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## Farmers perception of the utilization of agricultural waste as a feed in Maros regency

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**Abstract.** Utilization of agricultural waste as feed has many benefits for both the agricultural and livestock aspects. This study aims to determine the practice of using agricultural waste by farmers in Maros district. The study was conducted in April - July 2016 in two sub-districts, namely Bantimurung District (paddy field/ rice and corn centers) and Mallawa District (dry land / plantation). Surveys of farmers who raise cattle and utilize agricultural waste as the main feed source are carried out by trained enumerators. The variables measured are farmers' perceptions of the utilization of agricultural waste in terms of the fulfillment of livestock needs, including the adequacy of nutrition for livestock, the adequacy of the amount of availability and timeliness of provision for livestock. From the aspect of the ability of farmers, includes ease, accessibility, adequate time, adequate labor. At the paddy fields area, agricultural waste that is used as food is rice and corn straws. At the plantation site, agricultural waste that is used as food is rice straw, corn, peanuts and hedgerow waste (legumes). Farmers' perception of the fulfillment of livestock needs is in a different category, namely medium in the paddy field location and high in the plantation location. In terms of farmers' ability, perceptions of farmers in the plantation area are in the high category while in the paddy filed area are in the medium category.

### 1. Introduction

One of the key success of cattle farming is the availability of sufficient feed both in terms of quantity and quality. The feed source that is often used for cattle is elephant and native grass. However, along with the development of land needs and conflicts over land use with other sectors, the development of land for elephant grass and natural grass (pasture) is increasingly limited. There is a decrease of grazing area every year. There needs to be a solution to overcome the scarcity of feed ingredients for cattle so that the development of cattle can be sustainable.

One source of feed that has a great potential to be developed in Indonesia is agricultural by product. Agricultural by product is waste produced from agricultural or plantation activities [1]. Thus, the main function of land is to produce food for humans and still produce feed for ruminants. Literature studies showed that the use of agricultural by product as a feed can increase cattle body weight and farmer's income [1,2].

Utilization of agricultural by product in Maros district has been known by farmers. Farmers use rice straw, corn (yellow and pulut corn), peanut straw and hedgerow waste as animal feed. However, the use of agricultural waste as feed by farmers has not been through processing so that the quality of



the feed is still low. Because the quality of feed from agricultural by product is still low, the potential capacity of agricultural by product as a feed is also not optimal. One hectare of rice has a carrying capacity of 5-7 cows per year if the straw produced is processed through fermentation technology.

One important factor in increasing technology adoption for farmers is the perception of farmers. The better the farmers' perception of the utilization of agricultural by product, the higher the chance of technology adoption [3,4]. The purpose of this study was to determine the level of farmers' perceptions on the utilization of agricultural waste as feed in Maros district.

## 2. Research method

This research was conducted in Bantimurung sub-district and Mallawa sub-district, Maros district in April-July 2016. Bantimurung sub-district is a center for cattle farming and irrigated rice fields while Mallawa sub-district is a center for cattle and plantation crops. Agricultural by product in Bantimurung sub-district are rice straw and corn straw while in Mallawa sub-district are rice, corn, peanut straw and pruning of legumes.

Surveys to farmers who raise cows and utilize agricultural waste as a source of food are carried out by trained enumerators. The number of respondents was 65 people in Bantimurung sub-district and 57 people in Mallawa sub-district. The variables measured are farmers' perceptions of the use of agricultural waste in terms of fulfilling livestock needs including adequate nutrition for livestock, adequate amount of availability and timeliness of supply to livestock. From the aspect of farmers' abilities, they include convenience, accessibility, adequacy of time, adequacy of labor. Each variable is measured by using a score indicator 1-5 to strongly disagree, disagree, hesitate, agree and strongly agree. Data analysis uses descriptive statistics in the form of graphs and frequency distribution tables.

## 3. Result and discussion

### 3.1. Farmer characteristics

The characteristics of farmers who use agricultural by product as a feed in Bantimurung and Mallawa sub-districts are as follows:

**Tabel 1.** Farmer characteristic in Bantimurung and Mallawa

Variabel	Bantimurung		Mallawa	
	Mean	Std	Mean	Std
Age (Year) <sup>ns</sup>	44.49	10.53	41.51	9.53
Family member (person) <sup>ns</sup>	4.14	1.28	3.98	1.09
Number of cattle (head) <sup>**</sup>	2.35	1.05	4.93	1.88
Cultivated Area (ares) <sup>**</sup>	48.31	29.02	105.44	50.18
Education level (person)				
- low ( $\leq$ junior high school)	58		50	
- senior high school				
- university	7		7	
	0		0	
Total of farmers	65		57	

ns : Non significant, \* significant in level 0.05 ( $P > 0.05$ ), \*\*significant in level 0.01 ( $P < 0.01$ )

The age of the farmer, the level of education and the number of family members in the Bantimurung sub-district and Mallawa sub-district were not significantly different, but the number of livestock and the area of agriculture differed significantly ( $P < 0.01$ ). Farmers in Mallawa have a higher number of livestock than farmers in Bantimurung. Likewise the area of agriculture, breeders in Mallawa have more extensive agricultural areas compared to Bantimurung.

