

Factors and Strategies for The Development of Buffalo Production in Aceh Barat District

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ABSTRACT

This study analyzes what factors affect buffalo production in Aceh Barat District. Analyze what factors are more dominant in influencing buffalo production in Aceh Barat District. Determining the strategy for buffalo development in Aceh Barat District This research was conducted in Aceh Barat District from April to August 2023 with a sample of 90 farmers spread across three districts in Aceh Barat. The data analysis used was to use liner regression coo Douglas analysis to see the factors affecting. The results of multiple regression analysis can be seen that the factors of seeds, labor, cage area, total feed have a real effect on buffalo livestock production in Aceh Barat.

KEYWORDS

Aceh Barat; Production; Buffalo; Regression

INTRODUCTION

According to the Ministry of Agriculture, Directorate General of Livestock and Animal Health, the need for beef and buffalo until 2020 is estimated at 302,300 tons. The availability of beef and buffalo in 2020 is based on domestic production of 165,478 tons. Based on the results of 2019 Basic Commodities Consumption Survey, beef and buffalo consumption in 2019 reached around 782.40 thousand tons, or around 2.93 kilograms per capita per year. When compared with the results of the study of staple ingredients in 2017, beef consumption has increased by 11 percent within 2 years. And an increase in per capita consumption of 0.23 kg per capita per year. The need/consumption of beef and buffalo is mostly carried out in hotels, restaurants and catering, which is around 74.97 percent of the total need or consumption of beef and buffalo in Indonesia. While the need for beef and buffalo cooked in households is only around 17.58 percent

Meat needs cannot be enough with the growth of the population in Indonesia which is 1.3 percent per year. One of the meat providers to meet the needs of the Indonesian population is from farmers who have livestock businesses in various regions in Indonesia. In this case, the livestock sector, especially in the slaughter livestock business, looks very potential to be developed by farmers so that Indonesia no longer relies on meat imports from abroad. In Indonesia, buffalo meat consumption is not as large as beef consumption even though both physical appearance of meat is almost similar, the weight of buffalo carcass is also potentially high enough to be able to meet meat needs in Indonesia. Weighted in terms of nutritional content, buffalo meat has lower calories and fat content than beef

Aceh Barat livestock is dominated by buffalo populations, this is of course different from other regions in Aceh Province which generally raise cattle. The population of these buffalo cattle in 2021 fluctuated from year to year to the year that is 21,517 heads or by 15 percent decreased. The number of buffalo in 2021 was the lowest for the past three years. The high buffalo population is the reason for site selection, but buffalo production in Aceh Barat

fluctuates from year to year. This is the background for me to analyze the factors that affect buffalo livestock production and its development strategy so that continuous improvement can be made in buffalo livestock in Aceh Barat District.

RESEARCH METHODS

This type of research is qualitative descriptive research was conducted in Aceh Barat District. This research was conducted for four months starting from preparation in making research proposals, field data surveys, then continued with data analysis, to writing a thesis. Time allocation from April to June 2023. The data collected in this study are primary data and secondary data, namely primary data is the data that was first recorded and collected by the researcher. Primary data were obtained from direct interviews with farmers using a list of questionnaires that had been prepared. Secondary data is data that does not directly provide data to the data collector, but through other people or through documents. Secondary data sources of this study were obtained from the Central Bureau of Statistics (BPS) Aceh Barat District, the Livestock Office of Aceh Barat District, livestock journals, text books, and the internet.

The respondents of the study were beef buffalo farmers located in 3 sub-districts. The research method used is a survey method with respondent units that raise livestock. The determination of this research area is carried out intentionally (*purposive*), that is, this technique has the meaning of a sampling technique with certain considerations. The analytical method used in this study is Analysis of factors that allegedly affect buffalo production Identify functional relationships between buffalo production factors used multiple linear regression analysis with the Cobb-Douglas production function model. The use of this function is due to linearize the relationship between y and x factors using natural logarithms.

