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Technical Guidance on Silage Making as Cattle Feed in Lawoila Village, Konda Sub-District, South Konawe

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A B S T R A C T

This abstract presents the results of community service activities conducted by the Faculty of Animal Husbandry lecturers and postgraduate lecturers in Lawoila Village, Konda Sub-District, South Konawe Regency. The main focus of this activity is to provide technical guidance in silage making with the aim of maximizing the preservation of nutrient content in rice straw, thus enabling it to be stored for a longer period. The methods applied in this community service program include observation, counseling, and evaluation to ensure its effectiveness. The results of this community service activity indicate that the community in Lawoila Village, Konda Sub-District, responded well to silage-making. They demonstrated a high level of enthusiasm in understanding the concept of feed management.

INTRODUCTION

Feed is one of the fundamental necessities in managing ruminant livestock farming. Fluctuations in feed availability due to the changing seasons of rain and drought are natural phenomena unavoidable in tropical countries like Indonesia. However, if not handled wisely, this natural phenomenon can have negative impacts on the condition and performance of livestock (Sani *et al.,* 2022). During the dry season, feed availability becomes limited, and livestock are often fed with low-quality feed, resulting in potential physiological problems and decreased livestock production performance. Maintaining green feed availability for livestock requires planned and structured efforts (Kojo *et al.,* 2015). One solution that can be adopted to address feed scarcity issues is through innovation in storing fresh feed for a certain period. One commonly used technique is silage-making. Silage is a method of preserving fresh green feed in anaerobic conditions with the formation or addition of acid (Kurniawan *et al.,* 2015). This fermentation process produces organic acids such as lactic, acetic, and butyric acids, which inhibit the growth of spoilage microorganisms, thus extending the shelf life of the feed.

It is important to ensure that the conditions for making hay are optimal to produce high-quality silage. One key to successful silage-making is conditioning the silage material to be as airtight as possible and adding a source of fermentable carbohydrates. Various methods can be used to reduce oxygen presence, such as using CO_2 gas, conventional compaction, or vacuum usage. These steps are crucial to ensure efficient fermentation and produce high-quality silage. In Lawoila Village, Konda Sub-District, South Konawe, efforts to improve the production and quality of cattle feed have been a major concern for local farmers. One method considered effective is silage-making. Silage is livestock feed made from fermented green material rich in nutrients. In the context of modern agriculture, silage production has become a crucial strategy to ensure adequate feed availability throughout the year, especially in areas with long dry seasons like South Konawe. Silage making as cattle feed has been proven to provide several significant benefits. Besides improving the availability of quality feed, silage can also reduce the impact of dry seasons on livestock feed supply (Aka *et al.,* 2018). Thus, silage-making practices not only have the potential to increase farm productivity but also provide better feed resilience when coping with climate fluctuations and seasons.

However, despite its significant potential benefits, silage-making practices have not been widely adopted by farmers in Lawoila Village. Some technical constraints and limited knowledge about the silage production process might be inhibiting factors in implementing this practice. Therefore, a systematic and targeted approach is needed to provide technical guidance to farmers on silage making. This technical guidance aims to provide farmers in Lawoila Village with practical knowledge and skills in the proper techniques of silage making. Thus, it is hoped that farmers can improve the quality of their livestock feed, reduce green feed harvest losses, and enhance overall cattle productivity (Nafiu *et al.,* 2020). This step is expected to help improve farmers' livelihoods and the contribution of the livestock sector to the local economy.

Through collaborative approaches involving the government, agricultural research institutions, and the farming community, it is hoped that this silage-making technical guidance can be a starting point in promoting more sustainable and efficient farming practices (Sandiah *et al.,* 2019). Thus, this approach will not only provide short-term benefits to farmers but also have long-term positive impacts on food security and agricultural development in the Lawoila Village, Konda Sub-District.

IMPLEMENTATION AND METHODS

The technical guidance activity on silage making in Lawoila Village, Konda Sub-District, South Konawe Regency, was conducted by a team of postgraduate lecturers and the Faculty of Animal Husbandry with the main aim of providing understanding and skills to the farmers and agriculturalists in the area. The target beneficiaries of this activity were cattle farmers and farmers interested in utilizing silage-making technology. The method used in this technical guidance program comprised three main stages: observation, counseling, technical guidance, and evaluation. The team initially conducted observations to understand the environmental and community conditions in Lawoila Village, which served as the basis for planning subsequent activities. Subsequently, the team prepared the necessary tools and materials, including tarps, buckets, plastic silos, choppers, rice straws, Gamal legumes, EM4 liquid, and sugar.

