

Factors Influencing Farmers' Decisions to Conduct E-Marketing to Increase Pig Farming Income in Bolaang Mongondow, North Sulawesi, Indonesia

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ABSTRACT

The aim of this study was to determine the factors influencing farmers' decisions to conduct e-marketing to increase pigs in Bolaang Mongondow Regency, North Sulawesi Province. The survey method was carried out on 84 pig farmers in East Dumoga District, which was determined by total quota sampling, then data analysis used a logit model. The results showed that there were 50% of farmers using electronic marketing methods. Factors influencing farmers' decisions to conduct e-marketing to increase pigs are the number of sales, the price of the pigs, the distance between the pigpen and the market, and the ability to use electronic media. Electronic marketing is used by farmers who are already affiliated with pig farmer community groups, through Facebook and WhatsApp social media. The total income of pig farmers using electronic marketing methods is higher than those of pig farmers using other methods of 16.95% per period.

Keywords: e-marketing, pig farming, income

INTRODUCTION

Marketing is an important factor in the success of a business. A product that is produced in large quantities and of good quality must be marketed using the right

method so that the product can be sold to generate income ^[1]. This also applies to pig farms that sell pigs as their business output. Dumoga Timur District, Bolaang Mongondow Regency is one of the areas that has the potential for pig farming based on the total livestock population ^[2] Pig farmers in the area cultivate pigs intensively in pens located behind the farmer's house, as is common in other pig farms in North Sulawesi ^{[3][4][5][6]}. For generations, farmers market their pigs by selling directly to buyers. Buyers are regular buyers, and will be contacted by farmers if there are pigs that have reached the age of slaughter. Pig buyers also act as collectors. Usually, the buyer can predict when the pigs will be sold because they have recorded and memorized the number of pig populations along with their ages when they made the last purchase transaction with the pig farmer. In this condition, farmers as price takers and cannot determine the selling price.

Since 2020 with the Covid-19 pandemic, pig farmers have experienced a decline in sales and even losses due to the absence of buyers. The government's policy of carrying out social distancing causes people to not be able to worship or even hold celebrations or parties. This situation causes pigs not to be sold because there are no buying and selling transactions. The dependence of pig farmers on buyers remains very high so that if buyers do not make purchase transactions,

the pigs produced by breeders cannot be sold. Farmers suffer losses due to not being able to market their products. The decrease in the number of sales of pigs has also caused the price of pigs to be very low. The price of pork is around IDR48,000-IDR 50,000/kg, then drops to IDR30,000-35,000/kg. The price of pigs at the farm level is in the range of IDR20,000/kg, so that the income received by farmers has decreased and caused losses. Pig farmers cannot afford to buy pig feed which accounts for 80% of the total cost. On the other hand, pig farmers cannot afford to bring their livestock to be sold at the market, considering the distance of the pig pen to the market, from Dumoga Timur District to the Capital City of North Sulawesi Province is around 198 km and travel time is around 4-5 hours. In 2021, pig farmers in East Dumoga District have changed their marketing model to adapt to technological developments, with the aim of achieving success in the midst of a pandemic. Farmers are starting to get to know Facebook social media and join a special community of pig farmers. However, some pig farmers still use traditional marketing, namely by contacting or waiting to be contacted by the buyer. Marketing using electronic media and the internet has been researched before [5][6][7][8]. The results showed the internet contributed benefits for business owners to innovate so that there is an increase in income. The occurrence of a pandemic has prompted some pig farmers in Dumoga Timur District to use social media as a marketing method to help sell their pig production. This study aims to determine the factors influencing farmers' decisions to conduct e-marketing to increase pigs in Bolaang Mongondow Regency.

MATERIALS & METHODS

Sampling Methods and Data Collection

This study used a survey method conducted on 84 pig farmers using the nursery model in Dumoga Timur District, Bolaang Mongondow Regency using the total quota

sampling method [9]. There are 42 breeders who conduct electronic marketing methods and 42 breeders use traditional marketing. Data was obtained through interviews with farmers regarding production and marketing of pigs and the reasons farmers use social media in their marketing.

