

FERMENTED RICE STRAW AS AN ALTERNATIVE FEED FOR GOATS IN PEKON DATARAJAN, LAMPUNG

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Abstract - Rice straw is a waste product of the rice plant that is available in relatively large quantities and has the potential to be used as an ingredient for making fermented animal feed. Rice straw can be improved in quality through a fermentation process with the help of microorganisms. The purpose of community service is to increase knowledge and skills in the community about fermenting rice straw waste as an alternative to goat feed. The service method with a socialization approach is to introduce fermented animal feed from rice straw waste and training on making rice straw fermentation by farmers. The result of the activity is that the goat breeders in Pekon Datarajan have knowledge and skills about rice straw fermentation and goats like the fermented rice straw so that it can be an alternative feed.

Keywords: Rice straw, Fermentation, Alternative feed.

1. INTRODUCTION

Rice straw is the vegetative part in the form of stems, leaves and stalks of rice plants and is the largest agricultural waste in Indonesia (Setiarto, 2013). Rice straw is a waste product of the rice plant which is available in relatively large quantities compared to other agricultural by-products and is found in almost every region in Indonesia. The abundant availability of rice straw is an opportunity to be used as an energy source for ruminants (Antonius, 2009).

The potential of rice straw is unfortunately rarely used to its full potential. In Indonesia, rice straw has not been assessed as a product that has economic value. Farmers allow anyone to take hay from their paddy fields. In some areas, farmers are even happy when their fields are free of hay. In intensive farming systems, straw is often considered as crop residue that interferes with tillage and rice cultivation. Therefore, 70-80% of farmers burn straw on the spot, a few days after the rice is harvested. Some farmers cut the straw and pile it on the edge of the rice field, then burn it (Makarim, Sumarno, & Suyamto, 2007)

Data from Agricultural Research and Development (2012) shows that 37% of straw waste is not used because it is burned and it is used as compost from the bottom of the cage is 36%. Furthermore, only about 15-22% is used as a source of animal feed. Meanwhile, according to Masnun (2014), the use of rice straw as feed has only reached 31-39%, other than for burning or returning to the ground 36-62%, and for industry 7-16%. One method of processing straw as animal feed that is simple, inexpensive and can be done is fermentation. The results of research using the rice straw fermentation method generally show an increase in the quality of its nutritional value (Yanuartono *et al.*, 2017).

Feed is an important aspect in animal husbandry because 70% of the total production cost is for feed. Utilization of straw as animal feed has a major weakness in digestibility and low nutritional value. The low digestibility is due to the high content of lignocellulose, lignin and silica, while the low nutritional value is mainly due to the low content of energy, protein, minerals and vitamins (Yanuartono *et al.*, 2017).

Rice straw can be improved in quality through various technologies. For a long time, various efforts have been made to improve the digestibility and utilization of agricultural residues, including rice straw. The implementation effort is emphasized on the use of technology that is practical and economical so that it can be easily carried out, especially by small-scale farmers. One method of processing straw as animal feed that is simple, inexpensive and can be done is fermentation. The results of research using the rice straw fermentation method generally indicate an increase in the quality of its nutritional value. The rice straw fermentation method has been widely applied in livestock groups by government institutions and universities through counseling and community service. Fermentation is the process of preserving feed through the addition of microorganisms carried out anaerobically. According to Chilton *et al.*, (2015) the definition of fermented feed is feed that is treated with the addition of micro-organisms or enzymes so that

biochemical changes occur and will subsequently result in significant changes in the feed.

Socialization and training on fermented feed for goats has been carried out in Datarajan Village, Ulu Belu District, Tanggamus Regency, Lampung. In the provision of feed in Datarajan Village, there are still several problems, including: (a) Agricultural waste or straw at harvest time is quite abundant which tends to be underutilized, even a lot of it is burned, (b) Animal feed still relies on forage feed, (c) Public knowledge is still low on quality animal feed, (d) The technology for making quality animal feed is still lacking.

