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Analysis of Dairy Business Income in The Lowlands of Malang Regency

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Abstract:

This aim of this research was to analyze the production costs and profits of dairy farms in the lowlands of Malang Regency. The research was held in January-February 2022 in Kalipare, Gondanglegi, and Bantur Districts. The location determination was selected using the *purposive* method with the criteria of the location being in the lowlands <400masl. The research method is a descriptive quantitative survey—information obtained from respondents using questionnaires and interviews. The methods used to collect samples are *purposive* sampling and *sampling frames.* The number of respondents was 98 farmers divided into three strata based on the number of holdings of dairy cattle raised. Strata I with total ownership of 2-13 ST, strata II 14-24 ST, and strata III 25-35 ST. The results of this study are the average production cost in strata I Rp. 89,747,976 / ST/Year, strata II Rp. 412,643,067 / ST/Year and strata III of Rp. 681,784,000ST / year. The average net profit in strata I Rp. 34,331,682/AU/Year, in strata II Rp. 109.236.561/AU/Year and in strata III amounting to Rp. 210. 158. 535/AU/Year.

Keywords—**Analysis, dairy cattle, lowland,income.**

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I. INTRODUCTION

Malang Regency is the most significant milk contributor in East Java, with a dairy cow population in 2020 of 86,986 heads as in [1]. In Malang Regency, the dairy business is growing in almost all districts, starting from Ngantang, Karangploso, Dau, Lawang, Tumpang, Jabung, Wajak, Bantur, Poncokusumo, Gondanglegi, and Ngajum as in [12]. The dairy cattle business is generally cultivated in highland areas because highland areas have an optimal temperatures and humidity for dairy cow productivity. Altitude and temperature affect the diet of dairy cows, so it affects their productivity of dairy cows. Dairy cows produce well in comfortable environmental conditions (comfort zone), with maximum and minimum limits on the temperature and humidity of the environment that are in the comfort zone as in [6].

The dairy business is still concentrated in highland areas on the island of Java, such as Garut, Pangalengan, Lembang (West Java), Batu, Pujon, and Nongkojajar in East Java. The highlands are relatively dense dairy business areas, causing problems in farmers' environmental, social, and economic fields as in [8]. These real-world conditions with various existing problems must be found a way out, namely by pursuing dairy farming in the lowlands. This is in line with the results of

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research on alternative areas for developing dairy businesses, namely lowland areas [10]. One of the prominent obstacles in developing dairy business in lowland areas is the factor of air temperature and humidity. Biological and economic resources also need to be considered in opening up opportunities for developing dairy cattle businesses in lowland areas. Biological resources include the elements needed in the milk production process, while economic resources refer to profit generation that stimulates farmers to develop their dairy business as in [7].

Dairy farming businesses in the lowlands of Malang Regency have been developed in several districts such as Kalipare, Gondanglegi, and Bantur with an area height of ≤ 400 meters above sea level and have implemented cooperative and non-cooperative business group institutions. Reference [1] shows states that the population of dairy cows in Kalipare District is 384 heads, Gondanglegi is 680 heads, and Bantur is 1. 010 heads. The majority of dairy farming businesses in the three sub-districts are still traditional. Based on the initial observations that have been made, it can be seen that the potential for livestock business development is still immense if production inputs can be managed efficiently. Therefore, the income of dairy farming in the lowlands needs to be studied. The study was conducted to determine the amount of income for dairy farming in the lowlands of Malang Regency.

II. MATERIALS AND METHODS

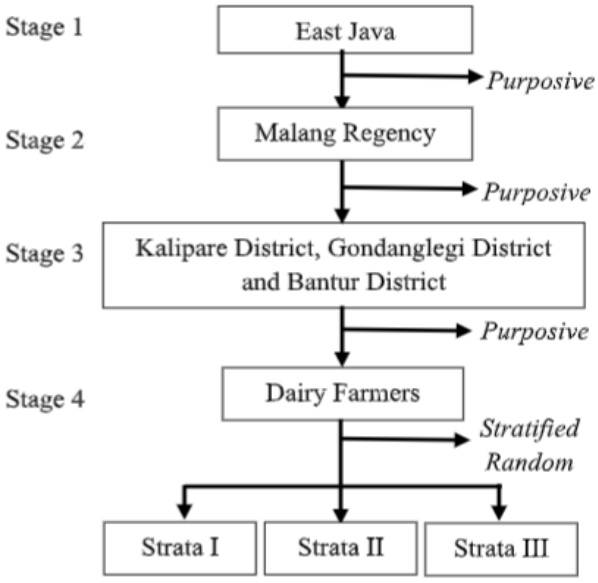
A. Research Location

The study was conducted in Malang Regency (Kalipare, Gondanglegi, and Bantur Districts) on January 20-February 20, 2022. The location was chosen because the district is in the lowland with an altitude of <400maslas in [4].

