Analysis of cattle breeder's income in South Kualuh sub-district of Labuhan Batu Utara Regency

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Abstract. Beef cattle breeding is a business of the majority people in South Kualuh Subdistrict among others business. Therefore it is necessary to know the people income of beef cattle farms in the district. This research was conducted in South Kualuh Subdistrict of Labuhan Batu Utara Regency of North Sumatera Province from October to December 2016. This research used survey method with family respondent unit that raising beef cattle. The sample was obtained through Proportional Stratified Random Sampling method and obtained by 97 farmers such as, from Tanjung Pasir village, 64 respondents, Simangalam village was 24 respondents and Lobu Huala village was 9 respondents. Data was analysed by multiple linear regression analysis. The results showed that scale of business, education of farmers positively affect the income of beef cattle farms while the age, breeding experience and the number of family dependents negatively affect to the income of beef cattle farms.

1. Introduction
The development of livestock sub-sector in Indonesia has a goal to increase livestock production. This increase in production is expected to have an impact on increasing farmer's income, improving environmental conditions, increasing business opportunities, opening up new jobs and expanding existing employment opportunities. The long-term goal of livestock sub-sector development is the achievement of nutritional adequacy standards from livestock products for the people of Indonesia. FAO[1,2001]

The livestock development strategy has good prospects in the future, as demand for livestock materials will continue to increase as population, income, and public awareness to consume nutritious food is high as a result of the rising education level of the average population. Development and development is one of the development in agriculture which includes development in the field of animal husbandry, where one of the many farms undertaken by the people in the countryside is raising beef cattle, which is in the form of community livestock business. FAO [2]

Livestock business is also a livestock activity where breeders and their families do livestock raising that aims to earn income from the sale of livestock. For farmers, cattle serve as a source of income, animal protein, and fertilizer producers. Other functions are as seeds and savings. The contribution of cattle to income depends on the type of cattle that is maintained, how to maintain, and the allocation of resources available in each region. Livestock business in Indonesia is dominated by small-scale community farms. Farming is not a rare thing to do. Only the scale of management is still a side that is not balanced with adequate capital and management. Almost all households (especially in rural areas) are cultivating cattle as part of daily activities. Zenihu Nigussie et al [3].
There are several factors that cause the amount of beef production is still low, among others, population and production of low cattle. It appears that in North Sumatra there are some very dense areas, some are moderate, but there are very rare or limited population distribution of beef cattle. Of course this greatly affects the amount of income or income society in the area so that differences arise in economic terms. IFAD [4].

In conducting cattle business, the farmer acts as a decision maker that seeks to make effective and efficient decisions in running and managing his business. The socio-economic characteristics of farmers (business scale, number of cattle, age of breeder, level of education, farming experience, number of dependents of the family can influence in making decisions that can give a profit for his business. Hartono, B, Rohaeni E.S [5].

Beef cattle business in North Sumatera spread in various regions with different population density. Southern Kualuh Sub-district is one of the districts where cow livestock population spread in 2016 reaching 531 heads Central Bureau of Statistics of Labuhan Batu Utara Regency[6].

2. Material and Methods
The research was conducted in Tanjung Pasir Village, Simangalam Village and Lobu Huala Village, South Kualuh Sub-district, Labuhan Batu Utara District, North Sumatera Province from November 10 to December 20, 2016.

The method of withdrawal of respondents used is as follows: in the first stage determine 3 village fruit from several villages in Southern Kualuh Subdistrict with the withdrawal of respondents by Proportional Stratified Random Sampling Soekartawi [7].

That is the village whose cattle population is high, is determined by looking at data from the Central Bureau of Statistics Labuhan Batu Utara District in 2016 number selected three villages are:
- Village with high population density is Tanjung Pasir.
- The village whose population density is medium cattle is Simangalam.
- Villages whose population density is rare are Lobu Huala.

In the second stage of simple random selection of respondents, 30% of all farmers from each sample village were taken. For research that will use statistical data the sample size of 30% is already representative of the population Prashant Palvia [8]. From each village in getting the number of farmers who become the sample as much as:
- Desa Tanjung sand 212 farmers, then the number of samples 64 breeders.
- Simangalam village 80 farmers, then the number of samples 24 breeders.
- Lobu Huala village 9 orang farmers, then the number of samples 9 breeders.

