

The effect of subjective norm on farmer behaviour in utilizing rice straw as feed in Barru district

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Abstract. Farmer behaviour is influenced by their social environment. The research objective was to determine the effect of subjective norms on farmer behaviour in using rice straw as feed. The research was conducted from January to March 2020 in Tompe Village, Barru Sub District, Barru District, which is one of the centers for developing Balinese cattle. The survey was conducted with farmers who used rice straw as feed by trained enumerators. The total population was 275 people and the number of respondents was 73 respondents which were determined by the simple random sampling method. Data analysis used the F test and t test using multiple linear regression models with the dependent variable of farmer behaviour in utilizing rice straw with criteria namely behaviour in hay storage, behaviour in processing and the technique of using straw as feed. The independent variables consist of extension agents influences (X1), family influences (X2), group influences (X3) and neighbour influences (X4). The results showed farmer dominantly stored their straw in a non-permanent warehouse. The technique of giving it to livestock was mixing salt and used it in the dry season. Factors that influence farmer behaviour in utilizing rice straw as feed are family ($P < 0.01$) and neighbour influence ($P < 0.05$). The family plays an important role in providing labour to collect hay, and neighbours become a model for other farmers to use rice straw as feed. Extension workers and groups are not a role model for breeders to adopt the technology of utilizing rice straw as feed in Barru district.

1. Introduction

Bali cattle are one of Indonesia's original cattle that have been raised for generations in Barru district. The advantages of Bali cattle are they have adapted to the social environment of the Indonesian people, are easy to care for, have high reproductive efficiency and are able to use poor quality feed [1,2]. Barru Regency is one of the areas designated as a breeding area for Balinese cattle in Indonesia based on the Directorate General of Animal Husbandry and Animal Health of the Ministry of Agriculture through Decree Number 619/Kpts/PK.210/E/03/2016.

The provision of quality feed and available year round is one of the problems faced by smallholder farms. Land use conflicts with other sectors have reduced land for the forage [3] so that another source of feed is needed that does not cause conflicts with other sectors, especially the agricultural sector. One source of feed that has been widely used by Balinese cattle breeders in South Sulawesi is rice straw which has been used in the Wajo area [4], Maros [5], Pasuruan [6] and several center of rice fields in Indonesia [7]. The potential for using straw as a source of forage is quite large, although in practice it requires processing so that the quality of rice straw can meet the needs of cattle [8].



The behaviour of breeders in using rice straw as feed is quite diverse. In Gowa district, most breeders provide rice straw directly to their livestock without any processing [9]. In Maros District, rice straw is used as a feed reserve in the dry season with the addition of salt as a mineral source [10]. Straw fermentation is only done by a small proportion of breeders.

One of the models used to predict farmer behaviour in adopting technology is the model proposed by Ajzen [11], namely Theory of Planned Behaviour (TPB). This theory is based on three main factors that influence the intention to behave, namely attitudes, subjective norms and behaviour control [12]. Attitude is the farmer's evaluation of the use of rice straw as feed. Subjective norms are social pressures that exist around breeders that affect farmer behaviour in utilizing rice straw as feed while behaviour control is the farmer's perception of his ability to apply rice straw technology as feed.

Studies on the effect of social pressure on farmer behaviour have been carried out. A Subjective norm has a significant effect on behaviour [13], but other side subjective norm some time has no effect on farmer behaviour [14]. Extension workers are one of the main reference sources for farmers in adopting technology [15,16]. Likewise, groups or people who become farmer role models are one of the factors that make farmers adopt technology in addition to family encouragement and support. Likewise, studies on the influence of neighbours in influencing farmer behaviour have been carried out mainly in conservation activities [17,18]. This study aims to determine the effect of extension workers, groups, neighbours and families on farmer behaviour in using rice straw as feed.

2. Research method

This research was conducted from January to March 2020 in the village of Tompo, Barru Sub-District, Barru District. Tompo Village was chosen because it is an area with a large number of Bali Cattle is the largest in the Barru sub-district and with a rice field area of 581.4 hectares. The research method is a survey by conducting a survey to the population of cattle breeders in the village of Tompo, amounting to 275 people. By using the formula proposed by Slovin, the sample size is 73 randomly selected.

$$n = \frac{275}{1 + 275 (0.10)^2}$$

$$n = \frac{275}{3.75}$$

$$n = 73 \text{ respondent}$$

The variables consist of the independent variable and the dependent variable. An Independent variable is a description of subjective norms [11] which consists of the influence of extension agents, farmer groups, neighbours and family. The dependent variable is the behaviour of farmers in utilizing rice straw as feed which is measured based on three criteria, namely behaviour in hay storage (score with the criteria of no warehouse, non-permanent warehouse and permanent warehouse), behaviour in processing (score with straw criteria given directly to livestock, given to livestock with the addition of salt and given after fermentation) and behaviour in the technique of using straw as feed (score with the criteria given during feed crisis, given during the dry season and given all the time).

Data analysis used the F test to determine the effect of the independent variable on the dependent variable and the t test to determine the partial effect of each independent variable on the dependent variable. The statistical model using multiple linear regression with the dependent variable is the behaviour of farmers in the use of rice straw as feed (Y) and the independent variable is the description of the subjective norm consisting of extension agents influences (X1), family influences (X2), group influence (X3) and neighbour influence (X4). The linear regression model in this study is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where : Y = Farmer Behaviour in utilizing rice straw as feed (score)
 β_0 = Intercept
 $\beta_1 - \beta_7$ = The dependent variable regression coefficient
 X_1 = Extension agent effect (score)

- X2 = Family effect (score)
 X3 = Farmer group effect (score)
 X4 = Neighbour effect (score)

3. Results and discussions

3.1. Farmers characteristic

The characteristics of Balinese cattle breeders in Tompo Village, Barru District can be seen in table 1.

