

Potential Productivity of Quail Farming in Ngaliyan, Pulutan, Wonosari, Gunungkidul

Annida Purnamawati⁽¹⁾, Wawan Nugroho⁽²⁾, Raffi Fa`Iq Firjatullah⁽³⁾, Mochamad Akbar Garudea Syahroni⁽⁴⁾

^(1,3,4) Bina Sarana Informatika University Yogyakarta, Jl. West Ringroad, Gamping, Yogyakarta,

⁽²⁾ Bina Sarana Informatika University Surakarta, Jl. Letjen Sutoyo No.43, Surakarta City

email: annida.npr@bsi.ac.id

ABSTRAK

Burung puyuh merupakan jenis hewan unggas yang mempunyai potensi produktivitas untuk dapat dikembangkan dan ditingkatkan dalam segi pemeliharaan demi terwujudnya produksi yang maksimal. Penelitian bertujuan menganalisis apasaja yang menjadi faktor pengaruh dari produksi usaha peternakan burung puyuh petelur yang ada di Ngaliyan, Pulutan, Wonosari, Gunungkidul. Jika rendahnya produksi telur burung puyuh menjadi kendala bagi peternak, hal ini dapat menghambat upaya untuk meningkatkan produktivitas dan memenuhi kebutuhan konsumen. Tujuan dari penelitian untuk mengidentifikasi berbagai faktor apasaja yang memengaruhi produksi telur burung puyuh. Penggunaan pendekatan gabungan antara metode kualitatif dan kuantitatif dengan menerapkan metode regresi linier berganda. Hasil penelitian mendapatkan pendapatan dari produksi telur burung puyuh Rp193.011.950 per periode usaha (15 bulan). Analisis regresi linier berganda menunjukkan bahwa kedua variabel independen, yaitu biaya pakan (X_1) dan biaya tenaga kerja (X_2), berpengaruh signifikan terhadap produksi telur burung puyuh (Y), dengan nilai signifikansi < 0.001 . Variabel biaya pakan (X_1) memiliki pengaruh positif dominan, sedangkan biaya tenaga kerja (X_2) memiliki pengaruh negatif. Hubungan antara kedua variabel independen terhadap produksi telur mencapai 88.1%, dengan 11.9% dipengaruhi oleh variabel lain di luar penelitian. Model regresi yang digunakan kuat dan valid, menunjukkan pengaruh signifikan kedua variabel independen terhadap variabel dependen.

Kata kunci: pendapatan, faktor produksi, burung puyuh, regresi linier berganda, spss.

ABSTRACT

Quails are a type of poultry with significant productivity potential that can be developed and improved through enhanced care to achieve optimal production. This study aims to analyze the factors influencing the production of laying quail farms in Ngaliyan, Pulutan, Wonosari, Gunungkidul. If low egg production becomes an obstacle for farmers, it can hinder efforts to increase productivity and meet consumer demand. The purpose of this research is to identify the various factors influencing quail egg production. The study employs a mixed-method approach, combining qualitative and quantitative techniques, with multiple linear regression analysis. The results indicate that income from quail egg production is IDR 193.011.950 per business period (15 months). Multiple linear regression analysis shows that both independent variables, feed cost (X_1) and labor cost (X_2), have a significant effect on quail egg production (Y), with a significance level of < 0.001 . The feed cost variable (X_1) has a dominant positive influence, while labor cost (X_2) has a negative influence. The relationship between the two independent variables and egg production is 88.1%, with 11.9% influenced by other factors outside of the study. The regression model used is strong and valid, demonstrating the significant impact of both independent variables on the dependent variable.

Keywords: income, production factors, quail, multiple linear regression, spss.

Annida Purnamawati¹, Wawan Nugroho², Raffi Fa`Iq Firjatullah³,
Mochamad Akbar Garudea Syahroni⁴/

INTRODUCTION

Based on data from the Coordinating Ministry for Economic Affairs, the livestock sub-sector contributes positively to the national economy by providing growth of 0.34% and contributing 1.58% to GDP [1]. One of the direct benefits obtained from the livestock sub-sector is animal food that has high value, especially as a source of animal protein. Along with population growth, education and public awareness also increase where the importance of nutrition and the role of nutrients in life, especially in children. So the higher the needs of the community also have an impact on the livestock sub-sector so that it has a positive impact on improving nutritional quality and also provides benefits for livestock businesses [2].

