

The Use of Probiotics in the Fermentation Process of Feed (Silage) for Conservation of Timor Deer (*Cervus Timorensis*) by the Empowerment Group of Timor Deer Breeders (Mammettang) in Cakura Village



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ABSTRACT: Timor Deer (*Cervus timorensis*) is a rare species of deer that is threatened with extinction. In order to maintain the sustainability of this species, effective conservation measures are necessary. One important aspect of Timor deer conservation is ensuring adequate feed supply in the captive environment. Silage feed has been identified as a potential alternative feed due to its availability and high nutritional value.

This research aims to evaluate the effect of silage feed on the conservation of Timor deer and the community empowerment group of Timor deer breeders (Mammettang) in Cakura Village. The research methods used include collecting primary data through direct observation, measuring deer growth, and analyzing the quality of silage feed. Secondary data were also collected from previous studies and official documentation related to Timor deer conservation.

The results of the research indicate that the use of silage feed in the captive environment for Timor deer in Cakura Village has a positive impact on the health and growth of the deer. Deer fed with silage showed a significant increase in body weight compared to those fed with conventional feed. Moreover, the quality of silage feed was proven to meet the nutritional requirements of Timor deer, with appropriate levels of crude fiber, protein, and energy.

These findings have significant implications for Timor deer conservation efforts and community empowerment in Cakura Village. The use of silage feed can improve feed efficiency, reduce dependency on conventional feed, and provide a more economical and sustainable alternative. Additionally, community involvement in Timor deer breeding can bring about significant social and economic benefits, including increased income and preservation of local culture.

In conclusion, the use of silage feed in Timor deer conservation in Cakura Village has a positive impact on the health and growth of the deer. This opens opportunities for further development in implementing silage feed as an effective and sustainable conservation strategy for Timor deer species. Furthermore, community empowerment in Timor deer breeding also provides sustainable social and economic benefits for the local community.

KEYWORDS: Timor Deer, *Cervus timorensis*, conservation, silage feed, community empowerment, growth, health, breeding, Cakura Village, Pertamina.

INTRODUCTION

Community empowerment refers to development carried out by and for the community. In this process, empowerment is driven and supported by various parties, including local government, relevant agencies, and stakeholders with shared objectives, particularly in the economic aspect. In other words, community empowerment is a form of economic development that incorporates the values existing within a specific community or location. Sutoro (2002) stated that empowerment is a process of developing, enabling, capacitating, and strengthening the bargaining position of lower-level communities against suppressing forces in all fields and sectors of life. Generally, empowerment is intended as a step to alleviate poverty and underdevelopment in various fields, whether in education or economics. However, this is not the case with community empowerment in Cakura Village, Takalar Regency, South Sulawesi. The community in Cakura Village is empowered as breeders of a protected animal, namely the Timor Deer.

The Timor Deer or *Cervus timorensis* is an Indonesian endemic species whose population continues to decline. Based on Regulation of the Minister of Environment and Forestry of the Republic of Indonesia number 106 of 2018, the Timor Deer is designated as a

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protected species. Furthermore, the International Union for Conservation of Nature's Red List, known as IUCN Red List, categorizes the Timor deer as Vulnerable, whereas previously in 1996, it was classified as of lower risk. The decline in the Timor deer population in the wild has led to conservation efforts as the main approach to increasing the population. One form of conservation is ex situ conservation through breeding. Breeding is an effort to maintain and propagate wild animals with the aim of ensuring the sustainability of their populations and sustainable development, both for consumption, tourism, and educational purposes (Fitriyanty et al., 2014). The requirements for breeding Timor deer include selecting an area with grass, available trees for shade, a water pond, and fenced enclosures (iron or concrete) (Garsetiasih, 2002). One of the breeding programs is located in Takalar Regency, South Sulawesi, in Cakura Village, involving the local community united in a breeder group.

Breeding Timor deer has become the main focus of efforts to conserve this species. For years, natural and artificial feeds have been used to meet the dietary needs of Timor deer in captivity.

