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# The Effect Of Good Dairy Farming Implementation On The Income Level And Efficiency Of Dairy Cows Farmers Businesses In West Malang Regency

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Abstract

The research aims to identify the implementation of Good Dairy Farming Practice, measure the income and efficiency of livestock business. The research was conducted in West Malang Regency from November 2021 to February 2022 in three sub-districts namely Pujon, Ngantang and Kasembon. Samples were taken as many as 100 using purposive sampling method. Data analysis was descriptive quantitative to identify the Good Dairy Farming Practice score, analysis of business efficiency with Cobb Douglass Production Function Regression, analysis of business income and influential factors with Multiple Linear Regression. The results showed that the application of GDFP with sufficient score categories is health aspects (2.84), milking hygiene aspects (2.76), feed nutrition and drinking water aspects (2.43), animal welfare aspects (2.87), environmental aspects (2.64), and unfavorable score category is socio-economic aspects (1.37). The average income of dairy farmers is IDR 70,959,024 per year. The results of income regression analysis showed that the variables of health and nutrition aspects had a very significant effect, the milking hygiene aspect had a significant effect, and the environmental aspect had a less significant effect. The results of the efficiency of the use of factors of milk production with a value of 1.215 showed increasing returns to scale. All aspects of GDFP are in the sufficient category and the socio-economic aspects are in the unfavorable category. This makes the farmer's income less than optimal.

## INTRODUCTION

Cow milk is cattle ruminant milk producers who own content nutrition high, fine consumed for the growth period child to adults. Based on data from the Central Statistics Agency level Indonesian people's milk consumption is experiencing enhancement each the year . In 2020 it is known to be 16.27 kg/ capita/ year increased 0.25% of in 2019 with mark milk consumption 16.23 kg/ capita/ year. Milk consumption in Indonesia is more low compared to with other ASEAN countries such as Malaysia 50.9 capita/ year, Thailand 33.7 capita/ year and the Philippines 22.1 capita/ year. However thereby increasing demand for milk is not balanced with increasing domestic fresh milk production (Taufik, 2019).

Based on BPS data on needs material Domestic fresh milk standards in 2020 amounted to 947,685.36 tons. National milk demand in 2020 is 4,385.73 tons For sufficient need 78% is fulfilled with milk imports. As many as 90% of milk producers in Indonesia are breeder people. This matter need exists enhancement national milk production For can sufficient domestic milk demand. The low national milk production related with low population cow milk, level productivity 11 liters/ day, scale business breeders average 2-3 heads / breeder, land forage the more limited, cost import cow milk and seeds are expensive, *good farming practices* Not yet done with OK, capital lacking, and assistance not optimal ( Hello *et al* ., 2013). Enhancement cow's milk production can done with repair management maintenance cattle. Besides that For overcome problem national milk production can also done with development strategy dairy national. One of them with do improvement, development and evaluation ability breeder through application *Good Dairy Farming Practices (GDFP).*

*Good Dairy Farming Practice* is something guidelines in maintenance or cultivation cow purposeful milk For increase business breeder cow milk. *Good Dairy Farming Practice* is used throughout the world to support farmers For producing and marketing quality, safe and suitable milk standard quality with condition healthy livestock as well as balance environment awake (Singh and

Jirli, 2020). The implementation of GDFP is form effort or business in enhancement productivity cattle as well as repair technical maintenance cow milk. Standard in evaluation *Good Dairy Farming Practice* consists from aspect health livestock, aspect hygienic milking, aspect nutrition feed and drink livestock, aspect aspect environment and aspects social economy. According to Aminah and Rondhi (2019) with application *Good Dairy Farming Practices* so will formed something farm cow milk more productive.

West Malang Regency is one of them regency the largest milk contributor in the East Java region with population cattle cow milk most, but in some areas it still is there is classified milk production low than it should be Can achieved. In accordance with opinion Adibowo (2014) power competition between breeders cow dairy in the Pujon area Not yet capable increase production To use fulfil milk needs in society. Condition this is also appropriate with opinion Rifa'i *et al* (2020) that on appearance reproduction tightly connection with management maintenance and management reproduction so required repair management marriage, registration, management giving feed. This matter caused by use factor production yet efficient by farmers. Development and improvement business farm cow milk need done with reach efficiency in production so that business can give profits received through income (Aisyah, 2012). Income in a way general interpreted as difference between reception with expenditure. Income in business farm people is addition income farmer, because is business secondary in business farmer. Income business cattle different between business one livestock with others, because there is difference type and quantity area effort, level production and efficiency use factor production.

Related with matter that, necessary exists development business cattle cow dairy managed by farmers, so that it produces with Good with implement GDFP as well efficiency factors production. Average milk production above 10 liters/ head/ day so that with implemented it *Good Dairy Farming Practice* (GDFP) in particular maintenance cow dairy in West Malang Regency is expected milk production will increase. System good maintenance in accordance with

standardization *Good Dairy Farming Practice* (GDFP) is capable For improve and add income breeder cow milk. The aspects of GDFP are: aspect health, aspect hygiene milking, aspect nutrition, aspect well-being livestock, aspect environment, and aspects social economy. Therefore That study This important done For see How influence application aspects of GDFP (Good Dairy Farming Practice) in income dairy farmer.

## METHOD

Research methods This use method quantitative descriptive For measure evaluation *Good Dairy Farming Practice* covers aspect health, aspect hygiene milking, aspect nutrition (feed and drinking water), aspects well-being livestock, aspect environment and aspects social economy, income breeders and efficiency business. The analysis model used is analysis multiple linear regression and using assumption tests classic For fulfil BLUE standard (Best Linear Unbiased Estimator). Determination method respondents breeder used in study determined with method *purposive sampling* or in a way on purpose. Determination respondents done in a way on purpose with criteria that have cattle cow milk at least one tail lactation. This is also based Because selected respondents considered own required information For study. Amount sample used in study This totaling 100 respondents based on the results observation determined based on amount ownership cattle that is small with ownership parent lactation 1-2, medium 3-4 and large above 4 tails. Selection on the data done based on amount population breeder cow milk the most that is Subdistrict Pujon taken amount 50% sample and selected in a way equally based on scale ownership, 30% on the amount population breeder currently that is Subdistrict Hang in there and get selected in a way equally based on scale ownership, and 20% is carried on the amount population breeder A little that is Subdistrict Kasembon and selected in a way equally based on scale ownership.

