Technical and Economic Value of the Use Ration for Male Fattening Bali Cattle Farmers Patterns with Supplementation Complete Feed Containing Silage Banana Stems

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Abstract. The purpose of this experimental was to determine the effect of giving complete feed containing silage of banana stems with different levels of feed conversion, efficiency of ration usage, production costs and profits from fattening Bali cattle farmers pattern. Experimental animals employed in this research were 12 heads of growing male Bali cattle of 1 to 1.5 years old with the body weight ranging from 111 to 136 kg, with an average of 120.79 kg and coefficient variation (CV) 5.23%, were employed. The experimental design used was completely randomized design (CRD) with 4 treatments and 3 replications: T₀: local feeds (commonly used by farmers) + 1 kg complete feed without banana stem silage, T₁: (commonly used by farmers) + 1 kg complete feed containing 10% silage of banana stems, T₂: (commonly used by farmers) + 1 kg complete feed containing 20% banana stem silage, T₃: (commonly used by farmers) + 1 kg of complete feed containing 30% silage of banana stems. Data collected was subjected to Analysis of Variance (ANOVA). The results showed that the effect of treatments was not significantly (P>0.05) on feed conversion, efficiency of ration usage, and profits from, but significantly (P<0.05) to production costs fattening Bali cattle farmers pattern. The conclusion of this study is the provision of complete feed containing silage of banana stems with different levels giving the same effect between treatments on feed conversion, efficiency of ration use and profits, but it has an influence on the production costs of fattening Bali cattle farmers pattern.

Keywords: banana stem silage, complete feed, fattening Bali cattle farmers patterns, technical and economic value.

1. Introduction
The constraints of farmers in improving the performance of local cattle are the slow pace of growth of local cattle, especially Bali cattle due to the low quantity and quality of feed, especially during the dry season, which causes low productivity of beef cattle, especially fattening cattle, which results in a decrease in farmers' income. Fattening system that still relies on traditional cultivation systems, as well as untapped use of local feed resources due to lack of knowledge of farmers in the field of feed processing technology [1]. This fact shows that there is a need for the application of local food processing such as banana stems that have not been used optimally as a commodity that has more...
value because of the low crude protein content of 4.81% and the coarse fiber content of 32.56%, but availability is sufficiently available in dry land areas such as NTT. Making silage is one of the breakthroughs that can be done because the processing procedure is easy to do so that it can be adopted by farmers [2]. To optimize the potential for silage of banana stems, it is necessary to combine it with other feed ingredients in the form of complete feed which aims to increase feed usability, complement feed elements so as to increase consumption and rumen microbial fermentation process in digesting low-quality feed [3]. Increasing the rumen fermentation process will have a positive impact on the technical value of ration use as a result of high absorption of nutrients by livestock to increase body weight and reduce ration costs and have an impact on increasing farmers' income.

2. Methodology

Material
The livestock used in this study were twelve male Bali cattle going in the age range of 1 - 1.5 years with body weight 111-136 kg, an average of 120.79 kg and a coefficient of variation of 5.23%. The feed material used in this study was basal feed in the form of lamtoro leaves and complete feed. The composition of the constituent feed ingredients and the nutritional content of the research ration for each treatment can be seen in Tables 1 and 2. The enclosure used is 12 individual plots, measuring 1.5 x 2m. The equipment used consists of a container to hold sample feed and faeces, digital scales with an excellent trademark with a capacity of 1000 kg with 0.5 kg sensitivity to weigh livestock, digital scales of morizon scale with a capacity of 10 kg with a sensitivity of 10 g to weigh feed.

Methods
The research method used was the experimental method using a completely randomized design (CRD) with 3 treatments and 4 replications. The treatment in this study is:

- **T₀**: local feeds (commonly used by farmers Timorese) + 1 kg complete feed without banana stem silage.
- **T₁**: local feeds (commonly used by farmers Timorese) + 1 kg complete feed containing 10% silage of banana stems.
- **T₂**: local feeds (commonly used by farmers Timorese) + 1 kg complete feed contains 20% silage of banana stems.