Quail farming is one of the livestock sub-sectors that has the potential to produce eggs and meat, and is a source of animal food that is rich in nutrition [3]. Quail, in addition to producing eggs and meat, quail droppings can also increase income for livestock business actors. Quail can be cultivated by the community as a source of daily income, although the marketing of quail eggs is not as large as chicken eggs due to different selling prices, but quail farming can also have great potential to be developed [4].

Various studies have examined analytical methods for processing poultry farm data. Research conducted by Naurah examined the financial feasibility of a quail egg farming business in Pringsewu District, Pringsewu Regency, by applying various approaches, such as NPV, IRR, and sensitivity analysis. The results of the analysis showed that this business is vulnerable to decreased production, fluctuations in selling prices, and increased feed costs [5]. Another study by Boni reviewed the feasibility of a quail egg farming business in Tebing Tinggi Okura Village, Rumbai Pesisir District, Pekanbaru, this study reviewed the financial aspects using investment criteria such as NPV, IRR, Net B/C Ratio, PBP, and BEP. The findings showed that the business was classified as feasible to run with an NPV of IDR 64.518.459, an IRR of 18.94%, and a Net B/C Ratio of 1.2 [6]. However, this study specifically explores the effectiveness of multiple linear regression method which can help in determining the potential factors in quail farming.

This study aims to reveal the effectiveness of analysis techniques on quail farming. The background of the research is to see today's society who are enthusiastic about the nutritional value of children in order to support maximum growth and development. As well as seeing the closest local livestock environment, namely quail farming. In addition, the author hopes that the results of the study can add to the contribution of research developers to always be able to improve the quality of studies in the future. Through this study, the author also hopes that readers can understand more deeply regarding the implementation of the multiple regression linear method effectively.

METHOD

This research was conducted in Ngaliyan, Pulutan, Wonosari, Gunungkidul. The location was chosen intentionally because it is one of the quail egg production farms in Wonosari District, Gunungkidul Regency. The stages carried out in the research are described in Figure 1.

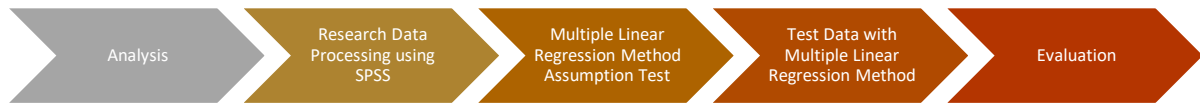


Figure 1. Research Stage

Explanation of the research stages in Figure 1 as follows:

1. Analysis

Writer adopt technique data collection based quantitative through survey literature academic in the field science related, aimed at For to obtain relevant concepts so that can support innovation study use development policy public [9]. In the research this is also done approach qualitative, so the data obtained is results from interview. Interview can give outlook deep about perspectives, experiences and information that are not can obtained through other methods such as survey. Data Preparation. At the stage This collect data with ensure all the necessary data for analysis Already collected and in a suitable format (example: Excel, CSV, etc.). Identification variable dependent (Y) and variables independent (X_1 and X_2). Turning off the complete and clean data, doing cleaning data from outliers, missing values, or data input error.

2. Research Data Processing using SPSS

Study This use SPSS tools for help in apply method multiple linear regression. Research data processing using SPSS is very easy for analyzing quantitative data with method statistics, such as multiple linear regression.

3. Multiple Linear Regression Method Assumption Test

The process of evaluating whether a multiple linear regression model meets the necessary statistical assumptions to ensure accurate and reliable results. These assumptions are critical for the validity of the model's coefficients, predictions, and associated statistical inferences

- a. Normality Test
To ensure that the residual data is normally distributed by visualizing it using a residual histogram or P-Plot.
- b. Heteroscedasticity Test
To test heteroscedasticity that the residual variance is homogeneous so that there is no heteroscedasticity pattern. The test results can be seen with the residual plot against the prediction or scatterplot.
- c. Multicollinearity Test
To ensure that there is no strong linear relationship between the independent variables depicted by looking at the VIF Value <10 indicating no multicollinearity.
- d. Autocorrelation Test
Autocorrelation test is a process to identify whether there is a relationship between the residuals (prediction errors) of one observation with the residuals of other observations in a regression model.

