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Research Article

FARMING TECHNOLOGY ADOPTION FOR CATTLE BUSINESS RESOURCE DEVELOPMENT

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Abstract: The decline in cattle prices can increase the demand for cattle, but the supply of fattened cattle will receive low cattle prices and have an impact on decreasing income. The usual strategy used to deal with changes in beef cattle prices in order to obtain higher prices was to postpone sales until prices rise again. Delaying sales causes additional total production costs, which can affect income. The introduction of the application of cattle farming business development technology was carried out as an effort to make it easier for farmers to calculate the income and profits from their cattle farming business. In this case, farmers were introduced to a system for calculating costs and income from cattle fattening businesses using the Visual Basic computer program. This application was a method for calculating the profits that can be obtained from a cattle farming business carried out by small-scale cattle farmers. This system was created to make it easier for a farmer to calculate the development of his cattle farming business. The results of the analysis showed an adoption rate of 72.84, which means that 72.84 percent of the introduction of technology was adopted by farmers. This indicates that the implementation of this price information technology was well received by farmers because it was considered to have a positive impact on the household economy and the development of sustainable cattle farming business resources.

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INTRODUCTION

One of the characteristics of the people's cattle farming business is the number of purchases of cattle and the number of sales of cattle produced from the fattening business is relatively small, generally 1-2 heads (Sukamta, et al. 2017). This condition indicates that people's cattle breeders are in a weak bargaining position, in addition to people's livestock businesses are generally not efficient in their management, there are also many hidden costs that are not cared for by small farmers, because they are less aware of it. Regarding maintenance techniques, it can be said to be quite good, meaning that small farmers already have knowledge about cattle breeds, feeding techniques and how to maintain good cattle, one of them is to keep cattle in pens and maintain the cleanliness of the pens and their livestock. However, in marketing the cattle, farmers are weak in determining the selling price, causing cattle breeders to be unable to receive a decent income. This condition is caused by the low knowledge and skills of farmers in business management (Prasongko et al 2017, Purnomo et al 2017; Sukamta et al 2017).

Farmers' efforts to deal with the increase in the price of feeder cattle are typically carried out in traditional ways, such as deferring the purchase of feeder cattle if the price of cattle rises. Farmers do not believe that deferring the procurement of feeder cattle leads fattening operations to be ineffective. On the other hand, because fattening cattle takes time, producers cannot rapidly respond to increases in beef cattle prices by boosting supply. The decrease in cattle prices may raise demand for feeder cattle, but the supply of fattened cattle will receive a low price for cattle, resulting in decreased income. The typical technique for dealing with changes in the price of beef cattle in order to acquire a higher price is to delay sales until the price rises again. Postponing sales increases total cost of production, which can reduce income (Umboh et al., 2023).

The introduction of cattle farming business development technology is carried out as an effort to make it easier for farmers to calculate income and profits from their cattle farming business. Farmers are introduced to a system for calculating costs and income from cattle farming using the computer program "Visual Basic". This application is a method for calculating the profits that can be obtained from a cattle farming business carried out by small-scale cattle farmers. This system is made to make it easier for a farmer to calculate the cattle farming business that he is working on. Simply by knowing the procedure for using this system, farmers can easily calculate the profits that can be obtained from their cattle farming business so that they can handle several priority problems.

The technology gets implemented through empowerment activities, such as counseling and training. Before carrying out this action, the team consults with the group about the timing and technical execution. Counseling is used to positively influence the conduct of group members. Following the counseling activity, group members receive training. The training in question is the practice of using technology. This application training activity is conducted without the use of a calculation formula in order to assist farmers in determining the selling price of cattle after they have been raised for a specific period of time, as well as when deciding on a price offer from cattle buyers. However, the extent to which farmers are willing to adopt the implementation of this technology must be investigated through research. In this case, it is vital to assess the level of technology adoption among smallholder cattle farmers targeted by counseling and training programs. The purpose of this study was to examine farmers' determination to use cattle business development technology through a cost-benefit analysis of cattle farming.

MATERIAL AND METHOD

This research was conducted in Kauditan District, North Minahasa Regency. The village sample was determined purposively based on (1) the beef cattle development area in North Minahasa Regency, (2) the location of livestock forage development in North Sulawesi,

and (3) the target village for information technology price extension and training activities. Watudambo and Watudambo Dua Villages, Kauditan District, North Minahasa Regency were selected. The determination of respondents was carried out by total sampling of 25 farmers involved in this technology introduction activity.

RESULT AND DISCUSSION

The condition of the North Minahasa Regency area in North Sulawesi Province is a central area and a central node for development and growth between Manado City, Bitung City and Minahasa Regency. This Regency is also included in the Kapet Manado-Bitung development area. The potential, mainstay, and superiority of this Regency including the development of the Industrial Area in Kauditan District make this area an industrial area. Moreover, the location of the area is close (about 20 km) from Bitung Port and about one kilometer from Sam Ratulangi Airport Manado. The nature and weather of this area are suitable for agricultural crops. Watudambo Village and Watudambo Dua are one of the villages in Kauditan District, North Minahasa Regency that carry out corn farming and cattle farming.