Livestock randomization
Before the research was carried out, cattle were weighed first to find out the initial body weight, then the animals were numbered. After the cattle are numbered, the cattle are put into each cage which has been prepared and then randomized to treatment using lottery / lottery.

Procedure for making silage. The banana stem is chopped into a small size of 2-3 cm, weighed in its fresh weight, then swayed until the remaining moisture content is 70%. The chopped ingredients were weighed, then mixed with rice bran 5% from the forage weight as a preservative, probiotics starbio 3% from the forage weight as the inoculum media according to [5], palm sugar 3% as a fermentation medium. After being mixed evenly then put into a silo in the form of a palastik drum with a capacity of 100 kg silage while pressed until it is solid until the condition becomes anaerobic, then closed using plastic and tied tightly, then stored at room temperature for 21 days. After 21 days the silage was harvested and aerated and then weighed fresh and heavy weight after drying and grinding into flour to be prepared as a complete feed preparation material.

The process of making complete feed. Preparation of feed ingredients in the form of rice bran, milled corn, fermented corn cob flour, gamal leaf flour, Moringa leaf flour, fish meal, starbio, urea and salt. After the ingredients are prepared, the feed ingredients are mixed homogeneously starting from the least feed ingredients to the most amount, with the aim of homogeneous mixing and accelerating the mixing process.

Consumption data collection procedures
Sampling of consumption data is carried out before feed is given to livestock. The feed is weighed first and the remaining feed is weighed the next day before feeding and the sample is taken (approximately
(10%) every day and dried in an oven at 60 °C for 7 consecutive days. At the end of the study, feed samples were given and the remaining feed was composited proportionally per head, then finely ground for analysis of nutrient content.

**Data Analysis**

The data obtained were tabulated and calculated then analyzed using variance analysis (ANOVA) according to a Completely Randomized Design (CRD) to determine the effect of treatment (Steel and Torrie, 1980) [6].

#### Table 1. Percentage ingredients of complete feed in DM basis

| Ingredients                  | T₀ (%) | T₁ (%) | T₂ (%) |
|------------------------------|--------|--------|--------|
| Rice-brain (%)               | 55     | 50     | 45     |
| Grinding corn (%)            | 20     | 15     | 10     |
| Fish meal (%)                | 5      | 5      | 5      |
| *Glicicidia sepium* leaves meal (%) | 10     | 10     | 10     |
| *Moringa oleifera* leaves meal (%) | 5      | 5      | 5      |
| Silage of banana stems (%)   | -      | 10     | 20     |
| Urea (%)                     | 2.5    | 2.5    | 2.5    |
| Salt (%)                     | 2.0    | 2.0    | 2.0    |
| *Starbio* (%)                | 0.5    | 0.5    | 0.5    |
| Total                        | 100    | 100    | 100    |

#### Table 2. Nutrients content of experimental ration in % of dry matter

| Ration ingredients            | OM %DM | CP (%DM) | EE (%DM) | CF (%DM) | CHO (%DM) | NEE (%DM) | Energy MJ/kg DM | Kkal/kg DM |
|-------------------------------|--------|----------|----------|----------|----------|-----------|-----------------|------------|
| *Leucaena leucocephala*       | 84.63  | 82.77    | 21.23    | 3.66     | 16.88    | 57.88     | 41.00          | 16.41      | 3,906.52    |
| *Acasia leucophloea* ficus sp | 82.80  | 80.84    | 16.60    | 3.46     | 24.56    | 60.78     | 36.22          | 15.72      | 3,742.55    |
| CF. T₀                        | 76.99  | 79.76    | 21.22    | 3.84     | 22.58    | 54.7      | 32.12          | 15.92      | 3,789.58    |
| CF. T₁                        | 73.90  | 80.33    | 20.27    | 3.70     | 16.80    | 56.36     | 39.56          | 15.93      | 3,791.76    |
| CF. T₂                        | 78.36  | 80.36    | 18.71    | 3.70     | 18.44    | 57.95     | 39.51          | 15.82      | 3,767.23    |

Analysis Results of the Feed Chemistry Laboratory – Faculty of Animal Husbandry, Nusa Cendana University (Undana) Kupang. DM = Dry Matter, OM = Organic Matter, CP = Crude Protein, C-Fat = Crude Fat, CF = Crude Fibre, CHO = carbohydrate, NEE = Non Extract Ether. The variables measured in this study are based on formulas according to instructions [4].