## RESULT AND DISCUSSION

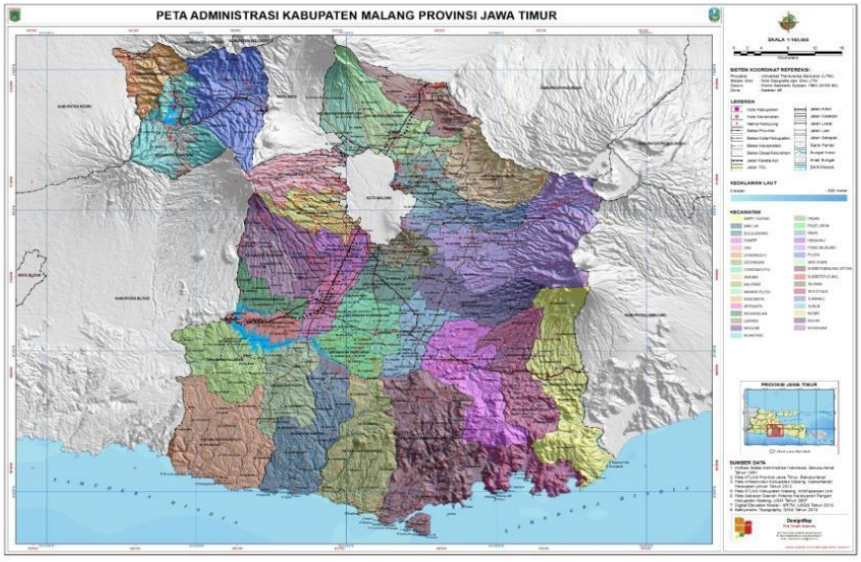
### Condition Geography West Malang Regency

Malang Regency has The area of 3,530.65 km² is located in the area plain tall with height 250-500 meters above surface sea, and the highest in the area

hills limestone (Mountains Kendeng). Malang Regency area geographical be in position geographical between 112° 17'-10.90' Longitude East and 112° 57-00.00' East Longitude and between 7° 44'-55.11 South Latitude and 8°26'-35.45 South Latitude. The administrative area boundaries of Malang Regency are as follows following:

1) North side, namely Regency Pasuruan and Regency Probolinggo ;
2) East side, namely Regency Lumajang
3) South side, namely Indonesian Ocean
4) West side, namely Regency Blitar, Kediri Regency

Malang Regency in general administrative divided in 33 (three tens three subdistrict consists of 12 (two twelve) sub-districts and 378 (three hundred and seven tens eight.




Gambar SEQ Gambar * ARABIC 1. Peta Kabupaten

West Malang Regency which consists of from Subdistrict Pujon, District Ngantang and District Kasembon is still there classified area plain tall. Subdistrict Pujon in a way astronomical located between 112.2611 to 122.2892 East Longitude and 7.5220 to 7.4937 South Latitude. Refers to potential data Subdistrict Pujon location geography around 8 villages is in the valley with topography village classified hills and plains. By administrative Subdistrict

Pujon divided into 10 villages with a total area of around 34.18 km² or around 4.39 percent of the total area Malang Regency (District BPS Pujon, 2021).

Potency Subdistrict Hanging out based on existing data topography is on a slope mountains, there are 10 villages and 3 villages other own topography land. District area Hanging out amounting to 147.70 km² or around 4.96 percent from wide Malang Regency. By astronomical Subdistrict Hanging out located between 112.2149 to 112.2286 East Longitude and 7.4945 to 7.5603 South Latitude (BPS District Ngantang, 2021).

Subdistrict Kasembon is the westernmost region of the border direct with Kediri Regency which has wide about 55.65 km² or around 1.87 percent of the total area Malang Regency. By geography around 4 villages is on a slope mountains and 2 villages on the plains. By astronomical Subdistrict Kasembon located between 112.1822 to 122.2193 East Longitude and 7.4636 to 7.5022 South Latitude (BPS District Kasembon, 2021).

Regency (District Pujon , District Ngantang and District Kasembon) which has potential in the sector abundant agriculture and animal husbandry with supported plain area conditions tall . Source eye livelihood main as farmers and ranchers, because in a way geographical is at an altitude of 700 -3,300 meters above sea level whereas bulk Rain generally the average reaches 2,000 mm. Rainfall by month December reach the most up to >500 mm is categorized bulk very heavy rain.

Population data West Malang Regency from three subdistrict based on updated data results in 2021 administration recorded amount resident as many as 157,776 soul with details a total of 80,676 types sex male and 77,100 gender sex Woman. Following This is details amount resident according to village in West Malang Regency.

Table: Amount resident West Malang Regency per village

| District name | | |
|---|---|---|
| Subdistrict Pujon | Subdistrict Hanging out | Subdistrict Kasembon |

| Name Village | Amount | Name Village | Amount | Name Village | Amount |
|---|---|---|---|---|---|
| Bendosari | 4,046 | Pagersari | 3,398 | Grand Lodge | 6,241 |
| Sukomulyo | 6,497 | Sidodadi | 5,191 | Spinach | 6,092 |
| Pujon South | 4,344 | Banjarejo | 4,976 | Pait | 4,175 |
| Pandesari | 11,008 | Purworejo | 4,184 | Wonoagung | 4,064 |
| Pujon Lor | 7,725 | Waiting in line | 5,515 | Kasembon | 4,498 |
| Groto | 6,418 | Banturejo | 3,388 | Sukosari | 5,877 |
| Ngabab | 7,727 | Pandansari | 4,948 | | |
| Tawangsari | 6,640 | Mulyorejo | 4,366 | | |
| Madiredo | 8,851 | Sumberagung | 5,571 | | |
| Miyurejo | 5,397 | Kaumrejo | 5,004 | | |
| | | Tulungrejo | 3,595 | | |
| | | Waturejo | 3,498 | | |
| | | Jombok | 4,542 | | |

Source: Badan Pusat Statistik (BPS) in 2021

Based on condition according to the table above so can observed that amount resident the most is in the District Pujon. This is also appropriate with regional conditions, where Subdistrict Pujon is area the highest plain compared to with Subdistrict Ngantang and District Kasembon. There is business Neither

do the farms in the West Malang Regency area regardless of existence role group breeder. Very big role For strive his efforts to produce mark added purposefully For efficiency in management his business.

