Income analysis of layer farm in Sidrap district South Sulawesi province (case study in PT. Cahaya Mario)

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Abstract. Laying hen farm business has enormous potential because it plays a role in providing a cheap and easy to obtain source of animal protein, namely eggs. Besides, for people business, laying hen farm can be used as a source of income for farmers. The different cost structures at each phase will certainly have an impact on farmer income. This study aimed to analyze the farm income of laying hens at PT. Cahaya Mario, Sidrap regency and to determine the scale of his business. This research was a case study research. Data were collected from the recording of the company business and completed with a questionnaire as a research instrument to obtain the information needed in this study. Descriptive statistical analysis was used to calculate the level of income at each phase of breeding and business feasibility using the R/C ratio formula. The results showed that in one production cycle, the level of income obtained was IDR 817,809.94 with the R/C ratio was 2.15. Particularly for the starter to grower phase, which produced a pullet income of IDR 202,659.00 with the R/C ratio was 1.51, while the income in the layer phase or production period was IDR 680,150.94 and the R/C ratio was 2.19. This showed that the business was managed by PT. Cahaya Mario was feasible. This condition was shown by his ability to manage 30 flocks for a layer farm.

1. Introduction
The population of layer farms in Indonesia in the last five years has increased but this increase does not apply in South Sulawesi, which has experienced population fluctuations, especially in 2017 and 2018. In 2019, the population of laying hens has increased by 10,945,221 tail compared to the previous year which is quite significant [1].

South Sulawesi as one of the egg-producing provinces comes from Sidrap district with a population of 5,639,971 with egg production of 42,468,982 tons in 2019 [3]. Farmers in Sidrap district run a variety of layer farms, from household to industrial. One of the companies engaged in laying hens is PT. Cahaya Mario Group, which has a population of 300,000 hens with a cage capacity of 30 units.

An increase in the population of laying hens will also increase egg production and old chicken. The breeding of laying hens that have a long enough breed phase to produce egg production is supported by various factors, one of these factors is the costs incurred to produce high productivity. The costs needed to produce high productivity include fixed costs and variable costs.

The breeding of laying hens that takes a long time to produce eggs goes through several breed phases, namely the starter, grower, and layer or production phases. In the starter and grower phases, the output will be in the form of pullet chickens that are ready to be produced, and in the layer or production phase,
eggs will be produced. In this phase, it requires costs for breeding to reach the output. The final results at each phase will generate income that has an impact on the profits of the farmers.

The layer farm is mostly carried out by farmers by dividing the two phases of breeding, namely the starter phase to the grower phase which produces pullets, and the production phase starting from the pullet breeding to the afkir chickens. PT. Cahaya Mario runs a laying hen business from the starter phase to the production phase, which as a whole requires a large amount of money, but in some layer farms, the effort made is not the whole of the breeding phase. This shows that breeding in each phase requires different costs so that the income will also be different at each breeding phase.

The breeding which aims to bring profit to the company by looking at the cost and income components, the calculation of the ratio between income or revenue, and costs is carried out to see the feasibility of the business. Based on the description, the objective of this research was to know the income of layer farm in Sidrap district.

2. Method
This research was conducted at PT. Cahaya Mario Group, Sidrap district South Sulawesi in July 2020 by taking data recording related to the cost components incurred including fixed costs and variable costs in IDR/hen. Fixed costs included fixed labor costs, depreciation of units, equipment, and vehicles. Variable costs include the cost of purchasing DOCs for the starter-grower phase, purchasing pullets for the production phase, cost of feeds, costs of medicines, and costs of electricity.

This research was a case study of a layer farm in the starter-grower phase and the production phase during 1 breeding period. The revenue or income obtained in the starter-grower phase was assumed to be the selling price of pullets in the market during the study period, while in the production phase it was obtained from selling eggs and unproductive chickens. In calculating the income of layer farm using the formula:

\[
\text{Income/Revenue} = \text{Price} \times \text{Quantity of production} \\
\text{Total Costs} = \text{Fixed Costs} + \text{Variable Costs}
\]

The efficiency of layer farm using the formula R/C (Revenue Cost Ratio), or known as the ratio between the revenue received and the costs incurred. Mathematically it can be written as follows:

\[
\text{R/C Ratio} = \frac{(\text{Revenue})}{(\text{Total Cost})}
\]

Criteria:
- If the R/C Ratio < 1, not feasible.
- If the R/C Ratio = 1, break-even point
- If the R/C Ratio > 1, feasible

3. Results and Discussion
Research on layer farm at PT. Cahaya Mario with the breeding phase, namely the starter-grower phase for 32 weeks, the production phase for 60 weeks, and the breeding phase from a starter - production which was 92 weeks.

The breeding of laying hens in each phase has the same cost components, namely fixed costs and variable costs. The longer the breeding period for laying hens, the costs incurred will also increase. This cost was not related to the amount of production incurred during the business. Meanwhile, variable costs were the costs incurred for the production of layer-flavored chickens [4]. Business income of laying hens was influenced by the amount of production, namely pullets, eggs, and old chickens, this was what was called business benefits [4].

The fixed cost component consisted of labor costs and depreciation costs, while the variable cost component consists of the costs of feed, medicine, electricity, DOC, and pullets during the production period. Meanwhile, the business feasibility of the layer farm at PT. Mario Group's light was indicated
by the R/C Ratio. Calculation of all cost components and the revenue is calculated in rupiah units per hen. For more details, see Table 1.

