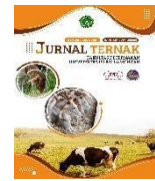


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Relationship Between Socio-Economic Factors Of Beef Cattle Breeding Farmers And The Response To Artificial Insemination Technology In Pantenan Village, Panceng District, Gresik Regency

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ABSTRACT

This study was to determine the relationship between socioeconomic factors of beef cattle breeders and the response to artificial insemination technology in Pantenan Village, Panceng District, Gresik Regency. Several socio-economic factors as variables used in this study are formal and non-formal education factors, age factors and income. The random sampling method used is by taking random samples of 34 farmers or 30% of the population of 112 farmers. As for knowing the relationship between variable X (Socio-Economic Factors) and variable Y (Farmers' Response to Artificial Insemination Technology) using the Chi-Square test. The results of the analysis show that there is no relationship between formal education factors and responses to artificial insemination technology, this is indicated by $X^2_{hit} = 3.78 < X^2_{table} = 3.84$, at a confidence level of 95%; but there is a relationship between the level of non-formal education and the response of farmers in implementing IB, this is shown by $X^2_{hit} = 17.23 > X^2_{table} = 3.84$, at a confidence level of 95%; there is a relationship between age and the response of farmers in implementing the IB program, this is shown by $X^2_{hit} = 6.76 > X^2_{table} = 3.84$, at a confidence level of 95%; and there is a relationship between the level income r on the response of farmers in implementing the IB program, this is shown by $X^2_{hit} = 11.93 < X^2_{table} = 3.84$, at a 95% confidence level.

Keywords: Social economy, Insemination Artificial

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Introduction

Foot and mouth disease (FMD), known as *Foot and Mouth Disease* (FMD) or *Apthtae Epizooticae*, The beef self-sufficiency program in Indonesia is targeted to be achieved in 2026. To achieve this target, the government through the Ministry of Agriculture has launched several programs. Various efforts have been made by the government to increase meat production, including through the

application of reproductive technology. One way to increase meat production is to increase the productivity of livestock per unit head, namely by increasing the birth rate and shortening the calving interval. These results can be achieved in various ways, including using Artificial Insemination (AI) technology or known as injection mating. The IB technique has been carried out in Indonesia since the early 1950s.

The success of AI implementation is determined by the achievement of efficiency in increasing livestock production and the acceptance of AI among farmers. Reproductive efficiency in AI services is influenced by variables including : service per conception (S/C), calving interval (CI), conception rate (CR), and birth rate. In achieving optimal reproductive efficiency, the availability of performance and mobility of inseminators, pregnancy checks (PKB), reproductive technique assistants (ATR) and the active role of farmers through increasing knowledge of aspects of reproduction and livestock health, especially the recognition of signs of estrus and reporting of estrus to inseminators.

The population of beef cattle in Gresik Regency from the results of the national livestock census in 2024 was 56,346 heads, from this population, Pantenan Village, Panceng District is one of the villages in Gresik Regency that has a large population and livestock potential to be developed, in addition, the condition of the community is mostly as beef cattle farmers but the response to IB technology still needs to be improved. To start changing the conditions experienced by farmers, a special livestock farmer learning method is needed to raise motivation and willingness to improve their socio-economic conditions. With different socioeconomic conditions between livestock farmers, the level of response to artificial insemination can be known.

Method

This study was conducted in Pantenan Village, Panceng District, Gresik Regency from January 1, 2025 to January 15, 2025. This study used a survey method. The determination of the research area was carried out intentionally (*purposive*) on the grounds that the research area is a center for the development of beef cattle with a population of 34 beef cattle farmer respondents in Pantenan Village, Panceng District, Gresik Regency. Sampling was carried out on the population of cattle farmers who carried out Artificial Insemination in Pantenan Village, Panceng, Gresik Regency based on a preliminary survey of the entire population of cattle farmers . as many as 112 people.

Determination of the sample using the Random Sampling method, namely the process of taking samples by drawing lots from all members of the livestock farmer population, then from 112 livestock farmers given a sequence number, then the draw is carried out until the desired number of samples is produced. Determination of livestock farmers as a sample of 30% of the population. This determination is based on Winarto Surachmad (1990) that for a population of 50-500, a sample of 15% -50% is used. From a population of 112 beef cattle farmers, 34 respondents were taken as research samples.

Problem Limitation and Variable Measurement

Problem Limitation

To limit the problem in this research, the implementation limitations are taken in the problems to be analyzed as follows:

- a. This research is limited to cattle farmers who participate Artificial Insemination in Pantenan Village, Panceng District, Sidoarjo Regency Gresik
- b. This research is limited to the level of response of livestock farmers in the following Artificial Insemination.
- c. Response of livestock farmers in participating in Artificial Insemination.
- d. The socio-economic factors observed include: formal education, non-formal education, age and income of livestock farmers.