3. **Results and Discussion**

The technical and economic value of the use of rations in a livestock business needs to be known because it greatly determines the amount of production and its impact on the achievement of the profits obtained. Next, the average effect of treatment on the technical and economic value of ration use is presented in Table 3.

In Table 3, it can be seen that the highest feed conversion rate, that is in treatment T₀, is followed by livestock that get T₂ treatment and the lowest feed conversion is obtained in livestock that get treatment T₁. The results of the Analysis of Variance (ANOVA) showed that the treatment had no significant effect of P> 0.05 on the feed conversion for Bali cattle fattening the pattern of livestock farming. This proves that the use of silage of banana stems in complete feed does not affect the conversion of Bali cattle feed fattening patterns of people's livestock. This unreal difference is assumed because the level of consumption of BK shows a significant difference, but the Daily body

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**Table 3. Results of Feed Conversion Rate**

| Treatment | Feed Conversion Rate |
|-----------|----------------------|
| T₀        | 1.00                 |
| T₁        | 0.98                 |
| T₂        | 0.95                 |

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Analysis of feed conversion rate showed that the T₀ treatment has the highest feed conversion rate, followed by T₂ and T₁ treatments. This proves that the use of silage of banana stems in complete feed does not affect the conversion of Bali cattle feed fattening patterns of people's livestock.
weight gain produced is not significantly different. [7] Feed conversion is often used to see the efficiency of the ration, the size of conversion ration value is influenced by daily body weight gain and consumption of BK feed ingredients. This also shows that the addition of silage of banana stems in complete feed does not significantly influence the body weight of livestock with the amount of feed consumed. In addition, it is suspected that the level of use of banana stem silage in the ration has not reached its optimum point, so there is no difference in utilizing 1 kg of feed to produce 1 kg of body weight between treatments. The cattle in this study needed BK consumption of 3.33-4.08 kg BK from body weight 111-136 kg, to produce 1 kg of body weight.

### Table 3. Effect of treatment on daily weight gain and linear size of fattening male bali cattle

| Treatment | Variabel T0±SD | Treatment T1±SD | Treatment T2±SD | P-Value |
|-----------|----------------|----------------|----------------|---------|
| Feed conversion | 6.23 ± 1.23 | 4.81 ± 0.28 | 6.81 ± 1.38 | 0.10 ns |
| Feed efficiency (%) | 11.69 ± 2.4 | 14.95 ± 1.2 | 10.43 ± 2.0 | 0.07 ns |
| Final body weight (kg) | 171.33 ± 12.8 | 180.67 ± 9.2 | 184.67 ± 4.6 | 0.07 ns |
| Production costs (Rp) | 3,961,305 ± 4697.6 | 3,947,001 ± 5246.7 | 3,924,719 ± 1,994.3 | 0.00** |
| Receipt (Rp) | 5,477,000 ± 306,907 | 5,515,667 ± 241,473 | 5,515,667± 439,169 | 0.98 ns |
| Profit (Rp) | 1,515,695 ± 302,689 | 1,568,666 ± 239,524 | 1,590,948 ± 438,923 | 0.96 ns |

NS Not significantly, ** significantly

In treatment T1 the highest average daily body weight gain (598 g/h/d) has a feed conversion value of 4.81 lower than treatment T0 with daily body weight gain (460 g/h/d) with Feed conversion value was 6.23, while daily body weight gain was T2 (420 g /h/d) with feed conversion value of 6.81 (Table 4). This shows that the lower the conversion rate of rations, the higher the daily body weight gain achieved. [5] the lower the value of feed conversion means that the feed used to increase body weight is greater weight or low feed efficiency. In this study daily body weight gain in cattle with low body weight did not differ from daily body weight gain in high body weight cattle. This shows that the fattening male Bali cattle used are still in the relatively similar growth phase.

