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Effect of intrinsic factors on farmers' willingness to pay on the success of artificial insemination of Bali cattle

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Abstract. Willingness to pay (WTP) or willingness to pay is the willingness of individuals to issue rewards for services they obtain. WTP analysis is used to find out how far each farmer is willing to pay or spend money in the context of compensation for inseminator services according to the desired conditions. Usually, inseminators receive operational costs from farmers, but in an unspecified or voluntary amount. This study aims to determine the amount of breeders PAP value on Artificial Insemination (AI) of Bali cattle and examine what factors influence the PAP of farmers. This research was conducted in Libureng district, Bone regency. Data analysis using multiple linear regression analysis. The research results show that Factor age, length of education, knowledge about IB, have a significant effect on the WTP of farmers.

1. Introduction

The livestock business is a business that many people in rural areas work on, especially beef cattle farming. Beef cattle are cattle that are cultivated with the primary purpose of producing meat. Beef cattle farming is widely known by the public. The relatively short maintenance period and the relatively high price of meat motivate farmers to continue to remain enthusiastic in developing beef cattle farming.

The livestock sub-sector is one part of the agricultural sector that has the potential to be developed by Indonesian farmers. Based on data obtained from the Central Statistics Agency (BPS), in 2017, the livestock subsector has been able to contribute to Indonesia's Gross Domestic Product (GDP) at the current price of 1.83 percent of Indonesia's total GDP. This indicates that the livestock subsector is not inferior to other sectors. This sector is able to play a role in developing the Indonesian economy through the absorption of the number of workers as much as [1-3].

The current situation of the development of the livestock sector has not gone according to ideals. The Government has anticipated by issuing a number of programs including UUS SIWAB (Special Efforts for Obligatory Parent Cattle) with the aim to increase beef cattle population by utilizing genetic potential such as Artificial Insemination (AI) and natural mating.

To support this government program, the application of AI is very important because the presence of bulls has diminished. The presence of bulls is reduced because of high consumer demand and limited superior bulls caused by inbreeding. The AI program has many advantages, which can increase



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the rate of increase in livestock population, increase the income of farmers and can optimize the performance of Bali cattle [4].

The problem faced by small-scale farmers is that for the application of AI technology, it is necessary to use the services of an inseminator where the services provided require a fee. That is because inseminators require operational costs, cement and drugs use during AI. Willingness or unwillingness of farmers to pay for the services of an inseminator (Willingness to Pay) can be influenced by several factors including the intrinsic factor of the farmer itself (age, education and breeders' knowledge of AI) [5].

8 Research methods

This research was conducted in June–July 2019. This research was conducted in Libureng District, Bone Regency, South Sulawesi. This type of research is quantitative explanatory research. To determine the sample size in this study the Slovin formula [6] was used so that the minimum number of samples used was 53 Balinese cattle breeders who applied AI technology (10% of 114 breeders) scattered in 4 villages namely Ponre-ponre, Suwa, Bune, and Mattirobulu. Furthermore, the determination of samples in each village was carried out randomly.

Data collection method is by conducting interviews with farmers who apply AI using research instruments in the form of commissioners or a list of questions that have been prepared according to the needs of researchers.

Intrinsic Variable:

- a. Age
- b. formal education
- c. Breeders' knowledge of AI

Rating Indicator:

- Age of breeders who apply AI in Bali cattle
- The education duration of the breeder has been taken
- The level of knowledge of farmers about AI

Data analysis uses Multiple Linear Regression. Determination of the dependent variable using the value of *Willingness to Pay* (WTP), the independent variable is determined from a collection of several theories. Regression model can be described in the equation below [7]:

$$\text{WTP Value (Y)} = \alpha + b_1(X_1) + b_2(X_2) + b_3(X_3)$$

Where:

- | | | |
|-----------------|---|----------------------------|
| WTP Value | = | WTP value |
| α | = | Constant |
| $b_1 \dots b_3$ | = | Regression coefficient |
| X1 | = | Age (years) |
| X2 | = | Length of education (year) |
| X3 | = | Farmer's knowledge of AI |

8 3. Results and discussion

3.1. Effect of age variable (X1) on farmers' willingness to pay on the application of technology AI in Bali cattle

From the results of the study, it was found that age had a significant effect on *Willingness to Pay* of the breeders as evidenced by the results of multiple linear regression analysis, obtained T count 2.221 and T table 2014 so T count > T table according to the significance level or significance value 0.031 < 0.05 then the decision is rejecting H0 and accepting Ha. This means that the variable age significantly affect *Willingness to Pay* breeder (Y). Age is also closely related to the mindset of farmers in determining the management system that will be applied in animal husbandry business activities.