The purpose of socializing the manufacture of fermented feed in Pekon Datarajan, among others, is to: (a) Apply directly related to the manufacture of fermented animal feed, (b) Assistance so that the community can independently make animal feed fermentation.

2. METHOD

The socialization activity for making fermented feed for rice straw cattle was carried out on August 12, 2021 at the Datarajan Village Center by inviting resource persons and goat breeders in Datarajan Village. The implementation of the training is in collaboration with the Datarajan Village Government and community leaders.

The methods used in the socialization of making fermented feed for livestock are as follows: (a) Socialization of alternative animal feed to goat farmers in Pekon Datarajan, (b) Counseling on the benefits of fermented feed for livestock, (c) Training is carried out by providing theory and the practice of making fermented hay, (d) Assistance so that the activity of making fermented animal feed takes place properly after the community assistance activity is expected to continue to carry out fermented feed production activities, (e) The results of fermented animal feed are implemented for goats, where goats prefer feed fermented straw compared to straw without fermentation, and (f) Evaluation to ensure the sustainability of activities.

The composition of straw fermented feed for one 100 liter drum includes chopped straw (about 5 cm in size) or milled as much as 60-80 kg, bran as much as 15 kg, sugar as much as kg or can use 1 bottle of sugarcane juice extract. , kg salt, 4 bottle caps of viterna, 4 caps of tough probiotics, 3 liters of clean water.

The manufacturing process that must be done first is to make a wet/liquid mixture that will be used to flush the dry ingredients. The wet/liquid ingredients consist of granulated sugar/cane juice extract, salt, viterna, tough probiotics, and clean water which are mixed until homogeneous. Dry material consists of a mixture of straw that has been chopped/milled with rice bran. After the dry ingredients are prepared and leveled, then doused with a solution that has been mixed with the wet ingredients previously then stirred until smooth, then put into a drum and fermented for at least 24 hours before being given to livestock as an alternative feed.

3. RESULTS AND DISCUSSION

The socialization activity is aimed at the community, especially goat breeders, with the hope that rice straw waste will not only be used as a dry feed ingredient that only has low nutritional value, it is not uncommon for a lot of rice straw waste to be not utilized.



Figure 1. Socialization of fermented animal feed

Training is a technology transfer activity that can be directly known and practiced by the community, with the aim that people increase their knowledge, skills, and have independence so that activities can continue to be carried out well.



Figure 2. The process of making fermented feed

Fermentation is a process that utilizes microbes with the aim of changing the substrate into certain products as expected (Iglesias *et al*, 2014). Fermentation is one method to increase the nutritional value in accordance with the characteristics of rice straw because the process is relatively easy and the results are palatable so that it is easier to give to ruminants (Liu *et al.*, 2015). Straw fermentation can not only increase its benefits but also reduce pollution due to the burning process in the fields so that it is expected to maintain the effect of ecological balance. However, great efforts are needed to improve the quality of the fermentation due to the low content of dissolved carbohydrates in the straw.

Straw fermentation can be carried out using an anaerobic process utilizing a mixture of several bacteria such as proteolytic, lignolytic, cellulolytic, lignocellulolytic and lipolytic bacteria (Kausar *et al.*, 2010). These bacteria can be used as starter inoculants and play a role in increasing the nutritional value of straw because it has the ability to produce lactase, cellulase, and xylanase enzymes which are able to hydrolyze lignin, cellulose and hemi cellulose compounds which are abundantly contained in rice straw, respectively. In addition to the above capabilities, microbial fermentation can also improve palatability, feed intake and livestock performance (Gado *et al.*, 2011).



Figure 3. Experiment of giving fermented feed to goats

4. CONCLUSION

This service activity went well and could provide additional knowledge and skills to farmers in Pekon Datarajan regarding quality feed based on rice straw waste through direct fermentation practices and tested directly on goats. One method of processing rice straw waste as animal feed that is simple, inexpensive and can be done is fermentation. In general, rice straw fermentation can increase its nutritional value so that if it is given as feed it will be able to increase its productivity.

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