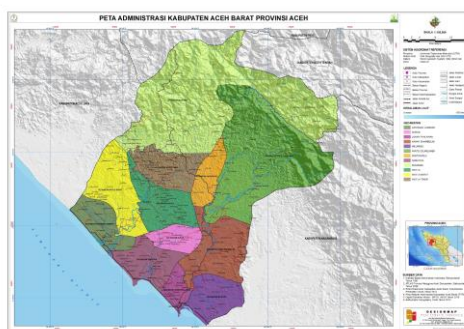


Figure 1. Map of Aceh Barat District

RESULTS AND DISCUSSION

Aceh Barat is one of the districts in Aceh Province, Indonesia. It is the largest buffalo population in Aceh Province from 2018 to 2020, reaching 24,971 heads. The buffalo population in Aceh Barat increased in 2019 by 4.3% from the previous year and an increase of 2.3% in 2020. People in western Aceh prefer buffalo meat. This makes the buffalo population in Aceh Barat District more dominant until the end of 2020. Livestock farms in Aceh Barat District consist of large livestock farms such as cattle and buffaloes, small farms in the form of goats and sheep and poultry farms such as chickens and ducks. The large ruminant population in Aceh Barat District is dominated by buffalo rather than cattle. This can be seen from the population in the Central Bureau of Statistics of Aceh Barat District (2021), the buffalo population is 25,345 while the cattle population is 7,697 heads.

Normality test

Table 1. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Predicted Value
N		90
Normal Parameters ^{a,b}	Mean	1.7739937
	Std. Deviation	.42069903
Most Extreme Differences	Absolute	.084
	Positive	.080
	Negative	-.084
Test Statistic		.084
Asymp. Sig. (2-tailed)		.155 ^c

a. Test distribution is Normal.
 b. Calculated from data.
 c. Lilliefors Significance Correction.

Based on the Basis of Decision Making in the Skewness and Kurtosis Normality Test, if the significance value (Sig.) is greater than 0.05, then the research data is normally distributed. conversely, if the significance value (Sig.) is less than 0.05 it is not normally distributed. In the table above shows a significant value of 0.155 thus it can be decided that the research data is normally distributed.

Table 2. Multicollinearity test

Model	<i>Collinearity Statistics</i>	
	<i>Tolerance</i>	<i>VIF</i>
<i>(Constant)</i>		
Seedlings	.856	1.168
Labor	.756	1.323
Enclosure Size	.935	1.070
Feed	.760	1.315
Vitamins/Supplements	.713	1.403

It can be seen from the table above based on the results that have been calculated using the SPSS application, it can be seen that the VIF and tolerance values are as follows, where the seed variable has a VIF value of 1.168 and a tolerance of 0.856. The labor variable has a VIF value of 1.323 and a tolerance of 0.756. The variable area of the cage has a VIF value of 1.070 and tolerance of 0.935. The feed variable has a VIF value of 1.315 and a tolerance of 0.760. The variable dose of vitamins/supplements has a VIF value of 1.403 and a tolerance of 0.713. It can be seen from the description of the table above that based on the calculation results it can be found that the value of VIF and tolerance are in accordance with the provisions where $VIF < 10$ and $tolerance > 0.10$ thus there are no symptoms of multicollinearity in the data.

Regression Analysis

Using multiple regression equations, then formed equation functions that are included in variables that are considered to have an influence on farmer production, the influence of seed prices, labor, cage area, feed, vitamins/ supplements, on production. These variables will be simultaneously included in the analysis of multiple regression equations.

In measuring how far the ability of the model in explaining the variable variation of buffalo production in Aceh Barat, the value of the coefficient of determination (R²) was obtained. The results of the analysis show that the coefficient of determination for the model is 0.51. The production of buffalo cattle in Aceh Barat District is influenced by 51% by factors such as seed prices, number of workers, amount of feed and dose of vitamin administration while the other 39% can be influenced by other factors outside the factors of this study.

In Table 3 it can be seen that this regression model has an F-count value of 17.983 and an F-table value of 0.05 is 4.362. Based on the decision criteria, H_a is acceptable because the F-count is greater than the F-table. That means that the existing variables, namely seed price, labor, cage area, total feed, dose of vitamins/supplements together have a significant influence on buffalo production in Aceh Barat District

Table 3. Regression Analysis

	<i>Coefficients</i>	<i>t count</i>	<i>P-value</i>	<i>Note</i>
Intercept	-4,5269	-1,6525	0,1022	
Seedlings	0,2584	1,5730	0,1195	ns
Labor	0,4810	5,0470	0,0000	*
Enclosure Size	0,1736	1,8582	0,0666	ns
Feed	0,2785	2,4206	0,0176	*
Vitamins/Supplements	0,3620	2,2249	0,0288	*
R ²	0,517			
t-table	1,986			
F-count	17,983			
F-table	4,362			

* : Significant

ns : not significant

$$\text{Log } Y = \text{log } -4,526 + 0,258 \text{ log } X_1 + 0,481 \text{ log } X_2 + 0,173 \text{ log } X_3 + 0,278 \text{ log } X_4 + 0,362 \text{ log } X_5$$

Livestock Production

Based on the description below, it can be concluded that labor, total feed, dose of vitamin administration have a real influence on buffalo production in Aceh Barat. The more labor, total feed, vitamin dose, the higher the production of buffalo farmers in Aceh Barat District.