Based on priority issues of livestock farmers, empowerment of the group was needed. The stages carried out to address several priority issues were carried out through training and mentoring. Extension was provided to group members, where extension methods and techniques were carried out to help change the behavior of members of the livestock farmer group. Assistance in the application of technology was a planned, systematic, and coordinated effort so that farmers obtain direct guidance from researchers as a source of technology to facilitate, accelerate and expand adoption. Through assistance, farmers will receive guidance in determining the technology components that were most appropriate to the specific needs of the location, how to apply the correct technology, making it easier for farmers to consult on problems and how to overcome the problems faced. Thus, farmers can truly apply location-specific technology so that they can increase productivity and can adopt technology sustainably (Ernawati et al., 2020).

The implementation of extension and training activities was an effort to address priority issues of farmer groups that require the involvement of group members. Participation of group members in the implementation of these activities includes: a) jointly determining priority issues that need to be addressed; b) jointly determining the time and location of implementation; c) jointly preparing the technical implementation of extension and training activities; d) jointly preparing the materials and equipment needed in extension and training activities; e) actively participating in training activities and implementing the introduction of technology for calculating costs and revenues in cattle farming businesses. The results of measuring the level of adoption of livestock technology in developing cattle farming business resources can be seen in Table 1.

The results analysis of the technology level adoption showed that there were 6 components measured in the application of livestock business resource development technology, namely: 1) information technology in determining cattle prices, 2) cattle fattening technology,

Table 1. The Level of Adoption of Cattle Farming Business Resource Development Technology

No	Technology Components	N	SA (%)	Rank	vaule	Amount of value	IA (%)	TA (%)
1	Using information technology in determining cattle prices	8	32,00	2	8	34,78	46,38	14,84
2	Using cattle fattening technology	5	20,00	5	5	21,74	18,12	3,62
3	Using cattle fattening technology	20	80,00	6	4	17,39	57,97	46,38
4	Using green fodder processing technology	5	20,00	7	3	13,04	10,87	2,17
5	Using cow dung waste processing technology	10	40,00	8	2	8,70	14,49	5,80
6	Using concentrate processing technology	1	8,00	9	1	4,35	1,45	0,12
		48	33,33		23	100		**72,84**

Source : Analysis results (2024)

3) cattle selection technology, 4) green feed processing technology, 5) cattle dung waste processing technology, and 6) concentrate processing technology. N (people) was the number of people who adopt the i-th technology component; the number of respondent farmers (N) was 25 people; Adoption target (SA) was the percentage of respondents who apply the i-th technology component compared to the total number of respondents; Rank (R) was the ranking of the i-th technology component from all existing technology components; ranks were arranged based on expert judgment; Weight (B) was set inversely to Rank (R); rank 1 has the highest weight; Weight Value (NB) was the value given to the j-th weight, calculated by dividing the j-th weight by the total weight value multiplied by 100; Adoption Intensity (IA) shows the ratio of the value of the observed adoption factor in the field (adoption units) to the total recommended components/aspects (units).

The number of farmers implementing technology components illustrates the distribution of technology. The results of the analysis show that the percentage of adoption targets reached 72.84 percent. The value of 72.84 explains that the components of the integrated system technology were spread across 72.84% of farmers. Meanwhile, the ratio of the value of the observation factor of adoption in the field (adoption units) to the total components/aspects of recommended technology (units). Adoption Intensity (IA) shows the ratio of the value of the observation factor of adoption in the field (adoption units) to the total components/aspects of recommended technology (units) varies in the range of 0.12-46.38.

The obstacles faced in the application of this technology include most of the farmers who participate in the extension and training do not convey the details to other farmers. In fact, it was expected that through extension and training activities, farmers who have been equipped with knowledge and skills can become opinion leaders, namely people who have expertise and knowledge so that they are worthy of being informants. This was in line with the research of Mulatmi et al (2016). Knowledge and information in rural communities were obtained from people they consider to be opinion leaders. Another obstacle faced was the lack of ability of farmers in using computer applications. Farmers must ask for help from family members, especially children or grandchildren to open the application. In addition, some farmers will search for information themselves by asking experts, reading print media or

searching for information via smartphones. This was due to the limitations of this application which was still based on visual basic which must be opened on a personal computer.

CONCLUSION

The components of the application of cattle business development technology were generally spread among farmers in the research area with a level of distribution. The level of adoption of the introduction of this technology shows good results based on the size of the adoption target, the intensity of adoption, and the level of adoption at the level expected in a technology introduction activity in the community. The adoption rate of 72.84 percent means that 72.84 percent of the technology introduction was adopted by farmers. This indicates that the implementation of this price information technology was well received by farmers because it was considered to have a positive impact on the household economy and the development of sustainable cattle farming resources.

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