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Income Analysis of Dairy Milk Production in Ciawi Livestock Research Center Bogor District

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Abstract. *The Ciawi livestock research center in Bogor is engaged in livestock research. The beginning of the Ciawi livestock research center was established in 1981 by Drh. Jan Nari until now. This study aims to analyze the amount of dairy milk production income in the Ciawi livestock research center, Bogor Regency. Primary data were collected based on observations at the research location, recording and interviews using questionnaires, while secondary data were obtained from the Ciawi Livestock Research Center, Bogor Regency, scientific journals and articles related to dairy milk production income. Data analysis using income and feasibility analysis. The results showed that the livestock research center in 2020 produced 28,699 liters of milk and in 2021 produced 29,783 liters of milk. In 2020 the livestock research center looks profitable at Rp. 102,393,980, and in 2021 it has decreased by Rp. 10,649,980. The R / C ratio of Dairy Cattle Farming Business at the Ciawi Livestock Research Center, Bogor Regency, West Java Province in 2020 is 1.12 and in 2021 1.01, which means that every Rp. 1 spent by the Livestock Research Center in business activities carried out is profitable or feasible to develop because the R / C Ratio > 1*

Keywords: *Dairy Cows, Production Costs, Income*

1. INTRODUCTION

Increasing public awareness of the important role of milk for health requires the dairy industry to produce milk in high quantities. Dairy cows are still the spearhead of milk producers in Indonesia because people are accustomed to consuming cow's milk rather than milk from other animals. Dairy cows that are widely developed in Indonesia are Friesian Holstein (FH) cows. This type of cow is widely developed because of its high adaptability and high productivity. FH dairy cows originate from temperate regions, so environmental differences cause the ability of milk production to decrease. FH cattle are the best dairy cattle breed that can be developed in the tropics due to their high adaptability. The average milk production of FH cows in Indonesia is 10 liters/head/day or approximately 3,050 kg per lactation (Sudono et al., 2005).

One of the centers of livestock development in Indonesia is the Livestock Research Center (BPT). Ciawi, Bogor. The vision of the Livestock Research Institute follows the vision of the Agricultural Research and Development Agency, which is to become a world-class livestock research institution in producing livestock technology innovations to support the realization of an industrial agricultural system (Anonymous, 2011). The center is responsible for the development of information and technology on livestock throughout Indonesia"

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including the development of dairy cattle. This is the background for the field work practice activities on dairy cattle rearing management at the Ciawi Livestock Research Center, Bogor.

The selection of good dairy cows is fundamental to the management of the dairy industry. Cows that play a role in producing milk are lactating cows, so this is closely related to the selection of good dairy cows. The selection of a good mother is key in the dairy cattle industry because a good mother will certainly have high milk productivity. The quality of the mother also affects the children it produces, because a good mother will produce good offspring as well. Genetic superiority as a result of livestock selection activities carried out in the population will increase the uniformity of livestock productivity, so that it can provide many benefits for human life (Bourdon. 2002).

Livestock development is part of regional development, so the implementation of livestock development must be able to directly touch the farmers. Development that is able to directly touch farmers is development that is able to increase farmers' income (Sundari, and Triatmaja, 2009). Profit is one of the indicators of successful management of a livestock business. The profit can be done through income analysis. From these results it can be known whether the dairy farming business carried out in the Ciawi livestock research center Bogor district is feasible or not to run, which is later expected to provide benefits as a guide for cattle farmers for the development and development of dairy cattle farming. The Ciawi livestock research center Bogor regency which has a pretty good dairy farm in terms of milk production, therefore I conducted research at the Ciawi livestock research center to find out the income of dairy cattle farming in terms of milk production.

The number of dairy cows kept in the Ciawi livestock research center Bogor district is 60 heads, for dairy cows that are milked as many as 17 heads. the amount of milk per day that can be produced is 115-120 liters / day with 17 dairy cows that produce milk. Milking of dairy cows is done twice a day, in the morning at 07:00 and in the afternoon at 13:00. The average milk production produced by farms in the Ciawi livestock research center is already good or according to dairy milk production standards. Siregar (1995) states that the milk production of dairy cows of the Friesian Holstein dairy cattle nation is 4,500-5,500 liters per lactation period or 16.6 liters / day. Based on this, the authors are interested in conducting research on how to analyze the income of dairy farming businesses in terms of milk production at the Ciawi Livestock Research Institute, Bogor Regency with the research title "Analysis of Dairy Milk Production Income at the Ciawi Livestock Research Institute, Bogor Regency".