### 3.2. Farmers' perception on fulfilling livestock needs

One of the obstacles to the use of agriculture by product as a feed is meeting the nutritional needs of livestock. Agricultural by product, especially rice straw, have low nutrient content and are unable to meet livestock needs [5]. The farmers' perception of the utilization of agricultural by product as a feed in Bantimurung and Mallawa sub-districts is as follows:

**Tabel 2** Farmer perception on fulfilling livestock needs

Variabel	Bantimurung		Mallawa	
	Mean	Std	Mean	Std
	(Skor)			
Diversity**	2.58	1.06	4.42	0.60
Quantity Sufficient <sup>ns</sup>	3.06	1.04	4.07	0.86
Nutrition Sufficient**	3.00	1.05	4.07	0.86
Timline provision <sup>ns</sup>	3.60	1.10	3.93	0.73

The farmers' perception of the diversity of agricultural by product as a feed was significantly different between Bantimurung sub-district and Mallawa sub-district. The Farmers in Mallawa have more diverse sources of food from agricultural by product than in Bantimurung sub-district. There are four feed sources in Mallawa sub-district, namely peanut, corn, and rice straw and *Gliricidia maculata* leaves. In Bantimurung sub-district, agricultural by product used by farmers as a feed is only two, namely corn and rice straw. Peanut straw and gamal has a high protein while rice straw and corn straw has a low protein content [6].

In terms of perceptions of the amount of agriculture by product used as a feed, there is no difference between Bantimurung sub-district and Mallawa sub-district. That is, farmers assumed that agricultural by product is able to meet the quantity. This means that sufficient agricultural by product is available in Bantimurung and Mallawa sub-districts.

In terms of perceptions of nutritional adequacy, there are significant differences between farmers in Bantimurung sub-district and farmers in Mallawa sub-district. Farmers in Mallawa sub-district consider that agricultural by product is able to meet the nutritional needs of cattle raised. Farmers in Bantimurung sub-district consider that agricultural waste has not been fully able to meet the nutritional needs of their livestock. The use of rice straw and corn straw as a source of fiber supplemented with peanut straw and legumes as a source of protein, is able to meet the nutritional needs of cattle [6]. The use of rice and corn straw without processing, is unable to meet the nutritional needs of cattle. Processing is needed to improve the quality of straw or add concentrated feed ingredients so that the nutritional needs of livestock can be fulfilled [2].

### 3.3. Farmers' perception of the ability to collect agricultural by product as a feed

The farmers' perception of their ability to collect agricultural by product as a feed is a measure of the farmers' ability to obtain agricultural by product as a feed in their respective locations.

**Tabel 3.** Farmers' perception of the ability to collect agricultural by product as a feed

Variabel	Bantimurung		Mallawa	
	Mean	Std	Mean	Std
Adequacy of farmer time <sup>ns</sup>	3.77	0.79	4.28	0.59
Adequacy of labor <sup>ns</sup>	3.80	0.94	4.19	0.79
Accessibility**	3.66	0.97	4.12	0.68
Availability of Storage <sup>s</sup>	2.89	1.05	3.07	0.90
Easy to collect**	3.57	0.97	4.03	0.68

Farmers' perceptions of the adequacy of time, availability of labor and availability of storage space to collect agriculture by product as a feed were not different between farmers in Bantimurung and Mallawa. The time of farmer to collect straw and labor to collect straw is in a high category. That is, farmers have enough time and labor to provide food. This is in line with the business scale of farmers, which is only one to five heads per family and the number of family members involved in cattle farming. The business scale of beef cattle farmers in Maros is relatively similar to beef cattle farmers in several regions in Indonesia such as in Kupang with a business scale of 1.72 [7], Seram district, 3 [8] and in Barru South Sulawesi 3 - 4 heads [9]. Storage of feed as feed reserves in both regions is in the low category. Breeders do not provide a place to feed straw.

Farmers' perceptions of accessibility and ease to collect of agricultural by product were significantly different between Bantimurung and Mallawa sub-district. Farmers in Mallawa have access and convenience in collecting agricultural product as a feed. Farmers plant their livestock in the garden so that they are close to the feed source. As in the case of Bantimurung sub-district, farmers breed their livestock near their homes so farmers need effort to collect agricultural waste and be transported near the cage.

#### 4. Conclusion

Farmers in Mallawa sub-district have more diverse sources of feed from agricultural by product than in Bantimurung sub-district so that they fulfill the nutritional needs of livestock in Mallawa sub-districts. The strategy of farmers in Mallawa sub-district by laying livestock around the garden makes it easy for farmers to collect and access agricultural waste as feed compared to the Bantimurung sub-district that empties their livestock around their homes.

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