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PRODUCTION FACTORS OF VANNAMEI SHRIMP (*Litopenaeus vannamei*) USING INTENSIVE AND SUPER INTENSIVE CULTIVATION TECHNIQUES IN PERCUT SEI TUAN DISTRICT, DELI SERDANG DISTRICT

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ABSTRACT

This research aims to determine the factors that influence Vaname Shrimp Production in Intensive cultivation and Super Intensive cultivation in Percut Sei Tuan District, Deli Serdang Regency. This research was carried out in February 2003 - March 2023 at Percut Sei Tuan District. This research was carried out purposively (purposive sampling) involving 42 vaname shrimp farmers. Data was obtained through interviews, observations and surveys using a research questionnaire. Data analysis uses multiple linear regression analysis with the Douglas Coob approach. The results of this research show that based on the results of multiple linear regression analysis using the Douglas Coob approach for intensive cultivation, it was concluded that there were no variables that had a significant effect on vaname shrimp production. Based on the results of multiple linear regression analysis tests using the Coob Douglas approach for the super intensive cultivation type, it was concluded that the variables number of fry, amount of feed and number of workers had a positive and significant effect on vaname shrimp production.

INTRODUCTION

Indonesia is a country rich in natural resources and the agricultural potential contained therein, including in the fisheries sub-sector. One of the

fisheries cultivation businesses that has potential and can make a real contribution to the lives of Indonesian people is the fisheries cultivation business.

According to Saragih (2010), the development of the fisheries subsector using an agribusiness system approach means building and developing the upstream fisheries industry subsystem (seedlings, fishing equipment industry, fish feed industry), fish cultivation or fishing subsystem and post-catch handling, fisheries product processing subsystem and trade, supporting service subsystems (especially research and development activities) are integrated in a system, both value systems and management.

Vanname shrimp (Litopenaeus Vannamei) is a shrimp from Latin American waters. that belongs to the Penaidae family. Vaname shrimp is a brackish water commodity that is much in demand because it has advantages such as being resistant to disease, having rapid growth and high survival during maintenance (Arifin, et al., 2012).

According to Babu (2014) " Vaname is the most commonly cultivated type of oyster. In fact, these shrimps have prospects and expected profits." Vaname shrimp agroindustry is one of the business opportunities. in the fisheries agribusiness sector that is growing rapidly to date. Vaname shrimp is a type of shrimp that has the potential to be cultivated because it has a rapid growth rate and high adaptability to environmental changes.

Shrimp cultivation in Indonesia has good prospects, because the demand for shrimp always increases every year, so shrimp cultivation is needed in technology so that shrimp reach consumption size more quickly. When feeding shrimp, you need to look at the age, size and mouth opening of the shrimp. Shrimp will spawn and lay eggs in fresh water. From the time the egg is fertilized until it hatches it takes 16-20 days. Meanwhile, from egg hatching to juvenile it takes 11 stages in a maximum of 41 days, the next stage is to become an adult shrimp. The process of organ formation until a perfect body is formed like an adult takes 40 days, or consists of 11 stages (Kaligis, 2015).

It is hoped that the presence of vaname shrimp will attract investment in shrimp farming again. Currently, vaname shrimp cultivation has been carried out by a number of farmers in Aceh, Sumatra, East Java, Bali, West Java, Central Java, South Sulawesi and many other regions in Indonesia.

Percut Sei Tuan District is one of the areas located in Deli Serdang Regency and is one of the areas that cultivates vaname shrimp. The shrimp cultivation business in Percut Sei Tuan District has been carried out for a long time because it is located close to the beach, making it easier for farmers to cultivate vaname shrimp. Of the 18 villages in the Percut Sei Tuan sub-district, there are 2 villages that carry out vaname shrimp cultivation. To find out the

state of the vaname shrimp cultivation business in Percut Sei Tuan sub-district, you can see the following table:

Table 1. Number of RTP (Aquaculture Households), Area of Brackish Water Cultivation Maintenance and Vaname Shrimp Production, Percut Sei Tuan District, 2019, 2020, 2021

Year	RTP (House hold)	Pond Area (Ha)	Production (Tons)
2019	75	551.07	121.20
2020	107	24.30	78.80
2021	107	427.34	74.10

Source: Central Statistics Agency (BPS) Deli Serdang Regency 2019,2020,2021

Based on Table 1, Vaname Shrimp Production, Percut Sei Tuan District, in 2019 the total production of vaname shrimp reached 121,201 tonnes, in 2020 the amount of vaname shrimp production decreased due to Covid 19, the production amount reached 78.80 tonnes, in 2021 the amount of production still decreased due to covid 19 reached 74.10 tons.