However, the availability of sufficient and high-quality natural feed often poses a challenge. Therefore, the use of silage feed as an alternative has been proposed as a potential solution. Silage feed is a fermented feed made from plant materials such as grass, corn, or other agricultural waste. Previous research has shown the benefits of silage feed in improving the quality of feed and livestock growth, but it has not been extensively studied in Timor deer.

In this study, we evaluate the use of silage feed as an alternative for Timor deer and its impact on their health and growth. Previous studies by Adams et al. (2015) on the feeding ecology of Timor deer in a protected area provided important insights into the dietary preferences and feeding patterns of Timor deer, which served as a basis for developing alternative feeds like silage feed. The findings from the study by Azizi et al. (2012) also support our research by demonstrating the benefits and potential use of silage in improving feed quality and livestock growth. Our study contributes additional evidence by showing that feeding Timor deer with silage has a positive impact on their growth and health.

In the research review by Daramola et al. (2014) on the use of silage as an alternative feed source for ruminants, they discussed the importance of silage as an alternative feed. Our study adds to the understanding of the potential use of silage in Timor deer by demonstrating that silage feed can be an effective alternative in meeting the dietary needs of Timor deer in the captive environment. Nugroho et al. (2017) have also provided information about the nutritional composition and fermentation characteristics of silage from various forage plants for Timor deer. Our research results support their findings by showing that feeding Timor deer with silage results in improved feed quality and better growth.

Furthermore, Soegianto et al. (2020) have identified silage from agricultural waste as a potential alternative feed for Timor deer in Indonesia. Our research contributes additional evidence by demonstrating that silage feed can be successfully used to meet the dietary needs of Timor deer in the captive environment, as well as reducing veterinary care costs.

METHOD

This study was conducted involving a population of Timor deer in captivity. Two comparable groups of Timor deer were randomly selected. The first group was provided with silage as their main feed, while the second group was given natural feed as commonly used. Food and water availability were regularly regulated and monitored. During the study period, health and growth parameters such as body weight, height, and physical condition of the Timor deer were observed and recorded.

Selection of Timor Deer Groups:

- The Timor deer population in captivity was identified as the research subjects.
- Two comparable groups of Timor deer were randomly selected from this population. - The first group would be provided with silage as their main feed, while the second group would be given natural feed as commonly used.

Feed Preparation and Water Availability Monitoring:

- Silage and natural feed were prepared according to the nutritional needs of Timor deer. - Water availability was also regulated and monitored periodically to ensure an adequate drinking water supply for the Timor deer.

Observation of Health and Growth Parameters:

- During the study period, health and growth parameters of the Timor deer were observed and recorded.
- Observed parameters included:
 - Body weight: The body weight of Timor deer was measured periodically to assess changes over the study period.
 - Height: The height of Timor deer was measured to monitor the growth of body height during the study.
 - Physical condition: The physical condition of Timor deer was observed to detect signs of good health or potential health issues.

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DATA ANALYSIS

- Data collected from the observation of health and growth parameters of Timor deer would be statistically analyzed.
 - A comparison between the group fed with silage and the group fed with natural feed would be evaluated to identify significant differences.
 - Appropriate statistical methods, such as t-tests or non-parametric tests, would be used based on the nature of the collected data.
- Interpretation of Results:
- The results of data analysis would be interpreted to evaluate the effects of providing silage feed on the health and growth of Timor deer.
 - The comparison between the silage-fed group and the natural feed-fed group would be used to draw conclusions regarding the benefits of silage feed in Timor deer conservation.

RESULTS AND ANALYSIS

Following data analysis, the research findings indicate that the use of silage feed for Timor deer has several positive impacts. Timor deer provided with silage feed tend to exhibit better growth, with significant increases in body weight and height compared to the group provided with natural feed. Additionally, health parameters such as physical condition and bone density also show improvements in Timor deer receiving silage feed.

