

## Utilization of Kepok Banana Peel Waste Fermented Using EM4 as Sheep Feed in Medan Tuntungan Sub District

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**Abstract.** A feed is the highest cost of the total livestock raising costs. This causes problems that are often faced by farmers. One solution to reduce the high cost of feed is by utilizing abundant agricultural waste materials. The aims of community service are: 1) Improving the skills of farmers in making fermented animal feed from Kepok banana peel waste, 2) preventing environmental pollution, 3) Utilizing banana peel waste for feed is expected to reduce the cost of animal feed. The method used in the first community service program is approach, interview, problem deepening and finding solutions to problems. The second is to use learning methods with a book guide to community service activities and training on making feed using fermented kepok banana peels. The third is the provision of brochures, leaflets, and banners that attract farmers' interest so that they can apply the skills acquired. The results achieved after 6 months of assistance were 95% of farmers applying fermentation technology using banana peels as animal feed, thereby reducing feed costs. Besides this, the application of banana peel waste as animal feed is also effective in reducing the environmental pollution.

**Keywords:** Fermentation, Banana peel, Breeder, Agricultural waste

**Abstrak.** Pakan merupakan biaya yang paling tinggi dari total keseluruhan biaya pemeliharaan ternak. Hal tersebut menyebabkan permasalahan yang sering dihadapi khususnya oleh peternak rakyat. Solusi untuk menekan tingginya biaya pakan salah satunya adalah dengan pemanfaatan bahan pakan lokal ataupun limbah pertanian yang melimpah. Tujuan pengabdian masyarakat ini adalah: 1) Meningkatkan keterampilan petani dalam pembuatan pakan ternak fermentasi dari limbah kulit pisang, 2) mencegah pencemaran lingkungan, 3) Pemanfaatan limbah kulit pisang untuk pakan diharapkan dapat mengurangi biaya pakan terak. Metode yang dilakukan dalam program pengabdian masyarakat yang pertama adalah pendekatan, wawancara dan pendalaman permasalahan dan mencari solusi permasalahan

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*kemudian. Kedua menggunakan metode pembelajaran dengan menggunakan media ajar berupa buku panduan kegiatan pengabdian masyarakat dan pelatihan pembuatan fermentasi kulit pisang kepok menggunakan EM4. Ketiga adalah pemberian brosur, leaflet dan banner yang menarik minat peternak sehingga petani dapat mengaplikasikan keterampilan yang diperoleh. Hasil yang telah dicapai setelah 6 bulan pendampingan adalah 95% petani menerapkan teknologi fermentasi menggunakan kulit pisang sebagai pakan ternak sehingga mengurangi biaya pakan. Selain hal tersebut, aplikasi limbah kulit pisang sebagai pakan ternak juga efektif mengurangi pencemaran lingkungan.*

**Kata Kunci:** Fermentasi, Kulit pisang, Peternak, Limbah pertanian

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## 1. Introduction

Medan Tuntung Subdistrict is one of the 21 Subdistricts in the City of Medan which has 9 villages located in North Sumatra Province. Medan Tuntungan District is bordered by Deli Serdang Regency in the west, Medan Johor in the east, Deli Serdang Regency in the south and Medan Selayang in the north [1]. Farmers in the Medan Tuntungan sub-district found it difficult to get forage in the dry season, so the use of banana peel waste was an alternative. Medan tuntung has 4 markets, restaurants, food stalls, and small food industries so there is a lot of waste. From the survey that has been carried out banana peels are quite abundant and untapped waste. This waste has the potential to feed livestock in the dry season.

Farmers in the field of sheep farms located at Jl Bunga Rinte, Medan Tuntung District, Medan City are Praditya rahardja farms. Sheep that are kept are 20 kinds of local sheep which are usually fed with grass and concentrate. In the dry season, forage production, especially grass and foliage, is reduced so that a strategy is needed to meet the needs of sheep feed so that weight gain, health, production, and reproduction reach maximum results so that the business benefits of raising sheep can be achieved. Based on taxonomic classifications, it belongs to the Musaceae family originating from South India. Banana peels contain 59.00% carbohydrates, 0.90% crude protein, 1.70% crude fat, 31.70% crude fiber, and some mineral contents in it such as 78.10% potassium, 19.20% calcium, iron 24.30% and manganese 24.30% [2]. In the banana peel, it turns out to have vitamin C, B, calcium, protein, and also enough fat so that it is potentially used for animal feed.