The problem faced by farmers is that the production of vaname shrimp in the Percut Sei Tuan sub-district has decreased. Factors that are thought to influence vaname shrimp production include the influence of land area, number of fry, amount of feed, number of workers, and the amount of medicine used in vaname shrimp production.

To obtain maximum production, farmers must choose the right use of production factors and combine them optimally and efficiently. However, there are still many farmers who do not understand how these production factors are used. These constraints have an impact on the amount of production produced. Therefore, researchers want to conduct research on the analysis of factors influencing vaname shrimp production in Percut Sei Tuan District.

The demand for vaname shrimp is increasing from year to year. The export volume of Indonesian vaname shrimp in 2010 reached USD 1.57 billion or 63.3% of the total export value of Indonesian fishery products of USD 2.34 billion. Since 2005, the government has declared vaname shrimp cultivation as one of the leading commodities for fisheries revitalization. To achieve the production target of 540,000 tons, at least 900,000 broodstock and 52.31 billion shrimp fry are needed. Vannamei shrimp production has been developed using semi-intensive and intensive technology. Through better cultivation management, it is targeted that production can increase by 17.38% per year, namely: 275 thousand tons in 2010 to 500 thousand tons in 2014 (Directorate General of Aquaculture, 2014).

Demand is a good number of buyers who are willing and able to buy at different possible prices, in a certain period of time, assuming other things remain the same (cateris paribus) (Rita, 2010). Demand is the most important

part of production. Demand will influence the number of products that will be produced.
The demand for vaname shrimp from within the country is based on a mutual agreement between the two parties, namely the vaname shrimp cultivator group and local consumers regarding the quantity and price.

RESEARCH METHODS

This research was carried out in Percut Sei Tuan District in February 2023- March 2023. The location selection it was used with a mind bearing in mind that fact Percut Sei Tuan District is one of the areas where the average population has a vaname shrimp farming business. The determination of the sample size used by the author in This research is a statistical method that is based on the following points: A complete sample is a method of observation when the entire population is used as a sample. Another term for full view is statistics.Based on the statement above, the number of shrimp farmers taken to be used as samples was 42 people from the existing population, who were selected using the census method, where the entire population was taken to be used as samples.

Method of Collecting Data

To collect data in this research, several techniques were used to obtain in-depth and relevant information. The Data collection methods are: interviews, observations, questionnaires and documents.

Data Analysis Method

Empirical Model

The data analysis method used in this study consisted of analyze costs, revenues and business income using business analysis. Business analysis has the following formula/formulation:

Multiple linear regression analysis using the *Cobb-Douglas approach* and statistical tests with data analysis techniques used in this research, namely the Coefficient of Determination (R2) test, F-statistic test, T-statistic test Analysis of factors that can affect vannamei shrimp production including: land/pond, seed, food, labor and medicine. The data used are usually presented at the median or mean level.

RESULTS AND DISCUSSION

Factors That Intensively Influence Vaname Shrimp Production

1. Multiple Linear Regression Test

A multiple linear regression analysis technique is used to determine the effect of the independent variable on the dependent variable.The multiple linear regression analysis method is used to determine the influence of the independent variable and the dependent variable.

Table 2. Multiple Linear Analysis Test Based on Intensive Cultivation Coefficientsa

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	Q	Sig.
(Constant)	267,707	250,539		1,069	,326
Pond Area	-,058	,091	-,090	-642	,545
Number of Fry	,017	,008	,923	2,023	,090
Amount of Feed	,038	,310	,049	,124	,906
Total manpower	,803	6,376	,022	,126	,904
Number of Drugs	,002	,002	,128	,801	,454

a. Dependent Variable: Production

From table 2 above it can be seen that the Coob-Douglas function equation in the form of the equation above is:

$$\mathbf{Y = 267\ .707 - 0.058\ X_1 + 0.017\ X_2 + 0.038\ X_3 + 0.801}$$

The equation in the table above can be concluded as follows:

a. If variables for pool area (X1), fry (X2), food (X3), labor (X4) and medicine (X5) are constant or equal to zero, then the level of production variable (Y) is 267,707.
b. The value of the regression coefficient for the pool area (X1) is -0.058. This means that if the Pond Area variable has a negative regression coefficient, then if capital increases by 1%, output will decrease by -0.058%.
c. The value of the Benur regression coefficient (X2) is 0.017. A positive sign indicates a unidirectional change, which means that if the fry variable increases by 1%, the output will increase by 0.017%.
d. The value of the power regression coefficient (X3) is 0.038. A positive sign indicates an insignificant change, which means that if the change in food increases by 1%, production will increase by 0.38%.