Table 1. Fixed Costs, Variable Costs, Income, and R/C Ratio in the Business of Layer Farm at PT. Cahaya Mario, 2020 (IDR/laying hen).

| Description                        | Starter-Grower Phase | Production phase | Starter-Production phase |
|------------------------------------|----------------------|------------------|--------------------------|
| **Fixed Costs (IDR)**              |                      |                  |                          |
| - Labor costs                      | 1,323.08             | 2,480.77         | 3,803.85                 |
| - Depreciation Cost                | 249.48               | 467.78           | 717.27                   |
| **Total fixed costs**              | 1,572.56             | 2,948.55         | 4,521.12                 |
| **Variable Cost (IDR)**            |                      |                  |                          |
| - Feed Cost                        | 119.55               | 241,548.33       | 361,094.50               |
| - Medicine cost                    | 35.08                | 65.77            | 100.85                   |
| - Electricity Cost                 | 1,143.53             | 2,144.12         | 3,287.64                 |
| - DOC                              | 12,000.00            | 0                | 12,000.00                |
| - Pullet                           | 0                    | 64,350.00        | 0                        |
| **Total Variable Costs**           | 132,724.77           | 308,108.22       | 376,482.99               |
| **Total costs (IDR)**              | 134,297.3            | 311,056.77       | 381,04.11                |
| **Revenue**                        |                      |                  |                          |
| - Pullets                          | 65,000.00            | 0                | 0                        |
| - Eggs                             | 137,659.00           | 647,479.29       | 785,138.29               |
| - Old chicken                      | 0                    | 32,671.65        | 32,671.65                |
| **Total Revenue (IDR)**            | 202,659.00           | 680,150.94       | 817,809.94               |
| **R/C Ratio**                      | 1.51                 | 2.19             | 2.15                     |

3.1. Fixed costs and variable costs

The amount of responsibility in management has an impact on the number of labor costs that must be paid. Labor costs at the company PT. Cahaya Mario Group consisted of 2 components, namely the staff employee and the temporary employee. The staff employees were 5 people who take care of all office and housing administration, while the temporary employees were 40 people who take care of the flocks. The temporary employees carried out the activities of feeding, cleaning cages, monitoring cages, and everything related to housing management in 30 housing at PT. Cahaya Mario Group. The labor cost for both staff and cage labor in the starter-grower phase was IDR 1,323.08 the production phase of IDR 2,480.77 and the starter-production phase of IDR 3,803.85. Overall staff labor costs were higher than domestic workers (95.88%), this was job responsibilities as remuneration for employees who contribute to achieving company goals [5].

Depreciation costs derived from the depreciation of housing, equipment, and vehicles will affect the cost structure. This depreciation cost is the same as labor costs which have a fixed value each month in a production process. Depreciation cost for the starter-grower phase was IDR 249.48 the production phase was IDR 467.78 and the starter-production phase of IDR 717.27.

The total fixed cost for the starter-grower phase was IDR 1,572.56 the production phase was IDR 2,948.55 and the starter-production phase was IDR 4,521.12. In percentage terms, labor costs represented the largest cost compared to depreciation, which was around 84.14%.

The variable cost component in the layer farm at PT. Cahaya Mario Group included costs for feed, medicine, electricity, DOC (day old chick), and pullet. The cost of feed was the largest in the starter-grower, production, and starter-production phases, namely 90.07%, 78.40%, and 95.91%. This indicated that the production cycle of laying hens requires a large enough feed cost for growth and egg production. The feed given to layer chickens depends on the chicken's needs so that the feed needs will be in line with the price of the feed. The biggest costs after feed were DOC costs in the starter-grower phase and
the production phase with the purchase of a pullet. The cost of DOC was lower than the pullet because the pullet has passed the breeding period ready to lay eggs so that the lower feed cost conversion in the production phase was accumulated at the pullet cost. Meanwhile, the cost of electricity and medicine did not affect the overall variable costs at each breeding phase.

The total variable cost for the starter-grower phase was IDR 132,724.77, the production phase was IDR 308,108.22 and the starter-production phase was IDR 376,482.99. The total cost incurred by the company in the process of breeding was largely determined by variable costs. This showed that for running a business the variable cost component occupied the largest cost and only about 2% of the cost was obtained from fixed costs. The total costs can be seen in table 1.

3.2. Revenue and R/C ratio

The size of the layer farm and the large income does not reflect that the business is efficient. One way to see the efficiency of the business is by calculating the R/C Ratio. Revenue from the business of laying hens at PT. Cahaya Mario Group in the starter-grower phase includes selling pullets and eggs. Egg production in this phase is not optimal because the eggs produced are eggs for the first time in the breeding process, so the selling value obtained is not too large, namely 137,659.00 IDR. While the selling value of the pullet per head was around 65,000.00 IDR. In the production phase, this egg production reaches the maximum because in this phase is the laying phase until the end of production. Whereas for the starter-production phase (afkir) it is the same as the production phase, which is to produce eggs and chicken because the breeding process takes place from the DOC.

The business feasibility of laying farms is considered feasible if the R/C value is more than 1 (one). Comparison between revenue and costs incurred by PT. Cahaya Mario Group has more than one score (see Table 1), namely the starter-grower phase of 1.51, the production phase of 2.19, and the starter-production phase of 2.15. If it is seen from this value that the three phases are feasible to work on, but if you want to get a bigger revenue value and have the largest R/C Ratio value, then the production phase is the most promising to work on. This is when compared with research conducted on various business scales with an average R/C ratio of 1.02 [2].

4. Conclusion

Based on the description and explanation of the results of the study, it was shown that the business of the layer farm at PT. Cahaya Mario is worth working on for various breeding phases with an R/C Ratio value in the starter-grower phase 1.51, 2.19 in the production phase, and 2.15 in the starter-production phase.

Acknowledgments

Layer farm business can be developed with various phases of breeding, but to get a greater income or revenue by doing breeding in the production phase by raising pullets ready to lay eggs.

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