4. Test Data with Multiple Linear Regression Method

Multiple linear regression refers to a statistical technique that uses two or more independent variables to predict the outcome of a dependent variable. The technique enables analysts to

determine the variation of the model and the relative contribution of each independent variable in the total variance.

- a. Determination Coefficient Test (R^2)
Measures how much variation in the dependent variable can be explained by the independent variables. Ensures the R^2 value ranges from 0 to 1; the closer to 1, the better the model is at explaining the data.
- b. ANOVA Test/Simultaneous Test (F Test)
Testing whether independent variables simultaneously (together) have a significant effect on the dependent variable. By looking at the calculated F with the F table or p-value with a significance level.
- c. Partial Test (t Test)
Testing the effect of each independent variable on the dependent variable. To see the calculated t value with the t table or p-value with a significance level.

The variable limitations that the author uses in the study using the SPSS multiple linear regression method, namely using the feed cost variables (X_1) and labor costs (X_2) to carry out calculations based on related variables which are things that can affect the production of quail eggs.

The calculation of income from quail egg farming in the study was carried out using the formula for cost of receipt and profit. With the ultimate goal of achieving maximum profit, so that the farm tries to maximize how to produce quail egg production. By considering several things to obtain input (total cost) and the amount received, namely egg production (total income). The profit formula with total income minus production costs is as follows [7] :

$$\pi = TR - TC \tag{1}$$

Information:

- π = Business income (Rp/period)
- TR (Total Revenue) = Income (RP/period)
- TC ((Total Cost) = Production Cost (RP/period)

The multiple linear regression model formula used in nature to carry out analysis in looking at production factors is as follows [8] :

$$Y = a + b_1X_1 + b_2X_2 + e \tag{2}$$

Information:

- A = Constant
- b_1 = Product variable regression coefficient
- b_2 = Regression coefficient of price variable
- Y = Egg production
- X_1 = Amount of feed
- X_2 = Labor costs
- e = Error (independent variable)

5. Evaluation

Evaluation in the research stage of multiple linear regression models is a process to assess whether the regression model built has met statistical criteria and can be relied on to explain the relationship between independent variables (predictors) and dependent variables (responses). This

evaluation involves several important steps aimed at ensuring the validity, accuracy, and usefulness of the model.

RESULTS AND DISCUSSION

Livestock business bird quail started in 2009, background behind from election business This Because with see opportunity big in cultivation farm bird quail in society. With supplies information and knowledge obtained from society and online media then decide for try manage business farm bird quail. The beginning cultivation bird quail as many as 1000 tails the longer the more develop business farm bird quail. Until now cultivation bird quail can develop with Good from in terms of production volume and marketing. Until Now 2024 cultivation egg bird quail with total of 8000 tails. This business is managed directly by the owner namely Mr. Marino and his wife. If there needs urge so There is power Work addition with payment system daily. According to Mr. Marino business this is one of them prospective business, on the other hand he also has a livelihood as a farmer.

A number of assumptions obtained in discussion cost production and implementation linear regression method multiple done in analysis:

1. Seeds egg bird quail purchased 1 month old
2. Bird quail Already Ready lay eggs age 40-45 days and effectiveness lay eggs up to 15 months.

Cost production in business cultivation egg quail reaching Rp475.238.050 per period business. Details cost includes: seeds amounting to Rp64.000.000, feed Rp257.394.300, vitamins Rp30.768.750, energy work Rp92.306.250, and depreciation Rp30.768.750 per period business. From the percentage cost production, feed become component the biggest with 54.16%, followed by power Work by 19.43%.

Reception in context business or business often refers to total revenue or revenue earned from sale egg bird quail before reduced cost others. Acceptance is results from the total production multiplied with price per unit of product such as, for example reception from results sale egg in farm bird quail. Acceptance This reflect flow enter funds into in organization or company, which will later use for cover cost operational and productive profit clean after reduced total cost [10].

Following This is the data obtained in study cultivation egg bird quail with data calculation per period business which is 15 months.