Developed efforts aim advance institutional so that exists interactions that will impact For each other help and strengthen in manage system business farm cow milk. Group Breeders also have them strategic position Because will produce quality breeder, which is characterized by the presence of independence and resilience in operate his business so that will have empowerment (Mauludin *et al.*, 2012).

This is also supported by existing jobs in the area Because will influential to income and welfare resident. The conditions in the West Malang Regency region show this that potency occupying job sector mainly namely in the field agriculture, animal husbandry, plantations and trade. Field Agriculture has great potential Because supported by existence source available power as well as condition nature supports it, so cultivation vegetables and fruit is opportunity in businesses in this area. Commodity agriculture which is general is in the West Malang area which was developed by farmers includes: (a) plants vegetables (onions red, onion white, potatoes, onions leaves, nuts long, chili, tomato, beans red, cucumber, kale, spinach, flowers cabbage, mushrooms); (b) plants biopharmaceuticals (ginger, laos, kencur, turmeric, lempuyang, ginger, and noni); (c) plants fruit (avocado, durian, orange, apple, mango, mangosteen, jackfruit, papaya, banana, rambutan, zalacca, breadfruit, guava, star fruit).

**Characteristics Respondent**

In the research carried out For take a data is used respondents who have characteristic features in accordance with characteristics that have determined. Respondent identification process that is percentage amount male and female, age, level education, experience raising, quantity dependents family and number ownership cattle. Respondents used in study For Collecting data from 100 people is based on on amount ownership cattle cow milk. Respondent is breeders who own amount cattle cow milk based lactation on ownership low namely 1-2 tails, ownership medium 3-4 tails and ownership tall more of 4 tails.

Table: Characteristics Breeder Dairy Cattle in West Malang Regency

| Variable | | Group Breeders (%) | | | |
|---|---|---|---|---|---|
| | | **Kasembon N=20** | **Hanging out N=30** | **Pujon N=50** | **Total N=100** |
| Age | a.<25 Years | 5 | 0 | 0 | 1 |
| | **b. 25-55 Years** | **55** | **61.3** | **68.6** | **63.7** |
| | c. >55 Years | 40 | 38.7 | 31.4 | 35.3 |
| Last education | a. No school | 15 | 16.1 | 17.6 | 16.7 |
| | b. elementary school | 25 | 29.0 | 29.4 | 28.4 |
| | c. JUNIOR HIGH SCHOOL | **20** | **32.3** | **41.2** | **34.3** |
| | d. SENIOR HIGH SCHOOL | 30 | 19.4 | 11.8 | 17.6 |
| | e. S1 | 10 | 3,2 | 0.0 | 2.9 |
| Experience Breeding | a. 1-5 Years | 15 | 3,2 | 11.8 | 9.8 |
| | b. 6-15 Years | 30 | 35.5 | 27.5 | 30.4 |
| | c. >15 Years | 55 | 61.3 | 60.8 | 59.8 |
| Gender | a. Man | 65 | 87.1 | 78.4 | 78.4 |
| | b. Woman | 35 | 12.9 | 21.6 | 21.6 |

**Age Breeder Dairy cows**

Age breeder own important role Because productive age will determine ability in a way thinking and physical in act on every breeder. Age increasing number of breeders old will experience decline so that slow in operate his business. Based on results study obtained age breeder respondents can classified become three category, are age not enough from 25 year old, between 25 to 55 year old and more from 55 year old. Amount the most running age business cow milk are aged 25 to 55 years with a total of 63.7 percent. Amount lowest in age not enough from 25 years with percentage 1 percent. Age with amount highest percentage is at age productive, where breeder cow milk capable

operate his business with ability still potential Good. In running business, farmer with age productive capable For accept all information and apply management cow milk with OK, so can increase income. According to Firdaus *et al.* (2021) with age the Breeders also have desires know what's high as well as capable in adopt technology and innovation so that breeder cow milk Can develop good empowerment.

Breeder Education Level Dairy cows

Level of education breeder is very influential thing method think in accept all information and treatment in nurse cattle. A person's education is increasing tall make it easier in develop all innovation nor pattern think for expand network in society. The more-tall level education someone, inside taking decisions are also based on many considerations, so level the risk will be happen will the more-low. Limitations in enjoy education will impact to pattern thoughts and insights of farmers in taking a decision in social. The results in the table above can is known that level education dominant breeder is junior high school. Formal education as well education informal breeder will influential positive to reception all information and broad insight that will make it easier for innovate. This matter in accordance with results research by Hasbullah *et al.* (2022), that level education dominant breeder low will give rise to difficulty in give education to breeder so that impact on productivity raising livestock. Enhancement innovation and good insight can supported with exists giving counseling to breeders, regarding governance maintenance cattle.

**Experience Breeding Dairy cows**

Experience farming is carried out is evaluation on base forever breeder in manage his business. Basically breeder cow milk No get education formally about procedures care and management cow milk. Based on results from study grouping based on experience raising categorized as to 1 to 5 years, 6 to 15 years and more from 15 years. Percentage value with experience raise the most namely on experience more from 15 years with total value percentage amounting to 59.8 percent. At the lowest percentage that is experience rearing 1-5 years with mark by 9.8 percent.