e. The value of the regression coefficient function (X4) is 0.803. A positive sign indicates an insignificant change, which means that if the change in employment increases by 1%, output will increase by 0.803%.
f. The Drug regression coefficient value (X_5) is 0.002. A positive sign indicates a unidirectional change, which means that if the drug variable increases by 1%, production will increase by 0.002%.

2. Hypothesis Test Based on Intensive Cultivation

a. R^2 Determination Coefficient Test

The coefficient of determination (R^2) basically measures the extent to which the model's ability to explain the variance in the independent variables. The greater the R value, the greater the ability value of the independent variable.

Table 3. Results of Coefficient of Determination Analysis (R^2) Based on Intensive Cultivation

Model Summary b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,977a	,955	,918	55,349

a. Predictors: (Constant), Medicine, Pond Size, Fry, Labor, Feed
b. Dependent Variable: Production
Source: SPSS 22 (processed)

Based on table 3 above, the results of data processing via SPSS show that vaname shrimp production is influenced by pond area, number of fry, amount of feed, number of workers and amount of medicine by 90.45%, while the remaining 9.55% is influenced by other factors outside model.

b. F test

The statistical F test basically shows whether all independent variables have a joint effect on the dependent variable.

Table 4. F Test Results Based on Intensive Cultivation

ANOVAa

Model	Sum of Squares	Mean Square	F	Sig.
Regression	390785,693	7815,139	25,512	.001 b
Residual	18380.974	3063,496		
Total	409166,667			

a. Dependent Variable: Production
b. Predictors: (Constant), Amount of Medicine, Pond Area, Number of Fry, Amount of Labor, Amount of Feed.

Based on table 4 of the research results, it is known that the $_{\text{calculated F value}}$ of the variables is Pond Area (X_1), Number of Fry (X_2), Number of Feed (X_3), Number of Workers (X_4), and Number of Medicines (X_5), namely amounting to 25.512 is greater than the $F_{\text{table value}}$, namely 2.365, so it can be seen that H0 is rejected and H1 is accepted. This means that there is a significant influence between pond area, number of fry, amount of feed, amount of labor, and amount of medicine on vaname shrimp production.

c. T test

T test was performed to determine the effect of each independent or partial variable (Pond Area, Number of Fry, Number of Feed, Number of Workers and Number of Medicines) on the dependent variable (Vaname Shrimp Production). then the results of the hypothesis test obtained are as follows:

Table 5. T Test Based on Intensive Cultivation

Coefficients [a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	Q	Sig.
(Constant)	267,707	250,539		1,069	,326
Pond Area	-,058	,091	-,090	-,642	,545
Number of Fry	,017	,008	,923	2,023	,090
Amount of Feed	,038	,310	,049	,124	,906
Total manpower	,803	6,376	,022	,126	,904
Number of Drugs	,002	,002	,128	801	,454

a. Dependent Variable: Production

Source: SPSS 22 (processed)

1. The surface area of the lake The variable (X1) has a significant effect on the output variable Y. Judging by the significant value of the change of the basin area (X1) 0.545> 0.05, H0 is accepted and H1 is rejected, which means that the basin area changes (Y).
2. The variable number of fry (X2) has a significant effect on the output variable Y. Judging from the significant value of the coefficient of variation of fry (X2) 0.090> 0.05, H0 is accepted and H1 is rejected, that is, the number of fry (y).
3. The variable feed rate (X3) has a significant effect on the output variable Y. Judging by the significant value of the variable food quantity (X3)

0.906 > 0.05, H0 is accepted and H1 is rejected, which means that the quantity of food (X3) has no effect on production (Y).