Table 1. Income Breeder Bird Quail Egg Layers Per Period (15 months) in Ngaliyan, Pulutan, Wonosari, Gunungkidul 2024

Description	Unit	Amount
1) Production	Kg/ period business	24,750
2) Price	Rp/kg	27,000
3) Acceptance (AxB)	Rp/ period business	668,250,000
4) Cost Production	Rp/ period business	475,238,050
5) Income (CD)	Rp/ period business	193,011,950

In table 1, it is stated that the average production egg bird quail per day an average of 55 kg, with price sell Rp27.000 per kg. The total production egg during One period business reached

Rp668.250.000. Profit business egg bird quail counted with reduce total revenue of the total cost production so Rp668.250.000–Rp475.238.050, so that obtained profit amounting to Rp193.011.950 per period business. Based on cost data analysis production, it is known that component the biggest in cost business cultivation egg quail in Ngaliyan, Pulutan, Wonosari, Gunungkidul is feed and energy work. For know how far has it changed cost feed and energy Work influence production egg quail, done analysis multiple linear regression. Analysis results using SPSS software is presented as follows:

1. Multiple Linear Regression Method Assumption Test

Before do multiple linear regression, must Conduct Assumption Test Classic For ensure results valid regression, with:

a. Normality Test

Normality test in multiple linear regression an assumption test classic aiming ensured that the residual (difference) between predicted value and actual value actually). This is important done due to the statistical tests used in Linear regression assumes that the residuals are normally distributed. If the assumption test violated, result analysis can invalid.

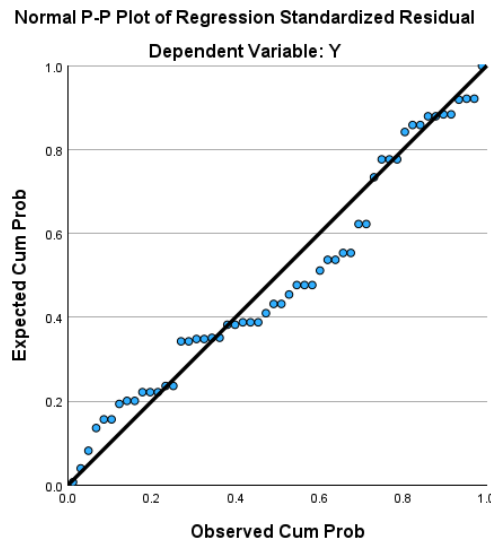


Figure 2. Normality Test

In Figure 2 the data is said to be normal if all data in motion following (approaching) the diagonal line.

b. Heteroscedasticity Test

Heteroscedasticity test in multiple linear regression aiming For see is residual (error prediction) has constant variance or no. Assumption base in linear regression is that the residual must be own the same variance (homoscedasticity). If the residual variance is not constant (heteroscedasticity), results regression Can So less valid or biased.

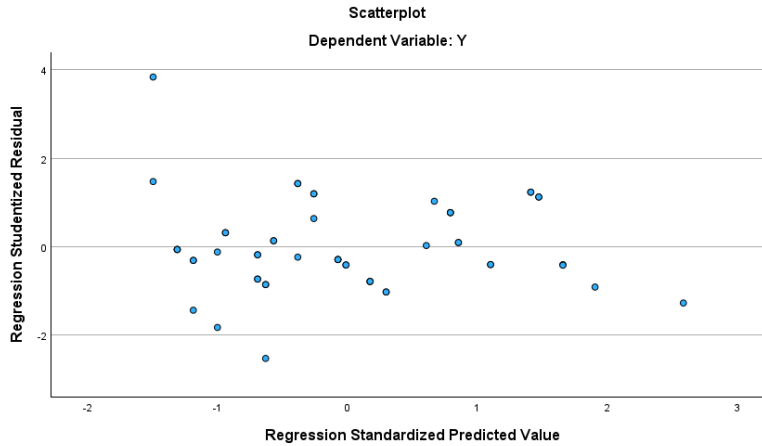


Figure 3. Heteroscedasticity Test

In figure 3 the data is stated safe from symptom heteroscedasticity Because all data is spread to all over part graph .

c. Multicollinearity Test

Multicollinearity test was conducted for identify whether there is very strong linear relationship between the independent variables in a regression model multiple.