B. Sample Determination Method

The research method uses descriptive quantitative surveys. The sampling method uses *purposive* sampling and *sampling frames*. Reference [11] stated that *purposive* sampling is deliberately determining samples to describe some population traits, while *stratified random* sampling is sampling by separating populations in group form.

As follows:



At the *stratified random sampling* stage, researchers select farmers with at least two lactation dairy cows, have at least two years of breeding experience, and are members of the dairy farmer group. Then group into each of the strata. Determination of strata as follows:

$$\text{Range} = \frac{Largest\ population\ number - smallest\ population\ number}{3}$$

$$\text{Range} = \frac{35 - 2}{3}$$

Range = 11 livestock units

Based on these calculations, strata I, strata II, and strata III are then determined as follows:

Strata I = 2-13livestock units
Strata II = 14-24livestock units
Strata III = 25-35livestock units

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In strata I, the number of respondents who met the requirements for the number of lactation dairy cows raised was 78; in strata II, as many as 15 respondents; in strata III, as many as five respondents, so the total number of respondents was 98 breeders

C. Data Collection Methods

1)**Primary Data:**Primary data obtained by direct observation and interview according to questionnaires

2) **Secondary Data:**The data collected is in the form of documentation about smallholder farmers, including the respondent's profile, the state of the respondent's location, and the respondent's laying hens. The literature is derived from journals or books related to this research.

III. DATA ANALYSIS

A. Total Cost (TC)

Total Cost (TC): Total Cost (TC) It is the addition of all fixed and variable costs with units of Rp/Year. Can be obtained by the formula [9].

$$TC = FC + VC$$

Information:
TC = Total Cost (Rp/Farm/Year)
FC = Fixed Cost (Rp/Farm/Year)
VC= Variable Cost (Rp/Farm/Year)

B. Acceptance

Revenue is obtained from the production process by multiplying the production results by the production price in force at that time by units of Rp/Year [9].

$$TR = P \times Q$$

Information:
TR = Total Revenue (Rp/Farm/Year)
P = Price of Quality (Rp./Kg)
Q = Quantity (Kg/Farm/Year)

C. Advantage

The profit obtained from the receipt is reduced by the total cost. The profit calculation can be obtained by the formula below in units of Rp./Year[9].

$$\mu = TR - TC$$

Information:
μ = Advantages of folk breeders (Rp/Farm/Year)
TR = Total Revenue (Rp/Farm/Year)
TC = Total Cost (Rp/Farm/Year)

IV. RESULTS AND DISCUSSION

A. Overview of Research Locations

1)**Kalipare Subdistrict:** Kalipare is one of the 33 sub-districts in the Malang Regency area and is located in the southern part, precisely south of the SutamiKarangkates Dam. Astronomically, Kalipare Malang District is located between 112.2241^{o} to 112.2917^{o} East Longitude and 8.1550^{o} to 8.1054^{o} South latitude. Kalipare Subdistrict has an area with an exciting topography because of its forests and beautifully arranged hills**.**

Luas area of Kalipare District is around 11.2632 km2 or about 2.02 percent of the total area of Malang Regency. This waterfall is located in the Lanes of the Kendeng Mountains with an undulating flat soil structure at an altitude of 303 meters above sea level. The rainfall reaches an average of 2. 107 mm/Year with an average temperature of 23 -30^{o} C. Stop-boundary area of Kalipare District is as follows:

- North : Sumberpucung Subdistrict
- East : Pagak Subdistrict
- South : Donomulyo District
- West : Blitar District

2)**Bantur Subdistrict:**Astronomically, BanturDistrictis located between 112.5497^{o} to 112.6066^{o} East Longitude and 8.0916^{o} to 8.1708^{o} South latitude. The topography of all villages in the Bantur District is plain. The total area of Bantur District is about 15.9 km2 or about 5.35 percent of the total area of Malang Regency. This district is located at an altitude of 317 meters above sea level with a temperature of 27-33^{o}C. Above-the boundaries of the Bantur District are as follows:

- North : Pagelaran Subdistrict
- East : Gedangan Subdistrict
- South : Indonesian Ocean
- West :PagakandDonomulyo Subdistricts.