Data Analysis

To analyze the total income of farmers (both using electronic and traditional marketing methods) using the equation $\Pi = TR - TC$, where TR is the total income of the pig farmer (IDR/year), TC is the total expenditure of the pig farmer (IDR/year). To analyze the difference in the income of farmers using electronic and traditional marketing methods, use the following formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} - 2r\left(\frac{s_1}{\sqrt{n_1}}\right)\left(\frac{s_2}{\sqrt{n_2}}\right)}}$$

where \bar{x}_1 is mean sample 1, \bar{x}_2 is mean sample 2, s_1 is standard deviation sample 1, s_2 is standard deviation sample 2, s_1^2 is variance sample 1, s_2^2 is variance sample 2, and r is the correlation between the two samples.

To determine the factors influencing farmers' decisions to conduct e-marketing to increase pigs in Bolaang Mongondow Regency using logit analysis with the following equation

$$\ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + e$$

Where X1 is the number of sales, X2 is the price of the pigs, X3 is the distance between the pigpen and the market, and X4 is the ability to use electronic media.

RESULT AND DISCUSSION

Pig Farming in Bolaang Mongondow Regency

Dumoga Timur District is an area that has the highest pig population in Bolaang

Mongondow Regency. The development of the pig population from 2017 – 2022 is explained as in Figure 1. The number of pig

populations from 2017-2019 has increased and decreased in 2020 due to the Covid 19 pandemic.



Figure 1. Development of the Pig Population in Dumoga Timur District, Bolaang Mongondow Regency (2017-2022).

Pig farming in Dumoga Timur District, Bolaang Mongondow Regency is an inherited business from parents which is continued by their offspring, so that farmers generally have farming experience of more than 25 years. The pigs kept are Hampshire, Chester White and Duroc types which are known based on their body performance. There are 90 percent of farmers who have 1 sow, and 10% of farmers have 2 sows. Working time on pig farming is 1-2 hours per day, so pig farming is a side business located behind the farmer's house, which is

the same as general pig farmers in Minahasa Regency. The total income of pig farming in Bolaang Mongondow District is explained in Table 1.

Table 1 explains that pig farming revenue is obtained through the sale of weaning piglets at a price of IDR700,000/head and brood stock calculated at a live weight price of IDR20,000-25,000/kg. Labor costs are costs calculated based on the number of hours worked in a pig farm multiplied by the labor wage of IDR 125,000/person working day.

Table 1. Revenue and cost of pig farming in Bolaang Mongondow District

Description	Amount (IDR)
I. Revenue	
Piglets	16,800,000
Capital (Sow)	4,000,000
Total Revenue	20,800,000
II. Cost	
Feed	2,457,000
Medicines	600,000
Biaya listrik	550,000
Labor	2,812,500
Depreciation of pigpen	400,000
Total Cost	6,149,500
Income (I-II)	14,380,500

The t test in Table 2 explained the revenue of pig farming using the online method is significantly different from other methods of IDR 2,580,000 or 16.95% per period. Pig farmers who market pigs using e-marketing are more profitable than without electronic. This result is in line with [12] that the use of computers can increase farmer income. The use of e-marketing can also increase the value of the R/C ratio [13]. However, the use

of e-marketing encourages farmers to improve the quality of the output they sell [14] because they have to adjust to consumer needs or requests that farmers directly receive when offering their products in online media.

Table 2. The results of the t-test

Description	Amount
Farming income with e-marketing	17805714.29**
Farming income without e-marketing	15225714.29

Significant (P<0.05)

Factors influencing farmers' decisions to conduct e-marketing to increase pig farming income

Table 3 shows the regression analysis results used logit model with a McFadden R-squared of 0.866855. Factors influencing

farmers' decisions to conduct e-marketing to increase pigs are the number of sales, the price of the pigs, the distance between the pigpen and the market, and the ability to use electronic media.

