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Livestock perception of use smart hatching machines

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Abstract. The study was carried out in Pagersari Village, Mungkid District on May 1, 2019 to June 30, 2019, aimed to determine the level of farmers' perceptions and to determine the characteristics of farmers. The data collection method uses observation and interviews. Data regarding the characteristics of respondents and the level of perception were analyzed descriptively, data analysis using the Spearman Rank correlation test was used to analyze the relationship between variables. The results showed the level of farmers' perceptions based on the level of relative profits with a percentage of 66%, the level of compliance with a percentage of 86%, the level of complexity with a percentage of 66%, aspects could be tried with a percentage of 98%, aspects observed with a percentage of 100% showed a positive direction of perception, Based on the results of the statistical analysis of binary logistic regression partially it is known that the value of income sig is 0.043, age is 0.576, education is 0.996 and experience is 0.999. The conclusion from the research results is known that the overall perception of farmers as much as 64% in the good category, based on the statistical analysis used it is known that the income factor has a significant effect of 0.043. While the age of 0.576, education of 0.996, and experience of raising 0.999 did not significantly influence the level of perception.

1. Introduction

The development of technological progress will lead people to progress in mindset and paradigm changes to improve the quality of life, both physically and psychologically. The community is increasingly aware of the importance of agricultural and livestock technology innovations, which in general contribute new innovations for human survival. The hatchery is an effort of the poultry nation to maintain its population, namely by laying eggs. The egg is then hatched, both naturally and artificially, until giving birth to a new individual [1].

One of the technological innovations that have developed in the community, the hatching of duck eggs have been carried out by farmers since many years ago, but the pattern of hatching of breeders still uses natural methods by utilizing chickens or thugs as a means of hatching. So that the fulfillment of ducklings cannot be fulfilled, the more modern method of hatching duck eggs using a duck egg incubator with a variety of models will help meet the needs of the seeds to produce duck cattle for the realization of diversity of animal products.

Pagersari Village Is one of the villages in Mungkid Subdistrict, Magelang District, which has potential in the field of animal husbandry, specifically in the commodity of laying ducks totaling 7500 of 86 owners, with a business pattern that has done the hatching of duck eggs to meet the needs of seedlings from market demand. In the hatching process, new problems have been experienced by the community. Inconsistent egg turning is one of the main factors in the low hatch rate. Based on the description, the research objectives are (1) to find out farmers 'perceptions of the use of smart hatching machines and (2) to find out the factors that influence farmers' perceptions on the use of smart hatching machines.

2. Methods

The purpose of this research is to find out the respondent's perception of a technological innovation in the field of animal husbandry that is used as counseling material with counseling using pre-experimental design with one shoot case study, or one group is given treatment (treatment), then measurements are taken. The target in this study was in the form of duck breeders by providing criteria so that 50 respondents were obtained. Data analysis uses descriptive analysis and inferential statistics with binary logistic regression to look for the influence of the dependent variable on the independent variables of data analysis using a questionnaire that has been validated. The questionnaire contains aspects of relative advantage, suitability, complexity, which can be tested, can be observed using a likert scale with 5 criteria.

3. Result and discussion

The level of breeder perception in the use of smart hatching machines is presented in table 1:

Table 1. Farmer perception rate in using smart hatching machines.

Perception Breeder	Amount (person)	Percentage (%)	The median
Good	32	64	57
Not Good	18	36	

Source: Processed Data 2019.

Based on the results of data collection on farmers' perceptions in the use of smart hatching machines in Pagersari Village, most of them showed good categories. Perceptions of farmers in the use of smart hatching machines in the good category as much as 64%. Why is the majority of farmers' perceptions at 64% this is alleged because farmers feel that duck egg hatching is not the only source of income for them and business in animal husbandry is only a side business but has a useful role in helping improve the farmer's economy in making ends meet.

Farmers' perceptions of the use of smart hatching machines based on the characteristics of innovation Relative advantage, compatibility/suitability, complexity, can be tried and can be observed presented in table 2.