2. LITERATURE REVIEW

Dairy cows are cows that can produce milk which is utilized as the main product. Dairy cows have the best characteristics in terms of efficiency in converting feed into animal protein and calories compared to other cows (Suryowardojo, 2012). The superior and most widely kept dairy cattle breeds are Shorhorn (from England), Friesian Holstein (from the Netherlands), Yersey (from the Channel between England and France), Brown Swiss (from Switzerland), Red Danish (from Denmark) and Drought master (from Australia).In general, dairy cows are very dominant milk producers compared to other terna. One of the most famous dairy cattle breeds is the Fries Holland (FH) dairy cow. FH cattle originated in the province of North Holland and the province of West Friesland, so this nation of cattle has the official name Fries Holland and is often called Holstein or Friesian only. The FH cattle nation was formed from the ancestors of wild cattle Bos (Taurus) typicus primigenius found in the Netherlands about 2000 years ago.(Williamson and Payne, 1993).Dairy cattle are very dominant milk producers compared to other dairy cattle. One of the famous dairy cattle breeds is the Fries Holland (FH) dairy cow. FH cattle originated in the province of North Holland and the province of West Friesland, so this nation of cattle has the official name Fries Holland and is often called Holstein or Friesian only. The FH cattle nation was formed from the wild ancestor Bos (Taurus) typicus primigenius found in the Netherlands about 2000 years ago.(Williamson and Payne, 1993).

The dairy cattle farming business at the Ciawi livestock research center, Bogor Regency, is one of the best farming businesses, because it has a total population of 60 dairy cows, ranging from lactating dairy cows, heifers, to dairy cattle seedlings. Dairy farming is one of the livestock businesses that play a role in the economy of rural communities. Milk is one of the animal food products that are indispensable for human life besides meat and eggs. Dairy cattle farming in Indonesia is dominated by small and medium-scale dairy cattle farms, with the composition of each being; small-scale farms (less than 4 cattle) as much as 80%, medium-scale farmers (4 - 7 dairy cows) reaching 17%, and large-scale farmers (more than 7 cows) as much as 3%, with an average ownership of 3 - 5 dairy cows per farmer so that the level of business efficiency is still low (Mandaka and Hutagaol, 2005).

Dairy cattle rearing management is a factor that affects the dairy cattle business and needs to be considered. These factors include seed selection, feeding, housing system, land, management, management, post-harvest, marketing, and economics. The economic factor is a very important factor to determine the production costs that have been incurred for business operations and the income earned by dairy farmers with the income analysis method. This income analysis is carried out by calculating the revenue received by farmers and the costs

incurred and the benefits obtained during the production process. Generally, a farm, revenue comes from marketing or selling business products such as harvests from farms and processed goods (Kadarsan, 1995).

Production is one of the most important management functions for a company's operations. Production activities indicate efforts to convert inputs or resources into outputs (goods and services). Inputs are all forms of resources used in the formation of outputs. Broadly speaking, inputs can be grouped into categories, namely labor and capital (Herlambang, 2002). Sugianto (1995) states that the production process is a process carried out by the company in the form of activities to combine inputs (resources) to produce outputs. Thus, the production process is a process of transformation (change) from input to output. The concept of production is a flow concept, meaning that production takes place in a certain period. In a broad sense, cost is an amount of money expressed from (economic) resources that are sacrificed (occurred and will occur) to get something to achieve certain goals as a sacrifice of (economic) resources to get something to achieve certain goals, the term cost is sometimes considered synonymous with the cost and expense of something for that particular purpose. For simplicity, the notion of cost as a cost price and as a burden is called the notion of cost in a narrow sense, namely when the necessary sacrifice occurs in the context of realizing income (Harnanto, 1992).