3)**Gondanglegi District:** Gondanglegi, one of Malang Regency's sub-districts, is astronomically located between 112.1330 o to 122.5455 o East Longitude and

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7.5890 o to 8.6813 o South Latitude. The topography of the Gondanglegi District consists of slopes, hills, and plains. The total area of Gondanglegi District is around 61.03 km2, or about 3.46 percent of the total area of Malang Regency. Gondanglegi Subdistrict is located at an altitude of 360 meters above sea level with a minimum temperature of 26 o C and a maximum temperature of 32oC. Stop-boundary area of Gondanglegi District:

- North : Bululawang Subdistrict
- East : Turen Subdistrict
- South : Performance District
- West : Kepanjen Subdistrict

B. Characteristics of Respondents

TABLE 1
CHARACTERISTICS OF FARMERS IN MALANG REGENCY

No	Characteristic	Precentage (%)
1.	**Farmers age**	
	• 15-64 years	93
	• > 64 years	7
2.	**Gender**	
	• Male	87
	• Female	13
3.	**Level of Education**	
	• Elementary School	36
	• Junior High School	19
	• Senior High School	34
	• Collage	11
4.	**Experience**	
	• 1-10 years	27
	• 11-20 years	23
	• 21-30 years	21
	• >30 years	29

Source: Processed Primary Data (2022)

Farmers in Malang Regency aged 15-64 years by 93% and aged>64 years by 7% because this age is included in the productive category. The increasingly productive age of breeders will have implications for increasing farmer productivity and the adoption or acceptance of the latest technology in animal husbandry. In addition to the above, the number of farmers with productive age indicates that many people are engaged in the livestock business and can be a benchmark for the government and the private sector to develop livestock businesses and subsidize the budget for the construction of community farms. The development of human resources with productive life also makes it easy for all parties to build long-term livestock so that domestic livestock products can be provided.

The experience of farmers in raising diverse dairy cows will certainly affect livestock productivity. Farming experience will determine how farmers manage their dairy farming business according to experience. Reference [3] stated that long farming experience would provide knowledge and skills in managing his livestock business. The experience of raising livestock can be used as a guideline for adjustments to future livestock business problems. The length of the experience of raising livestock has a positive effect; namely, farmers are more careful in making decisions—the experience of raising livestock influences farmers in making decisions related to their livestock business. Based on table 1, the amplest livestock experience (>30 years) was 29% (28 people) in Gondanglegi District, as many as 15 people, and Bantur District, as many as 13 people. In Kalipare District, no farmers have more than 30 years of farming experience. 21-30 years of livestock experience, as much as 21% (21 people) and spread across three sub-districts; Kalipare District as many as one person; Bantur District, as many as eight people and Gondanglegi District, as many as 12 people. 11-20 years of livestock experience of 23% (23 people) found in Kalipare District as many as six people, Bantur District 6 people, and Gondanglegi District as many as 11 people. The data above also illustrates that the number of farmers with breeding experience between 1-10 years is quite a lot, namely 27% (26 people). Farmers in Kalipare District generally have experience raising between 1-10 years and only one person with more than 20 years of farming experience.

A person's level of education is one of the critical factors that reflect a person's ability to perform and complete a type of work or responsibility assigned to him. The level of education can measure a person's ability to receive and absorb the latest knowledge and

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technology. Education is one factor that can determine a farmer's success in doing business, significantly developing his livestock business. Reference [13] shows this follows the opinion, who states that the level of education determines a person in receiving knowledge and information; the higher the level of education a person has, the higher the knowledge he has.

Farmers with a high level of education will be quick in receiving and understanding new information and able to make innovative changes in their livestock maintenance management. Reference [2] showsstated that farmers who have a higher level of education would be faster in receiving and understanding information, able to make innovative changes in their livestock management, and tend to implement the adoption of innovations quickly. The level of formal education is also one of the factors in efforts to develop a dairy farming business and the adoption of the latest technology as a conscious effort for farmers to increase production and business scale. Quality and knowledgeable Human Resources (HR) can facilitate the development of the dairy farming business, where good human resources innovation and technology adoption can continue to be updated regularly [5].

The longer the experience of raising livestock, the more responsive farmers are to face problems in their livestock business. Adequate experience and education would increase the horizon of understanding the technical and economic principles required for a person to succeed in a dairy farming business. Reference [5] stated that the experience of raising livestock is an excellent capital for livestock business activities. This experience can increase innovation in animal husbandry and business management in a better direction. Although, in principle, it requires support and attention from all parties in the development of the livestock business.

Men still dominate farmers in Malang Regency who are involved in running a livestock business. In the field research results thatresearchers got 87% of men became the primary movers and actors who run the dairy farming business. This is a sign that the culture and beliefs of the Indonesian people label men are more responsible figures in running the wheels of business and heavy work. This must be a concern for all circles to change the paradigm of society regarding the involvement of women in all fields, especially the livestock business sector. The potential of women still needs to be utilized. If women can be fully involved in the livestock business in the future, the livestock business can be more developed and developed.