Counseling and technical guidance were crucial stages in this activity, where the outreach team interacted directly with the community to explain the purpose and objectives of silage-making. Technical guidance was then conducted practically, starting from the mixing process of silage materials to harvesting. This hands-on approach allowed farmers and agriculturalists to directly understand the necessary steps in silage-making. Evaluation was conducted by the outreach team at the end of the activity to assess the understanding and knowledge acquired by the participants, especially cattle farmers. This evaluation was important to assess the effectiveness of the technical guidance activity and to determine future improvement measures. Thus, it is expected that this technical guidance activity on silage-making will provide tangible benefits for the development of agriculture and animal husbandry in Lawoila Village and its surrounding areas.

RESULTS AND DISCUSSION

Extension Techniques

In the initial stage of this community service activity, the primary focus was to provide detailed explanations regarding silage-making techniques to the farmers. These explanations were designed in such a way that the farmers could easily comprehend the process. The objective of this stage was to impart deeper knowledge and practical skills in applying complete feed-making technology to meet the nutritional needs of cattle. By gaining a better understanding of silage-making techniques, it is hoped that farmers can maintain livestock feed availability throughout the dry season, which often poses a significant challenge in agriculture.

The counseling on silage-making technology was also intended to provide an understanding of the importance of feed that meets the nutritional needs of cattle. Citing the research by Sugiarti *et al.,* (2020), this counseling effort aims to enhance the knowledge of both novice and experienced farmers. There is an understanding that experienced farmers tend to accept technological innovations compared to novice farmers. Therefore, the counseling and technical guidance activities are expected to reduce the knowledge gap between these two groups.

Technical Guidance on Silage Making

Technical guidance on silage making for ruminant livestock adopts a demonstration method that allows farmers to observe the process directly. In this activity, various materials are utilized, including rice straw, Gamal legumes, bran, and EM4 as preservatives. Research by Landupari *et al.,* (2020) emphasizes the importance of using preservatives to enhance silage quality.

Figure 1. (a). Material Presentation, (b) Process of Mixing Rice Straw and Gamal Legumes and Bran, (c) and (d). EM4 Liquid Administration Process and Mixing Materials

The primary objective of this demonstration is to enable farmers to understand and master the silage-making process so that they can produce silage feed when forage is abundant, overcome feed shortages during the dry season, and maximize the preservation of nutrient content from rice straw for long-term storage. Thus, the resulting silage will become a reliable feed source for livestock. Saelan & Lestari (2021) reduce the difficulties farmers face in obtaining forage during the dry season or when feed supplies are limited. The prepared hay is stored in a shaded room without direct sunlight, maintaining a normal room temperature of 20–25^{o}C. According to Kojo *et al.,* (2015), uncontrolled

temperatures, such as reaching 55oC, can cause the hay to turn dark brown to black and result in a decrease in the nutritional value of the feed as many carbohydrates are lost. This aligns with the opinion of Mashur *et al.,* (2022) that uncontrolled temperatures will cause the hay to turn dark brown to black.

The process of making hay involves crucial steps, where forage with low moisture content is put into a silo, and efforts are made to minimize the remaining air as much as possible. According to research conducted by Silalahi *et al.,* (2023), the quality of hay can be assessed from the texture it produces. Good quality hay has a soft, compact, non-clumpy, and non-slimy texture. The outreach also revealed that the level of texture density in hay is the primary indicator of its quality. The moisture content in the forage used affects the texture quality of silage; high moisture content (>75%) tends to produce slimy and mushy textures and triggers fungal growth, while low moisture content (<25%) produces drier textures with minimal fungi (Silalahi *et al.,* 2019). The research conducted indicates that the texture of the resulting silage still falls into the category of good quality (Sahala *et al.,* 2022) because it has sufficient and not excessive density and minimal fungi, indicating successful silage making. Asmara & Farda (2023) reported that good quality silage texture is characterized by the absence of slime, a fine texture, and compactness, indicating that the fermentation process is proceeding well without damage, thereby preventing oxygen from entering the silo in an anaerobic state, inhibiting fungal growth. Increasingly compact silage indicates good quality, while non-compact textured silage indicates poor quality (Silalahi *et al.,* 2023).

CONCLUSIONS AND RECOMMENDATIONS

Through this community service activity, a close relationship has been formed between the team of lecturers and the community of Lawoila Village, based on collaboration in efforts to enhance the welfare and productivity of local livestock farming. With an improved understanding of silage-making techniques, it is hoped that the community can reduce its livestock feed losses when the dry season arrives, which is often a major challenge in livestock management in the area.

Additionally, this activity has a positive impact on improving the quality of human resources at the local level by providing relevant training and learning in the context of livestock farming. This can create opportunities for local economic development through increased livestock productivity and sustainable utilization of local resources. Overall, this community service activity not only provides practical benefits in terms of enhancing livestock skills and knowledge but also strengthens community engagement in efforts for sustainable development and welfare improvement.

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