3. METHODS

This research was conducted for approximately three months from January to March 2022 located at the Ciawi Livestock Research Center, Bogor Regency.

The data sources used in this research are:

1. Primary data is data obtained directly from expert respondents in the form of local observations, document acquisition and direct interviews.
2. Secondary data is indirect data obtained from documents from statistical books, various sources of literature and related agencies as well as sourced from research which includes reading books related to the research title and data collected.

To calculate the amount of income from cow's milk production in the dairy farming business at the Ciawi Livestock Research Center, Bogor Regency, indicators that are considered to be representative will be used, namely calculating production costs, revenue, income, and calculating the feasibility of beef cattle business.

Business Feasibility

TR/TC > 1, Feasible

TR/TC < 1, Not feasible

TR/TC = 1, Break-even point

4. RESULTS AND DISCUSSION

Production Costs

1. Fixed Cost

Fixed costs are costs whose amount is the same even though the amount of production changes. Fixed costs are costs that do not affect production and continue to be incurred even though the production obtained is a lot or little and even though it does not make production, the amount of costs does not depend on the size of the production costs obtained. According to Himawati, (2006) fixed costs are costs that are not influenced by the production produced. Included in fixed costs are salaries of permanent employees, and depreciation of equipment (Depreciation). Depreciation costs include, the cost of depreciation of equipment, cages and warehouses. For more details the amount of fixed costs can be seen in table 1.

Table 1. Fixed Costs

Years	Shrinkage (IDR)	Employee Salary (IDR)	Fixed Costs (IDR)
2020	75.549.066	36.000.000	111.549.066
2021	73.390.522	36.000.000	109.390.522

Source: Primary Data, 2022

Table 1 shows that the fixed costs in 2020 incurred at the Ciawi Livestock Research Center, Bogor, amounted to IDR 111,549,066, and in 2021 amounted to IDR 109,390,522, consisting of depreciation costs in 2020 of IDR 75,549,066, and in 2021 of IDR 73,390,522. the cost of permanent employee salaries in 2020-2021 amounted to IDR 36,000,000.

2. Variable Costs

Variable costs are costs that in total change in proportion to changes in production or sales volume, meaning that variable costs change in proportion to changes in production or sales volume. In the beef cattle business, what usually affects variable costs is the number of livestock raised, which of course will determine the size of medical expenses, feed costs or sales and others (Kasmir, 2010). For variable costs in dairy milk production, it can be seen in table 2 including producing dams, feed, medicines, and transportation fuel.

Table 2. Variable Costs

No	Year	Total (IDR)
1.	2020	268.568.000
2.	2021	228.282.000

Source: Primary Data 2022

Table 2 can be concluded that the variable costs of the Ciawi Bogor livestock research center, there was a decrease from 2020 to 2021 with a total decrease of IDR 40,286,000, the total variable costs of the Ciawi Bogor livestock research center were IDR 496,850,000 in a 2-year period.

3. Total Cost

The budget/total cost is the total budget that can be spent by a company in producing expenses or in other words, the total cost includes the total amount of fixed costs with variable costs in the production process. The total cost borne in each unit is called the total cost (Average Total Cost). The overall cost budget is the expenditure borne by a company in order to pay off several types or aspects needed for production purposes (Syamsidar, 2012). Joesron and Fathorrozi (2003), suggest that the total cost/budget is the sum of fixed costs and variable costs in the production or cost mechanism.

Total Cost is the amount of costs incurred in a livestock business. These costs consist of fixed costs and non-fixed costs or variable costs. Non-fixed costs are costs that are incurred repeatedly in the form of feed, medicine, electricity, transportation fuel, among others. The total costs incurred by the Ciawi livestock research center in 2020-2021 can be seen in the table below in table 3:

Table 3. Total Cost

No	Year	Fix Costs (IDR) (1)	Biaya Variable Costs (IDR) (2)	Total Costs (IDR) (1+2)
1.	2020	111.549.066	234.997.000	346.546.066
2.	2021	109.390.522	228.282.000	337.672.522

Source: Primary Data 2022

Total costs are the result of the sum of fixed costs and variable costs and it can be seen from the table that the total costs incurred by the Ciawi Bogor livestock research center from 2020 to 2021 have decreased by IDR 8,873,544, from 2020 worth IDR 346,546,066 and 2021 amounting to IDR 337,672,522.