The length of time that livestock is carried out on the farm cow dairy in West Malang Regency because business carried out in a way down hereditary, so Lots from breeder start operate his business from age school. There is experience farming for a long time then the more big scale effort and ability finish problem in overcome problems in his business. According to Mumfiza et all. (2022) skills acquired by breeders are increasingly Good in manage his efforts, because forever experience raise the livestock you own. This thing that takes a long time to breed become role important, because the differences in experience are also different in pattern think in operate his business.

**Gender Breeder Dairy cows**

Work in manage business cow milk No fully carried out by men, but also carried out by women. The results have been obtained For maintenance cow milk show that work This dominated by men with mark amounting to 78.4 percent and for Woman amounting to 21.6 percent. On the job cow milk because more lots use strength muscle because need power more so that lots done by men in look for feed, bathe livestock, cleaning pen. The role of women in operate business only on activities assist with milking, depositing milk and the recording process. According to Ervina et all. (2019) work business cow family run dairy with role woman only help to do more light and fast finished, as well in take care of his livestock if her husband No There is so that supervise his business.

**Ownership Cattle Dairy cows**

Ownership livestock kept is something reflection on conditions scale business livestock which refers to income breeder . Amount ownership livestock at the farmer cow milk West Malang Regency was measured based on amount parent lactation, bulls and calves. Amount ownership livestock in West Malang Regency can observed in the table under This.

Table: Ownership Cattle Dairy cows

| Type of Cow | Mean ± SD | | |
|---|---|---|---|
| | Male | Female | Amount |
| Calf ( tail ) | 0.68 ± 1.25 | 1.24 ± 1.56 | 0.96 ± 1.44 |
| Dara ( tail ) | 0.11 ± 0.65 | 0.59 ± 1.51 | 0.35 ± 1.19 |
| Mature Dry ( tail ) | - | - | 1.33 ± 2.23 |
| Adult Male ( tail ) | - | - | 0.02 ± 0.14 |

| | | | |
|---|---|---|---|
| **Mature Lactation ( tail )** | **-** | **-** | **4.48 ± 3.99** |

The average result is the number ownership calf in breeder biggest is mature lactation (4.88 ± 3.99 tails). Amount ownership of cattle maintained lactation determine generated income. Asmara *et al* . 's opinion. (2016) that with exists addition cow lactation so There is enhancement amount milk production will influential to well-being breeder cow milk in operate business his livestock.

**Analysis Application *Good Dairy Farming Practice* (GDFP) in West Malang Regency**

Aspects application management management cow good milking must can optimized to produce productivity tall. Maintenance cow milking is very necessary something empowering experience competitive high to optimize results and p this is also necessary something guidelines maintenance good livestock based on *Good Dairy Farming Practice* (FAO&OEI, 2011). Breeders in West Malang Regency for increase good milk production in a way quality nor quantity required with knowledge will understanding *Good Dairy Farming Practice.* Analysis application *Good Dairy Farming Practice* tightly connection with level income will be obtained by breeder.

Value of results application the show that average aspect value *animal warfare* own highest score of 3.22 and the lowest average score in this aspect social economy of 1.37.

Table: Average implementation value aspect *Good Dairy Farming Practice* (GDFP) in West Malang Regency

| No. | Aspect Application GDFP | Implementation Score GDFP | Information |
|---|---|---|---|
| 1 | Health Aspects | 2.84 | Enough |
| 2 | Aspect Hygiene Milking | 2.76 | Enough |
| 3 | Aspect Nutrition | 2.43 | Enough |

| | | | |
|---|---|---|---|
| | (Feed and Drinking Water ) | | |
| 4 | Aspect *Animal Walfare* | 2.87 | Enough |
| 5 | Aspect Environment | 2.64 | Enough |
| 6 | Aspect Socioeconomic | 1.37 | Not good |

Source : Processed primary data (2022)

**Analysis Dairy Cattle Business Income**

Income in business farm cow dairy in West Malang Regency especially in acquisition profit is very important thing. This matter Because breeder in manage his business lack of good management in accordance with standardization that has been set. Acquisition income of the farmer based on calculation that is difference between mark reception with whole costs used in manage business his livestock. Condition This in accordance with results research, that mark income earned that is income cash and income on total costs consisting of from component on reception cash, total cost cash and total costs.

Table: Average income per breeder in West Malang Regency

| Description | Amount (Rp/ year ) |
|---|---|
| Total Receipts | 178,695,503 |
| Total CostCash | 106.360.287 |
| Total Non- Cash Costs | 1,376,192 |
| Total cost | 107,736,479 |
| Income on total cost | 70,959,024 |

Based on Table 16 it is known that income breeder cow milk amounting to IDR 70,959,024 per year, or every the month amounting to IDR 5,913,252. Breeder cow existing dairy in Inner West Malang Regency operate his business said obtain profit, with an average ownership of 4 animals / breeder. According to Amam *et al.* (2019), factors the dominant one that influences the most income breeder is amount ownership cow lactation and role providing institution facility credit as well as arrange sale feed cattle.

**Milk Production Input Efficiency**

Regression model function production *Cobb Douglas* total cow's milk production in West Malang Regency is as following:

$$\mathbf{Ln\ Y = ln\ 1.731 + 0.215\ lnX_1 + 0.833\ lnX_2 + 0.092\ ln\ X_3 + 0.097\ ln\ X_4 + e}$$

Information:

Y : Total cow's milk production per day

X1 : Labor (HOK)

X2 : Total cow lactation (tail)

X3 : Forage (Kg/day)

X4 : Concentrate feed and feed additional (Kg/day)

e : Error or level error

In the final model analysis regression so can explained results from influence of each variable free is as following:

1. Constant Value

   On value constant of 1.284 shows that If variable labour (HOK), amount cow lactation, forage, feed concentrates and additives have not effect or 0. The total cow's milk production per day an increase of 1,284 liters per day.

2. Labor

   Based on mark coefficient regression (X1) on variables labor (HOK) has mark of 0.215. These results show that if labor (HOK) increases by 1 person, the total cow's milk production milk increase amounting to 0.215 liters per day.

