Identification of breeder’s capacity on adoption technology in university profit-sharing partnerships in Tanete Riaja District, Barru Regency

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Abstract. The aim of this research was to identify the capacity of breeders who conduct profit-sharing partnerships with Hasanuddin University in the development of beef cattle to increase the utilization of existing resources, namely rice straw waste and livestock manure in order to have added value through processing technology innovations and can contribute to increasing business productivity. The study was located in Tanete Riaja District, Barru Regency. Determination of the location was carried out deliberately (purposive) with the consideration that in the area was the location of beef cattle breeding centers which were managed by Hasanuddin University together with the Regional Government of Barru Regency. Determination of breeders as respondents using proportional cluster random sampling with a total of 39 breeders. Research data were collected by conducting a survey using data collection techniques, namely interviews using questionnaires, as well as in-depth interviews (in-depth study) to several key informants. Data analysis is descriptive statistics using a frequency distribution table. The results showed that breeders (respondents) had known the technology of fermentation of rice straw waste and beef cattle waste. However, it turns out breeders do not know well about the technology. It can be seen that breeders applying technology are still low.

1. Introduction

In the era of the industrial revolution 4.0, agricultural development faces various challenges, such as the fulfillment of food sufficiency, improvement of breeders’ welfare, and jobseeker. One of the leading agricultural subsectors in Indonesia as a supporter of economic growth is livestock. To support the acceleration of growth in the field of animal husbandry needed appropriate technology that can support their business. The results of the research prove that the application and development of technology have an important role in increasing cattle production with traditional breeding. For the maintenance of the genetic quality and the development of the cattle population, appropriate technology innovation is needed, which is crucial to support the development of more advanced animal husbandry, modern, professional, and sustainable.

The function of technology breeding to improve the productivity of beef cattle and create farmer’s independence of economic. Shortage of feed quality in the dry season, limited land grazing, levels of morbidity and mortality of livestock in the summer rain which is quite high, limited access to services
of health of livestock and lack of knowledge of breeders in the processing of feed and sewage farms, are problems faced by breeders. Sewage farms in the form of the dung of cattle just left sitting outside the cage without any further processing [1].

The research of Syamsu et al [2] and Hidanah et al [3] who reported that agricultural waste has considerable potential as a source of animal feed. Rice straw is one of the agricultural wastes in Indonesia [4]. The amount of agricultural waste production in Indonesia is 51,546,297.3 tons with the largest production being 44,229,343.0 tons of rice straw or 85.81% of the total agricultural waste production (food crops). On the other hand, the Directorate General of Animal Husbandry [5] stated that based on livestock population in Indonesia consisting of 13,680,000 large ruminants, 21,688,000 small ruminants, 7,001,000 non-ruminants and 1,283,164,000 poultry can be produced fresh manure (KTS) as much as 80,194,166 tons and when processed produce 32 million tons of organic fertilizer. Similar research results [6], showed that breeders in Bulukumba, South Sulawesi generally considered feed technology, especially agricultural waste treatment technology, to improve feed quality and livestock productivity. However, breeders need a feed technology that is easy to do/apply, the materials used are available at the farmer's location, as well as at a low cost.

University is a place for the development of science and technology. In carrying out one of the Tridarma of Higher Education, namely community extension service, Hasanuddin University has made a partnership program for the results of cooperation with breeders in several areas, one of which is in Barru Regency, South Sulawesi. The profit-sharing partnership system of Hasanuddin University has several programs in empowering partner breeders, providing assistance in running their businesses, and providing instruction to breeders about technology in the field of animal husbandry as well as consultation to members of livestock groups about animal husbandry and handling of animal health. Unhas also contributed to increasing their income [7]. With the production sharing partnership in Barru regency, it is expected to benefit breeders in terms of increasing the capacity of breeders, namely increasing knowledge and skills due to the assistance provided by the University of Hasanuddin and the local government of Barru regency.

2. Methods
The population in this research was beef cattle breeders who conducted cow maintenance cooperation with Hasanuddin University in Tanete Riaja Sub-district, Barru District with a total of 63 breeders spread across 9 villages. The research sample is all or part of the population that is the object of research [8]. The determination of the sample in this study was carried out by a proportional cluster random sampling technique based on the class of the population that has been determined. The research data profit-sharing by conducting a survey using a collection technique, namely interviews using a questionnaire. The questionnaire used was a closed and open questionnaire. The form of questions in the questionnaire are closed questions and open questions. In addition, in-depth interviews (in-depth study) were conducted with several key informants.