Table 2. Distribution of farmers' perceptions of the use of smart hatching machines.

Perception Breeder	Amount (person)	Percentage (%)	Average Score	The Median
a. Relative Benefits				
- Good	33	66	15.2	12
- Not Good	17	34		
b. Compability / Conformity				
- Good	43	86	15.58	12

- Not Good	7	14		
c. Hassle				
- Good	31	62	13.42	12
- Not Good	19	38		
d. Can be tried				
- Good	49	98	16.64	12
- Not Good	1	2		
e. Can be observed				
- Good	50	100	12.96	9
- Not Good	0	0		

Source: Processed Data 2019

Table 2 analysis results can be seen in the calculation of farmers' perceptions of the use of smart hatching machines based on the characteristics of innovation can be explained as follows:

3.1. Relative profit level
The level of relative profits is the extent to which innovations can benefit farmers who are associated with carrying out livestock business activities. In accordance with the relative advantages of innovation, farmers' perceptions either amounted to 33 people or 66%. These results are due to:

Farmers can assess that hatching using an automatic hatching machine is more efficient, breeders carry out hatching using an automatic hatching machine without making adjustments or re-setting the machine until the eggs hatch, this will certainly make the time available by the farmer to do other activities.

Aswad (2014) states that an automatic hatching machine is one of the modern egg incubators because it is equipped with an automation system so that the egg can be rotated automatically as needed [2]. The automation system will help reduce human labor significantly and save time in the egg turnover process, and the time of egg turnover becomes more secure.

The results of data analysis based on the characteristics of the level of relative profit, breeders who have a bad perception of as many as 17 people or 34% it is because they have not proven or practiced individually that their eggs can drip well, and a small proportion of breeders are not sure that hatching with using a smart hatching machine can increase hatching results higher than using a manual hatching machine.

3.2. Compatibility/Suitability
The results of the analysis of data calculation of farmers' perceptions in accordance with the level of compatibility/suitability of innovation, there are 43 people or 86% with a good category. These results are due to:

Breeders believe that hatching using smart hatching machines does not conflict with customs, religious norms, and does not damage the environment and environmentally friendly tools and materials and does not produce waste that is harmful to the environment.

Testing is a requirement for farmers to carry out their farming. This extension material is selected in accordance with the identification of the area that was done before, so that according to the needs of respondents, with this smart hatching machine, farmers can easily carry out hatching eggs without having to carry out a reversal at any time.

According to Schiffman and Kanuk (2010), compatibility is defined as the extent to which technological innovation is considered as consistent with existing practices of operations, beliefs, values, past experience, and needs [3]. According to Flight et al. (2011), if compatible, innovation fits closely

with individual life situations and maybe compatible with two sub-dimensions: personal and social [4].

The results of the analysis of the suitability level data, farmers who have bad perceptions about hatching using smart hatching machines as many as 7 people or 14% it is caused by farmers who still choose to use manual hatching machines that are commonly used.

3.3. Hassle
The results of farmer data analysis based on farmers' perceptions, according to the level of complexity of innovation characteristics, showed as many as 31 people or 62% included in good perception. This is because breeders assess that in implementing the hatching of duck eggs using smart hatching machines is easier or no difficulty compared to using manual hatching machines, and in carrying out the hatching of duck eggs by using smart hatching machines does not require special expertise in the process of hatching when compared to using a manual incubator.

Paimin (2011) stating the hatching machine is one of the modern hatchers and is designed to allow eggs to be rotated automatically based on a predetermined time or timer [1]. This will help reduce human labor significantly and save time in the reversal process.

Table 2 explains that a small percentage of respondents had bad perceptions of 19 people or 38% this was because there were still breeders or minorities who did not want to try to hatch eggs using smart hatching machines because they did not have the will in understanding the hatching procedures using smart hatching machines.

The results of the analysis based on the characteristics of the respondents showed that the majority of respondents who had bad perceptions were above the age of 50 years with the average respondent not yet passing the level of formal education, this explains that the age and education of the respondents affected the mindset in the decision-making process based on the level of innovation adopted.