C. Production Costs

Production costs are one of the determining parts of the cost of goods as well as knowing the pricing can determine how much return on capital has been spent to make a profit [6]. Production costs are divided into two, namely fixed costs and non-fixed costs (variable costs). Production costs are the total expenses for obtaining production results. Production costs in dairy farming businesses in the lowlands of Malang Regency also consist of fixed and non-fixed costs. Fixed costs include cage depreciation, chopper machine depreciation, dairy machine depreciation, milkcan depreciation, water barrel depreciation, blower shrinkage, broom depreciation, and sickle shrinkage. Non-fixed costs incurred by dairy farmers include feed costs, medicines, vitamins, artificial insemination, electricity, water, transportation/fuel, and employee salaries. The following are the components of fixed and non-fixed costs incurred by dairy farmers in the lowlands of Malang Regency per year. Table 2 shows that the average fixed cost in strata I am Rp. 478.188/AU/Year, strata II is Rp. 1.627.213/AU/Year, while strata III is Rp. 2.535.440/AU/Year. The fixed costs in each strata differ since the number of dairy cows raised is different. The difference in the number affects the area of the drum and the number of equipment owned, so it affects the drum's

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shrinkage and the equipment's shrinkage. The average ownership of dairy cows in strata I am 4.95 ST, strata II 17.67 ST, and strata III 28.6 ST.

Fixed costs are costs that are not affected by the amount of production. Fixed costs are still incurred even though no production took place. While non-fixed costs, or variable costs, are costs that are influenced by the amount of production.

Non-fixed costs (variable costs), according to the data in table 2 in strata I amounted to Rp 89,269,788/ ST /Year, strata II increased to Rp 296,030,000/AU/Year and increased again to Rp 458,029,050/AU/Year in strata III. The average non-fixed cost in the three strata is Rp 878,667,956. The increase in the amount of non-fixed costs from strata I to strata II and strata III is because the number of raised cattle is increasing, so more and more costs are required to purchase feed, medicines, and vitamins.

TABLE 2
PRODUCTION COST OF DAIRY BUSINESS IN THE LOWLANDS OF MALANG REGENCY (RP/AU/Year)

Production Costs	Strata		
	I	II	III
Fixed Costs	Rp478.188	Rp1.627.213	Rp2.535.440
Variable Costs			
Feed	Rp67.660.429	Rp199.128.867	Rp310.232.650
Medicines	Rp401.667	Rp1.397.333	Rp2.496.000
Vitamin	Rp251.026	Rp777.133	Rp1.352.400
Artificial Insemination	Rp2.150.769	Rp8.040.000	Rp10.728.000
Electricity and water costs	Rp722.308	Rp15.000.000	Rp2.880.000
Transportation/Fuel	Rp656.923	Rp1.640.000	Rp3.660.000
Employee Salaries	Rp7.476.923	Rp67.680.000	Rp103.680.000
Purchase of Heifers	Rp9.589.744	Rp15.866.667	Rp23.000.000
Number of Variable Costs	Rp89.269.788	Rp296.030.000	Rp458.029.050
Total Production Costs/Year	Rp89.747.976	Rp297.657.213	Rp460.564.490

Source : Processed Primary Data (2022)

The total production cost in strata I am Rp 89.747.976/AU/Year, and in strata, II is Rp 297.657.213/AU/Year, and strata III Rp 460.564.490/AU/Year. The most significant total production cost is found in strata III due to the large population owned, which affects the number of production costs incurred.

D. Acceptance

Reference [14] shows states that revenue is the receipt of producers from the proceeds of output sales. Total receipts result from the multiplication between output and the selling price of production. Reference [15] shows business acceptance is the value or result of selling products from a business. The greater the number of products produced and successfully sold, the greater the receipts, but the amount of receipts does not guarantee the amount of income received. The revenue from the dairy business comes from the sale of milk, cows, and heifers. Based on table 3, the more significant the scale of the livestock business, the greater the potential profit received. Reference [16] shows receipts are the results producers receive from selling cow's milk that farmers deposit to milk shelters. The more ownership of lactation livestock production in the dairy farming business, the more milk sales will increase daily. Milk production in Malang Regency averages 10-12liters/day per day. Milk production in Malang Regency is still low because it can be caused by livestock conditions such as livestock type, livestock health, lactation month, and lambing.