The variables in this study are the capacity of breeders (knowledge and skills) in trying beef cattle business, the capacity of breeders in the management of rice waste (rice straw) and livestock waste. Measurement of research variables is done through measuring indicators for each variable/sub variable of the relevant research. For qualitative variable indicators measured using a Likert scale consisting of three levels, each was given a score of 1, 2, and 3. Measurement of each study variable was also carried out by withdrawing the average value of the scores of all indicators and sub-variables. Analysis of data obtained from the survey begins with tabulating data and doing descriptive analysis of data by looking at averages, percentages, and frequencies.

3. Results and discussions
The general condition of the respondent's breeders related to gender, age, education, number of livestock, the experience of raising beef cattle, can be seen in table 1.
3.1. Gender

Table 1 shows that the characteristics of beef cattle breeders who conduct profit-sharing partnerships with universities are dominated by men. Data from 39 respondents showed that 90% were male breeders and 10% were female. Considering this effort requires more energy in its maintenance. However, it is possible for men and women to work together with each other. This is in accordance with the opinion of Wahyono [9] that the right handling and the right placement of work positions will also increase the effectiveness and productivity as a trigger for the success of a business.

Table 1. Respondent characteristics in Tanete Riaja district, Barru regency.

| Respondent characteristics | n | Percentage (%) |
|----------------------------|---|----------------|
| Gender                     |   |                |
| Male                       | 35| 90            |
| Female                     | 4 | 10            |
| Age (years)                |   |                |
| 0-14                       | - | -             |
| 15-64                      | 38| 97           |
| >65                        | 1 | 3             |
| Education                  |   |                |
| Elementary School          | 18| 46           |
| Junior High School         | 13| 33           |
| Senior High School         | 7 | 18           |
| Bachelor                   | 1 | 3             |
| Cattle Amount (tail)       |   |                |
| 1-5                        | 20| 51           |
| 6-10                       | 18| 46           |
| >10                        | 1 | 3             |
| Breeding Experience (years)|   |                |
| ≤ 5                        | 22| 56           |
| > 5-10                     | 15| 38           |
| > 10                       | 2 | 6             |

3.2. Age

Table 1 shows that as much as 97.5% of respondents aged 15-64 years, this means that the average breeders are still in the productive age group to do work or run a business. A person's ability to work is greatly influenced by age. This is in accordance with the opinion of [10] which states that the level of productivity of one's work will increase according to age, then it will decrease again towards old age. Abdullah and Sutrisno [6] stated that the age factor is usually more identified with work productivity, and if someone is still classified as productive age there is a tendency for productivity to be high. Chamdi [11] argues, the younger the breeders' age (productive age is 20-45 years); generally, the curiosity about something is higher and the interest to adopt the introduction of technology is higher.

3.3. Education

Based on table 1, in terms of the formal education level, there are variations from the lowest of primary school and the highest of tertiary education. The farmer education level is dominated by elementary school graduates (46%) and junior high school graduates (33%), the rest are high school graduates (18%) and only 3% have completed tertiary education. The higher the farmer's education level, the higher the quality of human resources, which in turn will also increase the productivity of work done. With this level of education, it can be assumed that the ability of breeders to know and
adopt a skill in order to develop livestock business will experience obstacles and difficulties. Chamdi [11] suggested that the level of education will increase knowledge and skills so that it will increase work productivity and will determine the success of livestock businesses.

3.4. Cattle number
Table 1 shows that the scale of ownership of beef cattle ranges from 1-5 cattle with a percentage of 51%, which has cattle with a scale of 6-10 cattle ownership with a percentage of 46% and only 3% have experience of raising livestock over 10 years. It can be concluded that in general, the beef cattle business in Tanete Riaja district is still a community farm, this is reinforced because the average livestock ownership is in the small scale category with the number of livestock ranging from 1-5 cattle. Rianto and Purbowati [12] stated that the low scale of business is due to breeders generally still raising cattle as a side business, where the main purpose is savings so that maintenance management is done conventionally.

3.5. Breeding experience
Table 1 shows that judging from the experience of breeding shows that most breeders have experience of raising beef cattle under 5 years with a percentage of 56%, experience of raising 5-10 years with a percentage of 38% and only 6% who have experience of raising above 10 years. Generally, the experience of raising beef cattle and rice farming is obtained from her parents for generations. With a long experience of raising livestock gives an indication that the knowledge and skills of breeders on the management of raising cattle and paddy farming have a better ability [4].