Table 3. Regression results of factors influencing farmers' decisions to conduct e-marketing to increase pig farming income

Variable	Coefficient	Odds Ratio
Constant	-1327856.00**	
The number of sales	0.000003**	1.00
The price of the pigs	0.000721**	1.00
The distance between the pigpen and the market	0.349032*	1.42
The ability to use electronic media	0.047445*	1.05
McFadden R-squared	0.866855	

**= significantly (P<0.05); *= significantly (P<0.1)

The number of sales is a factor that has a positive effect and significantly on farmers in deciding to choose to use e-marketing (P<0.05) with an Odds Ratio of 1.00. An Odds ratio of 1.00 means that for every 1% increase in sales, the opportunity for farmers to use electronic methods will increase by 1 times compared to people who have lower sales. Pig farmers in East Dumoga District sell weaning piglets. Pig farmers generally sell piglets after weaning, so the number of pigs sold is related to the number of piglets born and farmer's skills in caring for newborn piglets [13][4][5]. Farmers will try to increase the number of piglets at each birth, because it is positively related to the amount of farmer's income [6]. The increasing number of piglets owned by farmers has prompted farmers to sell their pigs using e-marketing.

Pig prices are a factor that has a positive effect and significantly influence on farmers in deciding to choose to use e-marketing (P<0.05) with an Odds Ratio of 1.00. The Odds ratio is 1.00, meaning that for every 1% increase in the selling price of pigs, the opportunity for farmers to use e-marketing will increase by 1 times. Based on the results, since 2018, there has been a Facebook group for pig farmers created by a user located in North Sulawesi. The name of the Facebook group was originally "Komunitas Peternak Babi" then changed its current name to "Peternak Babi". Through this media, there is an exchange of

information and even bargaining between buyers and farmers as sellers until they get the right price. Pricing through e-marketing, both Facebook and WhatsApp, is very beneficial for both parties. This is because farmers can quickly inform livestock that will be sold, then buyers can also see and respond quickly to sellers. Joining sellers or producers in a social media group is one of the strategies in marketing products [10], where this strategy is proven to be able to increase the number of buyers. Increasing the number of buyers can affect the selling price of a product [8][14].

The distance between the pigpen and the market is a factor that has a positive and significant effect on farmers' decisions to choose to use e-marketing (P<0.10) with an Odds Ratio of 1.42. The Odds ratio value is 1.42, meaning that every time the distance between the pigpen and the market is increased by 1%, the opportunity for farmers to use e-marketing will increase by 1.42 times. The location of the traditional market as a center for selling pigs is in Manado City, about 198 km from East Dumoga District. Product marketing using social media does not recognize the distance between the pig pen and the market, so that the distance is not an obstacle for producers [7][14]. The use of social media can reduce information uncertainty for producers [5]. Pig farmers who market their products using e-marketing do not need to bring their pigs to the market but can easily identify

potential buyers and can even bargain as soon as possible.

The ability to use electronic media is a factor that has a positive and significant impact on farmers' decisions to choose to use e-marketing ($P < 0.10$) with an Odd Ratio of 1.05. The Odds ratio is 1.05, meaning that by increasing the ability of farmers to use electronic media by 1%, the opportunity for farmers to use electronic methods will increase by 1.05 times. Farmers who have the ability to use electronic media can market their products widely [5][7]. However, the success of product marketing, even using electronic media and the internet, also depends on the ability of farmers to market their products [7]. In addition to the ability to use electronic media, the success of pig farmers in marketing pigs requires farmer skills to influence buyers to be interested in buying pigs for sale.

CONCLUSION

Factors influencing farmers' decisions to conduct e-marketing to increase pigs are the number of sales, the price of the pigs, the distance between the pigpen and the market, and the ability to use electronic media. E-marketing is used by farmers who have joined the pig farmer community group on Facebook and WhatsApp. The total income of pig farmers using the e-marketing method is higher than other methods of 16.95% per period.

Declaration by Authors

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