Table 2. Multicollinearity Test Coefficients ^a

Model	VIF
1 (Constant)	
X1	1.026
X2	1.026

a. Dependent Variable: Y

In table 2 is multicollinearity test results it is no happen Because VIF value of each variable more low of 10.

d. Autocorrelation Test

Autocorrelation test in multiple linear regression used to test whether there is correlation between residuals (error prediction) in a regression model.

Table 3. Autocorrelation Test

Runs Test

	Unstandardized Residual
Test Value ^a	-5184.82711
Cases < Test Value	27
Cases >= Test Value	27
Total Cases	54

Number of Runs	32
Z	1.099
Asymp . Sig. (2-tailed)	.272

a. Median

In table 3 the results of the autocorrelation test it is said no occurs because results from auto correlation test show mark asymp sig. more tall from 0.05 namely of 0.272.

1. Multiple Linear Regression Method Test

a. Coefficient Test Determination (R^2)

To know magnitude the influence exerted by all independent variables (variable X) on the dependent variable (variable Y).

Table 4. Coefficient Test Determination

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.938 ^a	.881	.876	70328.755	2.418

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

In table 4 the results of the coefficient test determination ability from all X_1 and X_2 (independent variables) together in influencing the Y variable (dependent variable), from the coefficient test determination produce by 88.1%. Then the rest by 11.9% means can explained by other factors that are not included in study This .

b. ANOVA test/ simultaneous test (F test)

To know significant the influence exerted by all independent variables (variable X) on the dependent variable (variable Y).

Table 5. ANOVA test

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1861080511344.988	2	930540255672.494	188.135	<.001 ^b
	Residual	252252821988.345	51	4946133764.477		
	Total	211333333333.334	53			

a. Dependent Variable: Y

b. Predictors: (Constant), X2, X1

In table 5 we can see seen Sig. value < 0.05 and F count Far more big than F table value, we can conclude that the regression model in a way overall significant. This means that, X_1 and X_2 together have a significant influence on the dependent variable Y.

c. Partial Test (t Test)

To know significance the influence exerted by each independent variable (variable X) on the dependent variable (variable Y).

Table 6. Partial Test

Coefficients ^a						
Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	
	B	Std. Error				
(Constant)	11900121.319	2683811.153		4.434	<.001	
1	X1	1.063	.062	.841	17.168	<.001
1	X2	-6.677	1.080	-.303	-6.180	<.001

a. Dependent Variable: Y

Table 6 shows result partial test analysis, to know the value of the independent variable (X) individually against the dependent variable (Y). Variable it is said influential in a way significant if mark significant <0.05. So it can be seen in the table mark variable X₁ and X₂ influential significant on the dependent variable (Y). From the analysis the obtained the equation model multiple linear regression as following:

$$Y = 11,900,121,319 + 1,063 X_1 - 6,677 X_2 + e$$

a. Constant (Intercept)

B (constant)= 11.900.121.319 shows intercept value. This is mark from Y (variable dependent) when all variable independent (X₁ and X₂) are zero. With a t value of 4.434 and sig <0.001, this constant is statistically significant. That is, there is a basis for stating that this value is significantly different from zero in the model.

b. Coefficient X₁ (first independent variable)

B (X₁) = 1.063 indicates that every one unit increase in X₁ (the first independent variable) will increase Y (the dependent variable) by 1.063 units, assuming the other variables remain constant. The value of t = 17.168 and Sig < 0.001 indicate that it X₁ is very significant. In other words, the variable X₁ has a strong influence on the Y variable.

c. Coefficient X₂ (Second Independent Variable)

B (X₂) = -6.677 shows that every increase one unit in X₂ (the second independent variable) will decrease Y by 6.677 units, assuming the other variables remain constant. The t value = -6.180 and sig < 0.001 indicate that X₂ is also statistically significant. That is, X₂ it has a significant effect on Y, even though the effect is negative.