Data obtained from the results of field interviews processed and tabulated then made an average. Then the average data entered into the balance sheet of each breeder and taken the average income farmers. Then the data is analyzed by using the method of income analysis and multiple regression analysis with the following formula

\[ P_d = TR - TC \]  \hspace{1cm} (1)

Based on the results that have been obtained, then to see the factors that affect revenue can be seen using the approach model of econometric techniques by using multiple linear regression analysis with Statistical Package for Social Sciences (SPSS 19) software tools.

\[ \hat{Y} = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + \mu \]  \hspace{1cm} (2)

The variables in the hypothesis are tested simultaneously and partially to determine whether the variable has a dominant influence or not. If the variable is influential simultaneously then used the test F namely:

\[ F = \frac{r^2/k}{(1 - r^2)/(n - k - 1)} \]  \hspace{1cm} (3)
if the variables affect partially can be tested by T testie:

\[ T_{hit} = \frac{b_1}{Sb_1} = \frac{\sum(y - \bar{y})}{S_b} \]

\[ S^2_{y123} = \sum(y - \bar{y})^2 \]

\[ S^2_{b1} = \frac{s^2_{y123}}{n - k - 1} \]

\[ \sum X_i^2(1 - R_i^2) \]

Parameters of income analysis research include business scale, age of breeder, education level, experience (long) breeding, number of family dependents, receipts, expenses and income.

3. Result and discussion

**Table 1. Revenue and expenditure of farmers in research areas in 2016**

| Characteristics of sample breeders | Unit       | Total        | %  |
|-----------------------------------|------------|--------------|----|
| Income                            |            |              |    |
| Livestock sales                   | Rp/years   | 2,403,000,000| 100|
| Expenses                          |            |              |    |
| Seeds                             | Rp/years   | 1,339,000,000| 84,197|
| Drugs                             | Rp/years   | 17,600,000   | 1,106|
| Feed                              | Rp/years   | 53,700,000   | 3,376|
| Labor                             | Rp/years   | 180,000,000  | 11,318|
| B/C Ratio                         |            | 1.51         |    |

In the business of beef cattle in the research area obtained the total income from cattle business for 1 (one) year is ranged from Rp 10,000,000 to Rp 52,000,000 / year / breeders with an average of Rp, 24,773,196 / year / breeder.

The net income of each respondent from the business of beef cattle for 1 (one) year ranged from Rp, 28,400,000 up to Rp, 223,050,000 with average Rp 88,002,577 / year / breeder, From the average value of family income from the business of beef cattle this can illustrate that the respondents are motivated enough to do the development of their cattle business, they see very well that the beef cattle they earn can earn bigger income when done seriously.

The B / C Ratio analysis is used in an attempt to find out whether or not the effort is to be continued to the next period or otherwise the business is terminated because it is less feasible, From the above table obtained B / C Ratio 1.51. This indicates that the livestock business is feasible to continue, An effort can be said to be feasible or provide an advantage if the value of B / C ratio above 1 (> 1), While a business is declared not feasible or does not provide benefits if the value of B / C ratio is smaller 1 (<1), The greater the value of B / C ratio the more efficient the business and vice versa the smaller the B / C ratio the more inefficient the business, Andres Algabaa [9].

**Table 2. Analysis of variant income and variable estimates**

| Model       | The Sum of Square | Free Degrees | Middle squares | F      | Sig.  |
|-------------|-------------------|--------------|----------------|--------|-------|
| Regression  | 1.132E17          | 5            | 2,264E16       | 281,947| .000  |
| Residual    | 7.308E15          | 91           | 8,031E13       |        |       |
| Total       | 1.205E17          | 96           |                |        |       |

a. Predictors: (Constant), Number of dependents, Level of education, Breeding experience, Number of livestock, Age of breeder

b. Dependent Variable: income
Based on the above table, simultaneously the value of $F (281,947)$ is greater than $F_{table} (2,31)$. This indicates that simultaneously all variables are business scale, age of breeder, education level, length of livestock and the number of family dependent significantly influence to earnings of beef cattle farmer with level of significance $0.000$ and at $95\%$ confidence level, Jeff Sauro James [10],

**Table 3. Coefficient of Determination (R²)**

| Model | R | Coefficient of Determination | Adjusted R² | Standard Error and Estimation |
|-------|---|------------------------------|-------------|-------------------------------|
| 1     | .969* | .939 | .936 | 8961310.59200 |

Predictors: (Constant). Number of dependents. Level of education. Breeding experience. Number of livestock. Age of breeder

Based on the above table shows that the coefficient of determination (R Square) is worth 0.939 means that all free variables of cattle business scale (number of livestock), age of breeder, education level, breeding duration and number of dependents affect dependent variable $93.9\%$ and the rest is equal to $6.1\%$ was explained by another variable ($\mu$) not investigated in this study.

