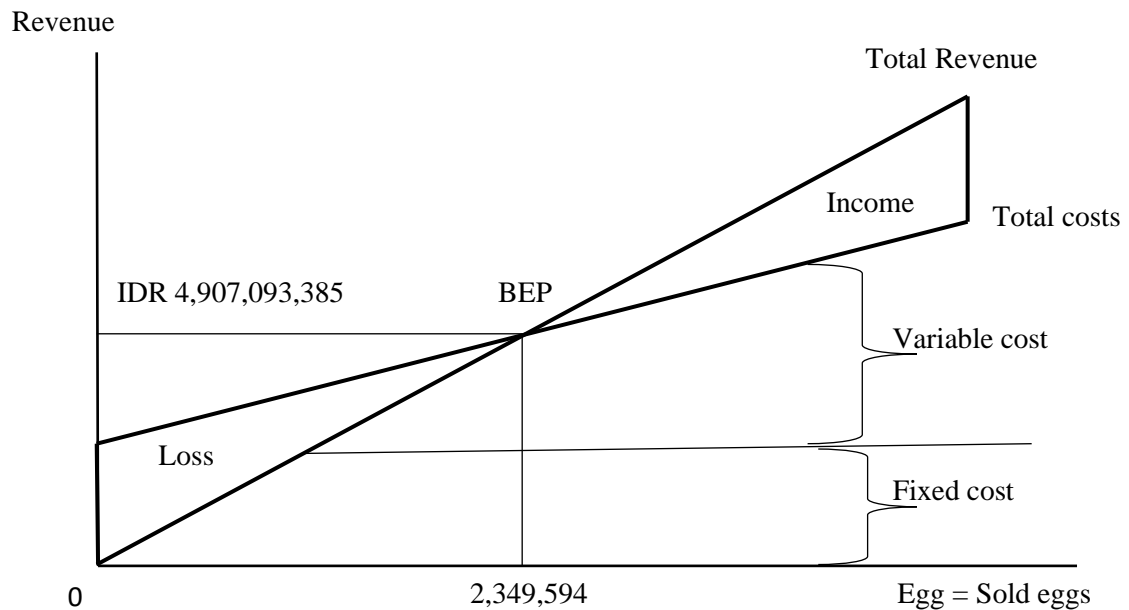


Figure 1. Break-Even Point Graphic of UD. Prima Unggas Farm

Note:

1. The horizontal axis (x-axis) represented sales volume expressed in units.
2. The vertical axis (y-axis) showed income from egg sales expressed in IDR units.
3. The break-even point was the intersection of total egg sales revenue with total costs.
4. If viewed at the intersection point and drawing a vertical line to the x-axis, the break-even achievement would be obtained based on egg sales volume. If the break-even point was drawn vertically to the y-axis, the break-even point was achieved based on egg sales revenue.
5. The loss area was the area to the left of the break-even point. The loss area was visible when the total costs line was higher than the line of the total revenue from egg sales because revenue was lower than the total costs. Meanwhile, the area to the right of the break-even point, such as the area between the line of revenue and the total cost, was the profit area, because revenue was higher than the total costs.

## CONCLUSION

Based on the research results, the farming company of UD. Prima Unggas Farm has been above the break-even point with egg sales of 2,349,594 eggs and revenue as of IDR 4,907,093,385.

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