3. Amount cow lactation

   Based on results mark coefficient regression (X2) on variables amount cow lactation of 0.833. That value show if amount cow lactation increased 1 point, and then the total cow's milk production milk increase amounting to 0.833 liters per day.

4. Forage

Based on value coefficient regression (X3), on variables forage (kg/ day) of 0.092, shows that if forage increase by 1 kg, the total cow's milk production milk will increase amounting to 0.092 liters per day.

5. Concentrate Feed

Coefficient value regression ($X_5$) on variables feed concentrate and additional (kg/ day) of 0.097 shows that if feed concentrates and additives increase by 1 kg, the total cow's milk production milk increase amounting to 0.097 liters per day.

**Autocorrelation Test Results of Total Milk Production Regression Model**

Autocorrelation is correlation between member series ordered observations according to time (in row time) or space (in cross section). Whether there is or not autocorrelation in a model can detected with using the Durbin Watson test, with hypothesis as following:

- If the Durbin Watson statistic value < DL, or Durbin Watson statistic > 4 – DL, then there is autocorrelation.
- If the value of DU< Durbin Watson < 4 – DU, then No There is autocorrelation.
- Jika nilai DL ≤ Durbin Watson ≤ DL atau 4 – DU ≤ D
- Durbin Watson ≤ 4 –DL,berati ragu-ragu.

Table: Autocorrelation Test Results of Total Milk Production Regression Model

| | |
|---|---|
| Durbin Watson | 1,918 |
| Dl | 1,571 |
| Du | 1,780 |
| 4-du | 2,220 |

Source : SPSS Data Processing Results (2022)

Autocorrelation test results in Table 21 show that du value (1.780) < Durbin Watson (2.220) and Durbin Watson value (1.918) < 4-du (2.220) which means no there is case autocorrelation in the total milk production regression model.

**Multicollinearity Test Results of Total Milk Production Regression Model**

Multicollinearity test done for know there are or not perfect linear relationship between independent variable in the regression model of total cow's milk production. How to see exists case multicollinearity is with VIF value. Multicollinearity happen If VIF value > 10 or *Tolerance* < 0.1. Multicollinearity test results obtained using SPSS with results as following.

Table: Multicollinearity Test Results of Total Milk Production Regression Model

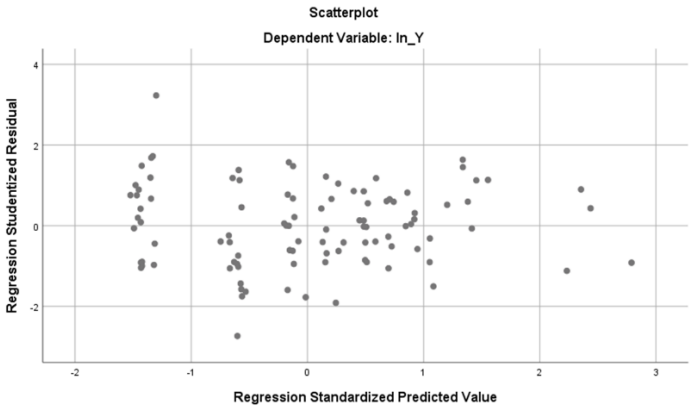
| Variable | *Tolerance* | *VIF* |
|---|---|---|
| Labor ( HOK ) | 0.733 | 1,364 |
| Amount cow lactation ( tail ) | 0.224 | 4,466 |
| Forage | 0.236 | 4,235 |
| Concentrate and Supplemental Feed | 0.874 | 1,144 |

Source : SPSS Data Processing Results (2022)

Based on table above can is known all variable own VIF value < 10 and *Tolerance* > 0.1 so has fulfil assumption multicollinearity or No exists case mutlicollinearity in the regression model of total cow's milk production in West Malang Regency.

**Heteroscedasticity Test Results of Total Milk Production Regression Model**

Heteroscedasticity is disturbance or obstacles that don't spread normally in distribution sample means that residual variation does not The same For all observation. Testing This intended For see is variant from component confounding (residual variance) will constant. Heteroscedasticity happen If in *Scatter Plot of* residual and predicted values No spread in a way random.




**Partial Test (T Test) Total Milk Production**

Partial test is the test used For analyze significance constant and every variable independent. Testing done For know influence power work (HOK), amount cow lactation, feed forage and feed addition concentrate to total cow's milk production milk. Value on level significance (Sig) < 0.01 then its influence has a very significant meaning, if mark significance (Sig) <0.05 means significant. Sig< 0.1 means less significant and Sig > 0.1 means no significant. Following This is results from T test analysis is as following:

Table: T Test Results for Total Milk Production

| **Coefficients** [a] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Note |
| | | B | Std. Error | Beta | | | |
| 1 | (Constant) | 1,731 | ,330 | | 5,248 | ,000 | *** |
| | Ln_X1 Labor ( HOK) | ,215 | ,076 | ,089 | 2,843 | ,005 | *** |
| | Ln_X2 Amount cow ( lactation ) | ,833 | ,056 | ,838 | 14,861 | ,000 | *** |
| | Ln_X3 Forage ( Kg / day ) | ,092 | ,062 | ,081 | 1,473 | .144 | - |
| | Ln_X4 Concentrate and Supplementary Feed (Kg / day ) | ,097 | ,059 | ,047 | 1,632 | .106 | - |
| a. Dependent Variable: Ln Production /Day | | | | | | | |

Influence Variable X to Y

***= Very Significant (very influential)

** = Significant (influential)

* = enough significant (enough influential)

- no significant (no influential)

Source : SPSS Data Processing Results (2022)

Table above show that effect of hypothesis testing power Work to total milk production in West Malang Regency has mark Significant = 0.005 < 0.01 = |t| = 2.843 > t (0.01/2.99) = 2.63. This result can concluded that power Work influential positive significant to total milk production in West Malang Regency at level significance 1%. Hypothesis test results influence amount cow lactation to total milk production own Sig value = 0.005 < 0.01 or |t| = 14.861 > t ( 0.01/2.99) =2.63 then can concluded that amount cow lactation influential positive significant to total milk production in West Malang Regency at level significance 1%. Hypothesis test results influence feed forage own Sig value = 0.144 > 0.1 or |t| = 1.473 < t ( 0.1/2.99) =1.66 then can concluded that feed forage No influential positive significant to total milk production in West Malang Regency at level significance 10%. Hypothesis test results influence feed concentrates and additives to total milk production own Sig value = 0.106 > 0.1 or |t| = 1.632 < t( 0.1/2.99) =1.66 then can concluded that feed concentrates and additives No influential positive significant to total milk production in West Malang Regency .