Table 1. Characteristics of Balinese cattle breeders in Tompo Village, Barru District.

Breeders characteristic	Average	Standard deviation
Age (year)	46	11.5
Number of cattle (head)	5	3.6
Family member (people)	4	1.6
Education	Amount (people/percent)	
Elementary school	48	
Junior high school	18	
Senior high school	6	
High education	1	

Table 1 shows that the average age of the breeders is 46 years, which means they are still in the productive age category. In terms of number of livestock, the average number of livestock ownership is 5 heads. The same thing in several areas in West Papua Province, the range is around 5 heads per household, while in Semarang district it is around 2–3 head per household. The number of family dependents is around four people who are also family workers involved in raising cattle. The education level of Balinese cattle breeders in Tompo Village is dominated by low education (elementary school and junior high school) as much as 90% of the total existing breeders. Low levels of education can be a barrier to technology adoption for beef cattle breeders in Barru district [19].

3.2. Farmers behaviour in utilizing rice straw in Barru district

Farmers Behaviour in the utilization of rice straw in Tompo Village, Barru sub-district was measured using 3 indicators, namely rice straw storage, processing technology and utilization techniques.

Based on Table 2, it is known that the adoption of the use of rice straw as feed in Tompo Village, Barru District is at a moderate level. Hay storage is generally carried out in non-permanent warehouses (71.23%). The common straw processing was the addition of salt (57.53%) and only 13.70% of farmers carried out straw fermentation. The number of breeders who provide straw directly to their livestock without processing reached 28.77%. The use of straw is generally carried out by farmers during the forage crisis and dry season (89.16%). Farmers who use straw as their main feed are only 10.96%.

The provision of rice straw as cattle feed is absolutely necessary for processing such as fermentation and or ammonization. The digestibility value of rice straw only ranges from 35–37% with a crude protein content of 3–4%, while the need for cattle or ruminants in general is a minimum digestibility value of 50–55% and a crude protein of 8% [20]. Processing technology is needed to improve the quality of the straw so that digestibility and crude protein can be increased so that it can meet the needs of cattle. Fermentation of rice straw using several different types of starter can improve the nutritional quality of straw including protein by 100% from 4% to 7.32 to 8.5%. Crude fiber has decreased from 32.14% to 22.41–19.73% after fermented [21].

Table 2. Farmer behaviour in utilizing rice straw as feed for Balinese cattle in Tompo Village, Barru District, Barru Regency.

Indicator	Category	Score	Freq. (people)	Amount	Perc. (%)
Rice straw storage	No warehouse	1	18	18	24.66
	Non permanent warehouse	2	52	104	71.23
	Permanent warehouse	3	3	9	4.11
	Amount		73	131	100
Rice straw Processing	Without processing	1	21	21	28.77
	Adding salt	2	42	84	57.53
	Fermentation	3	10	30	13.70
Using technique	Amount		73	135	100
	Crisis of feed	1	14	14	19.18
	Dry season	2	51	102	69.86
Using technique	Whole year	3	8	24	10.96
	Amount		73	140	100
Total				406	Moderate

In Barru district, rice straw is used during the dry season and other forage sources are critical. In the dry season (July to September), rice straw is easily collected from the rice field so that farmers find it easier to provide straw as feed. At the end of the dry season, other forage sources have become difficult to find, so rice straw becomes an alternative for reserve feed to be given to livestock. Rice straw for cattle breeders in Wajo was carried out during the dry season, when forage is difficult to obtain [4].

3.3. The effect of subjective norms on farmer behaviour in utilizing rice straw waste as feed

Table 3 shows that the extension agent, family, group and neighbours variables have a significant effect on the adoption of waste as feed ($R = 0.533$). The contribution of the independent variable on the adoption of rice straw waste as feed was 24.2%. There is the other variables of 75.8% which influence adoption other than the variables that have been determined in the model. The influence of family and neighbours variables was a significant variable affecting farmers adopting rice straw waste as feed ($P < 0.01$ each), while the influence of extension agents and groups was not significant on the adoption of rice straw waste as feed ($P > 0.05$).

Table 3. Effects of extension workers, family, groups and neighbours on the farmer behaviour in utilizing rice straw waste as feed.

Variable	Coefficient Standard	Error Standard	T-Value	Sig.
Constants	1.320**	0.136	9.714	0.000
Agric. extension (X1)	-0.028 ^{ns}	0.050	-0.217	0.829
Family (X2)	0.537**	0.036	4.965	0.000
Farmer group (X3)	-0.225 ^{ns}	0.103	-1.178	0.243
Neighbor (X4)	0.463*	0.121	2.153	0.035

** significant at 1%, *Significant at 0.05 ^{ns} Non-significant. $R = 0.533$, Adjusted R Square = 0.242, $F = 6.375$, Sample 63 respondents.

The role of family and neighbours in technology adoption has been discovered by many researchers. Farmers are unindividual beings who behave independently but depend on the influence of their culture and social life [12]. In addition, farmers in their behaviour also depend on the main reference group that has been the reference in their behaviour patterns [22]. The use of rice straw as feed in Barru district is influenced by neighbours and families. The greater the influence of family and neighbours, the higher the adoption of rice straw as feed. Farmer neighbours are places for breeders to discuss and share

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