Measurement of Variables

In this study, the research variables are divided into:

A. Variable X includes the following socio-economic factors:

- a. Formal and non-formal education
- b. Age of livestock farmers
- c. Income of livestock farmers

1. The level of formal farmer education, namely the formal farmer education that is measured by using restrictions on farmers who have an educational level equal to or more than nine years (graduated from junior high school) with education farmer for less than nine years.

2. The level of education of non-formal farmers, namely livestock extension, which is seen from the frequency of livestock farmers in following the extension services that we differentiate between farmers who have participated in extension and those who have not follow the counseling.

3. Age of livestock farmers, namely the age of livestock farmers as measured by:

High if \geq the average of the total number of samples.

Low if $<$ the average total number of samples.

4. The income of livestock farmers is the sum of the income of the entire family, measurement of variables that use limits, namely:

- a. High income if income is more than or equal to the average amount of income and samples obtained.
- b. Low income if the total income is less than the average amount income from the samples obtained.

B. Variable Y

This is the level of response of livestock farmers to Artificial Insemination, namely the perception shown by livestock farmers in accepting Artificial Insemination.

High response = average score value \geq respondent score value

Low response = average score $<$ respondent score

The variables used to determine the high and low response of livestock farmers to the Artificial Insemination (AI) program are as follows:

(1) Active participation in extension activities (0-250) for livestock farmers.

- a. Active 250
- b. Medium.... 100
- c. Never..... 0

(2) Why go for Artificial Insemination (0-250)

- a. Consciousness.... 250
- b. Following friends.... 100
- c. Forced.... 0

(3) Reasons Artificial Insemination was developed (0-250)

- a. Increasing livestock productivity..... 250
- b. Increase the birth rate... 150
- c. Increase the weight of cattle..... 0

(4) Excess livestock products through Artificial Insemination (0-250)

- a. Improving genetic quality.....250
- b. Free from disease.....150
- c. Reproductive efficiency.....0

Data Collection Method

The data taken are primary data and secondary data. Primary data through direct interviews with beef cattle farmers in Pantenan Village, Panceng District . While secondary data were collected

from agencies related to this study, namely from the Gresik Regency Livestock Service and Data from the Pantenan Village Office.

Data Analysis Methods

To test the hypothesis using the Descriptive Statistics method, namely by collecting data, presenting it, and creating tables.

Meanwhile, to find out the relationship between variables X and Y, use the Chi Square independent test. According to Sutrisno Hadi (1993), the Chi Square formula (X^2) is as follows:

$$X^2 = \frac{n \{ (ad - bc) - n/2 \}^2}{(a + b)(c + d)(a + c)(b + d)}$$

Information :

- n = number of samples studied
- a = frequency of occurrence in the first row, first column
- b = frequency of occurrence in the first row, second column
- c = frequency in the second row, first column
- d = frequency of occurrence in the second row, second column

Abba:

$X^2_{hit} > X^2_{table}$, means there is a relationship between the two variables

$X^2_{hit} \leq X^2_{table}$ means there is no relationship between the two variables.

Results and Discussion

Beef Cattle Farmers ' Response to Artificial Insemination Technology

Table 1. Breeders' Response to Artificial Insemination

Farmers ' Response	Amount	Percentage (%)
Tall	19	55.88
Low	15	44.12
Amount	34	100%

In the table above you can see the high response from farmers to Artificial Insemination of cattle is 55.88%, this shows that the level of knowledge about Artificial Insemination is quite good. This condition is known from the activeness in participating in IB counseling, the reasons for participating in the IB program for development and their knowledge of the benefits of IB activities for beef cattle farmers.

Relationship Between Factors Social Economy With Response Breeder To Insemination Artificial

The relationship between socioeconomic factors (level of education, age, income) and the response of beef cattle farmers to AI in Pantenan Village, Panceng District, in detail as follows:

Formal education

Education is the basis for understanding something. Among livestock farmers, education plays an important role in relation to the level of adoption of a technology. The relationship between formal education factors and livestock farmers' responses to IB in Pantenan Village can be seen in the following table:

Table 2. Relationship between Formal Education and Farmer Response to Artificial Insemination to Artificial Insemination

Level of education	Farmers' Response		Amount
	Tall	Low	
> Junior High School	10 (a)	3 (c)	13
< Junior High School	9 (b)	12 (d)	21
Amount	19	15	34

From the table above, the results of the Chi-Square test analysis show that there is no relationship between formal education factors and the response of livestock farmers to implementing the Artificial Insemination program, this is shown by $X^2_{hit} = 3.78 < X^2_{table} (\alpha = 0.05) = 3.84$

Non-Formal Education

According to Mosher (1972) it is assumed that the higher a person's education the easier it is for that person to respond to new technology. However, this study shows something different, this is because existing formal education rarely touches on technology related to the livestock sector, especially IB technology.