CONCLUSION

Reception from business egg bird quail in Ngaliyan, Pulutan, Wonosari, Gunungkidul reaching Rp668.250.000 per period business, with cost production amounting to Rp475.238.050. This resulted in an income of Rp193.011.950 per period business. Based on results analysis from method multiple linear regression the can with conclusion that in a way overall, both variable independent (X₁ and X₂) have a significant effect on the dependent variable Y because the Sig value for both variables is < 0.001 (meaning it is smaller than 0.05, the general significance limit). X₁ has a significant positive influence on Y, while X₂ is also statistically significant for Y, although its

influence is negative. This model can be said to be strong enough because the second independent variable is significant. Two variables were studied, namely cost feed (X_1), indicating the most dominant influence to production egg bird quail. Index correlation between variable amount feed (X_1) and costs power work (X_2) against production egg bird quail (Y) is 88.1%, while the remaining 11.9% is influenced by other variables that are not included in this study. In overall, regression model can be considered strong and valid, with second independent variable own significant contribution to prediction variable dependent.

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REFERENCES

- [1] H. Limanseto, "Support for Integrated Farming Corporations with Cluster Models to Drive the Rural Economy," <https://www.ekon.go.id/>, 2022. [https://www.ekon.go.id/publikasi/detail/4020/dukungan-bagi-korporasi-peternakan-terintegrasi-model-klaster-untuk-gerakkan-ekonomi-pedesaan#:~:text=The livestock subsector itself also contributes,1%20to%20GDP.](https://www.ekon.go.id/publikasi/detail/4020/dukungan-bagi-korporasi-peternakan-terintegrasi-model-klaster-untuk-gerakkan-ekonomi-pedesaan#:~:text=The%20livestock%20subsector%20itself%20also%20contributes,1%20to%20GDP.)
- [2] S. Maryam *et al.*, "ANALYSIS OF PURCHASE DECISION MAKING OF QUAIL (*Coturnix coturnix*) CARCASSES ON CONSUMER BEHAVIOR IN SUKABUMI REGENCY," vol. 9, no. 1, pp. 1371–1383, 2023.
- [3] T. Estining, MDS T, FR Industri, U. Telkom, P. Puyuh, and P. Eka, "Feasibility Analysis of the Development of Cultivating Quail Eka Farm in Bogor," *e-Proceeding Eng.*, vol. 4, no. 2, pp. 2–7, 2017.
- [4] Riyanti, K. Nova, and MMP Sirat, *Production of Various Poultry Livestock*. 2020. [Online]. Available: http://repository.lppm.unila.ac.id/30686/7/BUKU_PRODUKSI_ANEKA_TERNAK_UNGAS.pdf
- [5] N. Nisrina, MI Affandi, and L. Marlina, "Financial Feasibility Analysis of Quail Egg-Laying Business in Pringsewu District, Pringsewu Regency," *J. Animal Science, Padjadjaran University*, vol. 22, no. 2, p. 137, 2022, doi: 10.24198/jit.v22i2.40491.
- [6] B. Sanjaya, H. Yasid, P. Studi, A. Faculty, P. University, and L. Kuning, "Sanjaya Previous Research and Bep," vol. 13, no. 1, pp. 47–58, 2016.
- [7] AF Syahputra and I. Wicaksana, "Financial Analysis of Tilapia Fish (*Oreochromis Niloticus*) Seeding Business at the Pendem Fish Seed Center, East Java," *J. Agrimanex Agribusiness, Rural Manag. Dev. Ext.*, vol. 3, no. 1, pp. 37–46, 2022, doi: 10.35706/agrimanex.v3i1.7000.
- [8] AA-F. Nur Wahyudin, A. Primajaya, and ASY Irawan, "Application of Multiple Linear Regression Algorithm on Astra Isuzu Car Sales Estimation," *Techno.Com*, vol. 19, no. 4, pp. 364–374, 2020, doi: 10.33633/tc.v19i4.3834.
- [9] A. Purnamawati, MN Winnarto, and M. Mailasari, "Cart Analysis (Classification and Regression Trees) for Predicting Bicycle Users Based on Weather," *J. Teknoinfo*, vol. 16, no. 1, p. 14, 2022, doi: 10.33365/jti.v16i1.1478.
- [10] D. Saadudin, Y. Rusman, and C. Perdani, "ANALYSIS OF COST, INCOME AND R/C OF GINGER FARMING (*Zingiber officinale*)," *J. Ilm. Mhs. Agroinfo Galuh*, vol. 3, no. 2, p. 85, 2017, doi: 10.25157/jimag.v3i2.216.