Fermentation is the process of breaking down organic compounds into simpler compounds by involving the role of microorganisms [3]. The fermentation process can

be said as a process of "protein enrichment" which means the process of protein enrichment of materials using certain microorganisms [4]. Fattening sheep cannot be separated from proper feeding, because the nutrients in the feed can give effect to the trade and productivity. Therefore, it can be carried out fermentation of banana peel waste using EM4 which can increase production and reduce environmental pollution. The technology used by farmers about feed processing is still very simple, the composition of the ration and the method of preserving feed ingredients are also still traditional. This is what makes sheep production and reproduction less optimal.

This activity is useful and aims to: 1) Make alternative feeds for use in the dry season because of low forage production so that livestock feed supplies remain, 2) Improve farmers' skills in the utilization of horticultural waste, especially banana peels and can cause environmental pollution, 3) Providing insight and knowledge to the community to process banana peel waste using appropriate technology, namely fermentation as an alternative to animal feed 4) Providing training and counseling and mentoring to the community of waste treatment technology, preparation of sheep rations and livestock marketing through mass media. The expected output in this program is that farmers have skills in making animal feed from banana skin waste using fermentation technology to reduce feed costs. Besides that, the use of banana peels as animal feed can also reduce environmental pollution.

## **2. Methods**

- a. Survey and interviews conducted by the community service team to farmers, the main problem was that during the dry season, it was difficult for farmers to get forage. Utilization of agricultural waste using appropriate feed technology that is fermentation using abundant banana peel waste is very potential to be developed considering the natural resources, human resources and banana peel waste is very abundant but not yet utilized optimally. If the waste is not handled properly, it is feared that it can cause environmental pollution.
- b. Learning methods through counseling and training that aim to improve the skills of farmers in making feed from fermented banana peel waste so that it can be utilized in the dry season and has better quality. Farmers do not know how to improve the quality of feed nutrition using fermentation technology to make banana peel waste into animal feed. Training and practice are needed for this community service.

- c. Assistance to farmers so farmers can apply fermentation technology to animal feed to reduce feed costs.
- d. Providing agricultural equipment assistance packages, training books, leaflets to facilitate farmers in making feed. Apart from this it also educates farmers that the use of waste can reduce environmental pollution.

### 3. Results and Discussion

Questionnaire data from 12 farmers showed that after applying the processing of banana peel waste into animal feed, on average it could reduce feed costs by around 45% of the total feed costs they usually spend. The community service team made a sample of banana peel waste to be given to the livestock sample can also be shown to farmers a general description, the process and what it would be like if the banana peel waste was fermented so that farmers did not hesitate with the fermentation technology to be applied.



**Figure 1.** Early stage socialization to farmers in the use of banana peels waste



**Figure 2.** Banana peels drying as a banana peels waste

The results achieved in community service in Medan Tuntung District are very beneficial for farmers. Based on the results achieved can be seen in the data below:

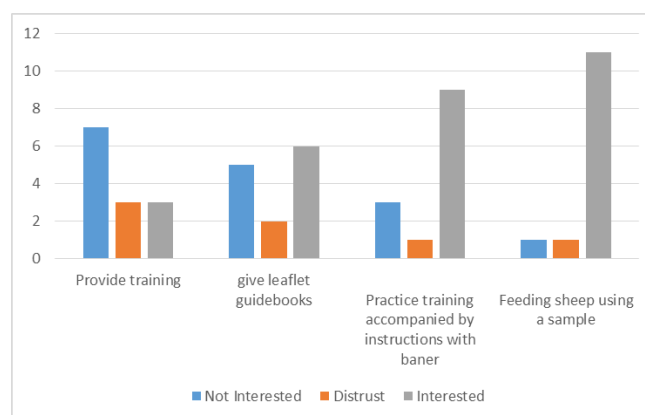
### 1. The fermentation technology of banana peel waste can reduce feed costs

The fermentation technology of banana peel waste using EM4 is expected to increase the farmer's income.