The sale of calves in the Malang Regency area, especially Kalipare, Gondanglegi, and Bantur Districts, depends on the sex born; if the calves are born male, the farmer will sell them because if the farmer raises them until adulthood, they will increase production costs in meeting the feed needs of the cow. The selling price of male calves is seen from the weight of livestock, livestock health, and prices in the market. The sale of after cattle is also a source of revenue for the dairy cattle business depending on the health of the fair cattle to be sold; sometimes, paternal sells after cows in a paralyzed state or cannot stand up; this can also affect the selling price.

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TABLE 3

DAIRY BUSINESS REVENUE IN THE LOWLANDS OF MALANG REGENCY (RP/AU/Year)

Acceptance	Strata		
	I	II	III
Milk Sales	Rp.121.527.615	Rp.404.576.400	Rp.667.584.000
Sales of Calves	Rp.2.692.308	Rp.2.666.667	Rp.4000.000
Sales of Afkir Cattle	Rp.1.666.667	Rp.5.400.000	Rp.10.200.000
Sum	Rp.125.886.590	Rp.412.643.067	Rp.681. 784.000

Source: Processed Primary Data 2022

The research results in table 3 show that the average receipt in strata I am Rp. 128,323,722 / ST / year, strata II is Rp. 412,643,067 / ST/Year, and strata III is Rp. 681,784,000 / ST/Year. The difference in receipts obtained by farmers is due to the different number of holdings of lactation cattle, the number of stud calves sold and the number of cows sold.

E. Advantages

The purpose of a livestock business, regardless of the cultivation in general, is to seek profit. Profit is the difference between the farmer's receipts and the total production costs incurred by the farmer in a livestock business. The profit of the dairy business in the lowlands can be obtained by reducing the farmer's acceptance by the total cost of production. The profit or loss of a livestock business can be known from the reduction results; if it is positive, the farmer is said to be profitable. However, if the opposite is obtained, a negative result, the farmer is said to be a loss in running his business [13]. The profit of the dairy business in Malang Regency can be seen in table below.

TABLE 4
PROFITS OF DAIRY CATTLE BUSINESS IN THE LOWLANDS OF MALANG REGENCY (RP/AU/Year)

Description	Strata		
	I	II	III
Acceptance	Rp125.886.590	Rp412.643.067	Rp681.784.000
Production Costs	Rp89.747.977	Rp297.657.213	Rp460.564.490
EBIT	Rp36.138.613	Rp114.985.854	Rp221.219.510
Income Tax	Rp1.806.931	Rp5.749.293	Rp11.060.976
EAT	Rp34.331.682	Rp109.236.561	Rp210.158.535

Source: Processed Primary Data 2022

Earnings Before Interest Taxes (EBIT) is a profit that has not been reduced by income tax. This follows the opinion of Siregar[10], which states that the calculation of operating profit and loss begins by reducing the amount of all receipts with total fixed costs and variable costs annually. The calculation of profit and loss is obtained from the value of receipts before deducting interest and income tax, also called net profit before tax (EBIT).

According to the data in table 4, the net profit before tax obtained by dairy farmers in Malang Regency in strata I am IDR 36,138,613 / ST / Year, strata II IDR 1 14,985,854 / ST/Year, and in strata III IDR 1 14,985,854 / ST/Year, and in strata III IDR 14,985,854 / ST/Year, and strata III IDR 1. 221,219,510/AU/Year. The profit before tax obtained by farmers in strata III is greater than that of strata II and I. This shows that the more dairy cows they have, the greater the profit before tax is obtained

Earning After Taxes (EAT) is a profit that an income tax of 5% has reduced. This is reinforced by the opinion of Siregar [10], who states that EAT is a deduction against EBIT with income tax for each EBIT that is of positive value or earns a profit. In simple terms, EAT is equal to EBIT minus tax. The data in the table shows the net profit after tax (EAT) received by farmers in strata I of Rp. 34,331,682/AU/Year, in

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strata II Rp. 109.236.561/AU/Year and in strata III amounting to Rp. 210. 158. 535/AU/Year.

V. CONCLUSION

Based on research carried out on dairy farms in Malang Regency, it can be concluded that the average ownership of dairy cows in strata I am 4.95 ST, strata II is 17.67 ST, and strata III is 28.6 ST. The average production cost in strata I am Rp. 89,747,976 / ST / year, strata II is Rp. 412,643,067 / ST/Year, and strata III is Rp. 681,784,000ST / year. The average net profit in strata I am Rp. 34,331,682/AU/Year, in strata II Rp. 109.236.561/AU/Year and in strata III amounting to Rp. 210. 158. 535/AU/Year.

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