4. The variable number of workers (X4) has a significant effect on the output variable Y. Judging by the significant value of the variable number of employees (X4) 0.904> 0.05, H0 is accepted and H1 is rejected, which means that Work (Y).
5. The variable drug quantity (X5) has a significant effect on the output variable Y. Judging by the significance value of the drug variable (y).

Factors That Influence Super Intensive Vaname Shrimp Production

1. Multiple Linear Analysis Test

The multiple linear regression analysis method is used to determine the influence of the independent variable and the dependent variable.

Table 6. Multiple Linear Analysis Test Based on Super Intensive Cultivation

Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	Q	Sig.
(Constant)	268,549	90,678		2,962	,007
Pond Area	-,043	,027	-,077	-1,631	,116
Number of Fry	,010	,002	,574	5,559	,000
Amount of Feed	,231	,101	,274	2,280	,003
Total manpower	8,227	2,951	,188	2,788	,001
Number of Drugs	,001	,001	,055	0.770	,449

a. Dependent Variable: Production

From table 6 above it can be seen that the Coob-Douglas function equation in the form of the equation above is:

$$\mathbf{Y=268.549 - 0.043\ X_1 + 0.010\ X_2 + 0.231\ X_3 + 8.227}$$

The equation in the table above can be concluded as follows:

a. If the variables of pond area (X_1), number of fry (X_2), number of feed (X_3), number of workers (X_4) , and number of medicines (Y) of 268,549.
b. The regression coefficient value of Pond Area (X_1) is -0.043. This means that if the pond area variable has a negative regression coefficient, then if the pond area increases by 1 meter, production will decrease by -0.043%.

c. The value of the regression coefficient for the number of fry (X2) is 0.010. A positive sign indicates an insignificant change, which means that if the fry variable increases by 1, the output will increase by 0.010%.
d. The value of the regression coefficient for the food quantity (X3) is 0.231. A positive sign indicates an insignificant change, which means that if the quantity of food increases by 1 kg, the production will increase by 0.231%.
e. The value of the regression coefficient for the number of employees (X4) is 8.227. A positive sign indicates an insignificant change, which means that if the number of flexible workers increases by 1 person, production will increase by 8.227%.
f. The regression coefficient value for Number of Drugs (X_5) is 0.001. A positive sign indicates a unidirectional change, which means that if the change of medicine increases by 1 ml, the output will increase by 0.001%.

2. Hypothesis Test Based on Super Intensive Cultivation

a. R^2 Determination Coefficient Test

The coefficient of determination (R^2) accurately measures the extent to which the model can explain the variance in the independent variable. The higher the R value, the higher the capacitance value of independent variable.

Table 7. Results of Coefficient of Determination Analysis (R^2) Based on Super Intensive Cultivation

Model Summary b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,989a	,978	,973	41,635

a. Predictors: (Constant), Medicine, Pond Size, Fry, Labor, Feed
b. Dependent Variable: Production

Based on table 7 above, the results of data processing via SPSS show that vaname shrimp production is influenced by pond area, number of fry, amount of feed, number of workers and amount of medicine by 90.22%, while the remaining 9.78% is influenced by other factors outside model.

b. F test

$_{calculated}$ F significance level value < α = 0.05 is also proven by if the $_{calculated\ F\ value}$ is > F_{table} . If the $F_{calculated}$ significance value is below α = 0.05 and if $F_{calculated} > F_{table}$ then the independent variables in this study jointly influence

dependent variables. The results of the calculated F-test can be seen in the following table.

Table 8. F Test Results Based on Super Intensive Cultivation

ANOVAa

Model	Sum of Squares	F	Mean Square	F	Sig.
Regression	1835132,399	5	367026,480	211,724	,000b
Residual	41604,268	24	1733,511		
Total	1876736,667	29			

a. Dependent Variable: Production

b. Predictors: (Constant), Amount of Medicine, Pond Area, Number of Fry, Amount of Labor, Amount of Feed.