3.6. Breeders’ capacity
Knowledge capacity and skills capacity of farmers in raising beef cattle are shown in figure 1. Figure 1 shows that from the technical aspects of production in beef cattle cultivation, it appears that in the category of knowing, feed technology gets the highest percentage of 85% of respondents already know the technology in feed processing like straw fermentation, straw ammoniation, and silage. However, the application rate is only 45% of respondents who apply or do from the number of respondents who know. For this reason, efforts should be made to improve and optimize the application of feed technology at the level of smallholder farms.

In the aspect of reproduction technology, breeders' knowledge of reproduction is quite high at 82%, such as signs of lust, pregnancy detection, postpartum management, and the presence of Artificial Insemination (AI) technology. However, the application rate is only 59% of respondents who know. The government socialized the AI technology in collaboration with universities to accelerate beef cattle breeding, but only a few respondents apply the technology because of the farmers' lack of understanding of the technology coupled with risks to livestock in the AI. Baba and Rizal [13] stated that the risk of implementing an AI is higher than that of natural marriages such as dystocia, difficulty in giving birth and better female conditions than natural mating is needed. Likewise, breeders feel that implementing an AI requires a greater cost compared to natural mating including AI fees, facilities, and infrastructure as well as the readiness of inseminators, all of which require a large fee. The ability of farmers to breed nature is still higher than doing AI on their cows. In natural mating, breeders only need to provide males while in AI breeders must contact inseminators, prepare infrastructure so that the success rate of AI is also lower than natural mating.

Another technical aspect is in terms of disease prevention, showing a high percentage of 82% of respondents who already know and the number of respondents who apply it is also quite high, that is 78% of those who know. The high level of application of disease prevention is one of them due to the level of health services and routine health surveillance carried out by field officers.

While from the aspect of feeding management, only 49% of respondents know and those who apply only 47% of respondents know that this is due to the traditional farming patterns of the community, their semi-intensive maintenance system released during the day and housed at night. In the technical aspects of housing, it is understood that only 46% of respondents know, and 50% of
those who know that implementing a good housing system, this happens because most of the respondents do not have a stable, their livestock are only tied under / under their house or left in a group/cow showroom cage.

Figure 1. The capacity of technological knowledge from breeder farmers in the cultivation of beef cattle in Tanete Riaja district, Barru regency.

Figure 2 shows the characteristics of the capacity of farmers in terms of knowledge and skills in processing rice waste and beef cattle waste. Rice waste treatment is rice straw processing technology as beef cattle feed. Livestock waste treatment is the processing of feces and urine manure into biogas, liquid fertilizer and compost / manure.

Figure 2. Characteristics of technological knowledge capacity for processing rice straw waste and beef cattle manure waste in Tanete Riaja District Barru District

In general, figure 2 shows that the respondent farmers already know the technology of processing rice waste (rice straw) and beef cattle dung waste, this can be seen from the percentage, namely biogas processing technology (67%), liquid fertilizer processing technology (77%), compost fertilizer technology (82%) and rice straw processing technology (79%). For the category of knowing, the percentage is quite high but in terms of its application only a few respondents are able to apply it, following the percentage of respondents who know that is biogas processing technology (25%), liquid fertilizer processing technology (47%), compost fertilizer processing technology (63%) and rice straw processing technology (32%) that applies it in the management of beef cattle business. So it can be seen that the high knowledge of breeders about the processing technology of rice straw waste and
cattle manure waste is not in line with its low application. Based on the high level of knowledge of farmers, coaching efforts are needed in the form of counseling or training in improving the skills of farmers. According to [14], counseling is a place of learning for farmers to increase their knowledge. It is expected, from high knowledge, will improve the attitudes and skills of farmers about technology in the field of animal husbandry.

4. Conclusion
The capacity of technological knowledge from breeder farmers in the cultivation of beef cattle in Tanete Riaja District, Barru Regency shows that the average percentage of respondents who know as much as 66% of all respondents and 53% who apply from respondents who know. Whereas in the characteristics of the knowledge capacity of rice straw waste processing technology and beef cattle manure waste, the level of knowledge of respondents is quite high at 76% and only 41% who apply the technology. The high level of farmers’ knowledge of technology is not in line with the level of application in the beef cattle business.

For this reason, efforts need to be made to improve and optimize the implementation of technology in beef cattle business management and the processing of rice waste and cattle waste into feed, fertilizer and biogas products at the level of community farms.

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