3.4. Can be tried
The results of perception analysis based on characteristics can be tried to show that farmers' perceptions of aspects can be tried; there are 49 people or 98% with good perception. This is because breeders assess that in the hatchery business using smart hatching machines can be used on a small scale, this hatching method can be done at home individually in a practical and simple way.

Table 2 explains that there are small farmers who have a bad perception of 1 person or 2% of this because the farmers do not want to apply or try the new innovative technology that is given This is in accordance with the opinion of Paimin (2011) which states that the hatching machine is a modern way that develops by the use of innovative technology that is profitable and makes people efficient as the main actor in the hatchery implementation in order to accept a new technological innovation [1].

3.5. Can be observed
The results of the analysis of perception based on the characteristics of innovation that can be observed shows that there are 50 people or 100% with a good perception category. These results are due to:
Hatching using a smart hatching machine has advantages compared to conventional hatching that is using a manual hatching machine, breeders assess that in the implementation of hatching using a smart hatching machine produces hatching results with higher hatchability compared to using a manual hatching machine, besides that the smart hatching machine is egg hatching tools that are quite simple and easy to understand and practical in the implementation of Islamic egg. Hajratul, A (2013) and Tjahjadi (2019) states that an innovation that is easily observed will be more quickly accepted by the community, and vice versa, if the results are difficult to observe, it will be long accepted as well [2,5].

3.6. Statistic analysis

The results of calculations using SPSS 16.0 based on the significance test simultaneously can be seen in table 3 below:

Table 3. Significance test.

		Chi - square	Df	Sig.
Step 1	Step	53.808	4	.000
	Block	53.808	4	.000
	Model	53.808	4	.000

Source: SPSS 16.0 (2019) processing results

The table above can be seen that the significant value of the model .000 because the sig value is smaller than <0.05, it can be decided that H0 is rejected. So it can be concluded that the independent variables used together to influence the dependent variable, or it can be said that the characteristics of the respondents named the age of the respondent, the respondent's education, the respondent's experience, and income respondents influence on perception.

Lahamma (2006) states that perception is the result of desires, goals and past experiences. Characteristics such as age, education level, experience, socioeconomic status and membership status are changes related to perception [6].

The overall model test includes a model fit test based on the likelihood L function of the probability model that the hypothesized model represents input data, then to determine the magnitude of the coefficient of determination can be seen in the summary model. The summary model is to find out how much the combination of dependent variables can explain the independent variable [7]. The results of calculations using SPSS 16.0 based on the summary model can be seen in table 4.

Table 4. Summary model.

Step	-2 likelihood	Cox & snell R Square	Negelkerker R square
1	11.534[a]	.659	.904

Source: SPPS Processing Results 16.0 (2019)

The coefficient of determination is seen at the value of Negelkeker R square of .904. Thus it can be interpreted that the dependent variable (perception) can be explained by the independent variable (age, educator, experience, and income) of 90.4% while others are explained by variables outside the model. Ghozali (2005) states the value of Negelkeker R square is a test conducted to find out how much the independent variable is able to explain and influence the dependent variable [7].

3.7. Partially Significant Test

Partial significance test results can be seen in table 5.

Table 5. Test significance.

Variable	Coefficient	Significant
Age	-.180	.576
Education	20.509	.996
Experience	17.187	.999
Income	1.194	.043
Constant		.997

Source: processed data 2019

The equation of breeder's binary logistic regression perception of the use of smart hatching machines is as follows:

3.7.1. Revenue. The results of the analysis in table 5. It can be seen that the P-value of significance is 0.043, where P <0.05, the livestock income variable has a significant effect on farmers' perceptions in using smart hatching machines. This is because the majority of respondents have a permanent job with a steady income so that the income earned by the community can affect the adoption of existing technological innovations.

Asih's research results (2009) states that revenue is an input value in the innovation adoption, this is very influential on the acceptance of technological innovation [8]. The higher the income the better the level of acceptability that can be received; otherwise, the lower the income, the less good the level of acceptance that can be received.