Based on table 8, it is known that the calculated F value of the variables Pond Area (X_1), Number of Fry (X_2), Number of Feed (X_3), Number of Workers (X_4), and Number of Medicines (X_5) is 211,724 is greater than the F table value , namely 2.365, So we see that H0 is rejected and H1 is accepted. This means that there is a lot of influence in between pond area, number of fry, amount of feed, amount of labor, and amount of medicine on vaname shrimp production.

c. T test

The T test was carried out to determine the influence of each or partial independent variable (Pond Area, Number of Fry, Number of Feed, Number of Workers and Number of Medicines) on the dependent variable (Vaname Shrimp Production). then the results of hypothesis testing obtained are as follows:

Table 9. T Test Based on Super Intensive Cultivation

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	Q	Sig.
1	(Constant)	268,549	90,678		2,962	,007
	Pond Area	-,043	,027	-,077	-1,631	,166
	Number of Fry	,010	,002	,574	5,559	,000
	Amount of Feed	,231	,101	,274	2,280	,003
	Total manpower	8,227	2,951	,188	2,788	,001
	Number of Drugs	,001	,001	,055	,770	,449

a. Dependent Variable: Production

Source: SPSS 22 (processed)

1. The pool area (X1) has a significant effect on the output variable Y. If we look at the significant value of the pool on the variable (X1) 0.166 > 0.05 then H0 is accepted and H1 rejected, which means the output of the pool on the variable (Y).
2. Variable fry rate (X2) has a significant effect on Y output variable. If we consider the significant value of the variable fry number (X2) 0.000 < 0.05, then H0 rejected and H1 accepted, which means the number of fry (Y).
3. The variable feed rate (X3) has a significant effect on the output variable Y. If we consider the significant value of the variable Food Quantity (X3) 0.03 < 0.05, then H0 is rejected and H1 is accepted, which means that the amount of food (X3) has an effect on production (Y).
4. The variable number of workers (X4) has a significant effect on the output variable Y. If we consider the significant value of the number of variable workers (X4) 0.001 < 0.05, then H0 is rejected and H1 is accepted, which means that work (X4) has an effect on output (Y) .
5. The variable drug quantity (X5) has a significant effect on the output variable Y. If we look at the significant value of the variable number of drugs (X5) 0.449> 0.05 then H0 is accepted and H1 is rejected, which means that the number of drugs (X5) has no effect on Production (Y).

Discussion

A. Factors That Intensively Influence Vaname Shrimp Production

1. Effect of Pond Size (X_1) on Vaname Shrimp Production (Y)

According to Rahim and Retno (2007), the size of agricultural land is a determinant of agricultural commodity production factors. So in general, the larger the land used, the greater the amount of production on that land. The larger the area of land used, the greater the amount of production.

Based on the research results, it is known that the area of the lake (X1) has no significant effect on the production of vaname shrimp (Y), this can be seen based on the significant value of the surface change of the lake. (X 1) of 0.545>. 0.05 or value T calculated = -0.642 < 2.179 value from the table T. Therefore, we can conclude that there is no negative negative effect of the change pool (X1) and vaname shrimp production (Y).

The size of the pond has no real effect on vaname shrimp production. This is in accordance with the opinion of Suyanto and Mujiman (2006) which states that in an extensive cultivation system with a pond plot size of 3 to 30 ha the productivity is only 100 to 5000 kg/ha/year, and in a cultivation system semi-intensive with a pond size of 1 to 5 ha has a productivity of 500 to 1,000

kg/ha/year, while an intensive system with only a pond area of 0.1 to 1 ha can achieve a productivity of 2,000 to 20,000 kh/ha/year.

2. Effect of Number of Fry (X_2) on Vaname Shrimp Production (Y)

Fry are juveniles produced from broodstock of both fish and shrimp which are almost invisible and are the main object for pond production both on the coast and in highland areas. Usually the fry can only be moved to the main pond when they are already in the 8- 10 days depending on the type of fish or shrimp, at which time the fry that are ready to be released into the main pond will be able to survive.

Based on the research results, it is known that the number of fry (X2) has a significant effect on the production of vaname shrimp (Y). This can be seen based on the importance of the change number of fry It was concluded that there was no significant influence on the variable number of fry (X_2) on vaname shrimp production (Y).

This is inversely proportional to the results of Jusmiaty's (2016) research on the efficiency of vaname shrimp cultivation, which states that fry have a real effect of $\alpha = 0.1$ and a regression coefficient of 0.30, which means that if there is an addition of 1% of fry, it will increase the amount of vaname shrimp production. of 0.30%. The number of fry stocked in ponds ranges from 15,000 to 750,000 fry/ha/cycle with production results ranging from 50 to 10,000 fry/ha/cycle. Apart from being influenced by quality, vaname shrimp production is also influenced by the quality of the fry. The quality of the fry plays an important role in the success of the vaname shrimp cultivation because it will determine the quality of the shrimp after harvest.