**Figure 3.** Training on making banana peel fermentation

At first, the breeders had doubts, but by approaching and providing counseling activities, training with materials on fermentation accompanied by giving leaflets, guidebooks and banners. Based on information from farmers they begin to think that feed is the biggest cost in raising livestock so that unused material around them such as banana peel waste can be a solution to reduce feed costs. Based on data obtained before training and after training is presented in Figure 4. Increasing the number of farmers participating in training and applying continuous fermentation technology is increasing.



**Figure 4.** Community interest in the application of banana peel fermentation technology

At the beginning of the training, banners, manuals, and leaflets were mostly not interested in applying the fermentation technology of banana skin waste as animal feed. In the practice and demonstration stages of making fermented feed, farmers begin to be interested in applying it because making feed is not difficult. After

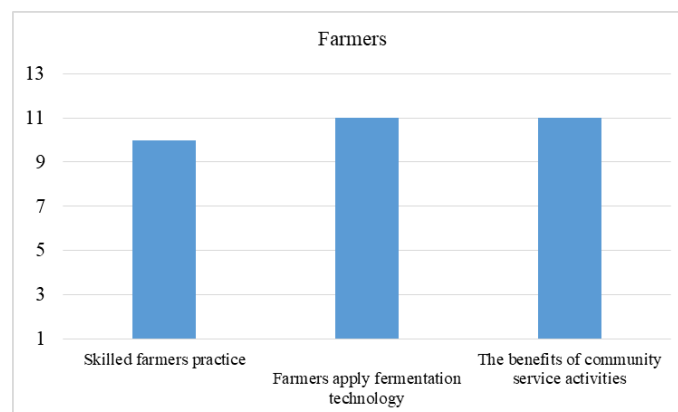
fermentation feed was applied to sheep, most farmers began to be interested and began to apply silage technology using banana peel waste for feed. Based on the questionnaire after 12 farmers gave information that using fermented banana peel waste as animal feed can reduce feed costs 45% of the total cost of feed.

## 2. Increased farmer skills

Participants who stated that they need this community service activity to resolve the existing problems are presented in Figure 6.



**Figure 5.** Farmers practicing banana peel fermentation



**Figure 6.** The benefit of developing farmers' skills

Farmers in Medan Tuntung District were very interested and most wanted to apply banana peel fermentation technology. Based on Figure 6 that farmers who can practice making fermented banana peel feed or skilled at making fermented animal feed are 10 out of 12 people participating in the activity. After the training of the community service training team conducted monitoring, it was found that 11 farmers applied fermented banana peel feeds. In the final assistance, the community service team took a questionnaire and the results showed that 11 farmers benefited greatly from this activity. Farmers who are still hesitant to

become targets for guidance so that farmers are confident in applying banana skin waste fermentation technology. Furthermore, other farmer group members who have succeeded in showing farmers who are unsure so there is no doubt to apply the technology of banana peel fermentation.

### **3. Reducing pollution of agricultural waste**

The potential for horticultural waste, especially banana peels, is quite good. Environmental pollution due to unused banana peels causes unpleasant odors. Air pollution also makes flies and mosquitoes thrive, causing an unhealthy environment. Livestock can also be disrupted if the development of flies and mosquitoes is not handled properly. By utilizing banana peel waste according to farmers, can reduce environmental pollution. The use of banana peels for animal feed can, according to farmers, improve environmental hygiene and both improve public health and livestock. Almost all service participants agreed to use banana peel waste for animal feed to reduce pollution from banana peel waste. After the training, assistance and enthusiastic counseling to use banana peels as food increased. This means that the awareness of farmers to preserve a healthy environment is increasing. The utilization of agricultural waste can be a solution to reduce pollution that disturbs health.

### **4. Conclusions**

The results are based on observations of indicators for 6 months of community service that 95% of farmers are skilled in making fermented banana peels for animal feed. The use of banana peel waste is also felt to reduce feed costs and reduce environmental pollution.

### **5. Acknowledgement**

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