The coefficient value of the variable is 1.194, which means that the higher the farmer's income, the farmers' perception of the use of smart hatching machines the better. This is in accordance with the opinion of Ansari (2017) income is one of the factors influencing decision making, the higher the income earned, the higher the level of technological innovation received [9].

3.7.2. Age. The results of the analysis in table 5. can be seen that the value of P-valueue significance, 576 where P> 0.05, the age variable has no significant effect on farmers' perceptions in using smart hatching machines.

Respondents with the characteristics of the age of 15 - 65 years were proven to have no significant effect on farmers' perceptions in the use of smart hatching machines. This contradicts the opinion of BPS (2007) which states that aged 15 - 65 years are said to be productive age population who carry out production in economic terms, where all the needs are borne by themselves, while unproductive residents are residents who have not been able to work and fulfill their own need [10].

Hasyim (2006) states that the characteristics of age affect one's productivity in carrying out daily activities, if the conditions of age are still productive, it is likely that a person can work well and optimally but not maximally in the process of absorbing technological innovation [11].

The coefficient value of the age variable obtained is 180, which means that the higher the age, the farmers' perceptions of the use of smart hatching machines are getting worse. This is not in accordance with the opinion of Soekartawi (2005), which states that the younger the farmer's age, the greater the curiosity, this speeds up the process of innovation adoption [12]. According to the results of Roswida's research (2003) age influences physical abilities and ways of thinking, the older a person is, the less productivity he produces but, the younger he will have high productivity in work [13].

3.7.3. Level of Education. The results of the analysis in table 5. can be seen that the value of P-value significance, 996 where P> 0.05, the educational level variable has no significant effect on farmers' perceptions in using smart hatching machines. This is because the majority of respondents have a level of education that is classified in the low category, can be seen in table 8, the majority of respondents have a maximum limit of education only up to high school level, this will certainly affect the mindset of respondents in decision making due to lack of knowledge possessed by respondents in order to receive input of new technological innovations developing in the community

Munizu (2010) and Haryanto (2016) states that perceptions in the process of innovation adoption cover personal factors of an individual's age, education, experience, knowledge, land use and so on as well as the education level of farmers both formal and informal will affect the way of thinking applied to his farming business [14,15].

The coefficient value of the education level variable obtained is 17,187, which means the higher the level of education the breeder perceptions of the use of smart hatching machines, the better. The higher the level of education of farmers, the better the mindset of farmers in absorbing and applying the new innovative technology that is obtained.

3.7.4. Breeding experience. The results of the analysis in table 5. It can be seen that the value of P-value significance .999, where P> 0.05, the experience variable has no significant effect on farmers' perceptions in using smart hatching machines. This is due to the lack of community experience in hatching eggs. It can be seen in Table 9 that the majority of respondents numbered 48 people or 98% had an experience of raising no more than 1 year, which means that most of the respondents who were used as research benchmarks were still pioneering hatchery efforts which are done and this affects the mindset of respondents in making decisions

The coefficient value of the good experience variable obtained is 12,685, which means the longer the experience of breeding the breeder perceptions of the use of smart hatching machines, the better. This is consistent with the opinion of Alisa (2007) that experience is an interaction experienced by someone during his life both with the environment so as to gain knowledge, skills, and understanding of an event [16]. The less experience owned by farmers, the lower the level of innovation adoption, Ansari (2017) adds that states that experience is the basis for the formation of individuals to provide responses and statements, a person must have experience about certain objects [9].

4. Conclusion

Based on the results of research on farmers' perceptions of the innovation of the use of smart hatching machines as a tool in hatching duck eggs can be summarized as follows:

a. Farmers' perceptions of innovation in the use of smart hatching machines in Pagersari Village, Mungkid District, Magelang Regency are good with a percentage of 64%

b. Characteristics of farmers based on income level have a significant effect on perceptions with a significance value of 0.043 or P-value <0.05, while characteristics of farmers based on age, experience, and level of education have no significant effect on perception.

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