3. Effect of Amount of Feed (X_3) on Vaname Shrimp Production (Y)

Feed is a very important factor for increasing livestock productivity. Feed of sufficient quality and quantity is needed to support livestock growth and production. Feed plays a very important role in the success of a livestock business.

Based on the research results, it is known that the amount of food (X3) has a significant effect on the production of white grass (Y). This can be seen based on the significance value of different types of food (X3) of 0.906>0.05 or the calculated T value of 0.124 < 2.179 T in order to conclude that there is no significant effect on food. changeon the variable amount of feed (X_3) on vaname shrimp production (Y).

This is inversely proportional to research by Jusmiaty (2016) which states that fry input has a real effect on vaname shrimp production. The amount of feed used ranges from 50 to 14,000 kg/ha/cycle. Feeding must be in accordance with the needs of vaname shrimp in order to produce better

production. The cultivation systems used are intensive and super intensive systems so that control of feed frequency is very high.

4. Effect of Number of Workers (X_4) on Vaname Shrimp Production (Y)

Active workers are all people who are considered able to work and who can work if work is required. Farming labor can be divided into male labor, female labor and child labor. Farming labor can be obtained from labor within the family and labor outside the family.

Based on the research results, it is known that the number of workers (X4) has a significant effect on the production of vaname shrimp (Y). This can be seen based on the significant value of the number of variable workers (X4) of 0.904 > 0.05 or the T value calculated 0.126 < 2.179 T from the table, so it can be concluded that there is no significant impact on change Number of Workers (X_4) on vaname shrimp production (Y).

This is in line with the opinion of Adriyanto et al (2013) which states that the amount of labor used is the Daily Working Person (HOK), the greater the HOK used in the vaname shrimp cultivation business, the greater the amount of vaname shrimp production will increase.

5. Effect of Amount of Drug (X_5) on Vaname Shrimp Production (Y)

Medicine is a material that is very important for the process of healing, preventing and alleviating a disease. Basically animals and humans really need medicine.

Based on the research results, it is known that the amount of medicine (X5) does not have a significant effect on the production of white grass (Y). This can be seen based on the significant value of the variable drug coefficient (X5) of 0.454 > 0.05 or the calculated T value of 0.801 < 2.179 T table to conclude that there is no significant negative effect and it. variable Amount of Drug (X_5) on white shrimp production (Y).

This is in accordance with the research of Jusmiaty (2016) which states that drugs do not have a significant effect effect on vaname shrimp cultivation with drug use ranging from 1 to 900 ml/ha/cycle. Haliman and Adijaya (2006) stated that the drug functions as an antidote to viruses that cannot be seen with the naked eye. Several medicines can be used to treat vaname shrimp problems, such as antibiotics and vaccines.

B. Factors That Influence Super Intensive Vaname Shrimp Production

1. Effect of Pond Size (X_1) on Vaname Shrimp Production (Y)

According to Rahim and Retno (2007), the size of agricultural land is a determinant of agricultural commodity production factors. So in general, the

larger the land used, the greater the amount of production on that land. The larger the area of land used, the greater the amount of production.

Based on the research results, it is known that the pond area (X1) does not have a significant effect on the production of vaname shrimp (Y), this can be seen based on the value of the variable pond (X1) of 0.166 > 0.05. or the value of T calculated = -1.631 < 2.042 from the table T. Therefore, we can conclude that there is no negative negative effect on the pool change. (X_1) on vaname shrimp production (Y).

The size of the pond has no real effect on vaname shrimp production. This is in accordance with the opinion of Suyanto and Mujiman (2006) which states that in an extensive cultivation system with a pond plot size of 3 to 30 ha the productivity is only 100 to 5000 kg/ha/year, and in a cultivation system semi-intensive with a pond size of 1 to 5 ha has a productivity of 500 to 1,000 kg/ha/year, while an intensive system with only a pond area of 0.1 to 1 ha can achieve a productivity of 2,000 to 20,000 kh/ha/year.