So to see the factors that affect the income by using the Model of Econometric Approach by using multiple linear regression analysis of Statistical Package for Social Sciences (SPSS 19) software tools can be seen in Table 4.

**Table 4. Multiple linear regression analysis of the scale of business / number of livestock, age of breeder, education level, farming experience and the number of dependent breeder to beef cattle rancher income**

| Model | Unstandardized Coefficients | Standardized Coefficients | T | Sig. |
|-------|-----------------------------|---------------------------|---|-----|
|       | B | Std. Error | Beta |       | |
|       | 4411049.755 | 5235016.264 | .843 | .402 | |
|       | 9832525.557 | 302860.466 | .960 | 32.466 | .000 |
|       | -273444.655 | 155450.396 | -.067 | -1.759 | .082 |
|       | 2620840.973 | 1177024.737 | .058 | 2.227 | .028 |
|       | 588037.574 | 286683.363 | .075 | 2.051 | .043 |
|       | 135681.213 | 820654.806 | .005 | .165 | .869 |

Based on the above table we get the following equation:

$$\hat{Y} = 4411049.755 + 9832525.557X1 - 273444.655X2 + 2620840.973X3 + 588037.574X4 + 135681.213X5 + \mu$$

Information:

$\hat{Y}$: Income of beef cattle ranchers
X1: Business scale / number of cattle (tail)
X2: Age of breeder (year)
X3: Education level (year)
X4: Breeding experience (year)
X5: Number of dependents of the family (people)
$\mu$: Uncompromised variables

Based on the above equation model can be interpreted that:

a. If the free number of livestock (X1) has increased by 1 tail then there will be an increase in income (Y) of Rp. 9.832.525.557.
b. If the age-free variable of breeders (X2) has increased by 1 year, then there will be a decrease in income (Y) of Rp 273,444.655.

c. If the independent variable of education level (X3) has increased by 1 level, then there will be increase of farmer income (Y) equal to Rp 2,620,840.973.

d. If the free variable of breeding experience (X4) has increased by 1 year, then there will be increase of farmer income (Y) equal to Rp 588,037.574.

e. If the dependent variable of family dependent number (X5) has increased by 1 person, then there will be decrease of farmer income (Y) equal to Rp 135,681.213.

f. If the X1, X2, X3, X4 and X5 variables in the analysis are ignored (not doing the activity), the beef farmer will still receive income of Rp 4,411,049,755/year

The influence of the number of livestock. age of breeder. level of education. experience and number of dependents partially to the income of breeder can be known as follows:

a. Variable of cattle counted have significant effect to beef cattle farmer income. if measured at 95% confidence level indicated by t-count value (X1) equal to 32.466 bigger than t-table (α = 0.05) that is equal to 1.98. Pytrick Reidsma and Marie Helene Jenttroy [11], that the income of cattle business is influenced by the number of livestock sold by the farmers themselves so that the more the number of cattle. the higher the net income earned.

b. The variable of age of the farmer does not significantly affect the income of beef cattle. if measured at 95% confidence level indicated by the value of t-count (X2) equal to -1.759 smaller than t-table (α = 0.05) that is equal to 1.98 this variable is negative because because the criteria of age breeders do not encourage farmers in developing a business of beef cattle in Southern Kualuh Subdistrict. Suggests that the younger age of breeders (productive age 20-45 years) is generally a sense of curiosity towards something higher and interest to adopt towards the introduction of higher technology.

c. The variable of education level has significant effect to beef cattle farmer income. if measured at 95% confidence level shown by t-count value (X3) 2.227 bigger than t table value (α = 0.05) that is equal to 1.98. Irina and Helena [12] states that education has a bit more important role to the productivity of farmers in managing their livestock.

d. Variable of experience / duration of livestock have real effect to beef cattle farmer income. if measured at 95% confidence level indicated by t-count value (X3) equal to 2.051 bigger than t table value (α = 0.05) that is equal to 1.98 . A long breeding experience will provide information on the purpose of breeding is to provide added value for their lives Hasan [13].2000).

e. The variable of number of family dependent have no significant effect to beef cattle farmer income. if measured at 95% confidence level shown by t-count (X5) 0.165 smaller than t-table (α = 0.05) that is equal to 1.98 That the dependents of the child in the breeder's family can not provide a positive boost to the income increase of the farmer.

4. Conclusion

Business scale. farmer education level. breeding experience give positive influence to increase farmer's income. while the age of breeder and the number of family dependent do not give increase of beef cattle farmer income in Kecamatan Kualuh Selatan. Labuhan Batu Utara Regency.

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