**Simultaneous Test (F Test) Total Milk Production**

On testing hypothesis The F test was used in a way together For know is power work (HOK), amount cow lactation, feed forage and concentrate influential in a way together or simultaneous to total cow's milk production milk. On research This use level significance 5%, and if Sig > 0.05 or F < F table so in a way simultaneous No there is significant influence from all variable independent. On the contrary if Sig < 0.05 or F > F table so in a way simultaneous there is significant influence from power work (HOK), amount cow lactation, total AI and

health costs animals, feed forage and feed addition concentrate to total cow's milk production milk. Following This is F test results:

Table: F Test Results for Total Milk Production

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 58.899 | 4 | 14.725 | 327.461 | .000[b] |
| | Residual | 4.272 | 95 | .045 | | |
| | Total | 63.171 | 99 | | | |

a. Dependent Variable: Ln_Y= Produksi Susu Perhari

b. Predictors: (Constant), Ln_X1 Tenaga Kerja (HOK), Ln_X2 Jumlah Sapi (Laktasi), Ln_X3 Pakan Hijauan (Kg/Hari), Ln_X4 Pakan Kosentrat dan Tambahan (Kg/Hari)

Source : SPSS Data Processing Results (2022)

Result of table above show that F Test results have Sig value (0.000) < 0.05 or F = 327.461 > $F_{(5.94)}$ = 2.31 then can concluded that power work (HOK), amount cow lactation , feed forage and feed addition concentrate influential in a way together or simultaneous to total cow's milk production milk .

**Coefficient Determination of Total Milk Production**

Value on coefficient determination used For know how much big contribution variable X against variable Y. If value obtained approach number 1, show strength connection the more Good. Test result coefficient determination on research This is as following:

Table : Results Coefficient Determination of Total Milk Production

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .966[a] | .932 | .930 | .21205 | 1.918 |

a. Predictors: (Constant), Ln_X1 Tenaga Kerja (HOK), Ln_X2 Jumlah Sapi (laktasi), Ln-X3 Pakan Hijauan (Kg/Hari), Ln_X4 Pakan Kosentrat dan Tambahan (Kg/hari)

b. Ln-Y=Produksi Susu Perhari

Value results coefficient determination influence power work (HOK), amount cow lactation, feed forage and feed concentrate to total cow's milk production milk it in breeder West Malang Regency in 2021 was 0.932. This matter show that power work (HOK), amount cow lactation, and feed forage as well as feed concentrate capable explains the total milk production of 93.2% and the remainder 6.8 % is explained by variables other. Coefficient value determination classified as very good, Because the value obtained is > 80% and almost approach value 1. Analysis results efficiency use factors production with use scale return effort ( *Return to scale* ) for know response production to change all over factor production so you can is known is production can improved show value 1.237 ( $\sum \beta$>1) or enter *increasing returns to scale* . It means addition production input factors, will followed with enhancement the output the more Lots .

**Influencing Factors Milk Income per Year Breeder Dairy Cattle in West Malang Regency**

Analysis regression done For know connection between variable independent aspect *Good Dairy Farming Practice* (GDFD) towards income of milk per year at the farm cow milk West Malang Regency in 2021. Regression analysis results to determine the effect aspect of GDP towards income is as following :

$$\mathbf{Ln\,(Y) = 14.720 + 2.316\,X_1 + 0.520\,X_2 - 0.057\,X_3 - 0.619\,X_6 + e}$$

Information :

Y = Milk income per year
$X_1$ = Health Aspect
$X_2$ = Hygiene Milking
$X_3$ = Aspect Nutrition (Feed and Drinking Water )
$X_4$ = Aspect *Animal Walfare*
$X_5$ = Aspect Environment
$X_6$ = Aspect Socioeconomic
e = Error or level error

Based on the final model regression so can explained results from mark model equation as following.

a. Constant k value of 1 4,720 shows that If variable a spec health , hygiene p reddening , a spec n nutrition , a spec a minimal w alphare , a spec l environment and a spec social economy No There is or 0 then annual milk income decreased 14,720
b. Health Aspects: Based on results mark coefficient regression ($X_1$) on variables aspect health as big as 2, 316 shows that if aspect health increases by 1 value so milk income that will earned per year will increase as big as 2 , 316. Breeders in West Malang Regency treatment For livestock that are sick on average immediately carried out by officers health , so No will lower production and income will be obtained by breeders . In accordance with results study Asminaya *et al* . (2018) that with handling disease in a way precise and fast so that income as well as productivity No will disturbed and decreased .
c. Hygiene Milking: Based on results mark coefficient regression ($X_2$) on variables hygiene milking of 0.520 show that when it comes to aspects hygiene milking reduced by 1 value so For annual milk income will reduce of 0.520 This is Because price the determined based on the quality of the milk that has been deposited to KUD. In accordance with Aminah and Rondhi's opinion (2019) is that with low milk prices will influence efficiency use costs and income received by farmers cow milk . Aspects management hygiene good and correct milking must applied by farmers to produce milk free from contamination bacteria as well as loss antigens other .
d. Aspect Nutrition (Feed and Drinking Water): Based on results from mark coefficient regression ($X_3$) on variables aspect nutrition ( feed and drinking water ) of -0.057 shows that if aspect nutrition ( feed and drinking water ) reduced by 1 value so For annual milk income will increase equal to 0. This in accordance with results study Mardhatilla and Amini (2022) that

with management giving feed and drinking water with quality and quantity fulfilled so influential to productivity and quality of fresh milk.