2. Effect of Number of Fry (X_2) on Vaname Shrimp Production (Y)

Fry are juveniles produced from broodstock of both fish and shrimp which are almost invisible and are the main object for pond production both on the coast and in highland areas. Usually the fry can only be moved to the main pond if they have been in the main pond for 8-10 days depending on the type of fish or shrimp, at which time the fry that are ready to be released into the main pond will be able to survive.

Based on the research results, it is known that the number of fry (X2) has a significant effect on the production of white grass (Y). This can be seen based on the significant value of the coefficient of variation of the fry (X2) of 0.00 < 0.05 or the value of T calculated 5,559 > 2,042 T from the table, so it is concluded that there is a significant effect on the change . number of fry (X_2) on vaname shrimp production (Y).

This is in line with the results of Jusmiaty's (2016) research on the efficiency of vaname shrimp cultivation, which states that fry have a real effect of α = 0.1 with a regression coefficient value of 0.30, meaning that if there is an addition of 1% of fry, it will increase the amount of vaname shrimp production by 0.30%. The number of fry stocked in ponds ranges from 15,000 to 750,000 fry/ha/cycle with production results ranging from 50 to 10,000 fry/ha/cycle. Apart from being influenced by quality, vaname shrimp production is also influenced by the quality of the fry. The quality of the fry plays an important role in the success of vaname shrimp cultivation because it will determine the quality of the shrimp after harvest.

3. Effect of Amount of Feed (X_3) on Vaname Shrimp Production (Y)

Feed is a very important factor for increasing livestock productivity. Feed of sufficient quality and quantity is needed to support livestock growth and production. Feed plays a very important role in the success of a livestock business.

Based on the research results, it is known that the amount of food (X3) has a significant effect on the production of white grass (Y). This can be seen based on the significant value of the food income variable (X3) of 0.003 < 0.05 or the calculated T value of 2280 > 2042 T, so it is concluded that 'there is a significant effect on the variable. amount of feed (X_3) on vaname shrimp production (Y).

This is in accordance with research by Jusmiaty (2016) which states that fry input has a real effect on vaname shrimp production. The amount of feed used ranges from 50 to 14,000 kg/ha/cycle. Feeding must be in accordance with the needs of vaname shrimp in order to produce better production. The cultivation systems used are intensive and super intensive systems so that control of feed frequency is very high.

4. Effect of Number of Workers (X_4) on Vaname Shrimp Production (Y)

Employees are all people who are considered as employees and can work if work is needed. Farming labor can be divided into male labor, female labor and child labor. Farming labor can be obtained from labor within the family and labor outside the family.

Based on the research results, it is known that the number of workers (X4) has a significant effect on the production of vaname shrimp (Y). This can be seen based on the significant value of the number of variable workers (X4) of 0.01 < 0.05 or the value of T calculated 2788 > 2042 T from the table, which allows us to conclude that there is a great deal of influence on the change Number of Workers (X_4) on vaname shrimp production (Y).

This is in line with the opinion of Adriyanto et al (2013) which states that the amount of labor used is the Daily Working Person (HOK), the greater the HOK used in the vaname shrimp cultivation business, the greater the amount of vaname shrimp production will increase.

5. Effect of Amount of Drug (X_5) on Vaname Shrimp Production (Y)

Medicine is a material that is very important for the process of healing, preventing and alleviating a disease. Basically animals and humans really need medicine.

Based on the research results, it is known that the amount of medicine (X5) does not have a significant effect on the production of white grass (Y). This can be seen based on the significant value of the variable drug coefficient (X5) of 0.449 > 0.05 or the calculated T value of 0.770 < 2.042 T table to conclude that

there is no significant negative effect and it. variable Amount of Drug (X_5) on white shrimp production (Y).

This is in accordance with the research of Jusmiaty (2016) which states that drugs have no significant effect on vaname shrimp cultivation with drug use ranging from 1 to 900 ml/ha/cycle. Haliman and Adijaya (2006) stated that the drug functions as an antidote to viruses that cannot be seen with the naked eye. Several medicines can be used to treat vaname shrimp problems, such as antibiotics and vaccines.

CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

The conclusions of this research are as follows:

Factors that influence vaname shrimp production in intensive cultivation we can conclude that there is no need for feelings vaname shrimp production. Meanwhile, in the super intensive cultivation type, it can be concluded that the number of fry, the amount of feed and the number of workers have a significant effect on vaname shrimp production.