Although statistically it shows no different effect, empirically, treatment T1 has lower ration conversion than other treatments. This is because the treatment contains nutrients, especially protein and energy, which is sufficient for livestock so that more nutrients are converted to meat. [8] the lower the conversion rate the more efficient the ration is converted into livestock products. While treatment T2 obtained the highest feed conversion, this was due to the high consumption of feed but was not accompanied by increasing body weight as a result of the low digestibility value of the ration.

The highest average feed efficiency is in treatment T1 then followed by livestock that get treatment T0 and the lowest feed efficiency is obtained in cattle that get treatment T1. The results of Analysis of Variance (ANOVA) showed that the treatment had no significant effect on P> 0.05 on the efficiency of Bali cattle ration fattening the pattern of people's livestock. This is because there is no difference in feed consumption and weight gain obtained in this study so that it cannot influence the efficiency of the use of livestock ration as a result of providing complete feed containing silage of fermented banana stems. [9] ration efficiency is defined as the ratio of the number of product units produced (body weight gain) to the number of feed consumption units in the same time unit. Feed efficiency for meat production is influenced by several factors, namely livestock nation, composition and level of production and nutritional value of feed.

The average ration efficiency in the study ranged from 5-7% or 0.05-0.07 g / h/d (Table 3) lower than the results obtained by [5], namely the efficiency of feed use for cattle ranging from 0.075 to 0.112. However the feed efficiency obtained in T1 treatment is high, which is caused by higher BK and PK digestibility than other treatments resulting in high feed efficiency. [10] digestibility is a factor that influences feed efficiency. The results of this study are different from [11] who reported that the
efficiency of feed given fermented palm and concentrates with rumen by pass protein in local sheep was around 4.86-13.41%. [12] The feed provided is said to be efficient if the feed can be consumed entirely by livestock and well digested.

Feed efficiency is the value obtained from body weight gain produced per unit of dry matter consumed by ration [11]. The size of feed efficiency is influenced by daily body weight gain and feed consumed by livestock. The higher the ration efficiency value, the less amount of ration needed to produce one kilogram of meat that increases feed efficiency can reduce the cost of feed released and will produce better efficiency in the overall production system. Improving the efficiency of feed utilization will increase the chances of farmers to get greater profits.

The highest average production cost is in treatment T₀ then followed by livestock that get treatment T₁ and the lowest production costs are obtained in cattle that get treatment T₂. The results of the Analysis of Variance (ANOVA) showed that the treatment had a very significant effect on P <0.01 on the production costs of Bali cattle fattening in the pattern of people's livestock. This is due to the higher level of addition of silage of banana stems because they substitute feed energy sources such as rice bran and milled corn so that the lower costs incurred to produce 1 kg of complete feed, in other words the higher the level of substitution of local feed ingredients such as rice bran and maize with a high price with fermented agricultural and plantation crops, it will reduce the ration costs. While the benefits obtained in this study are the highest in T₂ treatment then followed by livestock that get treatment T₁ and the lowest gain is obtained in cattle that get treatment T₀. The results of the Analysis of Variance (ANOVA) showed that the treatment had no significant effect of P <0.05 on the profits of the Bali cattle fattening business in the pattern of people's livestock. This is because the final body weight (Table 3) achieved is not much different so that the selling value is not much different, although the released costs are very different to produce body weight. This illustrates that the ongoing costs of increasing livestock production are able to provide a profit so that the factor that needs to be considered is the nutritional quality of the ration given where the processing of agricultural waste and cultivation through a fermentation process is a breakthrough to reduce ration costs and have an impact on income levels farmer farmers.

4. Conclusions
The conclusion of this study is the provision of complete feed containing silage of banana stems with different levels giving the same effect between treatments on feed conversion, efficiency of ration use and profits, but it has an influence on the production costs of fattening Bali cattle farmers pattern.

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