*e.* Aspect *Animal Walfare:* Based on results mark coefficient regression ($X_4$) on variables animal warfare aspect as big as -0.619 shows that if aspect *animal walfa* re increases by 1 value so For annual milk income will reduce as big as -0, 619. Based on conditions in the field regarding the assessment of animal welfare aspects, related to the frequency of feeding per day and the expansion of cages for breeding areas, breeders experience difficulties if they are added. The average frequency of feeding forage is 2 times per day and concentrate 2 times per day. If the frequency of feeding is increased, the costs for purchasing feed will increase. Regarding the land available for livestock farming, on average no one owns it and the conditions in the field are that all the pens are close to the residence so that the available land is very limited. To fulfill this, breeders experience having to buy land in separate locations, resulting in costs and less time efficiency for grazing. This causes the average condition of dairy cows to lack freedom This results in stress, because the land owned is limited according to the number of livestock owned and the maintenance system with the cattle tied using a long rope around the head and nose. For optimizing productivity in cattle milk must use principle on well-being livestock , care , housing , and systems maintenance ( Mumfiza *et al.* , 2022).

f. Aspect Environment: Based on results from mark coefficient regression ($X_5$) on variables aspect environment as big as 1,161 shows that if aspect environment increased by 1 value so annual milk income will increase amounting to 1.161. Farm cow dairy in West Malang Regency matter management dirt Still not enough , so that influence environmental causes cattle stress . Many breeders do not manage manure properly by making biogas and still pile up manure and leftover feed around the cage. On average, farmers do not want to spend on the costs of making biogas and the land they own is very limited. Pollution related to ammonia gas which

every day also affects livestock, causing a decrease in milk production because livestock are less comfortable. Environment own positive impact For cattle do productivity will influential to income ( Susilorini *et al.,* 2022).

g. Socioeconomic: Based on results mark coefficient regression ($X_6$) on variables aspect social economy as big as -0, 6 2 2 shows that if aspect social economy increases by 1 value so annual milk income will the more reduce as big as 0, 622. Condition This different with results research by Prabowo *et al.* (2022) that breeder cow milk with scale high ownership with do it recording , then opportunity breeder in adopt technology more tall compared to with scale ownership low . Utility bookkeeping with function For help in plan finance , as well need in administrating and assisting in decide management his business . However, this is different for breeders because the results in the field show that bookkeeping takes time and cannot be done consistently. On average, farmers, especially heads of families, spend more time looking for forage, and wives spend more time taking care of household needs. Increasing the workforce and purchasing forage continuously will result in an increase in the amount of expenditure so that the farmer manages his business with his family.

**Autocorrelation Test Results**

Autocorrelation is correlation between member series ordered observations according to time ( in row time ) or space ( in cross section). Whether there is or not autocorrelation in a model can detected with using the Durbin Watson test, with hypothesis as following :

- If the Durbin Watson statistic value < DL, or Durbin Watson statistic > 4 – DL, then there is autocorrelation .
- If the value of DU< Durbin Watson < 4 – DU, then No There is autocorrelation .
- If the value DL ≤ Durbin Watson ≤ DL or 4 – DU ≤ D
- urbin ≤ 4 – DL, means doubtful.

Table: Autocorrelation test results of the regression model annual milk income

| | |
|---|---|
| Durbin Watson | 1,902 |
| Dl | 1, 613 |
| Du | 1, 736 |
| 4-du | 2,236 |

Source : Primary data analysis (2022)

Autocorrelation test results in the table above show that mark durbin watson (1,902 > dl (1,613) which means There are no cases of autocorrelation in the regression model of annual milk income.

**Regression Model Multicollinearity Test Milk Income per Year**

Multicollinearity test done For know There is or or not perfect linear relationship between variable independent in the regression model annual milk income cow. How to see exists case multicollinearity is with VIF value. Multicollinearity happen If VIF value > 10 or *Tolerance* < 0.1. Multicollinearity test results obtained using SPSS with results as following:

Table: Regression Model Multicollinearity Test Results

| Variable | *Tolerance* | *VIF* |
|---|---|---|
| Health Aspects | 0.449 | 2,226 |
| Hygiene Milking | 0.632 | 1,583 |
| Aspect Nutrition (Feed and Drinking Water) | 0.4 80 | 2,083 |
| Aspects of Animal Welfare | 0.5 83 | 1, 715 |
| Aspect Environment | 0.367 | 2 , 722 |
| Aspect Socioeconomic | 0, 4 34 | 2, 3 03 |

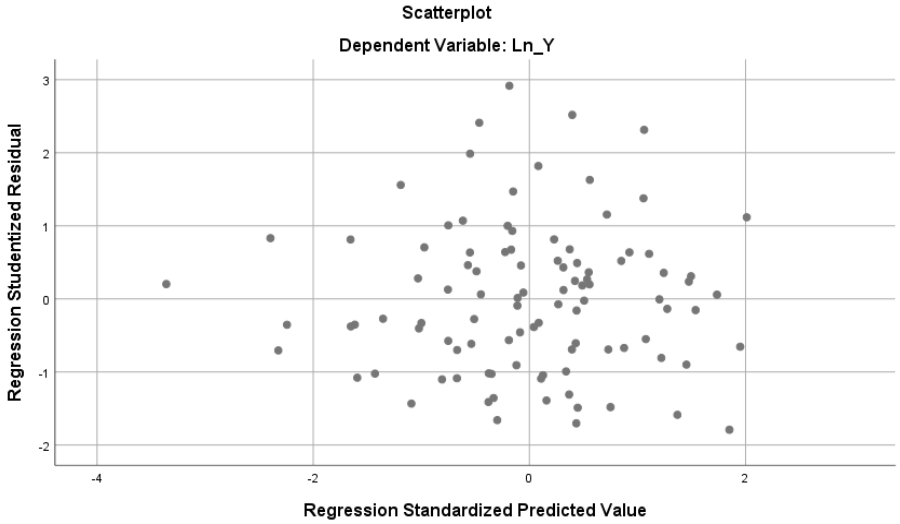
Source : Primary data analysis (2022)

Based on Table 25 can is known all variable own VIF value < 10 and *Tolerance* > 0.1 so has fulfil assumption multicollinearity or No exists case mutlicollinearity in the regression model annual milk income cattle in West Malang Regency.