The effect of livestock production in accordance with the 2020 Ministry of Agriculture Regulation concerning increasing the production of cattle and buffalo mainstay commodities of the country is carried out by taking into account aspects of animal welfare including treatment of livestock in a non-rude manner, the use of facilities, infrastructure, and equipment that do not injure them, animal health programs/management, the use of ideal cages, protection from nuisance animals, from the heat of the sun and rain; and also the provision of feed and water in accordance with the physiological needs of farm animals.

Seedling

The price of seeds (x₁) has a regression coefficient of 0.258, this shows that capital has an influence on buffalo production in Aceh Barat. If farmers experience a capital increase of 1%, then farmer production will increase by 0.258%. The seedling has a t-count value of 1.573 with a table t value of 1.986. According to the decision criteria, H₀ was rejected because t-count has a smaller yield than t-table where seed prices do not have a significant

effect on livestock production.

The price of seeds owned by farmers in Aceh Barat to raise buffalo has sufficient capital which will affect buffalo productivity. This is in accordance with Marpaung (2019) stating that the capital owned by farmers is quite limited, which can cause low livestock production. According to Kariyasa (2005) also mentioned that the low livestock population is partly because most livestock are raised by small-scale farmers with limited land and capital.

Labor

Labor (x2) has a regression coefficient of 0.481, indicating that labor has an influence on livestock production. If farmers increase the workforce by one person, livestock production will increase by 0.481%. The workforce has a t-count of 5.047 and a t-table of 1.986. According to the existing criteria, H0 is accepted because the t-count is greater than the t-table where labor has a significant influence on the farmer's production.

The existing workforce in Aceh Barat District is still adequate enough to take care of buffalo livestock, the amount of labor available can affect the production of a livestock business, this is in accordance with Parulian (2023) which suggests that not having labor is a factor that can result in low productivity of a livestock business.

Cage Area

The area of the cage (x3) has a regression coefficient of 0.173, this shows that the area of the cage has an influence on livestock production. If the area of the cage increases by 1%, then the farmer's production increases by 0.173%. The area of the cage has a t-count value of 5.047 with a table t value of 1.986. According to the decision criteria, H0 was rejected because the t-count was smaller than the t-table where the cage area did not have a significant effect on buffalo production in Aceh Barat District.

Cages are where livestock are kept, the use of cages is ideal protection from disturbing animals, from the heat of the sun and rain can increase production in accordance with the Minister of Agriculture of the Republic of Indonesia Number 17 of 2020. Buffalo farmers in Aceh Barat have cages that only serve as a place to stay overnight but in the morning to evening the buffalo cattle are released. According to Marpaung (2019) managing livestock businesses with livestock not being caged can cause farmers difficulties in managing their livestock businesses.

Feed

Feed (x4) has a regression coefficient of 0.278, this shows that total feed has a positive influence on farmer production. Every time the total feed increases, the farmer's production will increase by 0.278%. The total feed has a t-count of 2,420 with a t-table of 1,986. According to the decision criterion that the value of H0 is accepted where the t-count is greater than the t-table. Total feed has a significant effect on livestock production.

Feed is a factor that greatly affects production. According to Parulian (2023), the amount of feed given will affect the production of these livestock, especially in their performance. The feed given must also pay attention to the amount and nutrition of the feed given.

Dose Vitamin

The dose of vitamins and supplements (x5) has a regression coefficient of 0.362, this shows that the dose of livestock vitamins has a positive influence on livestock production. Each dose of vitamins increases, the farmer's production increases by 0.362%. The dose of

vitamins in cattle has a t-count of 2.224 with a t-table of 1.986. According to the decision criterion that the H_0 value is accepted where the t-count is large compared to the t-table, the administration of vitamin doses has an effect on production.

The provision of vitamins shows that it has no effect on livestock production, the provision of vitamins is given according to the dose of body weight because it is in accordance with the recommended dose, usually farmers in Aceh Barat call veterinarians to tell vitamins, vitamins given in the form of vitamin B complex and given 1 year 2 times. According to Marpaung (2019) that the provision of vitamins requires long-term effects on livestock production.

CONCLUSION

The results of multiple regression analysis can be seen that the factors of seed price, labor, cage area, total feed, dose of vitamins/supplements together have a real effect on buffalo production. Partially, labor factors, feed, vitamin doses have a real influence on buffalo livestock in Aceh Barat District.

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