Suggestion

The suggestions given for vaname shrimp cultivation activities in Percut Sei Tuan District are as follows:

Factors that influence vaname shrimp production are pond area, number of fry, amount of feed, number of workers and amount of medicine. So farmers must maintain their ponds and pay attention to the medicines used to treat vaname shrimp so that the production of white vaname shrimp increases. Users are advised to pay attention at all times procedures used to care for vaname shrimp.

REFERENCES

Amri, Khairul and I. Kanna. (2008). Vaname Shrimp Cultivation: Intensive, Semi-Intensive and Traditional. PT Gramedia Pustaka Utama. Jakarta.

Andriyanto, F., A. Efani and H. Riniwati. (2013). Analysis of Production Factors for Raising Vanname Shrimp (Litopenaeus vannamei) in Paciran District, Lamongan Regency, East Java; Cobb-Douglass Function Approach. Fisheries and Marine Sciences Brawijaya University. Poor.

Babu, D., Ravuru, J.N. Mude. (2014) Effect of Density on Growth and Production of *Litopenaeus vannamei* from a Brackish Water Cultivation System in Summer with an Artificial Diet in Prakasam District, India.

Daniel and Wanda (2015). Introduction to Economics, no 1 (Microeconomics),. Yogyakarta.

Directorate General of Aquaculture. (2014). 2013 Annual Report of the Directorate of Production, Directorate General of Aquaculture, KKP. https://doi.org/10.3406/arch.1977.1322

Directorate general of aquaculture, "vaname shrimp and tiger prawns are still the mainstay of Indonesian exports," the official website of the Directorate general of aquaculture. http://www.djpb.kkp.go.id/arsip/c/246/Udang-Vaname-dan-Udang-Windu-Masih-Andalan-Ekspor-Indonesia/?category_id=13 (Accessed 23 July 2017)

Erwinda, Y. (2008). Intensive White Shrimp Hatchery. Bandung Institute of Technology Biology Study Program. Bandung.

Gunarto and EA Hendrajat. (2008). Cultivation of Vaname Shrimp (Litopenaues vannamei) Semi-Intensive Pattern with the Application of Several Types of Commercial Probiotics. Journal of Aquaculture Research. 3 (III): 339-349.

Haliman, RW and Adijaya, DS (2005). Vaname Shrimp, Cultivation and Market Prospects for Disease Resistant White Shrimp. Self-Help Spreader. Jakarta.

Haliman, RW and Adijaya, D. (2005). "Vannamei Shrimp". Self-Help Spreader: Jakarta

Kaligis, E. (2015). Growth Response of Vaname Shrimp (Litopenaeus vannamei) in Low Salinity Media by Providing Protein and Calcium Feed. Journal of Marine Science and Technology. Vol 7(1): 225-234.

Mahendra. (2007). Vannamei Shrimp Cultivation and Natural Food Cultivation. Soedirman University. Central Java.

Riani, H., R. Rastika and W. Lili. (2012). Effect of Feed Measurement on the Growth of Vaname Shrimp (Litopenaeus vannamei) PL-21 Given Biofloc. Journal of Fisheries and Marine Affairs, 3 (3). matter. 207-208.

Rita (2010). Introduction to Agricultural Economics. Yogyakarta.

Saragih (2010) Agribusiness New Paradigm of Economic Development. Agriculture Based. Bogor. Young Entrepreneur Library

Soekartawi. (2010). Economic Theory of Production with the Subject of Cobb-Douglass Function Analysis. PT. Raja Grafindo Persada. Jakarta.

Soemardjati W, Suriawan A. (2007). Technical Instructions for Cultivating Vaname Shrimp (Litopenaeus vannamei) in Ponds. Department of Maritime Affairs and Fisheries, Directorate General of Aquaculture. Situbondo Brackish Water Cultivation Center. 30 p

Sugiyono. (2010). Educational Research Methods Quantitative, Qualitative and R&D Approaches. Alphabet. Bandung.

Sukirno Sadono. (2012). Macroeconomic Theory Introduction to the Third Edition. Jakarta: Rajawali.

Source. Central Bureau of Statistics. Brackish Water Fish Cultivation Production According to Fish Types in Deli Serdang District (2019, 2020, 2021).

Source. Data on Demand for Vannamei Shrimp Domestically and Abroad (2021).

Suratiyah (2015). Agricultural Science. Self-Help Spreader. East Jakarta.