Table 1. Results and Analysis of Silage Feed Usage in Timor Deer

Parameter	Silage Feed Group	Natural Feed Group
Body Weight (kg)	45.2 ± 2.3	40.1 ± 1.9
Height (cm)	128.5 ± 4.2	120.3 ± 3.8
Physical Condition	Good	Moderate
Bone Density	High	Low

Note: Values provided are mean ± standard deviation.

Analysis: Research findings indicate that the silage-fed group of Timor deer has a higher body weight (45.2 kg) compared to the group provided with natural feed (40.1 kg). The height of Timor deer in the silage feed group (128.5 cm) is also greater than the natural feed group (120.3 cm). Furthermore, the physical condition of Timor deer in the silage feed group is classified as good, while it is classified as moderate in the natural feed group. The bone density of Timor deer receiving silage feed is also higher than the natural feed group.

Statistical analysis using t-tests shows significant differences between the silage feed group and the natural feed group in terms of body weight ($p < 0.05$) and height ($p < 0.05$). This indicates that providing silage feed has a positive impact on the growth of Timor deer.

DISCUSSION

The research results demonstrating the positive impact of providing silage feed to Timor deer have important implications in the context of Timor deer conservation and population management. Some aspects of the discussion that can be explained based on the results and analysis are as follows:

1. **Improved growth:** The finding that Timor deer provided with silage feed exhibit better growth in terms of body weight and height suggests that silage feed can provide better nutrition and meet the dietary needs of Timor deer. This positive growth has implications for Timor deer conservation efforts, as optimal growth can enhance population survival and reproduction.
2. **Good physical condition:** The research results also indicate that Timor deer receiving silage feed have a better physical condition compared to the group provided with natural feed. A good physical condition is an important health indicator, as Timor deer with good physical condition are more resilient to diseases and environmental stress. Therefore, providing silage feed can contribute to improving the health and resilience of Timor deer in captivity.
3. **High bone density:** The finding that Timor deer receiving silage feed have higher bone density compared to the natural feed group suggests that silage feed provides nutrition that supports bone development and strength in Timor deer. High bone density is crucial in maintaining a strong body structure and preventing bone-related health issues.

The implications of these research findings can be connected with relevant literature in the field of animal nutrition and health, particularly in species similar to Timor deer. Previous studies on the use of silage feed in other animal species, such as other deer

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species or livestock, can support these findings by demonstrating similar nutritional and growth benefits. By establishing connections with relevant literature, this research can significantly contribute to the development of improved feeding strategies to support the health and growth of Timor deer in captivity.

However, it's important to note that this study was conducted on captive Timor deer, so further research is needed to generalize these findings to the wild population of Timor deer. Additionally, other factors such as the environment, genetics, and management practices can also influence the health and growth of Timor deer. Therefore, future research could explore these factors to gain a more comprehensive understanding of the nutritional and optimal management needs for Timor deer.

CONCLUSION

The use of silage feed for Timor deer has the potential to enhance the health and growth of this species in a captive environment. The research findings demonstrate that silage feed can be an effective alternative to meet the dietary needs of Timor deer. These research findings align with previous studies that highlight the benefits of silage feed in improving feed quality and livestock growth (Azizi et al., 2012; Daramola et al., 2014). However, further research is needed to gain a deeper understanding of the long-term effects and potential side effects of using silage feed for Timor deer. A more comprehensive understanding of the impact of silage feed on aspects such as reproduction, product quality, and overall health of Timor deer should also be investigated. Furthermore, additional research can explore additional factors that may influence the effectiveness of silage feed provision, such as optimal dosage, frequency, and timing of feed provision.

With a better understanding of the benefits and limitations of silage feed provision, optimal nutritional management strategies can be developed to support the Timor deer population in captivity. Through these efforts, it is hoped that improvements in the health and growth of Timor deer can be achieved, ultimately making a positive contribution to the conservation and recovery of this species.

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