**Heteroscedasticity Test Results**

Heteroscedasticity is disturbance or obstacles that don't spread normally in distribution sample means that residual variation does not The same For all observation. Testing This intended For see is variant from component

confounding (residual variance) will constant. Heteroscedasticity happen If in *Scatter Plot of* residual and predicted values No spread in a way random.




Gambar: Scatter Plot Heterokedastisitas Model Regresi

Based on the results from the image on describe that the plot is scattered in a way random and not form something pattern certain so that can concluded that regression model annual milk income cow Already own similarity variant homogeneous residual value or in other words no happen heteroscedasticity .

**Partial Test Results (T Test) Milk Income per Year**

Partial test using the T test was carried out For know application of GDFP to aspects health, aspect hygiene milking, aspect nutrition, animal welfare aspects, aspects environmental and social economy to annual milk income cow milk. On research This If obtained t value < t table so in a way Partial No there is significant influence from variable independent to variable dependent. On the contrary If t value > t table so in a way Partial there is significant influence from variable independence and control to variable dependent. The significance value of Sig < 0.01 then its influence has a very significant meaning, Sig < 0.05 has a significant meaning, Sig < 0.1 has a less significant meaning significant and Sig > 0.1 means no significant. Following This is results T test analysis is

Table : Analysis of influencing factors Income

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Note |
|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | |
| 1 | (Constant) | 14,720 | 3,615 | | 4,071 | ,000 | *** |
| | Ln-X1Health Aspects | 2,316 | ,781 | ,416 | 2,968 | ,004 | ** |
| | Ln-X2 HygieneMilking | ,520 | ,881 | ,204 | -1,726 | ,088 | * |
| | Ln-X3 Nutritional Aspect | -.057 | 822 | -.009 | 3,963 | ,945 | - |
| | Ln-X4 AspectAnimalWalfare | -.619 | ,776 | -.098 | -.798 | ,427 | - |
| | Ln-X5 Environmental Aspects | 1,161 | ,527 | ,341 | 2,201 | ,030 | ** |
| | LnSocioeconomic Aspects | -.622 | -442 | -.201 | -1,408 | ,162 | - |

Note : *** = very significant effect (P<0.01)
** = influence real (P < 0.05)
*= influence not enough real (P< 0.1)_

Table above show implementation of GDFP aspects health and aspects environment influential positive significant to annual milk income at the farmer cow milk West Malang distric , meanwhile aspect hygiene milking not enough significant .

**Simultaneous Test Results (F Test) Milk Income per Year**

On testing hypothesis F test is used for know is aspect health, aspect hygiene milking, aspect nutrition, animal welfare aspects, aspects environment and aspects social economy influential in a way together or simultaneous to annual milk income cow milk. Following This is F test results using SPSS:

Table: F Test Results for Milk Income per Year

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 11.608 | 6 | 1.935 | 3.368 | .005[b] |
| | Residual | 53.421 | 93 | .574 | | |
| | Total | 65.029 | 99 | | | |

a. Dependent Variable: pendapatan susu pertahun

b. Predictors: (Constant), Aspek Sosial Ekonomi, Higiene Pemerahan, Aspek Animal Walfare, Aspek Nutrisi (Pakan dan Air Minum), Aspek Kesehatan, Aspek Lingkungan

Based on The table above shows the F Test results Sig value (0.005) < 0.05 or F = 3.368 > $F_{(6.93)}$ = 2.20 then can concluded that application of GDFP to aspects health , aspect hygiene milking , aspect nutrition , animal welfare

aspects , aspects environmental and social economy influential in a way together The same or simultaneous to annual milk income .

**Coefficient Determination Milk Income per Year**

Coefficient value determination used For know how much big X's contribution to variable Y. On value coefficient determination the more approach number 1, then strength connection will the more Good. The calculation results mark coefficient determination in study This is as following:

Table: Coefficient Results Determination of Total Milk Income

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .422[a] | .179 | .126 | .75790 | 1.902 |

a. Predictors: (Constant), Aspek Sosial Ekonomi, Higiene Pemerahan, Aspek Animal Walfare, Aspek Nutrisi (Pakan dan Air Minum), Aspek Kesehatan, Aspek Lingkungan

b. Dependent Variable: pendapatan susu pertahun

Coefficient value determination from the regression model influence aspect health, aspect hygiene milking, aspect nutrition, animal welfare aspects, aspects environment and aspects social economy to annual milk income cow dairy in West Malang Regency in 2021, namely of 0.179 which is significant that aspect health, aspect hygiene milking, aspect nutrition, animal welfare aspects, aspects environment and aspects social economy capable explain annual milk income amounting to 17.9% and the remainder 82.1 % is explained by variables other. Coefficient value determination classified not enough Good Because value <50%.

## CONCLUSIONS

1. Identification from application *Good Dairy Farming Practice* (GDFP) on the farm cow milk West Malang Regency shows score Enough that is aspect health (2.84), aspect hygiene milking (2.76), aspect nutrition feed and drinking water (2.43), animal welfare (2.87), environment (2.64) and score not enough Good from aspect social economy (1.37).
2. Income breeder cow milk amounting to IDR 70,959,024 per year or IDR 5,913,252 per month. Efficiency results factor Milk production shows mark *increasing returns to scale* equal to 1.215 meaning addition factor production, will followed with enhancement output results.
3. Analysis results regression show influence application of GDFP to aspects health and aspects environment influential positive and significant whereas aspect hygiene milking influential positive and less significant, and animal welfare, social and economic aspects No influential significant to income breeder.

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