Revenue

Revenue is the value or proceeds from the sale of products produced from a business. The greater the number of products produced and successfully sold, the greater the income received (Munawir, 2012). Revenue is defined as the total product value of the business within a certain period of time. This revenue is said to be the gross income of the business because it

has not been reduced by the entire price incurred during the production process (Soekartawi, 2011).

The total revenue of dairy milk production in 2020-2021 obtained in total is IDR 233,848,000.

Table 4. Revenue

No	Year	Total (IDR)
1.	2020	414.796.000
2.	2021	374.052.000
	Total	788.848.000

Source: Primary Data 2022

In table 4. The revenue received by the Ciawi Livestock Research Center, Bogor, in 2 years is IDR 788,848,000, in the table above it can be seen that the 2021 revenue has decreased from 2020 with a decrease of IDR 40,744,000.

Income

Income is the amount of capital obtained after all costs are met, or in other words, income is the difference between revenue and all capital (Muawir, 2012). Aritonang (1993), suggests that income analysis has a function that can estimate the success or failure of the activity of the business, determining the main factors in income whether these factors can still be increased or not. Business activities can be said to be successful if the income earned if the provisions have been met enough to meet all the needs of production.

From the results of research at the Ciawi livestock research center, Bogor district, the milk production income of dairy cows can be seen in the following table:

Table 5. Income

No	Year	Total Revenue (TR) (IDR)	Total Cost (TC) (IDR)	Revenue (TR – TC) (IDR)
1.	2020	414,796,000	346,546,066	68,249,934
2.	2021	374,052,000	337,672,522	36,379,479

Source: Primary Data 2022

The revenue shown in the table above shows that the Ciawi Bogor livestock research center in 2020 received revenue of IDR 68,249,934, while the revenue in 2021 decreased by IDR 36,379,479, so the 2020 to 2021 revenue decreased by IDR 31,870,455.

Business Feasibility

From the results obtained during the research that the dairy milk production business at the Ciawi livestock research center, Bogor Regency is quite good or profitable, which can be determined by the following calculations:

TR / TC Ratio (Revenue / Cost Ratio)

TR/TC Ratio is the ratio between total revenue and total cost (Munawar, 2010). The R/C Ratio can be calculated using the following formula:

$$\text{R/C Ratio} : \frac{Total\ Revenue}{Total\ Cost}$$

Tabel 6. R/C Rasio

No	Year	Total Revenue (TR) (IDR) (1)	Total Cost (TC) (IDR) (2)	R/C Ratio (TR/TC) (1 : 2)
1.	2020	414,796,000	346,546,066	1.20
2.	2021	374,052,000	337,672,522	1.11

Source: Primary Data 2022

The R/C ratio of the dairy cattle farming business at the Ciawi Livestock Research Center, Bogor Regency, West Java Province in 2020 is IDR 1.20, which means that every IDR 1 spent by the Ciawi Livestock Research Center in the business activities carried out is profitable or feasible to develop because the R/C ratio> 1. Meanwhile, in 2021 the R / C ratio is 1.11, a decrease compared to 2020 which R / C ratio> 1, so the business being run is profitable or feasible to develop. Based on the results of the research conducted, the dairy milk production business at the Ciawi Livestock Research Center, Bogor Regency is feasible to develop according to business feasibility based on several literature with a total profit obtained in 2020 of 1.20, and the profit obtained in 2021 of 1.11.

5. CONCLUSION

The revenue earned by the Ciawi livestock research center, Bogor in 2020 amounted to Rp. 102,393,980, and in 2021 it decreased by Rp. 10,649,980. By spending fixed costs of IDR 106,497,020 and variable costs of IDR 1,408,810,000. The R / C ratio of the dairy cattle farming business at the Ciawi livestock research center in Bogor Regency, West Java Province in 2020 is 1.12 and in 2021 1.01, which means that every Rp 1 spent by the Ciawi livestock research center in the business activities carried out is profitable or feasible to develop because the R / C Ratio> 1.

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