Table 1 . Results of multiple linear regression analysis.

Independent variable	Dependent variable	Regression coefficient (B)	T count	Sig.
A constant	Willingness to pay farmers (WTP) = Y	-227688,945	2,579	0.013
Age (X1)		0304	2,221	0.031
Education (X2)		0.205	3,273	0.012
1 knowledge (X3)		0.279	2,553	0.023
Multiple R = 0.765				
R Square = 0.585				
F table = 2.22				
T Table = 2014				
Sign = 0,000				

This situation illustrates that the age of farmers who apply AI in Libureng sub district, Bone regency in general is still relatively productive. So to determine the decision, they consider the good and bad decisions they take. This is consistent with the opinion [8] which states that breeders of productive age usually have a dynamic and mature mindset in determining decisions in managing their livestock businesses. In line with opinion [9], to participate in service payments is significantly influenced by age. Age categorical variables confirm the hypothesis that participation increases with increasing age of the farmer.

3.2. The influence of education length variable (X2) on farmers' willingness to pay on the application of Bali cattle AI (Y)

In table 1 obtained that the results of previous studies of b¹²der education have a significant effect on *Willingness to Pay* of farmers. This is evidenced from the results of multiple linear regression analysis of the significant value of 0.012 years of education whose value is smaller than the significant level ($p < 0,05$). In accordance with the value of T arithmetic > T table where T arithmetic 3,273 and T table 2014 so the decision is to accept H_a and reject H_0 which means that the length of education variables significantly influence the *Willingness to Pay* of farmers (Y).

Education can affect community participation in increasing Farmers' *Willingness to Pay* to pay for inseminator services. The farmer's low level of education has a direct influence on skills, which can make less confident in the ability to master and use technology.

The direct relationship between formal education and the willingness to pay (*Willingness to Pay*) of farmers in the Libureng District of Bone Regency can be interpreted that, the higher the farmer's education, the more ready the farmer is to pay for inseminator services. This is consistent with the opinion [10] of farmers' participation with a higher level of education, higher income and positive attitude tends to be more express to pay. Education increases the strength of behavior in social settings, enabling the development of general knowledge, consequently increasing responsibility for payment for service. Knowledge is a prerequisite for responsible behavior [11]. This shows that the length of education and willingness to pay are significantly related.

3.3. Effect of variable knowledge about AI (X3) on willness to pay on the application of AI of Bali cattle (Y)

Based on table 1 obtained that the knowledge of farmers about AI has a significant effect on *Willingness to Pay* farmers. This is indicated by the results of the multiple linear regression test that the value is significantly smaller than the significance level ($p < 0.05$) 0.023 < 0.05. In line with the calculated T value (2,553) and T table (2,014) T calculated > T table. Then the decision is to reject H_0 and accept H_a .

Breeders in Libureng district, Bone regency are willing to pay for the services of inseminators because they already know the benefits that can be obtained from the application of AI. This is why farmers are willing to pay for the services of an inseminator. The human factor is a very important factor in the success of the AI program, because it has a central role in AI service activities.

Human factors, facilities and field conditions are very dominant factors. In this regard, humans as livestock managers, farmers' motivation to participate in new programs or activities are greatly influenced by social and economic aspects. This is in accordance with the opinion [12], knowledge of the respondent will be goods or services offered are assumed to have an influence in determining its value in paying for goods or services itself. This can be interpreted that the more respondents know about the products or services offered, the value of paying will increase.

Ameriana [13] also states that consumers who have sufficient knowledge and experience regarding the benefits of the goods or services offered will increase the willingness to pay for the goods or services themselves. Meanwhile, for consumers whose knowledge and experience is still lacking with counseling, it can lead to consumer curiosity about the product. So that in the end can encourage consumers to want to buy. This shows the increasing knowledge of respondents will be able to influence the value of paying respondents.

4 Conclusions

Based on the results of research on the influence of intrinsic factors on the willingness of farmers to pay for the success of Artificial Insemination Bali cattle can be concluded that intrinsic factors include age, education and knowledge of farmers about Artificial Insemination have a significant effect on willingness to pay of farmers.

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