Non-formal education or livestock extension activities are the delivery of new technology to targets, so that it can change the target's behavior to make better and more profitable efforts.

non-formal education and the response of livestock farmers in implementing the Artificial Insemination program can be seen in the following table:

Table 5. Relationship between the Level of Non-Formal Education and the Level of Response of Livestock Farmers in Implementing Artificial Insemination Program

Non-formal education level (Counseling)	Response of Livestock Farmers to Implement IB		Amount
	Tall	Low	
High (≥ 3 times)	15	1	16
Low (< 3 times)	3	15	18
Amount	18	16	34

The results of the analysis (attachment 4) show $X^2_{hit} = 17.23 > X^2_{table} = 3.84$, between the level of non-formal education and the response of livestock farmers actively following agricultural extension. In the analysis of the Chi-Square free test, it was proven that non-formal education has a relationship with the level of response of livestock farmers in implementing the Artificial Insemination program. This due to agricultural extension carried out by means of IB which is practiced. In general, livestock farmers directly understand the benefits and importance of IB extension because the extension carried out is accompanied by direct practice and knowing the results.

Therefore, the more often livestock farmers attend extension services, the more they will respond to new technology, which is measured by the frequency of attendance at extension services (Syamsudin, 1997).

Age Factor

The relationship between age factors and the response of livestock farmers in implementing the Artificial Insemination program in Pantenan Village, Panceng District, Gresik Regency, as shown in the following table :

Table. 6. Relationship between age and livestock farmers' response in implementing the artificial insemination program.

Farmer Age	Response of Livestock Farmers to Implement IB		Amount
	Tall	Low	
Young (≤ 44 years old)	12	5	17
Old (> 44 years)	7	10	17
Amount	18	15	34

From the analysis (attachment 5) the relationship between age factors and livestock farmers' responses in implementing the Artificial insemination program shows that $X^2_{hit} = 17.23 > X^2_{table} = 3.84$, at a confidence level of 95%. So the null hypothesis is rejected and H1 is accepted, meaning that there is a relationship between age factors and livestock farmers' responses in implementing the Artificial insemination program.

Several studies show that high innovation diffusion is among those who are middle-aged. This is because older farmers have sufficient experience in dealing with farming land problems than younger farmers.

Income Factors of Livestock Farmers

This study shows that the amount of income is related to the level of response of livestock farmers in implementing the Artificial Insemination program. The results of the analysis of the relationship are as in attachment 6 and for clarity as in the following table:

Table. 7. Relationship Between Income Level and Farmer Response in Implementing Artificial Insemination

Income Level	Response of Livestock Farmers to Implement IB		Amount
	Tall	Low	
High (\geq Rp1,170,558,-)	13	4	17
Low ($<$ Rp1,170,558,-)	2	15	17
Amount	15	19	34

$X^2_{hit} = 11.93 > X^2_{table} = 3.84$, at a confidence level of 95%. So the null hypothesis is rejected and H1 is accepted, meaning there is a relationship between income and the response of livestock farmers in implementing the Artificial Insemination program, on the basis of 95% confidence.

The greater the income of livestock farmers, the greater the model they have in raising livestock, so that it will increase responsive production to new technology (Syamsudin, 1997). In accordance with Syamsudin's opinion (1997) that livestock farmers who have a higher economic status will be quicker to accept and use new things than farmers who have a lower economic status. Farmers with higher incomes tend to be oriented towards the business or profit aspect of farming, so they always want to try new technologies that are more feasible.

CONCLUSION

Based on Research results and discussion, so can take conclusions and suggestions as following:

1. Formal education level of farmers cattle No There is connection with response farmer cattle in carry out insemination program artificial with X^2_{hit} value = $3.78 < X^2_{table} (a = 0.05) = 3.84$, . While non-formal education is actually There is the relationship with response farmer cattle in carry out insemination program artificial , with the value of $X^2_{hit} = 17.23 > X^2_{table} = 3.84$.
2. Factor age with response farmer cattle in carry out insemination program artificial There is relationship $X^2_{hit} = 17.23 > X^2_{table} = 3.84$, meaning age old more responsive to innovation technology new .
3. Factor income There is connection with response farmer cattle in carry out insemination program artificial with the value of $X^2_{hit} = 11.93 > X^2_{table} = 3.84$, matter This due to farmer cattle with income tall more free in use his income For try innovation new compared to farmer cattle with income low.

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